

# Cotati General Plan Update

## Background Report

September 2011



*Photo: Richard Merriss*



Prepared for:



Prepared by:

**DE NOVO PLANNING GROUP**



A LAND USE PLANNING, DESIGN, AND ENVIRONMENTAL FIRM

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# BACKGROUND REPORT

FOR THE

## GENERAL PLAN UPDATE

SEPTEMBER 2011

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## 1. LAND USE, COMMUNITY CHARACTER, AND DEMOGRAPHICS

This chapter examines the land use and development patterns in the City of Cotati, as well as the City's demographics and housing profile. The information and analysis is intended to inform the General Plan Update process by providing both historical context and a baseline of existing land use, demographic, and housing development information. This chapter provides an overview of existing land uses and community patterns, community character, and demographics.

"Community Character" refers to the physical characteristics that lend shape, form and identity to the community. Concepts such as "small town," "quality of life," and "community" are expressions of familiar physical characteristic – landmarks, streets, buildings, parks, and natural features that create a unique identity in every community.

### REGULATORY FRAMEWORK

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

#### State

##### *CALIFORNIA GENERAL PLAN LAW*

Government Code Section 65300 requires that each county and city adopt a General Plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning."

The General Plan consists of a statement of development policies and includes a diagram or diagrams and text setting forth objectives, principles standards, and plan proposals. It is a comprehensive long-term plan for the physical development of the county or city and is considered a "blueprint" for development. The General Plan must contain seven state-mandated elements: Land Use, Open Space, Conservation, Housing, Circulation, Noise, and Safety. It may also contain any other elements that the City wishes to include. The land use element designates the general location and intensity of designated land uses to accommodate housing, business, industry, open space, education, public buildings and grounds, recreation areas, and other land uses.

The 2003 General Plan Guidelines, established by the Governor's Office of Planning and Research (OPR) to assist local agencies in the preparation of their general plans, further describes the mandatory land use element as a guide to planners, the general public, and decision makers prescribing the ultimate pattern of development for the City.

##### *CALIFORNIA ENVIRONMENTAL QUALITY ACT*

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

## Local and Regional

### *CITY OF COTATI GENERAL PLAN*

The City's current General Plan was adopted October 14, 1998, and was amended in 2002, 2003, 2004, and most recently on August 26, 2009. Land uses in Cotati have been developed based on the Land Use Map, goals, and policies established by the City of Cotati General Plan. The 1998 Cotati General Plan includes 15 broad goals that guide land use and planning decisions within the City. The goals most related to the topic of land use include:

- Establish an efficient and environmentally sensitive land use pattern that provides adequate space to meet housing and economic needs while maintaining Cotati's small-town image.
- Enhance the quality of life of Cotati residents through the creation and maintenance of well-designed and appropriately served neighborhoods.
- Establish the inner Hub area as a principal retail and service center.
- Future development shall complement Cotati's historic Hub and small-town image.

These guiding goals are reinforced by the City's General Plan Land Use Map through the designation of the Downtown Specific Plan Area, designation of urban land uses in and adjacent to established transportation corridors, locating the majority of industrial and highway commercial sites along the U.S. Route 101 corridor and Gravenstein Highway, and providing significant rural residential living opportunities within the City's Sphere of Influence.

### Land Use Designations

Table 1-1 summarizes the City's General Plan land use designations for areas within the City limits, Sphere of Influence and Urban Growth Area by acreage and parcels. In some cases, a single parcel will have multiple land use designations, so the number of parcels listed in this table exceeds the total number of parcels as counted by the County Assessor. Land use designations adopted under the 1998 General Plan, as amended through 2009, are shown on Figure 1-1. A brief description of each of the 1998 General Plan land use designations is provided below. These descriptions are based on the text of the 1998 General Plan, as amended through 2009. Sonoma County's land use designations for areas within the Sphere of Influence and Urban Growth Area are shown in Table 1-1a.

<b>TABLE 1-1: GENERAL PLAN LAND USE DESIGNATIONS</b>		
<b>Land Use</b>	<b>Parcels</b>	<b>Acreage</b>
<b>City Limits</b>		
Rural Residential (RR)	85	120.53
Low Density Residential (LDR)	143	136.96
Low/Medium Residential (LMDR)	1145	229.90
Medium Density Residential (MDR)	651	87.62
High Density Residential (HDR)	177	27.44
General Commercial (GC)	344	187.45
Highway Commercial (HC)	6	4.90
Office (O)	109	17.37
General Industrial (GI)	55	48.83
Commercial Industrial (CI)	28	59.79
Public Facilities (PF)	17	26.36
Park (P)	20	18.36
Open Space (OS)	1	0.93
No Designation and/or Right of Way	153	254.22
<b>TOTAL- City Limits</b>	<b>2934</b>	<b>1220.66</b>
<b>Sphere of Influence</b>		
Rural Residential (RR)	262	761.79
Low Density Residential (LDR)	29	97.00
Low/Medium Density Residential (LMDR)	38	36.50
General Commercial (GC)	5	22.08
Park (P)	3	8.74
No Designation and/or Right of Way	42	64.93
<b>TOTAL- SOI</b>	<b>379</b>	<b>991.04</b>
<b>Urban Growth Area</b>		
Rural Residential (RR)	57	320.96
General Commercial (GC)	1	16.64
<b>TOTAL- Urban Growth Area</b>	<b>58</b>	<b>337.6</b>

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<b>TABLE 1-1A: SONOMA COUNTY LAND USE DESIGNATIONS IN SOI AND UGA</b>		
<b>Land Use</b>	<b>Parcels</b>	<b>Acreage</b>
<b>Sphere of Influence</b>		
Rural Residential (RR)	337	925.34
Limited Commercial (LC)	3	11.61
Public/Quasi-Public (PQP)	2	5.34
Right of Way	37	48.74
<b>TOTAL- SOI</b>	<b>379</b>	<b>991.04</b>
<b>Urban Growth Area</b>		
Rural Residential (RR)	56	272.39
Land Extensive Agriculture	3	65.24
<b>TOTAL- Urban Growth Area</b>	<b>59</b>	<b>337.63</b>

*RR – Rural Residential:* The Rural Residential land use designation permits one residential unit per acre on land intended to provide for a limited variety of agricultural uses as outlined in the Zoning Ordinance. This designation also permits associated neighborhood retail. The average population density is three people per acre. The maximum building coverage is 20% and the height limit is 35 feet.

*LDR – Low Density Residential:* This designation permits up to two units per acre of single family residential attached or detached homes. The average population density is six people per acre. The maximum building coverage is 40% and the height limit is 28 feet.

*LMDR – Low-Medium Density Residential:* The Low-Medium Density Residential designation permits up to six units per acre of single family attached and detached units, duplexes, and planned unit development. This designation also permits associated neighborhood retail. The average population density is 14 people per acre. The maximum building coverage is 45% and the height limit is 28 feet.

*MDR – Medium Density Residential:* The Medium Density Residential designation permits up to ten units per acre of single family attached and detached units, duplexes, multiple-family dwelling units, and planned unit development. This designation also permits associated neighborhood retail. The average population density is 24 people per acre. The maximum building coverage is 45% and the height limit is 28 feet.

*HDR – High Density Residential:* The High Density Residential land use designation permits up to 15 units per acre of single family attached and detached units, duplexes, multiple-family units, and planned unit development. This designation also permits associated neighborhood retail. The average population density is 35 people per acre. The maximum building coverage is 50% and the height limit is 28 feet.

*GC – General Commercial:* The General Commercial land use designation provides for the basic business and service needs of the local community. Office and multi-family residential land uses which are easily integrated into the adjacent districts are also appropriate in the General Commercial district. The maximum building coverage is 100% and the height limit is 50 feet.

*HC – Highway Commercial:* The Highway Commercial land use designation applies to land adjacent to major arterials and permits uses which serve the traveling public and regional needs of the area. The maximum lot coverage is 80% and the height limit is 35 feet.

*O - Office:* The Office land use designation permits professional services, retail and residential land uses which are easily integrated into the adjacent residential districts. The maximum lot coverage is 80% and the height limit is 28 feet.

*GI – General Industrial:* The General Industrial land use designation applies to areas appropriate for manufacturing and warehousing uses. The maximum lot coverage is 80% and the height limit is 40, or 20 feet if located within 50 feet of any residential district.

*CI – Commercial/Industrial:* The Commercial/Industrial land use designation accommodates both light industrial and retail uses in the same district. The maximum lot coverage is 80% and the height limit is 40 feet.

*P - Parks:* The Parks land use designation is designed to identify land already utilized or intended for community recreational purposes. Appropriate uses include recreational facilities, and areas of important aesthetic, historical, or public health and safety significance. No dwelling units occupy this district. The uses in this category have a maximum building coverage of 5% and a height limit of 35 feet.

*OS – Open Space:* The Open Space land use designation applies to land areas which have been designated for the preservation of natural and scenic resources and a distinct community identity. The residential development would be limited to an average population density of one person for every two acres. The uses in this category have a maximum building coverage of 5% and a height limit of 35 feet.

*PF – Public Facilities:* The Public Facilities designation applies to land areas reserved for schools, government administration and operation facilities, and other facilities not of specific open space or recreation value. The lot coverage and height limit shall reflect the adjacent land uses where feasible.

### *CITY OF COTATI LAND USE CODE*

Title 17 of the Cotati Municipal Code consists of the City's Land Use Code. The City's Land Use Code carries out the policies of the Cotati General Plan by classifying and regulating the uses of land and structures within the City, consistent with the General Plan. The Land Use Code is adopted to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the City. More specifically, the purpose of this land use code is to:

- Provide standards and guidelines for the continuing orderly growth and development of the city that will assist in protecting the small town character and community identity of Cotati;
- Conserve and protect the city's natural beauty and setting, including scenic vistas, cultural and historic resources, hills and oak trees, and agrarian heritage;
- Ensure that proposed development and new land uses conserve energy and natural resources;
- Create a comprehensive and stable pattern of land uses upon which to plan transportation, water supply, sewerage, energy, and other public facilities and utilities;
- Ensure that proposed development is of human scale, primarily pedestrian-oriented, and designed to create attractive streetscapes and pedestrian spaces;

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- Minimize vehicle traffic by providing for a mixture of land uses, pedestrian-oriented development, compact community form, safe and effective traffic circulation, and adequate on- and off-street parking facilities;
- Provide neighborhoods with a variety of housing types to serve the needs of a diverse population; and
- Ensure compatibility between different types of development and land uses.

Article 2 of the Land Use Code (Municipal Code Sections 17.20 through 17.28) includes the City's Zoning Map, defines allowable land uses within each zoning district, provides development standards for each zoning district, identifies street and streetscape standards, and establishes standards for special purpose zones and overlay zones.

### *COMPREHENSIVE AIRPORT LAND USE PLAN FOR SONOMA COUNTY*

In January 2001, the Sonoma County Airport Land Use Commission adopted the Comprehensive Airport Land Use Plan for Sonoma County (CALUP), which sets forth the "referral area boundaries" around each airport and the limits on land use, building height and population density in those areas. The CALUP regulates land use in three major areas: safety zones, noise zones, and height restrictions. It provides land use compatibility guidelines for lands near the airport, to avert potential safety problems and to ensure unhampered airport operations. The CALUP establishes three safety zones that are linked to land use compatibility: clear, approach/departure, and overflight.

Under California Government Code Section 65302.3(a), general plans must be consistent with any airport land use plan adopted pursuant to Public Utilities Code Section 21675. Lands within the City of Cotati, the City's SOI and the City's Urban Growth Area are not located within any of the airport influence areas identified in the CALUP.

### *LOCAL AGENCY FORMATION COMMISSION OF SONOMA COUNTY*

In 1963, the State Legislature created a local agency formation commission (LAFCO) for each county, with the authority to regulate local agency boundary changes. Subsequently, the State has expanded the authority of a LAFCO. The goals of the LAFCO include preserving agricultural and open space land resources and providing for efficient delivery of services. The Sonoma County LAFCO has authority over land use decisions in Sonoma County affecting local agency boundaries. Its authority extends to the incorporated cities, including annexation of County lands into a city, and special districts within the County. LAFCO has the authority to review and approve or disapprove the following:

- Annexations to or detachments from cities or districts.
- Formation or dissolution of districts.
- Incorporation or disincorporation of cities.
- Consolidation or reorganization of cities or districts.
- Establishment of subsidiary districts.
- Development of, and amendments to, Spheres of Influence. The Sphere of Influence (SOI) is the probable physical boundary and service area of each local government agency. This may extend beyond the current service area of the agency.



- Extensions of service beyond an agency's jurisdictional boundaries.
- Provision of new or different services by districts.
- Proposals that extend service into previously unserved territory in unincorporated areas.

In addition, the Sonoma County LAFCO conducts Municipal Service Reviews (MSRs) for services within its jurisdiction. An MSR typically includes a review of existing municipal services provided by a local agency and its infrastructure needs and deficiencies. It also evaluates financing constraints and opportunities, management efficiencies, opportunities for rate restructuring and shared facilities, local accountability and governance, and other issues.

### *SONOMA COUNTY GENERAL PLAN*

Sonoma County adopted its General Plan in September 2008. The County's General Plan provides a comprehensive set of goals, policies, and implementing actions to guide the County's growth through the year 2020. The County's General Plan includes the following 10 elements:

- Land Use Element
- Housing Element
- Agricultural Resources Element
- Open Space and Resource Conservation Element
- Water Resources Element
- Public Safety Element
- Circulation and Transit Element
- Air Transportation Element
- Public Facilities and Services Element
- Noise Element

The County's General Plan establishes allowed land uses for lands within the City of Cotati's Sphere of Influence and Urban Growth Area. While the City of Cotati General Plan Land Use Map identifies planned land uses within the SOI and UGA, the County of Sonoma has ultimate land use planning and project approval authority within the SOI and UGA unless the lands are annexed to the City.

### *COTATI REDEVELOPMENT PROJECT FIVE-YEAR IMPLEMENTATION PLAN*

The Cotati Redevelopment Area and Redevelopment Agency were established in 1986. The purpose of establishing the Redevelopment Area was to create a mechanism by which the City could leverage public funds to remedy blight. The California Community Redevelopment Law, Health and Safety Code Section 33000 *et seq.* requires that a redevelopment agency administering a redevelopment plan prepare and adopt a new implementation plan for its project area every five years (Section 33490). The principal goal of the implementation plan is to guide an agency in implementing its redevelopment program to help eliminate blighting influences. In addition, the affordable housing component of the implementation plan provides a mechanism for a redevelopment agency to monitor its progress in meeting both its affordable housing obligations under the law and the affordable housing needs of the community. In effect, the implementation plan is a guide, incorporating the goals, objectives, and potential programs of an agency for the five-year implementation plan period, while providing flexibility so the agency may adjust to changing circumstances and new opportunities. The City's current Redevelopment Five-Year Implementation Plan covers the years 2010-2014. The Redevelopment Area is shown in Figure 1-2.

# 1. LAND USE

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## *DOWNTOWN SPECIFIC PLAN*

The Downtown Specific Plan (DSP) was adopted in August 2009, and superseded the La Plaza Specific Plan which was adopted in 1991. The DSP project area comprises approximately 59.5 gross acres (inclusive of road right-of-way) oriented generally along Old Redwood Highway from the northbound Highway 101 on-ramp south to Page Street, (see Figure 1-1). The DSP area is currently designated in the General Plan as General Commercial, Parks, and Public Facilities. The DSP area contains a mix of commercial, residential, public and parks uses.

The DSP implements a variety of goals and policies in the Cotati General Plan by providing a renewed vision and standards for the continuing enhancement of the Downtown and adjacent areas extending north to Gravenstein Highway. Six primary goals were established as part of the DSP:

1. Enhance Old Redwood Highway as the downtown, mixed-use center of Cotati community life.
2. Maintain the historic character which makes Cotati unique, and achieve a high level of design quality to reinforce this character.
3. Improve the walking and bicycling system through downtown Cotati as well as the interconnections between Cotati and the region.
4. Promote a street system that is safe for all modes of transportation within a successful commercial mixed-use environment.
5. Design housing to accommodate a diversity of income levels, ages, and needs.
6. Encourage development that is sustainable, energy efficient, and conserves resources.

The DSP establishes five districts: Historic Core, La Plaza, Northern Gateway, Commerce Avenue, and Parks. Development throughout the DSP is intended to focus on small-scale buildings with ground-floor commercial or office uses and primarily residential uses on the upper floors in order to create a vibrant, walkable community core. The DSP accommodates a maximum of 418,000 square feet of non-residential uses and 450 residential units.

*Historic Core* - The Historic Core district includes the portions of the Cotati downtown. This area is intended to maintain its historic character and smaller scale pedestrian orientation. Allowable land uses include ground floor commercial facing Old Redwood Highway. Office and residential uses may be permitted above or on the ground floor on other streets.

*La Plaza* - The La Plaza district includes the historic La Plaza Park, and properties along La Plaza Street surrounding the original park site. Properties around the park are intended to provide for small-scale ground floor retail with some office and restaurant uses that are highly compatible with residential above, emphasizing opportunities for business operators to live above their workspaces. Buildings are intended to emphasize small-scale ground floor pedestrian-oriented storefronts or frontages, with upper floor office or residential uses.

*Northern Gateway (NG)*. The Northern Gateway district includes properties along both sides of Old Redwood Highway north of La Plaza district to south of Commerce Avenue district. This area is intended for a new mixed-use core, accommodating a wide variety of retail, restaurant, and entertainment uses, with offices and primarily residential above.

*Commerce Avenue* - The Commerce Avenue district includes properties along the east side of Old Redwood Highway across from Highway 101 and up to the north City limits. This area is intended to accommodate a variety of land use types ranging from automobile-oriented uses that serve the travelling public, to retail, office, and residential uses.

*Parks* - The Parks district is applied to land designated as open space, principally La Plaza Park.

### *SANTERO WAY SPECIFIC PLAN*

The Santero Way Specific Plan (SWSP) was adopted on July 12, 2000 and amended in 2001. The plan area is located on the eastern edge of Cotati (see Figure 1-1). A governing objective of the plan is to allow for a mix of uses resulting in a vital neighborhood that complements the existing character of Cotati. Development is planned to support all modes of transportation, including bus and the future Sonoma Marin Area Rapid Transit station, to reduce use of single-occupant automobiles. Land use regulations developed in the plan ensure a mix of uses providing for residential, commercial, and employment needs of the community that are complementary with development of the downtown Hub.

The SWSP establishes objectives related to land use and community character, circulation, utilities and public services, and implementation. At buildout, the plan would accommodate 198 homes, up to 270,000 square feet of commercial and employment development, and approximately 225,000 square feet of public and private open space. Five land use districts: Retail Mixed-Use, Office Mixed-Use, Employment, Residential, and Parks are identified in the plan. Each of the mixed-use and employment districts identifies a minimum and maximum percentage of uses, including retail, office, live/work, and residential, allowed in each development to ensure that a variety of uses is provided.

*Retail Mixed-Use* – The Retail Mixed-Use district requires development of retail uses on the ground floor, allows office uses on the ground and upper floors, and limits residential uses limited to work and entrance lobbies on the ground floor, and allows residential uses on the upper floors.

*Office Mixed-Use* – The Office Mixed-Use district requires development of office uses on the ground floor, allows work area of live/work units, apartments or condominium uses on the ground floor, with upper floors limited to residential and any portion of live/work units.

*Employment* – The Employment district allows cottage business, office, and live/work units.

*Residential* – The Residential district is intended to add activity to the neighborhood in the evenings and weekends while allowing a mix of housing that accommodates affordable units allowing people to live and work in the neighborhood. Allowed land uses include single family attached and detached homes, including duplexes, townhomes, and live/work units. Property G allows for employment uses such as cottage businesses and offices.

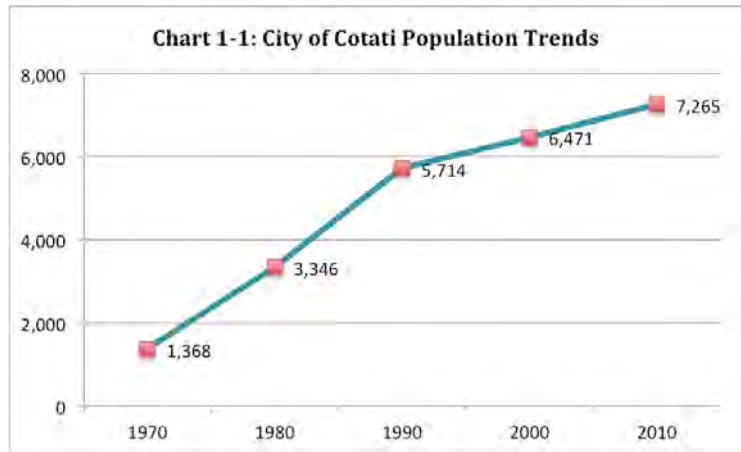
*Parks* – Three public parks or plazas are designated within the SWSP: the Transit Plaza, the Village Green, and the Neighborhood Park. The parks and plazas shall be designed for both active and passive uses, and reflect the character of the buildings and uses that front onto them.

# 1. LAND USE

## EXISTING SETTING

### Population and Housing

The population of Cotati has increased steadily over the years, growing from 3,346 persons in 1980 to 7,265 in 2010. The decade from 1970 to 1980 experienced the greatest population increase, 14.5 percent annual growth, followed by another decade of strong growth from 1980 to 1990. From 2000 to 2010, the population increased from 6,471 to 7,265 persons, an increase of 1.2 percent per year. It is projected that the population of Cotati will increase at a slightly lower annual rate of 0.8 percent over the next ten to fifteen years, of 0.8 percent to reach a population of approximately 7,867 persons in 2020. Historical population growth trends in Cotati are shown in Chart 1-1 and growth trends in Cotati and Sonoma County from 1970 through 2010 are shown in Table 1-2.

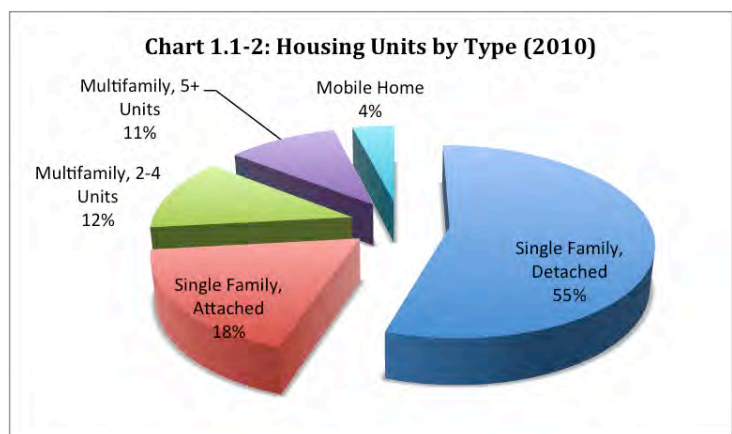


**TABLE 1-2: POPULATION GROWTH – COTATI AND SONOMA COUNTY**

	1970	1980	1990	2000	2010	1970-2010 Change	2000-2010 Change	Avg. Annual Change
<b>Cotati</b>	1,368	3,346	5,714	6,471	7,264	431%	12%	1.2
<b>Sonoma County</b>	204,885	299,681	388,222	458,614	483,878	136%	5.5%	0.6%

SOURCE: DEPARTMENT OF FINANCE, 2010

The City’s population grew by about 1,551 or by 27 percent over the last twenty years, while households grew generally at proportional levels. Interestingly enough, the City’s housing stock grew at a much higher rate than population growth over the last 20 years. Particularly, from 2000 to 2010, the population increased by 13 percent while the housing stock increased by 23 percent. This divergence in growth rates can be partially attributed to the recession, which has resulted in a number of foreclosed and unoccupied homes in the City as well as production of a number of smaller one or two bedroom housing units that are occupied by households smaller than the average size during previous decades. Due to the recent economic decline, growth in both the population and housing stock over the next few years is anticipated to remain relatively low.



There are 3,143 housing units in Cotati. The majority of housing units in the City are single family detached (55 percent), with single family attached units, such as condominiums and townhomes, comprising the second largest type of housing unit (see Chart 1-2). The vacancy rate in the City is 5.3 percent, which means 2,978 of the housing units are occupied. The 2,978 households have an average household size of 2.44 persons, a decrease from the average size of 2.55 in 2000.

Detailed demographical information discussing the characteristics of the City's population, households, and housing units will be provided in the Housing Element Update Background Report (draft anticipated to be published August 2011).

## Land Use Patterns

When discussing land use, it is important to distinguish between planned land uses and existing land uses. The General Plan land use designations identify the long-term planned use of land but do not present a complete picture of existing land uses. The Sonoma County Assessor's office maintains a database of existing land uses on individual parcels, including the number of dwelling units and related improvements such as non-residential building square footage. This information is used as the basis for property tax assessments.

General Plan land use designations for parcels within the City, Sphere of Influence, and Urban Growth Area are described below. Assessed land uses are described in the following subsection.

### *General Plan Land Use Designations*

#### *RESIDENTIAL LANDS*

Residential lands include parcels with a General Plan designation of Rural Residential, Low Density Residential, Low/Medium Density Residential, Medium Density Residential, and High Density Residential. There are 2,201 parcels of residential land within the City limits, totaling 602.45 acres. A detailed breakdown of land use designations by parcel count and acreage is shown in Table 1-1.

**Rural Residential** parcels within the City limits range in size from approximately 0.1 acres up to 5 acres. There are 85 parcels within the City limits designated Rural Residential, totaling 120.53 acres. Within the Sphere of Influence there are 262 RR parcels, totaling 761.79 acres, with parcels reaching up to 18.25 acres in size. Within the Urban Growth Area there are 57 RR parcels, totaling 320.96 acres, with parcels reaching up to 77.38 acres in size. The majority of the RR parcels within the City limits are located west of Highway 101, south of the Gravenstein Highway, and west of West Cotati Avenue, in the vicinity of Thomas Page Elementary School. RR parcels are also located within the City limits in the southern portion of the City, along Cypress Avenue. The majority of the City's Sphere of Influence area is located south and west of the City limits. Most parcels within the City's SOI are designated RR. The City's Urban Growth Area extends beyond the SOI to the north and west, and consists almost entirely of RR parcels. This land use pattern provides for extensive rural living opportunities in and around Cotati and results in the concentration of higher development densities near the City center and eastern portions of the City. The vast areas of RR lands surrounding the City contribute to Cotati's small-town feel.

**Low Density Residential** parcels within the City limits range in size from 0.18 acres up to 10.20 acres. There are 143 parcels within the City limits designated LDR, totaling 136.96 acres. Within the Sphere of Influence there are 29 parcels designated LDR, totaling 97.0 acres. There are no LDR parcels within the Urban Growth Area. Most of the LDR parcels within the City limits are located south of Valparaiso Avenue, and east of Highway 101. There are also a limited number of LDR parcels located along West

## 1. LAND USE

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Cotati Avenue, south of Gravenstein Highway. LDR parcels with the Sphere of Influence are located south of Helman Lane, to the northwest of the City limits, and north of East Railroad Avenue, southeast of the City limits. The location and distribution of LDR parcels within Cotati supports the City's prevailing land use pattern, which places lower density residential parcels around the City's edges, while concentrating higher density residential development patterns closer to the City core and adjacent to comparable residential development densities in Rohnert Park to the east.

**Low/Medium Density Residential** parcels within the City limits range in size from 0.01 acres up to 9.6 acres. There are 1,145 LMDR parcels totaling 229.9 acres within the City. Within the Sphere of Influence there are 38 LMDR parcels totaling 36.5 acres. There are no LMDR parcels within the Urban Growth Area. LMDR parcels represent the largest percentage of residential parcels within Cotati, and are spread throughout most areas of the City. The largest concentration of LMDR parcels is located in the eastern area of Cotati between Old Redwood Highway and the City limits. The LMDR parcels are largely developed with single-family housing.

**Medium Density Residential** parcels within the City limits range in size from 0.01 acres to 5.34 acres. There are 651 Medium Density Residential MDR parcels within the City, totaling 87.62 acres. There are no MDR parcels within the Sphere of Influence or Urban Growth Area. MDR parcels within the City are generally located closer to the City core, with the largest concentration of parcels occurring north of the Hub along Wilford Lane near the City's northeastern border.

**High Density Residential** parcels within the City limits range in size from 0.01 acres to 2.91 acres. There are 177 HDR parcels in the City, totaling 27.44 acres. There are no HDR parcels located in the Sphere or Influence or Urban Growth Boundary. The HDR parcels generally occur in "clusters" which are located throughout areas of the City, east of Highway 101.

### *COMMERCIAL LANDS*

Commercial lands include parcels with a General Plan designation of General Commercial, Highway Commercial, and Office. There are 459 parcels of commercial and office land within the City limits, totaling 209.72 acres. A detailed breakdown of land use designations by parcel count and acreage is shown in Table 1-1.

**General Commercial** parcels within the City represent the vast majority of commercial land use designations in Cotati. There are 344 parcels of GC lands totaling 187.45 acres. There are five GC parcels in the Sphere of Influence, totaling 22.08 acres, and one GC parcel in the Urban Growth Area totaling 16.64 acres. The largest GC parcel within the City is 12.37 acres. Smaller GC parcels are concentrated around the Hub. Larger GC parcels are located north of the Hub, along Old Redwood Highway, and the largest GC parcels are located west of Highway 101 along the Gravenstein Highway. All of the parcels along Santero Way, in the eastern area of Cotati are also designated GC.

**Highway Commercial** parcels within the City are located immediately west of Highway 101 along the Gravenstein Highway. There are only six HC parcels totaling 4.9 acres. There are no HC parcels within the Sphere of Influence or Urban Growth Area.

**Office** parcels are concentrated to the north of East Cotati Avenue, east of the Hub. There are 109 Office parcels totaling 17.37 acres. There are no office parcels within the Sphere of Influence or Urban Growth Area.

*INDUSTRIAL LANDS*

Industrial lands include parcels with a General Plan designation of General Industrial and Commercial Industrial. There are 83 parcels of industrial land within the City limits, totaling 108.62 acres. A detailed breakdown of land use designations by parcel count and acreage is shown in Table 1-1.

**General Industrial** parcels in Cotati are all concentrated near the City's northern boundary, west of Highway 101 and north of the Laguna de Santa Rosa creek channel. GI parcels range in size from 0.12 acres to 4.12 acres. There are no GI parcels within the Sphere of Influence or Urban Growth Area.

**Commercial Industrial** parcels in Cotati are all concentrated in an area north of Helman Lane and west of Highway 101. CI parcels range in size from 0.03 acres to 10.94 acres. There are no CI parcels within the Sphere of Influence or Urban Growth Area.

*PUBLIC, PARKS AND OPEN SPACE LANDS*

Public, Parks and Open Space lands include parcels with a General Plan designation of General Public Facilities, Parks, and Open Space. There are 38 parcels with these land use designations within the City limits, totaling 45.65 acres. A detailed breakdown of land use designations by parcel count and acreage is shown in Table 1-1.

**Public Facilities** parcels are spread throughout Cotati and are generally developed with uses such as City Hall, parks, Thomas Page Elementary, and churches. Parcels range in size from 0.12 acres to 4.0 acres. There are no PF parcels within the Sphere of Influence or Urban Growth Area.

**Parks** parcels within the City limits range in size from 0.03 acres to 4.79 acres. The Parks designation is applied to Helen Putnam Park, Kotate Park, La Plaza Park, areas immediately east of Thomas Page Elementary, and areas along the Laguna de Santa Rosa. Not all of the parks within the City have a land use designation of P. There are three parcels, totaling 8.74 acres of Parks land located in the Sphere of Influence, east of Old Redwood Highway and north of Fern Avenue.

**Open Space** is limited to a single 0.93-acre parcel in Cotati located west of Wilford Lane in the northeastern portion of the City.

*Assessed Land Uses*

Table 1-3 summarizes land uses based on the County Assessor's data.

TABLE 1-3: ASSESSED LAND USES –CITY OF COTATI					
Use Description	Parcels	Acres	% of Acres	Dwelling Units	Non-Residential Square Footage
<b>Commercial</b>					
Vacant Commercial Land	32	42.94	3.52%	1	0
Store	15	22.66	1.86%	32	102,408
Store and Office Combo, Single Story	4	0.96	0.08%	0	13,614
Shopping Center	8	18.53	1.52%	0	137,047
Office Building	8	2.45	0.20%	4	22,780
Professional Building	10	5.75	0.47%	1	19,012

# 1. LAND USE

**TABLE 1-3: ASSESSED LAND USES – CITY OF COTATI**

Use Description	Parcels	Acres	% of Acres	Dwelling Units	Non-Residential Square Footage
Miscellaneous Commercial Space	10	11.04	0.90%	0	57,884
Restaurant or Bar	9	5.11	0.42%	3	23,575
Bank	1	0.18	0.01%	0	2,825
Service Station	9	9.17	0.75%	0	19,304
Service Shop	5	2.66	0.22%	1	15,946
Nursery	1	0.87	0.07%	0	0
<i>Subtotal - Commercial</i>	<i>112</i>	<i>122.32</i>	<i>10.02%</i>	<i>42</i>	<i>414,395</i>
<b>Industrial</b>					
Vacant Industrial Land	17	15.92	1.30%	0	0
Light Manufacturing	22	30.68	2.51%	2	160,099
Warehouse	44	42.03	3.44%	166	391,902
Lumber	1	2.94	0.24%	0	0
Packing Plant	1	2.67	0.22%	1	0
Miscellaneous Industrial	2	1.86	0.15%	0	12,600
<i>Subtotal - Industrial</i>	<i>87</i>	<i>96.1</i>	<i>7.87%</i>	<i>169</i>	<i>564,601</i>
<b>Residential</b>					
Vacant Residential Land	236	266.46	21.83%	1	0
Single Family Dwelling	2,101	345.77	28.33%	2,044	0
Duplex or Double	116	48.30	3.96%	213	0
Three and Four Unit Complexes	30	10.38	0.85%	104	0
Apartments	29	28.47	2.33%	254	1,901
Rural Residence 1-20 acres	67	148.05	12.13%	42	2,370
Residential Common Area	36	37.56	3.08%	0	0
Mobilehome/Trailer Park	4	11.91	0.98%	0	0
<i>Subtotal - Residential</i>	<i>2,619</i>	<i>896.9</i>	<i>73.49%</i>	<i>2,658</i>	<i>4,271</i>
<b>Government</b>					
State Government Properties	3	2.11	0.17%	0	0
County Government Properties	19	22.46	1.84%	0	0
City Government Properties	53	34.58	2.83%	1	12,672
Special Districts Properties	3	20.53	1.68%	0	12,998
<i>Subtotal - Government</i>	<i>78</i>	<i>79.68</i>	<i>6.53%</i>	<i>1</i>	<i>25,670</i>



**TABLE 1-3: ASSESSED LAND USES – CITY OF COTATI**

Use Description	Parcels	Acres	% of Acres	Dwelling Units	Non-Residential Square Footage
<b>Institutional</b>					
Religious Property	5	12.76	1.05%	3	5,860
School	7	4.88	0.40%	5	1,164
Home (Institutional)	2	0.69	0.06%	0	0
<i>Subtotal - Institutional</i>	<i>14</i>	<i>18.33</i>	<i>1.50%</i>	<i>8</i>	<i>7,024</i>
<b>Recreational</b>					
Indoor Recreation Facility- Private	1	1.96	0.16%	0	0
Park	1	0.35	0.03%	0	0
<i>Subtotal - Recreational</i>	<i>2</i>	<i>2.31</i>	<i>0.19%</i>	<i>0</i>	<i>0</i>
<b>Miscellaneous Categories</b>					
Utilities	1	0.03	<.01%	0	0
Roadway	4	3.76	0.31%	0	0
Parking Lot- Private	4	1.19	0.10%	0	0
Dry Farm- Wasteland	3	0.04	<.01%	0	0
<i>Subtotal - Miscellaneous</i>	<i>12</i>	<i>5.02</i>	<i>0.41%</i>	<i>0</i>	<i>0</i>
<b>GRAND TOTAL</b>	<b>2,924</b>	<b>1,220.66</b>	<b>100.0%</b>	<b>2,878</b>	<b>1,015,961</b>

SOURCE: SONOMA COUNTY ASSESSOR'S OFFICE, 2011 AND DE NOVO PLANNING GROUP, 2011

# 1. LAND USE

## Pending and Approved Projects

Table 1-4 lists recently approved and pending projects in the City of Cotati.

<b>TABLE 1-4: APPROVED AND PENDING DEVELOPMENT PROJECTS</b>		
<b>Location</b>	<b>Description</b>	<b>Status</b>
780 West Cotati	5-Lot Subdivision on a 4.58-acre site	Tentative Map valid until 9/26/12 Final Map approval pending Design Review required
Village Walk Subdivision 690 East Cotati Avenue at Lancaster Avenue	46-lot Residential Subdivision on a 3.88-acre site	Final Map Recorded Design Review pending
100 Valparaiso Avenue	64-lot residential subdivision of a 10-acre site located on the corner of Old Redwood Highway and Valparaiso (100 Valparaiso).	Approved by City Council on 10/28/09
7764 Old Redwood Highway	Peet's Coffee & Tea  Remodel building on 0.26 acres	Under construction
Oliver's Market Highway 116 and Old Redwood Highway	40,000-square-foot grocery, 14 apartments, office space, and 18,000 square feet of retail space	Project application in process
Habitat for Humanity APN 144-650-020	Five self-help affordable single family homes.	Project application in process
Sonoma County Housing Land Trust Ryan Lane APN 144-301-012	Six affordable single family homes.	Project application in process
Site not yet determined.	Up to 45 affordable multifamily units in the Downtown Specific Plan.	Project application pending
<b>TOTAL</b>	110 residential lots approved; 19 residential lots pending approval; 58,000 square feet of non-residential uses pending approval; and 56 residential units pending application.	

SOURCE: CITY OF COTATI, 2011; CITY OF COTATI, 2010

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## COMMUNITY CHARACTER

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Cotati is a small historic town located 40 miles north of San Francisco, in the southern region of Sonoma's wine country. Cotati has a population of approximately 7,265 and was established in 1892 by the Page brothers, acting as The Cotati Company on an 1877 Spanish land grant. The City incorporated in 1963. Cotati is located in the southern portion of Sonoma County, immediately adjacent and to the west of the City of Rohnert Park. Sonoma County as a region covers approximately 1,604 square miles, including Pacific Ocean beaches and wine country hillsides. There are nine incorporated towns and cities in Sonoma County, with a total countywide population just below 484,000. Cotati is the smallest incorporated city in Sonoma County.

Cotati has long been considered the "Hub" of Sonoma County by virtue of its central location and its distinct and historic hexagonal plaza. Surrounded by beautiful vistas of hills, vineyards, majestic oaks and redwoods, Cotati mixes all the benefits of living in a small city, with the cultural advantages of being located near more major urban centers and a highly acclaimed state university. Cotati's roots are steeped in agriculture and music, and its citizens are proud of the diverse and charming community that has been shaped by over 100 years' history.

There are a number of events and celebrations that take place throughout the year that offer a wide variety of community entertainment and activities. The annual Kids' Day Parade and Festival, the summertime Farmers' Market, the Cotati Jazz Festival, Oktoberfest and the Cotati Accordion Festival, the largest Accordion Festival in California, all take place in historic La Plaza Park, in the heart of Cotati.

### *HISTORY*

Over 2,000 years ago the fertile valleys of the Cotati area had been home of Coastal Miwoks, a clan of Native Americans who lived well on the nuts, grains and tubers, berries, fish and game that abounded in the region's temperate climate. The Indian name of their village, Kota'ti, produced the legend of Chief Cotati, whose visage is featured in the city's logo.

In 1837 the Mexican government established a system of land grants, including the 17,234-acre Rancho Cotate, which encompassed what is now Cotati, Rohnert Park and Penngrove. At that time the Sonoma County region marked the northernmost frontier of Mexican territory. The Mexican government was anxious to establish its hold on the area, since it was being eyed for takeover by several nations. Rancho Cotate was first awarded to Capt. Juan Castenada, but he was unable to hold onto the land grant, and within a few years it was purchased by the California land-baron Thomas Larkin. In 1846 the Bear Flag Rebellion succeeded in displacing the Mexican domination of the region. The Bear Flaggers were primarily Anglo-Americans who did not want to sit by and wait for the British, French or Russian to wrest the lands from Mexican control. The original papers deeding the Rancho Cotate were lost in the takeover of the Sonoma fort. Larkin subsequently sold the Rancho to Joseph Ruckle, who sold it to Dr. Thomas Page in 1849.

Although Page purchased Rancho Cotate in 1849, it would be another seven years until he received clear title to the land since the original deed had been lost. For nearly 80 years after that, the Page family controlled most of what was called Cotati Valley, the area covering the southern end of the Santa Rosa plain.

Dr. Page and most of the family members actually spent very little time living on the ranch. Two of the seven Page sons developed the land into a cattle and sheep concern, and until the early 1890's it

## 1. LAND USE

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remained largely unchanged. During these years, the two roads that connected Santa Rosa and Petaluma traversed the east and west boundaries of the ranch.

During the period from 1849 to 1892, the most significant development for Cotati was the building of the railroad, which was completed in 1870. Not until 1892 would a town begin to gather around the wood and water stop known only as Page's Station, because when Dr. Page died in 1872, he provided in his will that the ranch would not be subdivided and sold until the youngest Page son reached the age of 25. In this way, Cotati became the last of the Sonoma County Ranchos to remain intact.

Finally, in 1892, the Cotati Land Company was formed by the Page family to subdivide and sell the vast ranch, and to transform Page's Station into a small town. To head up the marketing of the five, ten and twenty acre parcels, they hired David W. Batchelor. Batchelor succeeded in selling over 900 tracts of land for the Page brothers, and also was a pioneer in the poultry business, which he is credited with introducing into the region.

By 1895 the county road was built between Santa Rosa and Petaluma, passing directly through the hexagonally laid-out heart of the new town. In 1909 this road would be incorporated into what was then called California Route One, running from San Francisco to Crescent City. It was this road, along with the train station, which opened up Cotati as a convenient place to stop for travelers. On Feb. 13, 1894 the U.S. Post Office was installed, and by the turn of the century Page's Station had become a town named Cotati. The construction of the center of the town in the hexagonal motif allowed the Page family to name each of the six peripheral streets after one of the seven Page sons.

Throughout the first half of the 20<sup>th</sup> century, Cotati remained a relatively small rural community with a farming and agricultural focus. Residential growth pressures in the 1950's led to calls for the community to incorporate. By the fall of 1961, citizens of semi-rural Cotati and infant Rohnert Park, discontented with the level of services provided by the county, were exploring the possibilities of merging their interests and incorporating as one city. A joint citizens' committee was formed, and a municipal expert, William Zion, was hired to conduct a feasibility study. By January 1962, however, a contingent in Rohnert Park had decided that a combined city wasn't to their liking, and filed notice of their intention to incorporate independently. Rohnert Park's incorporation was approved by voters on August 21, 1962.

On August 27, one day before Rohnert Park was to be officially declared a city, the Cotati committee filed its notice of intention to circulate incorporation petitions. Boundaries of the proposed city were roughly the same as the Cotati Public Utility District but extended farther out Gravenstein Highway and down East Cotati Avenue to include Sonoma State College, an extension later nullified by the state. Thirty-seven citizens signed the petition which was presented to the Board of Supervisors, stating that incorporation "seemed necessary to retain the character of the town, preserve its name and guide its future growth." Voters approved the measure to incorporate the City of Cotati on July 2, 1963.

Sonoma State University opened in 1966. The year 1968 saw the birth of the counter culture's influence on Cotati. The Inn of the Beginning, a nightclub, came alive and brought nationally and internationally recognized musicians to Sonoma County. The major forms of music played were rhythm and blues, rock and roll, country and western, and folk. Already a popular area with the students, Cotati attracted a variety of independent and colorful citizens leading to a number of unique traditions and characteristics, including the Cotati Accordion Festival, which continues to this day; the Freestore, where Cotati residents could outfit themselves free of charge; and Cotati Company No. 2, an early incubator for entrepreneurs and micro-enterprise.

During the 1990's and early 2000's, Sonoma County grew at a rapid pace. Many of these transplants have moved to the area in an effort to escape the crowded city life of the larger Bay Area cities to the south such as San Francisco and San Jose.

This rapid growth has provided a significant challenge to the City and to the preservation of its unique charm. Managing this growth has become one of the prominent issues facing the City. While many feared that too much growth would spoil the City's small town character, others felt that too little growth would cause more and more City residents to leave Cotati to shop at newly constructed shopping centers in Santa Rosa, Rohnert Park and Petaluma. They feared that this would cause the City's share of the sales tax revenue to wither, leaving the City unable to provide adequate City services.

Throughout the 1990's, Cotati has faced this challenge by effectively encouraging growth within strict limitations. In 1990 the citizens of Cotati overwhelmingly voted to curtail the growth of the City by forbidding any annexation of land beyond a fixed urban boundary line. This highly popular self-imposed limit on annexation turned the focus on development inwards. The City has worked aggressively to enhance the downtown area and to encourage business development. In the 80's the City remodeled the two-block downtown stretch of Old Redwood Highway. In 1991 the City Council voted to enact the La Plaza Downtown Specific Plan which kicked-off a series of enhancements to the City's downtown including new bus shelters, sidewalks and city benches. During this period, La Plaza Park was remodeled extensively with a new bandstand and a new playground structure. The City also has worked towards significant developments outside the downtown including a successful industrial section and on a plan for mixed-use residential/commercial development on E. Cotati Avenue associated with future commuter rail travel.

### *COMMUNITY DESIGN*

Cotati's urban design and walkable orientation, with its central hexagonal plaza, urban core, and vibrant neighborhoods, coupled with pastoral, rural areas on the fringe make Cotati a unique and attractive community.

Recent development trends in Cotati have placed more emphasis on higher density residential development projects such as small-lot residential subdivisions and apartment/condominium developments with shared open space and communal areas and access and connectivity to existing and planned services, especially along commercial corridors.

### ***Neighborhoods, Districts, and Corridors***

Its unique urban design is one of the most attractive features of Cotati. From the street layout around the central La Plaza hexagon to the collection of early 1900s Victorian and Arts and Crafts homes, Cotati is easily recognizable as a special place. The earlier architecture has in some cases been compromised by later additions that do not complement its character. The Land Use Code establishes building siting and design standards for each zoning district of the City, and the Downtown Specific Plan will guide the design, placement, and coordination of future development along the Old Redwood Highway corridor.

**Neighborhoods**, which make up most of Cotati, are primarily residential areas where people can walk to a mixed-use neighborhood center in 5-10 minutes - though many people consider the block they live on as their true neighborhood. Local neighborhood centers include community spaces such as schools and parks, as well as informal meeting places like cafes.

## 1. LAND USE

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**Districts** are areas where nonresidential uses prevail, such as the historic core and the Redwood Drive industrial area. Other uses may occur in these areas, but their characters are shaped by the primary commercial and industrial uses.

**Corridors** can be natural features, such as the Laguna de Santa Rosa, or transportation routes, such as major streets or the railroad. Corridors can form both boundaries and connections between neighborhoods or districts. Cotati's urbanized corridors are expected to continue to become vibrant mixed-use areas, as is already happening along East Cotati Avenue and Old Redwood Highway south of La Plaza, and is called for along Old Redwood Highway north of La Plaza by the Downtown Specific Plan.

The range of buildings in Cotati's neighborhoods, districts, and corridors includes attached and detached housing, apartments, shops, restaurants, and civic facilities. Public buildings such as City Hall and places of worship retain special importance by serving as landmarks that shape visual character.

### *COMMUNITY CHARACTER AND FORM*

By virtue of its development over time in different subdivision and architectural styles, Cotati generally combines traditional neighborhood development near the City core with areas more closely resembling the suburban pattern of cul-de-sacs and non-connecting streets in residential areas near the periphery of the City.

Cotati's downtown area (the Hub) is the City's urban center, and contains the greatest mix of uses - including retail, office, and civic - and buildings tend to be more urban, such as apartments above retail shops (like the co-housing development). Buildings are close to the property line, sidewalks are larger, parking is often diagonal, and public meeting spaces are key features. Cotati is fortunate to have a thriving historic center with a variety of uses and a main street and plaza for celebrations, farmer's markets, and the everyday experience of the marketplace and civic participation. The Downtown Specific Plan extends the urban center north along Old Redwood Highway. The Plan calls for aligning buildings along the corridor to define the street and sidewalk and to accommodate pedestrians, cars, and bicycles in careful balance. Most uses will be allowed in the expanded urban center corridor, and public transportation can be accessed from most places within the community by foot.

In general, Cotati's urbanized areas outside of the downtown area have a blend of building types, but are primarily residential in nature. Detached houses, townhouses, apartments, and small amounts of retail and office uses all occur throughout the areas of the City east of Highway 101, and are usually based on compatible building size and shape, rather than strict control of uses. Setbacks tend to be minimized, roads allow on-street parking, sidewalks are required, and landscaping is more uniform. These areas lie within a 5-minute walk of a neighborhood center, as is the case of the Wilford Lane and LaSalle Avenue neighborhoods.

Suburban areas in Cotati typically consist of detached homes. Yards tend to be bigger, houses set back more, roads smaller, and landscaping more natural, as in the Lund Hill and West Cotati Avenue areas. Suburban areas are usually more than a 5-10 minute walk from a neighborhood center.

In most suburban areas, roads are sized and designed for traffic flow, which creates barriers for pedestrians and bicycles. However, with the exception of Old Redwood Highway (which is addressed in the Downtown Specific Plan) and East Cotati Avenue, streets in Cotati generally allow a comfortable balance among pedestrians, cars, and bicycles. Cotati also lacks the large housing tracts that increase dependence on vehicles for everyday needs. Pedestrians and bicycles have fairly safe and direct access to their destinations in most areas.

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REFERENCES

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The primary sources of data referenced for this section is derived from the following:

California Department of Finance. 2010. Table E-5, Population and Housing Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark.

City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.

City of Cotati. 2009. Downtown Specific Plan.

City of Cotati. 2011. Santero Way Specific Plan.

Cotati Community Redevelopment Agency. 2010. Cotati Redevelopment Project Five-Year Implementation Plan, 2010-2014.














U.S. Census Bureau. 2010 and 2000.










**Figure 1-1: Existing General Plan Land Use Map**

Land Use Designations

-  RR - Rural Residential
-  LDR - Low Density Residential
-  LMDR - Low/Medium Density Residential
-  MDR - Medium Density Residential
-  HDR - High Density Residential
-  OSR - Open Space
-  GC - General Commercial
-  HC - Highway Commercial
-  O - Office
-  P - Park
-  PF - Public Facilities
-  GI - General Industrial
-  CI - Commercial Industrial

Planning Areas

-  Planning Areas
-  Sphere of Influence
-  Urban Growth Boundary
-  Downtown Specific Plan Area
-  Santero Way Specific Plan Boundary



0 600 1,200 2,400 Feet

1:20,000

Data source: Cotati GIS. Map date: June 30, 2011.

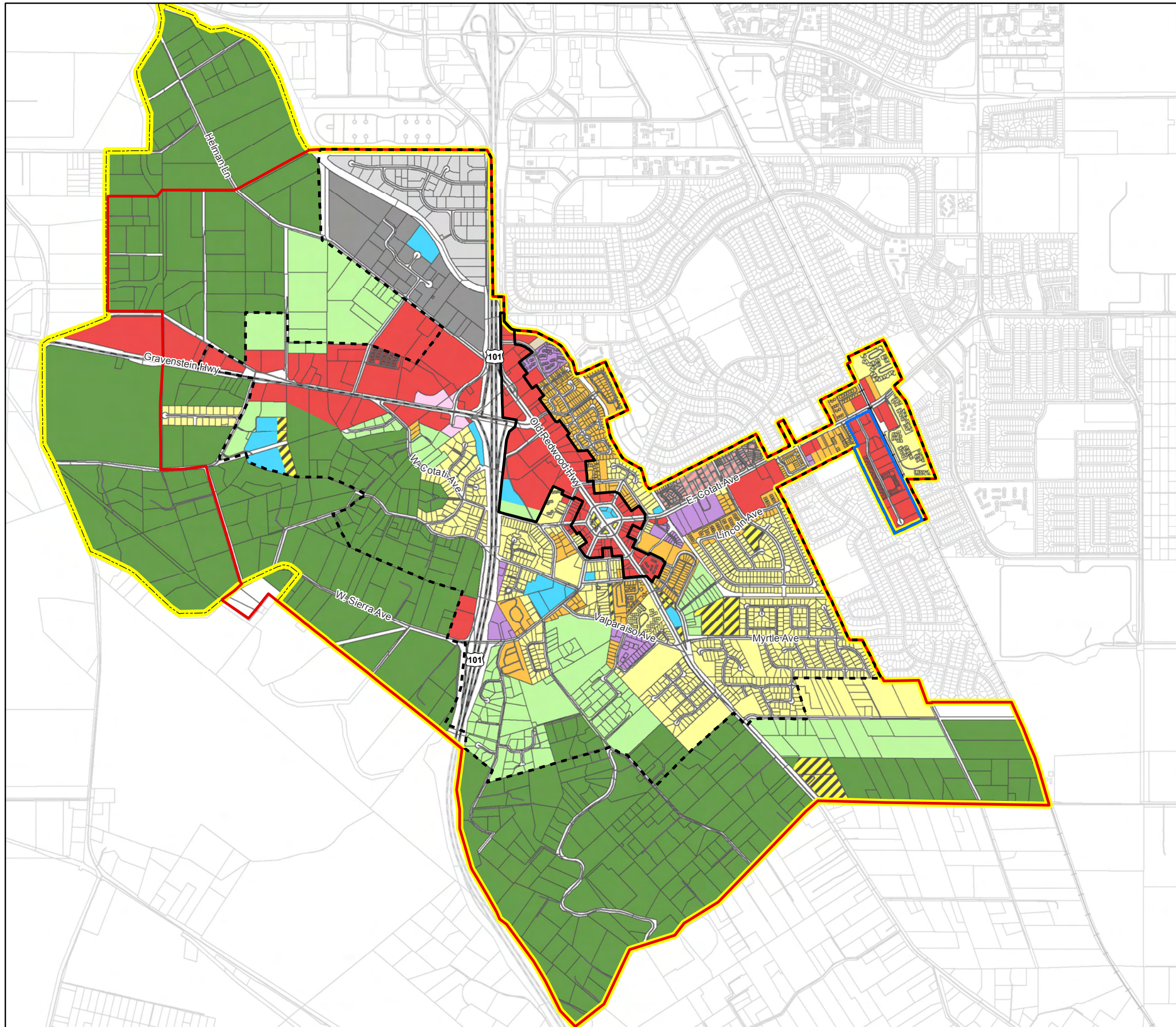
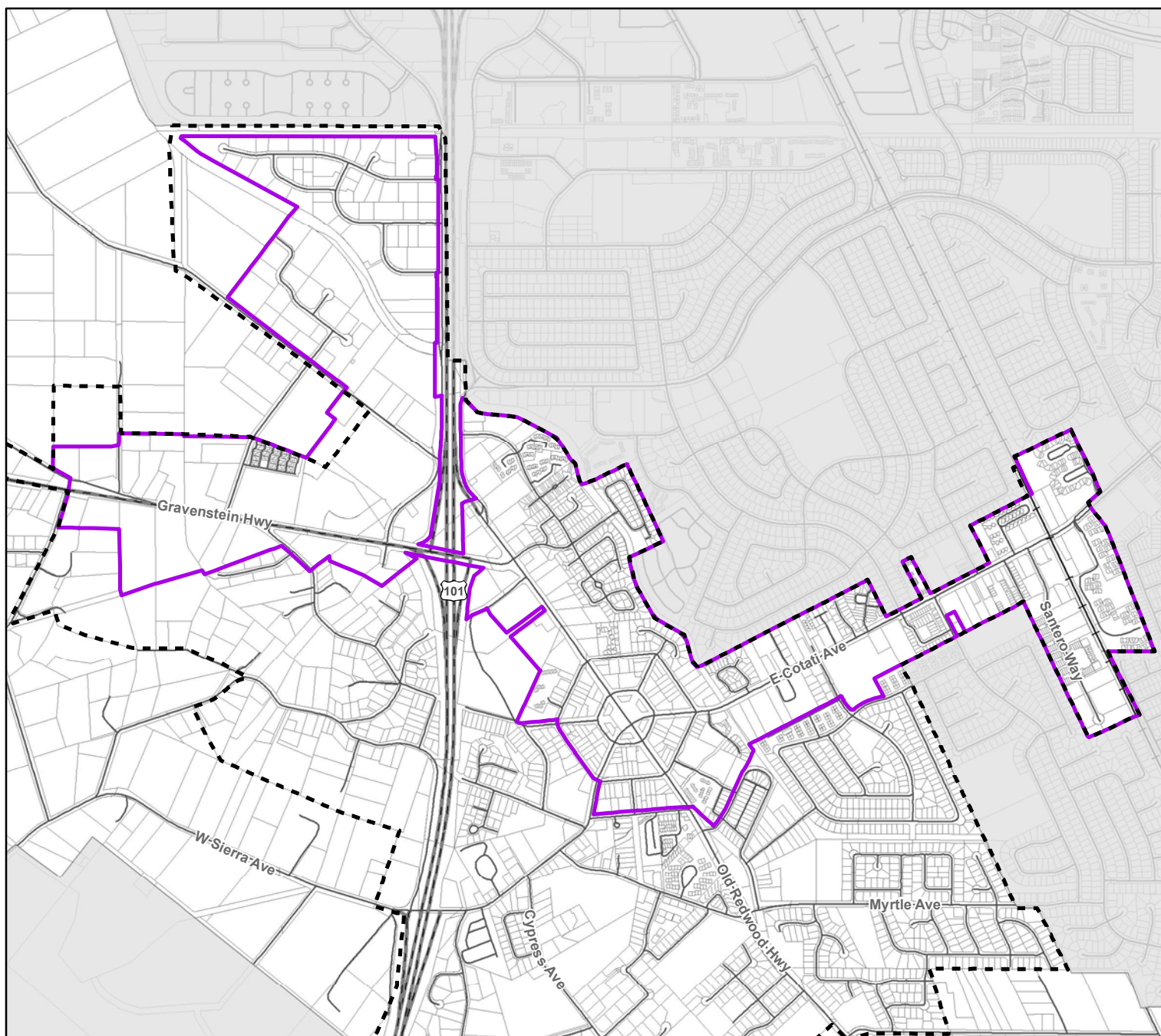




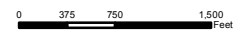




Figure 1-2: Redevelopment Agency Project Area



-  Project Boundary
-  Cotati City Limits



1:18,000

Data source: Cotati Community Redevelopment Agency; Cotati GIS. Map date: June 30, 2011.



### 2. COMMUNITY HEALTH AND WELLNESS

This section addresses community health and wellness in the City of Cotati. This section provides an overview of existing health conditions in Cotati and describes components of the built environment that impact human health. Community health and wellness is related to a number of environmental categories and topics. Therefore, this section of the Cotati General Plan Background Report contains numerous references to other sections in this report. For example, conditions regarding transit options, bicycle facilities, and pedestrian facilities are addressed in Section 4. Parks and recreational facilities are discussed in Section 5. Hazardous materials and applicable hazards regulations are addressed in Section 7. Air quality and air quality regulations as well as water quality and water quality regulations, are addressed in Section 9.

### 2.1 HEALTH AND THE BUILT ENVIRONMENT- BACKGROUND AND OVERVIEW

#### HISTORICAL BACKGROUND

The field of city planning and the roles of city planners grew out of concerns for public health and welfare during the periods of rapid industrialization and urban growth in American cities in the early 20<sup>th</sup> century. These concerns were related to pollution and unsanitary conditions in cities where industrial operations such as tanneries and slaughter houses abutted homes and schools, and tall skyscrapers blocked light and air from streets. Poor living conditions for city residents often resulted in infectious disease outbreaks and public health emergencies. Early planners required sanitary sewers to prevent cholera epidemics and zoned city blocks to buffer residential neighborhoods from polluting industries, often resulting in a strict separation of uses that is still common today.

These land use restrictions, infrastructure requirements, and development regulations went far beyond the 19<sup>th</sup> Century Common Law Theory of Nuisance that addressed public health and safety by prohibiting ‘unreasonable’ uses of land to prevent similar outbreaks of infectious diseases.

By 1926, the U.S. Supreme Court’s decision on Village of Euclid vs. Ambler Realty Co. established the right of local governments to control land use through zoning laws and introduced the concept of ‘Euclidean’ Zoning that segregated land uses to minimize conflicts. While these laws and trends prevented factories from locating close to neighborhoods, and offered centralized wastewater and waste disposal services which decreased instances of disease and epidemics, they also resulted in a shift in the built environment.

Strong zoning regulations that separated industrial and residential uses gave rise to the rapid expansion of suburbs and the “suburban lifestyle” during the 1950s. Increased U.S. investments in the national highway system, and the increased accessibility of the automobile to average American families resulted in people living further and further away from their place of work, schools, shopping centers, and recreational centers. Improvements in the transportation system, including the construction of freeways, further weakened the connection between work, home, retail, and other daily services, isolating them from one another and making them accessible only by car.

While these laws and trends prevented factories from locating close to neighborhoods, and offered a means to escape from the polluted city center, they also provided local governments the power to exclude and segregate communities, and supported the growth of suburbs. People were protected from infectious diseases such as tuberculosis and cholera, but they now faced new epidemics such as obesity, asthma, heart disease, and diabetes, all related to the design of the built environment.

## 2. COMMUNITY HEALTH AND WELLNESS

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Despite the historical connection between public health and planning, addressing public health through city planning became less common as the 20th century progressed. One reason is that early planning practices successfully resolved many of the public health issues plaguing urban areas during the early 20th century, such as overcrowding and the close proximity of housing to heavy industry. Public health professionals began to focus on disease treatment, education, and discouraging unhealthy behaviors, while planning professionals shifted their attention to such issues as economic development and transportation. In particular, planners focused on how to accommodate rapid population growth and the desire for unlimited personal mobility through driving. Zoning increasingly became a means to protect property values and bolster the tax base, and infrastructure projects more often served to provide for efficient movement of vehicles.

In recent decades, however, there has been a rediscovery and professional shift in city planning that recognizes the role our built and natural environments play in public health and wellbeing. The environmental movement in the 1970s gave rise to the environmental review process, including the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Other urban planning concepts such as new urbanism and smart growth are attempting to reverse the impacts of urban development policies of the previous decades. All these efforts attempted to return to the traditional neighborhoods and urban form that valued a mix of uses, pedestrian and transit amenities and compact development.

### CURRENT TRENDS

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The places where people live, work, and play profoundly shape the health of a community. Transportation options, accessible parks, crosswalks, the availability of grocery stores, and the prevalence of fast food restaurants, and real or perceived levels of crime and safety are a few examples of physical indicators that provide a framework for a community, sculpt the daily routines of residents, impact lifestyle choices, and ultimately affect public health and longevity. Collaborative work between city planners and public health professionals can help strategically develop spaces and systems for safe and healthy human activity.

A growing body of evidence supports the idea that the built environment (urban form, design, and street configurations) has a strong impact on the public's health. Between 1995 and 2010, the number of Americans who are overweight or obese (as measured by body mass index, or BMI) has increased from 15.9 percent to 27.6 percent.<sup>1</sup> Additionally, between 2004 and 2010, the percentage of Americans diagnosed with diabetes increased from 7 percent to 8.7 percent.<sup>1</sup>

Based on current obesity trends, for the first time in American history, children are not predicted to live as long as their parents.<sup>2</sup> Increasing rates of these chronic conditions in the US have paralleled higher levels of physical inactivity, auto-dependence, and consumption of foods high in calories and low in nutrients. There is a movement to better understand our decisions about the way we structure our community. Walkable urban form, more compact development, mix of land uses, transportation

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<sup>1</sup> Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, Prevalence and Trends Data: California 2010. Available at <http://apps.nccd.cdc.gov/brfss>. Accessed on June 21, 2011.

<sup>2</sup> L. Besser and A. Dannenberg, *Walking to Public Transit: Steps to Help Meet Physical Activity Recommendations*, Vol. 32, Issue 4, *American Journal of Preventative Medicine*, at 273-280 (November 2005).

choices, and access to recreation spaces all increase physical activity, which can improve health outcomes.<sup>3</sup>

Land use and planning decisions play a role in determining community members' behavioral and lifestyle choices that ultimately impact their physical health and mental wellbeing. The quality, safety, location, and convenience of the pedestrian or bicycle environment, such as sidewalks, bicycle lanes, signals, and crosswalks, can impact a resident's decision to use them, which in turn influences physical activity levels. Similarly, neighborhood parks and open space provide an avenue for increased physical activity. Infrastructure and zoning to support local food processing and distribution enables local food to be used in the community where it was grown. Access to full-service grocery stores and farmers' markets is also correlated with increased consumption of fruits and vegetables. The physical presence and distribution of health care providers and facilities influence how easily people can access health care.

Furthermore, urban design and maintenance can contribute to or decrease levels of crime and perceptions of pedestrian comfort and safety. Poor mental health is associated, in part, with a number of factors related to planning, including long commute times, exposure to crime, lack of transportation choice, driving related stress, lack of access to public spaces, and lack of opportunities for recreation and physical activity. Emissions from transportation sources are strongly linked with respiratory diseases, and various toxic contaminants are known or suspected to cause asthma and cancer. Driving carries with it the risk of accidents that are fatal and or cause injuries for drivers, cyclists, or pedestrians. Automobile accidents kill about 40,000 Americans each year. In 2009 alone, over 4,000 pedestrians were killed in auto accidents.<sup>4</sup> Crash data trends and analysis for the City is provided in Section 5 of this Background Report.

Addressing public health in the Cotati General Plan Update acknowledges the profound effects of the built environment on travel choices, access to food, levels of physical activity, and exposure to risk from accidents or pollution. Each of these has a health impact, and the General Plan provides an opportunity to prevent further disease and injury and sustain healthy lifestyle choices for Cotati residents.

## 2.2 HEALTH AND WELLNESS IN COTATI

### LEADING CAUSES OF DEATH

The California Department of Public Health provides detailed statistics on deaths throughout California. Table 2.2-1 shows total deaths by age in the City of Cotati for the years 2000, 2005 and 2009. Table 2.2-2 shows the percentage of deaths by age for Cotati and California in 2009, while Table 2.2-3 shows the causes of death, by percentage, in 2009 for Cotati and California.

<sup>3</sup> Frank, L.; Kavage, S; Litman, T. (2006). Promoting Public Health through Smart Growth. Prepared for *Smart Growth BC*: page 6.

<sup>4</sup> National Highway Traffic Safety Administration, Fatality Analysis Reporting System, National Statistics. (2009). Accessed June 21, 2011. Accessible at: <http://www-fars.nhtsa.dot.gov/Main/index.aspx>.

## 2. COMMUNITY HEALTH AND WELLNESS

**Table 2.2-1 Deaths by Age in Cotati**

Year	Total Deaths	Sex		Age										
		M	F	<1	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
2000	51	21	30	-	-	-	-	1	5	3	8	6	12	16
2005	40	24	16	-	-	-	1	1	1	4	5	6	14	8
2009	60	32	28	1	-	-	-	2	3	2	10	5	16	21

SOURCE: CALIFORNIA DEPARTMENT OF HEALTH, DEATH PROFILES BY ZIP CODE (94931). DATA FILES FROM 2000, 2005 AND 2009. AVAILABLE AT: [WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX](http://WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX). ACCESSED JUNE 21, 2011. NOTE: DATA IS ONLY AVAILABLE BY ZIP CODE, AND ZIP CODE 94931, WHICH INCLUDES ALL OF THE CITY, ALSO INCLUDES LIMITED PORTIONS OF THE COUNTY IN THE CITY'S URBAN GROWTH AREA.

As shown in Table 2.2-1, there have been very few deaths in Cotati of persons under 35 years of age during the sample years shown. In 2000 and 2009, approximately one-third of total deaths in Cotati were of persons over 85 years old. For all sample years, over 55 percent of total deaths in Cotati were of persons 75 years and older.

**Table 2.2-2 Percentage of Deaths by Age (2009)**

Age	Cotati	California
<1	1.67%	1.12%
1-4	0%	0.21%
5-14	0%	0.27%
15-24	0%	1.39%
25-34	3.33%	1.78%
35-44	5.00%	3.18%
45-54	3.33%	7.94%
55-64	16.67%	12.37%
65-74	8.33%	15.43%
75-84	26.67%	24.88%
85+	35.00%	31.42%

SOURCE: CALIFORNIA DEPARTMENT OF HEALTH, DEATH PROFILES BY ZIP CODE (94931). DATA FILES FROM 2009. AVAILABLE AT: [WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX](http://WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX). ACCESSED JUNE 21, 2011.

As shown in Table 2.2-2, the percentages of deaths by age in Cotati generally mirror statewide statistics in California. Death rates in the 25-34 and 35-44 age brackets are approximately 1.5 percent higher in Cotati than in California, while death rates in the 45-54 age range are approximately 4.5 percent lower than the statewide average. The largest divergence in death rates between Cotati and California occurs in the 65-74 age range, with approximately 7 percent fewer deaths occurring in Cotati.

Table 2.2-3 shows the causes of death, by percentage, in the City of Cotati and the entire State of California in 2009, as reported by the California Department of Health.



**Table 2.2-3 Causes of Death by Percentage (2009)**

Cause	Cotati	California
Heart Disease	28%	25%
Cancer	37%	24%
Stroke	2%	6%
Lower Respiratory Disease	5%	6%
Injury (unintentional)	3%	5%
Pneumonia or Influenza	0	4%
Diabetes	0	3%
Alzheimer's	0	3%
Liver Disease or Cirrhosis	3%	2%
Suicide	7%	2%
Hypertension	0	2%
Homicide	0	1%
Other	15%	18%

SOURCE: CALIFORNIA DEPARTMENT OF HEALTH, DEATH PROFILES BY ZIP CODE (94931). DATA FILES FROM 2009. AVAILABLE AT: [WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX](http://WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX). ACCESSED JUNE 21, 2011.

Table 2.2-3 shows that the leading cause of death in Cotati in 2009 was cancer, which was the second leading cause of death Statewide. However, the percentage of deaths in Cotati in 2009 caused by cancer were approximately 13 percent higher than the statewide percentage. The second leading cause of death in Cotati in 2009 was heart disease, which accounted for approximately 28 percent of all deaths.

Another noteworthy statistic regarding deaths in Cotati is the relatively high percentage of deaths by suicide. Suicide in Cotati in 2009 accounted for seven percent of all deaths, which is approximately five percent high than the statewide average of two percent. It should be noted however, that in 2008 there were no deaths by suicide reported for Cotati, while in 2007 suicides accounted for 4.5 percent of deaths. In 2005 suicides in Cotati accounted for 5.0 percent of all deaths. The data indicates that while 2009 was an abnormally high year for suicides in the City, the percentage is consistently above the statewide average.

## OBESITY AND OVERWEIGHT

Evidence demonstrates that risk of cancer, heart disease, stroke, Alzheimer's, and diabetes can be decreased by avoiding obesity or being overweight through lifestyle and behavior changes such as increased physical activity<sup>5</sup> and reduced consumption of foods high in calories, sugar, and fat.<sup>6</sup> As shown above, heart disease and cancer are the two most prevalent causes of death in Cotati, and both of these causes exceed the statewide averages.

The California Health Interview Survey (CHIS) is the nation's largest state health survey. A random-dial telephone survey conducted every two years on a wide range of health topics, CHIS data gives a detailed picture of the health and health care needs of California's large and diverse population. Data regarding

<sup>5</sup> Giles-Corti, B., ad Donovan, R.J. (2002). "The Relative Influence of Individual, Social and Physical Environment Determinants of Physical Activity". *Social Science & Medicine* 54: 1793-1812.

<sup>6</sup> Morland, K., Roux, A., & Wing, S. (2006). "Supermarkets, Other Food Stores, and Obesity: The Atherosclerosis Risk in Communities Study". *American Journal of Preventive Medicine* 30(4):333-339.

## 2. COMMUNITY HEALTH AND WELLNESS

obesity and overweight status is available from CHIS for Sonoma County and the entire State. While data specific to the City of Cotati is not available, the Sonoma County data provides the City with useful insight into obesity and overweight status for adults and teens living throughout the County, including the City of Cotati. Adult obesity and overweight trends are shown in Table 2.2-4 and teen obesity and overweight trends are shown in Table 2.2-5.

Year/Region	Overweight (BMI 25.0 – 29.99)	Obese (BMI 30.0 or higher)
2001/Sonoma County	34.3%	14.1%
2009/Sonoma County	36.8%	21.4%
2001/California	35.5%	19.3%
2009/California	35.0%	24.4%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2001 & 2009 ADULT SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: [WWW.CHIS.UCLA.EDU/](http://WWW.CHIS.UCLA.EDU/) ACCESSED JUNE 22, 2011.

As shown in the table above, overweight status in adults, or those with a body mass index (BMI) of 25.0 – 29.99, are very similar to statewide rates, and have shown approximately a 1.5 percent increase in Sonoma County from 2001 to 2009. Obesity rates among adults in Sonoma County are slightly lower than the statewide average, however, adult obesity rates in Sonoma County increased by over seven percent between 2001 and 2009, which exceeds the statewide adult obesity increase of approximately five percent during the same time period.

Year/Region	At Risk of Overweight (85 <sup>th</sup> -95 <sup>th</sup> percentile)	Overweight/Obese (highest 5 <sup>th</sup> percentile)
2003/Sonoma County	18.3%	6.3%
2009/Sonoma County	18.9%	10.3%
2003/California	16.6%	12.4%
2009/California	16.7%	12.0%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2003 & 2009 TEEN SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: [WWW.CHIS.UCLA.EDU/](http://WWW.CHIS.UCLA.EDU/) ACCESSED JUNE 22, 2011.

Teens considered at-risk of being overweight, or those in the 85<sup>th</sup>-95<sup>th</sup> BMI percentiles, occur in slightly higher rates in Sonoma County compared to the rest of the State, while teens who are overweight or obese (the highest 5<sup>th</sup> BMI percentile) are slightly lower than the statewide average. However, between 2003 and 2009 teen overweight/obesity levels in Sonoma County increased by four percent, while Statewide levels decreased slightly.

### PHYSICAL ACTIVITY AND FITNESS

Lack of physical activity is a major risk factor for many chronic diseases and leading causes of death, including cancer, heart disease, diabetes, stroke, and Alzheimer's. The 2009 California Health Interview Survey includes data regarding activity levels for children and teens in Sonoma County. As shown in the table below, over 31 percent of children ages 5-11 were physically active every day of the week for at least one hour, which is significantly higher than the Statewide average for children. While a higher percentage of children in Sonoma County were more active seven days a week than the Statewide averages, the percentage of children in the County who were not active for one hour per day on any day of the week was also higher than the Statewide average. Nearly 15 percent of children in the County

reported zero days per week of more than one hour of physical activity, compared to a Statewide average of 11.8 percent.

The data shows that exercise and activity levels decrease from childhood ages to teen ages. Only 14.7 percent of teens in the County were active for at least one hour, seven days a week, compared to 31.3 percent of children.

Days per Week	Sonoma County Children (5-11)	California Children (5-11)	Sonoma County Teens	California Teens
0	14.9%	11.8%	13.9%	16.2%
1	11.0%	7.0%	5.4%	6.4%
2	10.2%	14.1%	23.5%	14.1%
3	14.2%	14.1%	13.0%	15.8%
4	11.6%	12.3%	9.9%	10.3%
5	6.8%	14.4%	17.8%	14.7%
6	-	3.8%	2.0%	7.2%
7	31.3%	22.6%	14.7%	15.2%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2009 CHILDREN AND TEEN SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: [WWW.CHIS.UCLA.EDU/](http://WWW.CHIS.UCLA.EDU/) ACCESSED JUNE 22, 2011.

CHIS data also captures trends on transportation modes and choices. According to CHIS data, 34.8 percent of students in Sonoma County walked, biked or skated to or from school during a typical week. Additionally, 78 percent of teens reported visiting a park or other open space area in the past month (from the time the 2009 CHIS survey was conducted). Nearly 83 percent of adults reported that they walked for transportation, fun, and/or exercise on a regular basis.

In addition to CHIS data, another indicator of physical activity and fitness is the California Department of Education's Physical Fitness Testing (PFT) Program, which is administered by local school districts to all fifth, seventh, and ninth graders annually.<sup>7</sup> The test assesses six major fitness areas, including aerobic capacity (cardiovascular endurance), body composition (percentage of body fat), abdominal strength and endurance, trunk strength and flexibility, upper body strength and endurance, and overall flexibility. The PFT Program provides a statewide snapshot of physical fitness. However, its data is collected at the local school district level by people who are not health professionals, and tests for each of the fitness areas are difficult to administer consistently. Consequently, its results are prone to some margin of error over time and from place to place.

PFT results from Thomas Page Elementary School in Cotati and the Cotati-Rohnert Park School District for the 1998-99 academic year are shown in Table 2.2-7, and results from the 2009-10 academic year are shown in Table 2.2-8.

<sup>7</sup> California Department of Education. Physical Fitness Testing Results, Accessed on June 22, 2011. Accessible at <http://www.cde.ca.gov/ta/tg/pf/pftresults.asp>.

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**TABLE 2.2-7 STUDENT PHYSICAL FITNESS TESTING (PFD) RESULTS (1998-99)**

# of Physical Areas Meeting the HFZ	Thomas Page Elementary School		Cotati-Rohnert Park School District		California	
	Gr. 5	Gr. 9	Gr. 5	Gr. 9	Gr. 5	Gr. 9
6 of 6 fitness criteria	10.7%	-	26.3%	0.0%	19.9%	20.4%
5 of 6 fitness criteria	23.2%	-	28.9%	23.0%	26.6%	26.4%
4 of 6 fitness criteria	35.7%	-	22.6%	34.4%	22.7%	21.7%
3 of 6 fitness criteria	19.6%	-	11.5%	23.4%	15.6%	14.3%
2 of 6 fitness criteria	5.4%	-	6.6%	11.8%	8.4%	7.6%
1 of 6 fitness criteria	1.8%	-	2.1%	3.1%	3.5%	3.5%
0 of 6 fitness criteria	3.6%	-	2.1%	4.3%	3.3%	6.1%

Source: California Department of Education, Physical Fitness Testing Results. Available at: [www.cde.ca.gov/ta/tg/pf/pftresults.asp](http://www.cde.ca.gov/ta/tg/pf/pftresults.asp). Accessed 6/22/2011.

**TABLE 2.2-8 STUDENT PHYSICAL FITNESS TESTING (PFD) RESULTS (2009-10)**

# of Physical Areas Meeting the HFZ	Thomas Page Elementary School		Cotati-Rohnert Park School District		California	
	Gr. 5	Gr. 9	Gr. 5	Gr. 9	Gr. 5	Gr. 9
6 of 6 fitness criteria	9.0%	-	24.7%	30.1%	29.0%	38.7%
5 of 6 fitness criteria	32.8%	-	26.7%	31.0%	26.4%	27.4%
4 of 6 fitness criteria	16.4%	-	17.9%	18.1%	19.5%	15.9%
3 of 6 fitness criteria	20.9%	-	15.7%	13.1%	13.1%	9.6%
2 of 6 fitness criteria	13.4%	-	10.5%	5.9%	7.7%	5.5%
1 of 6 fitness criteria	4.5%	-	2.9%	1.5%	3.5%	2.2%
0 of 6 fitness criteria	3.0%	-	1.6%	0.2%	0.8%	1.1%

Source: California Department of Education, Physical Fitness Testing Results. Available at: [www.cde.ca.gov/ta/tg/pf/pftresults.asp](http://www.cde.ca.gov/ta/tg/pf/pftresults.asp). Accessed 6/22/2011.

As shown in the two tables above, the PFT results for 5<sup>th</sup> and 9<sup>th</sup> graders in the Cotati-Rohnert Park School district decreased between 1998-99 and 2009-10, while Statewide numbers showed an increase, particularly among students scoring 6 out of 6 and 5 out of 6 for fitness criteria. In 2009-10, 4.88 percent of 5<sup>th</sup> graders at Thomas Page Elementary School scored 5 or 6 out of the 6 criteria, which is below both the Rohnert-Park School District (51.4 percent) and the state (61.4 percent). These changes in data indicate a decline in physical fitness levels of students within the Cotati-Rohnert Park School District and indicate that elementary school students in Cotati are generally less fit than other students in the district.

### ASTHMA AND HEART DISEASE

Local air quality conditions can be a strong indicator of asthma rates within a community. Table 2.2-9 includes data from CHIS for asthma rates, symptoms and hospitalizations for Sonoma County, California, and Marin and Napa Counties. Marin and Napa Counties border Sonoma County, and were included in this table to provide additional comparisons between local asthma rates and asthma rates in neighboring counties. Detailed data on local air quality conditions is contained in Section 9.5 of this report.

Region	Ever Diagnosed with Asthma	Emergency or Urgent Care in Past 12 Months for Asthma	Had Asthma Symptoms in Past 12 Months (current asthmatics)
Sonoma County	16.8%	7.1%	95.2%
Marin County	11.6%	4.9%	81.6%
Napa County	16.2%	3.0%	83.6%
California	13.7%	10.3%	91.0%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2009 ASTHMA SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: [WWW.CHIS.UCLA.EDU/](http://WWW.CHIS.UCLA.EDU/) ACCESSED JUNE 22, 2011.

As shown in Table 2.2-9 above, nearly 17 percent of Sonoma County residents have been diagnosed with asthma at some point in their lives, and of those who have been diagnosed, over 95 percent have had asthma symptoms in the past 12 months (from the time the 2009 CHIS survey was conducted). The percentage of people diagnosed with asthma in Sonoma County is approximately 3 percent higher than the Statewide average, and is very similar to asthma rates in neighboring Napa County. The percentage of Sonoma County residents who have experienced asthma symptoms in the past 12 months was notably higher than the rates reported in neighboring Marin and Napa Counties. While Sonoma County's rates of hospitalization for asthma were approximately three percent lower than the Statewide averages, they were over four percent higher than hospitalization rates in Napa County.

Approximately 4.0 percent of adults in Sonoma County have been diagnosed with heart disease, compared with nearly six percent of adults Statewide. Of the County residents who have ever been diagnosed with heart disease, nearly 92 percent have been provided with a heart disease management by a health care professional. As shown previously in Table 2.2-3, heart disease was the second leading cause of death in Cotati in 2009, accounting for 28 percent of total deaths in the City.

## ALCOHOL, DRUG AND TOBACCO USE

In 2009, 12.9 percent of adults and teens in Sonoma County reported to the CHIS that they were currently tobacco smokers, which very closely mirrors statewide averages for smoking rates. For County teens who had reported ever smoking tobacco in the past, 94.3 percent reported smoking no cigarettes in the past 30 days (from time CHIS survey was conducted).

The American Medical Association (AMA) reports that approximately 11 million American youth under the age of 21 drink alcohol. Nearly half of them drink to excess, consuming five or more drinks in a row, one or more times in a two week period. Alcohol is the most frequently used drug by high school seniors, and its use is increasing. Boys usually try alcohol for the first time at just 11 years old, while the average age for American girls' first drink is 13. The AMA reports the following facts for teen-related drinking<sup>8</sup>:

- Underage drinking is a factor in nearly half of all teen automobile crashes, the leading cause of death among teenagers.
- Alcohol use contributes to youth suicides, homicides and fatal injuries – the leading cause of death among youth after auto crashes.

<sup>8</sup> American Medical Association, 2011. Facts About Youth and Alcohol. Available at: <http://www.ama-assn.org/ama/pub/physician-resources/public-health/promoting-healthy-lifestyles/alcohol-other-drug-abuse/facts-about-youth-alcohol.page>. Accessed June 27, 2011.

## 2. COMMUNITY HEALTH AND WELLNESS

- Alcohol abuse is linked to as many as two-thirds of all sexual assaults and date rapes of teens and college students.
- Alcohol is a major factor in unprotected sex among youth, increasing their risk of contracting HIV or other transmitted diseases.

The 2007-09 Sonoma County Healthy Kids Survey reported that 32 percent of Sonoma County 11<sup>th</sup> graders have never had one full drink of alcohol. Approximately 1.3 percent of County teens reported binge drinking at least once during the past month, compared to the higher Statewide rate of 5 percent. Male binge drinking is five or more drinks on one occasion in past month, female binge drinking is four or more drinks. CHIS data on reported binge drinking rates is significantly lower than the AMA estimates for teen binge drinking rates. This discrepancy may be due to the fact that teens did not accurately report drinking rates during the CHIS survey.

Research indicates that the density of alcohol outlets is closely related to the level of crime, domestic violence, and sexual assault in a community. Areas with a higher density of alcohol outlets also tend to have higher rates of vehicular accidents and fatalities, underage drinking, and adult alcohol and drug use.<sup>9</sup> In Cotati, there is one retail license for alcohol sales per 165 persons. This is a density greater than the Countywide rate of 1 per 278 persons, but is in line with the densities of smaller cities in the County, Sebastopol and Cloverdale. Table 2.2-10 summarizes retail liquor licenses per capita in Cotati, Sonoma County, and other small cities in Sonoma County.

	<b>Retail Licenses</b>	<b>Density per Capita</b>
Cotati	44	1 / 165
Cloverdale	39	1 / 221
Sebastopol	55	1 / 134
Sonoma County	1,738	1 / 278

SOURCE: DEPARTMENT OF ALCOHOLIC BEVERAGE CONTROL, ALCOHOLIC BEVERAGE LICENSES, JUNE, 2010

Over 13 percent of Sonoma County teens reported using marijuana in the past year, compared to 8.8 percent statewide. Additionally, 17.4 percent of Sonoma County teens reported having tried drugs (any type of illicit drug) at least once in their lifetime, compared to 13.5 percent statewide.

### 2.3 OPPORTUNITIES FOR PHYSICAL ACTIVITY

This section focuses on levels of neighborhood walkability and existing commercial services (and other destinations) that enable or encourage physical activity. Other chapters of this General Plan Background Report address topics that also impact physical activity and health – these include parks and recreation space (Section 5.4) and transportation facilities (Section 4).

#### NEIGHBORHOOD WALKABILITY

One factor that determines physical activity levels is the distance between the home and other neighborhood amenities, including shopping centers, parks, transit, and places of work. If this distance is perceived as “walkable” (safe, pleasant, and distance-appropriate), residents may be more likely and willing to walk to those amenities. A distance of 1/4 mile is a commonly cited threshold for how far most

<sup>9</sup> Community Health Needs Assessment 2011-2014. Babs Kavanaugh, BK Consulting Services. No date.

people are willing to walk for neighborhood services, while many people are willing to walk up to 1/2 mile for work or access to regional transit. Many factors contribute to a neighborhood's real or perceived walkability. Land uses, pedestrian facilities such as lighting and benches, commercial services, urban design, and residents' perceptions of safety, distance, and relative need for goods and services are some indicators that may promote or impede the decision to walk, rather than drive. Residents of higher-density, mixed-use areas make fewer vehicle trips and drive fewer miles than residents of lower-density, more single-use areas.<sup>10</sup>

Within Cotati, different areas of the City have different levels of walkability. One way of measuring walkability is with Walkscore, which is based on access and proximity to various destinations and amenities from a selected location within a community.<sup>11</sup> Walkscore provides numerical rankings of an area's walkability on a scale of 0-100. A description of the numerical ranking system is provided below.

- 90-100: Daily errands do not require a car.
- 70-89: Most errands can be accomplished on foot.
- 50-69: Some amenities within walking distance.
- 25-49: A few amenities within walking distance.
- 0-24: Almost all errands require a car.

Table 2.2-11 shows the Walkscore calculated for various areas within Cotati. A map of these locations is shown on Figure 2-1. As described above, a Walkscore above 70 indicates that most daily errands can be accomplished on foot, while a Walkscore below 49 indicates that few amenities are within walking distance.

City Area	Intersection or Street Name	Walkscore
1- The Hub	E. Cotati Ave./Old Redwood Hwy	78
2- Gravenstein Hwy. Corridor	Isabel Dr./Madrone Ave.	34
3- Southern Cotati	Cypress Ave./Lund Hill Lane	35
4- Eastern Cotati	E. Cotati Ave./Santero Way	52
5- Southeast Cotati	Myrtle Ave./Veronda Ave.	57
6- Northeast Cotati	Wilford Lane/Pinewood Court	78

SOURCE: [WWW.WALKSCORE.COM](http://WWW.WALKSCORE.COM). ACCESSED JUNE 23, 2011.

The results in Table 2.2-10 show that areas of the City that are centrally located and have higher development densities, such as the Hub and the areas of Medium Density Residential development north of the Hub, score relatively high on the walkability scale. While areas that are dominated by rural residential and low density residential land uses around the perimeter of the City score much lower, and are generally suited for auto use to travel to most destinations. Areas of Low/Medium Density residential density scored in the middle range of the scale, indicating that these areas are somewhat walkable for certain types of destinations. While not shown in the table above, areas immediately east and west of U.S. 101, near the pedestrian tunnel at West Cotati Avenue, scored approximately 70, indicating that the pedestrian tunnel under U.S. 101 greatly improves walkability in this area.

<sup>10</sup> Crane, R. (2000). The Influence of Urban Form on Travel: An Interpretive Review. *Journal of Planning Literature*; 15(1), 3-23.

<sup>11</sup> Walkscore assessments and methodology are available at [www.walkscore.com](http://www.walkscore.com). Accessed June 23, 2011.



These findings complement empirical evidence: in a comprehensive study of transportation, land use, air quality, and health, researchers found that when many destinations are near the home and there is a direct path to get there, people are more likely to engage in active transportation for at least 30 minutes on any given day.<sup>12</sup> These results highlight the importance of urban form and of a comfortable, safe, and inviting pedestrian environment. They suggest that a mix of land uses, higher residential development densities, a connected and well-maintained pedestrian network, and traffic calming measures can increase physical activity and health.

### ACTIVITY-RELATED COMMERCIAL SERVICES

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Another proxy measure for physical activity is the availability of activity-related commercial services. Currently, there are approximately 11 private health clubs, gyms, or personal training facilities within the City of Cotati, and a total of 23 such facilities within a two-mile radius of the Hub in downtown Cotati (which includes facilities in Rohnert Park).<sup>13</sup> The locations are primarily located east of Highway 101 and north of the Hub, though they are concentrated along the main arterials. Research suggests that formal spaces for physical activity, such as gyms and health clubs, may not be enough to increase individual physical activity levels, even if it's easily accessible.<sup>14</sup> This demonstrates the importance of providing an environment where residents can easily incorporate physical activity into their everyday routines, such as by adding bicycle lanes and convenient bicycle parking near shops and restaurants or improving the pedestrian realm with wider sidewalks and count-down signals. Figure 4-1 depicts existing and proposed bicycle and pedestrian facilities in Cotati.

## 2.4 FOOD ACCESS

Residents of neighborhoods with higher concentrations of “unhealthy” food outlets – such as fast food and liquor stores rather than full-service grocery stores have more health problems and higher mortality rates than residents of neighborhoods with more full-service grocery stores and other vendors selling fruits and vegetables, even when other factors are held constant.<sup>15</sup> The presence of a grocery store in a neighborhood is linked to higher fruit and vegetable consumption and reduced prevalence of overweight and obesity.<sup>16</sup>

### RETAIL FOOD ENVIRONMENT

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Given Cotati's proximity to the City of Rohnert Park, the retail food environment for City residents includes non-restaurant shopping options that are located within the City limits and some locations outside of the City limits of Cotati. Table 2.2-12 provides a summary of retail food options within a two-mile radius of downtown Cotati.

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<sup>12</sup> Frank, L. D., Schmid, T. L., Sallis, J. F., Chapman, J., and Saelens, B. E. (2005). “Linking Objectively Measured Physical Activity with Objectively Measured Urban Form: Findings from SMARTRAQ”. *American Journal of Preventive Medicine*, 28 (2, Supplement 2), 117-125.

<sup>13</sup> Assessed using <http://www.yelp.com>. Accessed June 23, 2011.

<sup>14</sup> Giles-Corti, B., & Donovan, R. J. (2002). “The Relative Influence of Individual, Social and Physical Environment Determinants of Physical Activity”. *Social Science & Medicine*, 54(12): 1793-1812.

<sup>15</sup> Mari Gallagher Research and Consulting Group. (July 2006). “Examining the impact of food deserts on public health in Chicago”. Accessed June 23, 2011. Available at: [http://www.marigallagher.com/site\\_media/dynamic/project\\_files/Chicago\\_Food\\_Desert\\_Report.pdf](http://www.marigallagher.com/site_media/dynamic/project_files/Chicago_Food_Desert_Report.pdf).

<sup>16</sup> S. Inagami et al. (2006). “You Are Where You Shop: Grocery Store Locations, Weight, and Neighborhoods”. *American Journal of Preventive Medicine*; 31(1): 10-17.; K. Morland et al. (2006). “Supermarkets, Other Food Stores, and Obesity: The Atherosclerosis Risk in Communities Study”. *American Journal of Preventive Medicine*; 30(4): 333-339.



TABLE 2.2-12 RETAIL FOOD ENVIRONMENT SUMMARY		
Retail Food Type	Examples	Quantity
<b>Non-restaurant Food Vendors<sup>1</sup></b>		
Grocery Stores	Oliver's Market, Safeway, Raley's	6
Small and/or Specialty Markets	Asiana Market, Apna Bazaar, Juanita Market	7
Farmer's Markets/Produce Stands	Cotati Farmer's Market, Sal's Produce	3
Convenience Stores	7-Eleven, AM/PM, Fast and Easy	7
Liquor Stores	Cotati Corner, Lombardi Wine Co.	3
<b>Restaurants<sup>2</sup></b>		
Fast Food Chains	Subway, Burger King	2
Large Restaurant Chains	Denny's, Applebees, etc.	0
Coffee Shops	Cotati Coffee, Starbucks	3
All other restaurants	Redwood Café, Mike's at the Crossroads, etc	42

1- INCLUDES FOOD VENDORS IN THE CITY OF ROHNERT PARK

2- ONLY RESTAURANTS LOCATED WITHIN COTATI

SOURCES: [WWW.YELP.COM](http://WWW.YELP.COM), [WWW.WALKSCORE.COM](http://WWW.WALKSCORE.COM), [WWW.YAHOO.COM](http://WWW.YAHOO.COM) ACCESSED JUNE 27, 2011

As shown in Table 2.2-12, there are six grocery stores within a two-mile radius of downtown Cotati, however, most of these stores are located within the City of Rohnert Park. Oliver's Market, in Cotati, provides a wide variety of healthy, organic and locally produced grocery options. Within Rohnert Park, several grocery stores, including a Costco, provide residents with a full range of grocery options. There are several small specialty markets within two miles of Cotati, including options for Asian foods and ingredients, and other ethnic foods. Cotati hosts a weekly certified farmer's market every Thursday evening from June through September. Convenience stores are largely limited to gas station stores, such as Chevron and AM/PM. There are very few liquor-only stores located within the City limits.

With respect to restaurants, the vast majority of dining options in Cotati consist of locally owned, non-chain restaurants. Many of the City's restaurants are located within or near the Hub in downtown Cotati. Cotati offers a wide array of dining options covering a broad range of food types (Thai, Mexican, Chinese, etc.)

In October 2007, Cotati passed Ordinance 801, which places restrictions and limitations on "formula-based fast food restaurants." Section 17 of the Cotati Municipal Code was amended to include restrictions related to the location, type and number of formula-based fast food restaurants in the City. These formula-based fast food restaurants are prohibited within the Hub, and require a use permit with Specific Use Regulations for approval in other areas of the City. The regulations place a limit of eight (8) total formula-based fast food restaurants within the City at any given time, and identifies areas within the City that these establishments must be dispersed throughout, in order to avoid an over-concentration in any particular area of the City. The regulations also prohibit more than one of any specific type of fast food restaurant in the City (i.e., two Burger Kings would be prohibited).

## EATING HABITS

A person's overall health and wellbeing is strongly correlated to food choices. Fast foods tend to be high in saturated fats, high in simple sugars, and low in fiber and nutritional value. Recent studies suggest that junk food consumption alters brain activity in a manner similar to addictive drugs like cocaine or

## 2. COMMUNITY HEALTH AND WELLNESS

heroin.<sup>17</sup> After many weeks on a junk food diet, the pleasure centers of rat brains became desensitized, requiring more food for pleasure. After the junk food was taken away and replaced with a healthy diet, the rats starved for two weeks instead of eating nutritious fare.

More than 80 percent of people with Type 2 diabetes, the most common form of the disease, are obese or overweight. Data from the Centers for Disease Control and Prevention (CDC) National Health and Nutrition Examination Survey III shows that two-thirds of adult men and women in the U.S. diagnosed with Type 2 diabetes have a body mass index (BMI) of 27 or greater, which is classified as overweight and unhealthy.

Table 2.2-13 below, shows the frequency that fast food was consumed in the past week (2009) for Sonoma County residents, compared to residents throughout California. As shown in the table, the frequency of fast food consumption in Sonoma County is significantly lower than the Statewide averages. The CHIS does not provide a specific definition of “fast food”, however, surveyors were instructed to say “Such as food you get at McDonald’s KFC, Panda Express or Taco Bell” if the respondent had questions regarding the meaning of fast food.

<b>Number of Times</b>	<b>Sonoma County</b>	<b>California</b>
No times	49.3%	35.3%
One Time	31.5%	28.3%
Two Times	9.4%	16.7%
Three Times	8.2%	8.6%
Four or more Times	1.6%	11.0%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2009 DIET SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: [WWW.CHIS.UCLA.EDU/](http://WWW.CHIS.UCLA.EDU/) ACCESSED JUNE 27, 2011.

According to the California Center for Public Health Advocacy, scientific evidence also suggests that sugar-sweetened beverages and sodas are contributing to the obesity epidemic. One 20 ounce bottle of soda has almost 17 teaspoons of sugar and contains 250 calories. Drinking a sugar-sweetened soda daily increasing a child’s risk for obesity by 60 percent.<sup>18</sup> Based on a 2009 health policy briefing, 41 percent of children (ages 2-11), 62 percent of adolescents (ages 12-17) and 24 percent of adults in California drink at least one soda or other sugar-sweetened beverage every day.<sup>19</sup>

### 2.5 ACCESS TO HEALTH CARE AND HEALTH FACILITIES

Access to health care and mental health services is an important determinant of health and disease prevention, and increased access is very likely to improve public health. Preventive measures, such as screening for common health problems like diabetes and respiratory illnesses, dental care, and vaccinations have been shown to reduce the incidence and severity of illnesses,<sup>20</sup> and are often less expensive than care once someone has become sick.

<sup>17</sup> Johnson, Paul M.; Kenny, Paul J. (2010). "Dopamine D2 receptors in addiction-like reward dysfunction and compulsive eating in obese rats". *Nature Neuroscience* 13 (5): 635.

<sup>18</sup> California Center for Public Health Advocacy, Resources: Soda Consumption. Accessed on June 27, 2011. Accessible at [http://www.publichealthadvocacy.org/resources\\_soda.html](http://www.publichealthadvocacy.org/resources_soda.html).

<sup>19</sup> Babey SH, Jones M, Yu H and Goldstein H. (2009). "Bubbling Over: Soda Consumption and its Link to Obesity in California". Healthy Policy Brief: UCLA Center for Health Policy Research. Sept 2009.

<sup>20</sup> U.S. Department of Health and Human Services Agency for Healthcare Research and Quality, *National Healthcare Disparities Report*, pg. 112, Rockville, Maryland. July 2003.

Most of the major medical service providers near Cotati are located outside of the City. There is a Kaiser Permanente Medical Center located in Rohnert Park, as well as the St. Joseph Urgent Care Center. Several hospitals are located in Santa Rosa and Petaluma. According to 2009 CHIS data, over 71 percent of Sonoma County residents receive their primary medical care from a doctor's office (including HMOs and Kaiser), over 14 percent utilize a community or government clinic, and 13 percent have no usual source of medical care.

Sonoma County offers several community health care clinics for County residents, however, none of the clinics are located within the City of Cotati or Rohnert Park. Community clinics in Sonoma County are located in Cloverdale, Guerneville, Healdsburg, Occidental, Petaluma, Santa Rosa, Sebastopol, Sonoma, and Windsor. According to 2009 CHIS data, 87 percent of Sonoma County residents currently have medical insurance, which closely mirrors the Statewide coverage rate. Of those with medical insurance, approximately 49 percent receive employment-based medical insurance, and over 12 percent maintain privately purchased insurance coverage. Over 21 percent of County residents reported not visiting a doctor within the past year (from the time the 2009 CHIS survey was conducted), and nearly 21 percent reported visiting a doctor only once in the past year. Approximately 18.4 percent of residents reported visiting an emergency room at least once in the past 12 months. Over 74 percent of teens in Sonoma County reported visiting a doctor for a physical exam or routine checkup within six months of the 2009 CHIS survey.

While there are very few medical offices located within the City of Cotati, Cotati residents can receive medical care at regional facilities located throughout the County and the Bay Area, however, access to these regional facilities can be very difficult with access to a vehicle.

### **2.6 MENTAL HEALTH AND SOCIAL CAPITAL**

Poor social ties and networks and weak mental health is associated with a number of factors related to planning, including long commute times, exposure to crime, lack of transportation choice, and lack of access to public spaces. Social capital — often characterized by level of neighborhood trust and community participation — within a neighborhood is associated with many health benefits, such as increased physical activity. During the initial public outreach efforts conducted for this General Plan Update, numerous visioning workshop participants identified community identity and community involvement as key factors that make Cotati a great place to live and work.

Based on 2009 CHIS results, over 90 percent of Sonoma County residents reported having no significant psychological distress during the past year, which is below the statewide rate of 93.5 percent. However, approximately 14.4 percent of residents reported seeing a healthcare provider for emotional, mental and/or alcohol or drug related issues in the past year (from the time the 2009 survey was conducted), which is above the Statewide rate of 10.9 percent. Of those County residents who sought treatment from a mental health professional, 92 percent visited for a mental or emotional problem, while seven percent sought treatment for an alcohol or drug related problem.

Nearly 68 percent of teens in Sonoma County reported doing some sort of volunteer or community service in the past year (from the time the 2009 CHIS survey was conducted), which is nearly 10 percent higher than the Statewide averages for teen community service.

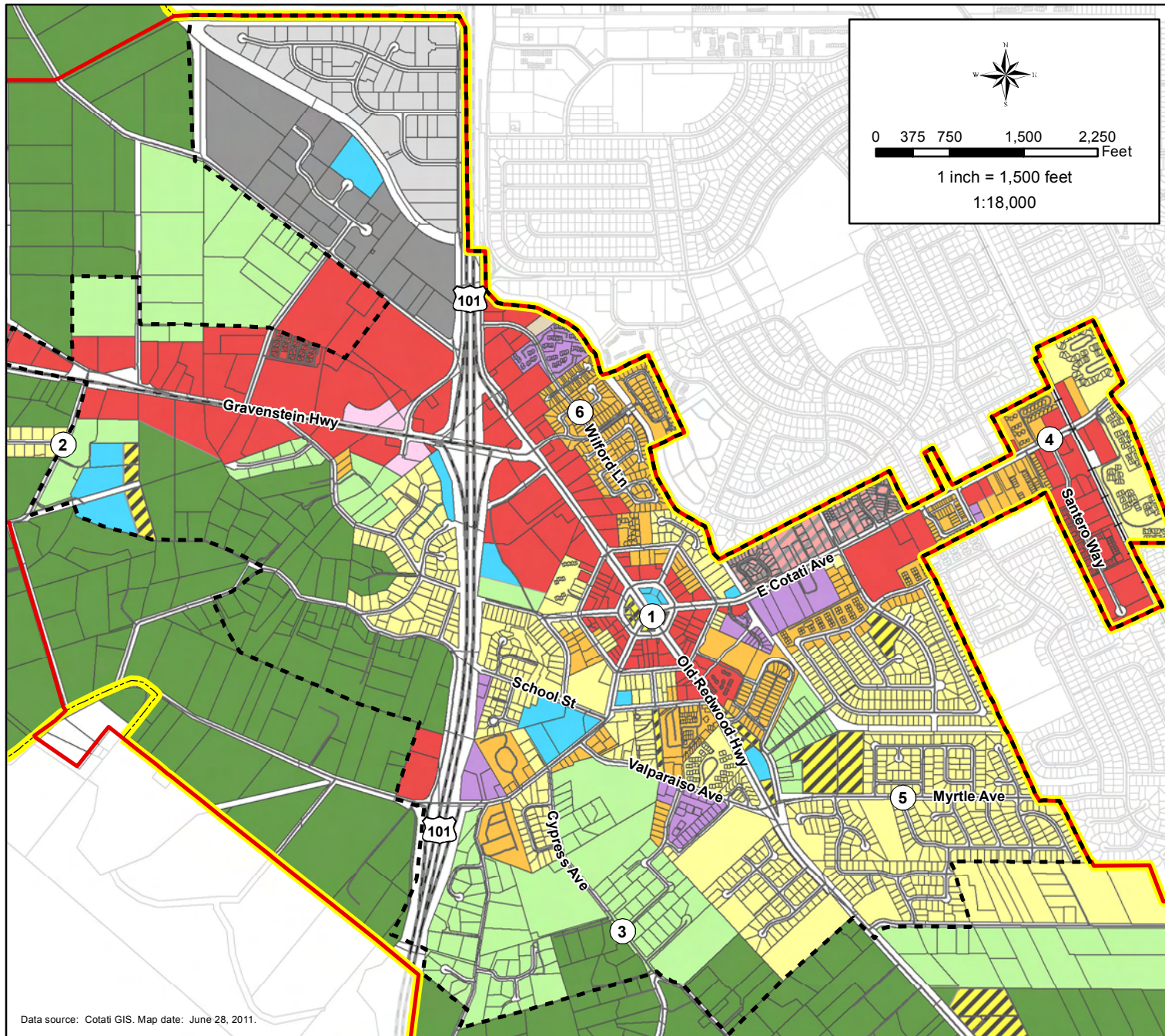
The City of Cotati offers numerous programs to foster community activities and volunteering opportunities. There are a number of committees and commissions on which citizen can volunteer to assist with and participate in a range of community and environmental topics and priorities. Numerous community social events are held in Cotati, including the farmer's market, concerts in the park, movies

## 2. COMMUNITY HEALTH AND WELLNESS

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in the park, Kid's Day parade and festival, Cotati Jazz Festival, Cotati Accordion Festival, Four Nights of Festive Fun, the annual Christmas tree lighting, and Oktoberfest.





**Cotati General Plan Update**  
**Figure 2-1: Walkability**  
**in Cotati**

General Plan Land Use Designations

- RR - Rural Residential
- LDR - Low Density Residential
- LMDR - Low/Medium Density Residential
- MDR - Medium Density Residential
- HDR - High Density Residential
- OSR - Open Space
- GC - General Commercial
- HC - Highway Commercial
- O - Office
- P - Park
- PF - Public Facilities
- GI - General Industrial
- CI - Commercial Industrial

Planning Areas

- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary

1	E Cotati Ave./Old Redwood Hwy
2	Isabel Dr./Madrone Ave.
3	Cypress Ave./Lund Hill Lane
4	E Cotati Ave./Santero Way
5	Myrtle Ave./Veronda Ave.
6	Wilford Lane/Pineood Court



### 3. ECONOMIC DEVELOPMENT

This section provides an overview of Cotati's economy, including employment and labor force characteristics, primary industry sectors, major employers, taxable sales, and spending patterns. The analysis generally discusses data from the California Employment Development Department (EDD), ESRI (a firm that provides GIS, demographic, and economic data), the state Board of Equalization, and US Census to identify economic statistics and trends in Cotati over the past 10 years.

#### EMPLOYMENT CHARACTERISTICS

##### Labor Force

From 2000 to 2010, Cotati has seen an increase in population from 6,471 to 7,265 persons, an increase of 794 persons or 12 percent. In 2000, there were 2,540 jobs in Cotati. Over the past decade, jobs have declined to approximately 2,410. The City's labor force has remained relatively steady over the past decade, however, employment declined from 3,700 to 3,500 persons. The decline in jobs and employment has increased the unemployment rate from 3.3 percent in 2000 to 10.5 percent in 2010. The annual average job growth rate is less than the population growth rate, 0.9 percent versus 1.8 percent respectively from 2000 to 2009. The ratio of employment opportunities in Cotati to the local labor force was 0.62:1, a decrease from 0.65:1 in 2000. A jobs-to-persons in labor-force ratio that is less than 1:1 means that a percentage of local residents must travel outside of Cotati for employment as there are not enough jobs available locally. Table 3-1 summarizes population, job, and employment data from 2000 to 2010.

**TABLE 3-1: JOBS, POPULATION, AND EMPLOYMENT <sup>1</sup>**

	Population	Employment Statistics			
		Jobs	Labor Force <sup>1</sup>	Employed	Jobs per Persons in Labor Force
2010	7,265	2,410	3,900	3,500	.62
2005	7,185	2,550	3,900	3,700	.65
2000	6,471	2,540	3,900	3,700	.65

<sup>1</sup>LABOR FORCE DATA IS ROUNDED TO THE NEAREST HUNDRED

SOURCE: US CENSUS, 2000; US CENSUS 2010; CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT, 2011; ABAG PROJECTIONS, 2009

While the number of persons in the labor force (e.g., residents of Cotati that are employed or looking for a job) has remained relatively constant since 2000 despite the overall increase in population, the number of employed persons has ranged from 3,700 in 2000 to a peak of 3,800 from 2006 through 2008 down to 3,500 in 2011. The annual average unemployment rate has increased significantly from 3.3 percent in 2000 to a high of 11.0 percent in 2010. The year-to-date average unemployment rate in 2011 is 10.6 percent. Table 3-2 identifies the annual average labor force statistics, including employed and unemployed persons and the unemployment rate.

### 3. ECONOMIC DEVELOPMENT

**TABLE 3-2: ANNUAL AVERAGE LABOR FORCE AND EMPLOYMENT**

Year	Labor Force	Employed	Unemployed	% Unemployed	% Change in Unemployed
2011*	3,900	3,500	400	10.6	-3.6%
2010	3,900	3,500	400	11.0	8.9%
2009	4,000	3,600	400	10.1	68.3%
2008	4,000	3,800	200	6.0	30.4%
2007	4,000	3,800	200	4.6	9.5%
2006	3,900	3,800	200	4.2	-10.6%
2005	3,900	3,700	200	4.7	-4.1%
2004	3,900	3,700	200	4.9	-9.3%
2003	3,900	3,700	200	5.4	8.0%
2002	3,900	3,700	200	5.0	38.9%
2001	3,900	3,800	100	3.6	9.1%
2000	3,900	3,700	100	3.3	

SOURCE: CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT (CEDD), 2011 \*DENOTES PARTIAL YEAR DATA

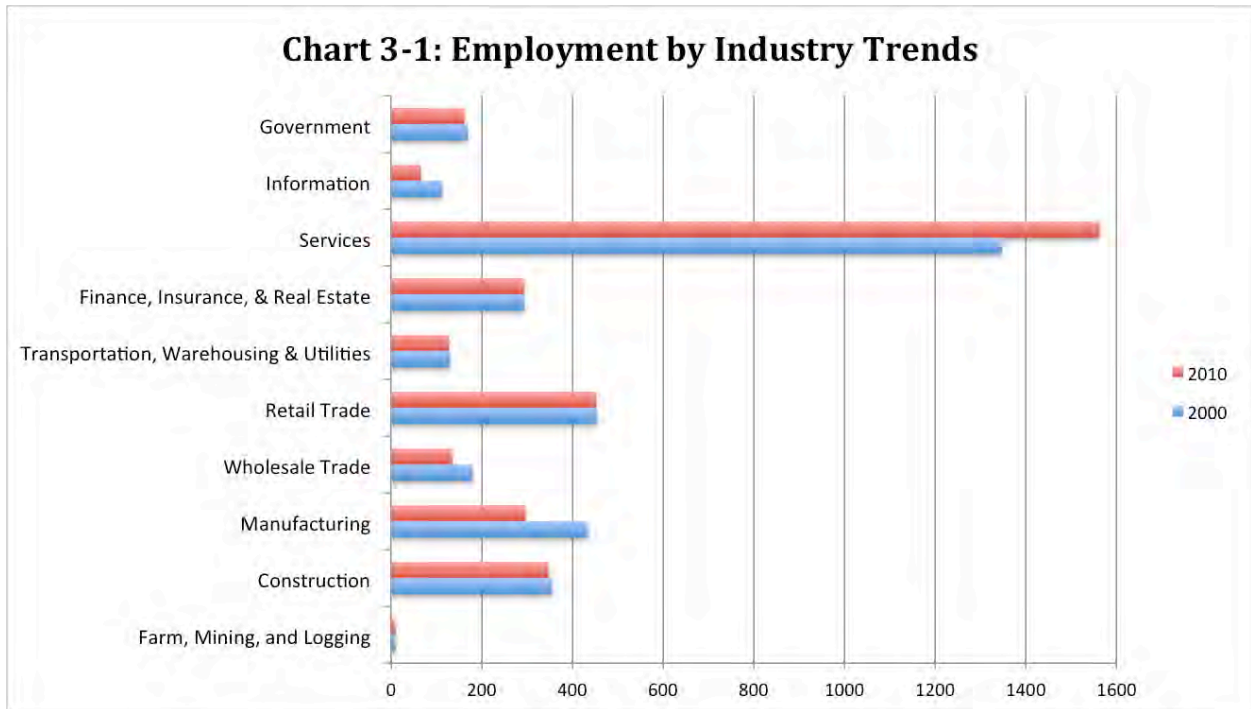
NOTE: CEDD PROVIDES LABOR FORCE, EMPLOYED, AND UNEMPLOYED DATA ROUNDED TO THE NEAREST 100, BUT PROVIDES PERCENT UNEMPLOYED DATA ROUNDED TO THE NEAREST 0.1.

#### Industry and Occupation

Cotati’s work force is employed in a broad range of industries, with the services category, which includes a broad range of service industries, comprising 45 percent of jobs; while the retail trades and construction groups are the next largest sectors at 13 percent and 10 percent, respectively. Over the past decade, most industries have seen a decline in employment, with the information and manufacturing sectors showing the largest declines in number of persons employed. The services industry grew by 10 percent. Chart 3-1 summarizes the employment of Cotati’s residents by overall industry in 2000 and 2010.

Table 3-3 provides a detailed breakdown of employment by industry from the 2000 Census. While services as a whole is the largest industry sector, individual services categories of educational, health, and social services and professional, scientific, management, administrative, and waste management services employ as many individuals as the other top two non-service categories, manufacturing and retail trade.





**TABLE 3-3: EMPLOYMENT BY INDUSTRY**

	2000	
	Number	Percent
Agriculture, Forestry Fishing, Mining, and Logging	10	< 1%
Construction	355	10%
Manufacturing	434	12%
Wholesale Trade	180	5%
Retail Trade	454	13%
Transportation, Warehousing & Utilities	130	4%
Information	113	3%
Finance, Insurance, & Real Estate	294	8%
Professional, Scientific, Management, Administrative, and Waste Management Services	424	12%
Educational, Health, and Social Services	467	13%
Arts, Entertainment, Recreation, Accommodation, and Food Services	303	9%
Other Services	158	5%
Government	169	5%

SOURCE: US CENSUS, 2000; ESRI, 2011

While industry represents the overall sector in which an individual is employed, occupation represents a person’s position at their place of employment. Occupations can be generally divided into white collar, services, and blue collar; in Cotati, the majority of the workforce is employed in white collar occupations, with professional and related occupations as the largest subset. Followed by office and administrative support Over the past decade, the ratio of service and blue collar workers has increased, while the white collar category has declined. There is no employment in the agriculture, fishing, farming, or mining industries and employment in the production and transportation categories is relatively low. Table 3-4 summarizes jobs by occupation in in 2000 and 2010.

### 3. ECONOMIC DEVELOPMENT

**TABLE 3-4: JOBS BY OCCUPATION - COTATI**

	2000		2010		Percent Change
	Number	Percent	Number	Percent	
White Collar	2,853	68%	2,142	61%	-26.0%
<i>Management, Business, and Financial Operations</i>	1,112	26%	441	13%	-60.9%
<i>Professional and Related Occupations</i>	719	17%	749	21%	2.7%
<i>Sales</i>	351	8%	375	11%	5.2%
<i>Office and Administrative Support</i>	671	16%	574	16%	-15.7%
Services	498	12%	606	17%	19.8%
Blue Collar	859	20%	756	22%	-13.2%
<i>Farming, Fishing, and Forestry</i>	0	0%	0	0%	0.0%
<i>Construction, Extraction, Installation/Maintenance</i>	460	11%	413	12%	-11.5%
<i>Production</i>	208	2%	147	4%	-30.3%
<i>Transportation and Material Moving</i>	191	5%	196	6%	1.2%

SOURCE: US CENSUS, 2000

#### Major Employers

Table 3-5 shows that the largest employers in Cotati provide employment in the agricultural and/or services industries. The four largest employers in Cotati have over 50 employees, with Oliver's Market and Stockham Construction each having over 100 employees according to EDD. The major employers are varied by type and no single industry has a large concentration of employers. Industry categories with multiple employers include construction and contracting companies, trucking, solid waste services, and wholesale foods.

**TABLE 3-5: MAJOR EMPLOYERS**

Employer Name	Location	Industry
<b>100 to 249 Employees</b>		
Lowe's	Redwood Dr	Home Improvement Store
Oliver's Market	E Cotati Ave	Grocery Store
Stockham Construction	Portal St. #E	Other Heavy Construction
<b>50 to 99 Employees</b>		
21St Century Health Club	E Cotati Ave	Fitness And Recreational Sports Centers
<b>20 to 49 Employees</b>		
C & A Trucking	Derby Ln	Specialized Trucking
City of Cotati	W. Sierra Avenue	Legislative Body
Cotati Brand Eggs & Food Svc	Houser St	Wholesale Foods
Cotati Police Department	W. Sierra Avenue	Police Protection
Leslie Electric	Portal St	Electrical Contractors
Making It Big	Portal St	Women's Clothing Store
Marin Sonoma Mosquito Control	Helman Ln	Legislative Body
Mc Clure R Electric Co	Portal St	Computer Systems Design Services
Michael's Harley-Davidson	Redwood Dr	Motorcycle Dealers
Mike Brown Electric Co	Mercantile Dr	Electrical Contractors
Mike's At The Crossroads	Old Redwood Hwy	Full-Service Restaurants

**TABLE 3-5: MAJOR EMPLOYERS**

Employer Name	Location	Industry
Minatta Transportation Co	Gravenstein Hwy	Specialized Trucking, Long Distance
North Coast Concrete	Issel Ct	Poured Concrete Structure Contractors
Pump It Up	Blodgett St	Musical Groups And Artists
Santa Rosa Fire Equipment Svc	Portal St	Durable Goods - Wholesale
Sara Lee Bakery Group	Blodgett St	Wholesale Foods
Thomas Page Elementary School	Madrone Ave	Elementary School
Walgreens Pharmacies	Old Redwood Hwy	Pharmacies And Drug Store

*\*FOR SOME EMPLOYERS, ONLY THE RANGE OF EMPLOYEES WAS AVAILABLE.*

*SOURCE: CALIFORNIA EMPLOYMENT DEVELOPMENT DEPARTMENT, 2011; LOWE'S, 2011*

## SALES AND SPENDING

### Taxable Sales

Taxable sales indicate the value of all transactions subject to sales tax. The California Board of Equalization publishes quarterly data regarding retail sales, total taxable sales, and the number of businesses with a sales tax permit. Total taxable sales do not reflect the gross sales since some transactions are not subject to sales tax.

Table 3-6 identifies taxable sales by category for the City bi-annually from 2001 through 2009. During this time, total amount of annual taxable transactions increased by \$28 million while the total number of businesses with a sales tax permit decreased by four. However, total taxable transactions almost doubled from 2001 to 2007, reaching \$201 million with the majority of transactions occurring in the retail and food services sector (\$132 million). Total taxable transactions then declined sharply from 2007 to 2009 by almost \$70 million. From 2001 to 2005, sales tax permits in Cotati increased from 309 to 331; permits then decreased to 305 in 2009. From 2001 to 2009, there was a significant decrease in the number of non-retail and food service permits, a decline of 97 permits or 48.1 percent. Correspondingly, permits for retail and food sales increased significantly by 86.9 percent (93 permits). The shift between non-retail/non-food services to increased retail and food service permits also occurred in Sonoma County, which saw an overall decline in total sales and a small increase in permits, but a significant increase in retail and food service permits accompanied by a significant decline in non-retail/non-food service permits. This shift toward retail and food services is mirrored by the increase in jobs in the services industry (+16.0 percent) and significant decreases of jobs in the wholesale (-25.3 percent) and manufacturing (-31.6 percent) industry in Cotati shown in Chart 3-1.

### 3. ECONOMIC DEVELOPMENT

**TABLE 3-6: TAXABLE SALES – COTATI**

	Retail and Food Services		Non-Retail/Food Services		Total Outlets	
	Sales Tax Permits	Taxable Transactions	Sales Tax Permits	Taxable Transactions	Sales Tax Permits	Taxable Transactions
2009	200	\$113,274,000	105	\$17,879,000	305	\$131,153,000
2007	137	\$131,900,000	184	\$68,950,000	321	\$200,850,000
2005	141	\$78,678,000	190	\$46,787,000	331	\$125,465,000
2003	117	\$71,385,000	181	\$33,818,000	298	\$105,203,000
2001	107	\$69,248,000	202	\$33,094,000	309	\$102,342,000
Change 2001 – 2009	93	\$44,026,000	- 97	- \$15,215,000	- 4	\$28,811,000
Percent Change 2001-2009	86.9%	63.6%	- 48.1%	- 46.0%	- 1.3%	28.2%
Countywide Change 2001-2009	5,280	- \$327.8 M	- 5,082	\$5.0 M	198	- \$555.8 M
Countywide % Change 2001-2009	98.4%	- 6.9%	- 45.2%	- 72.9%	1.2%	- 8%

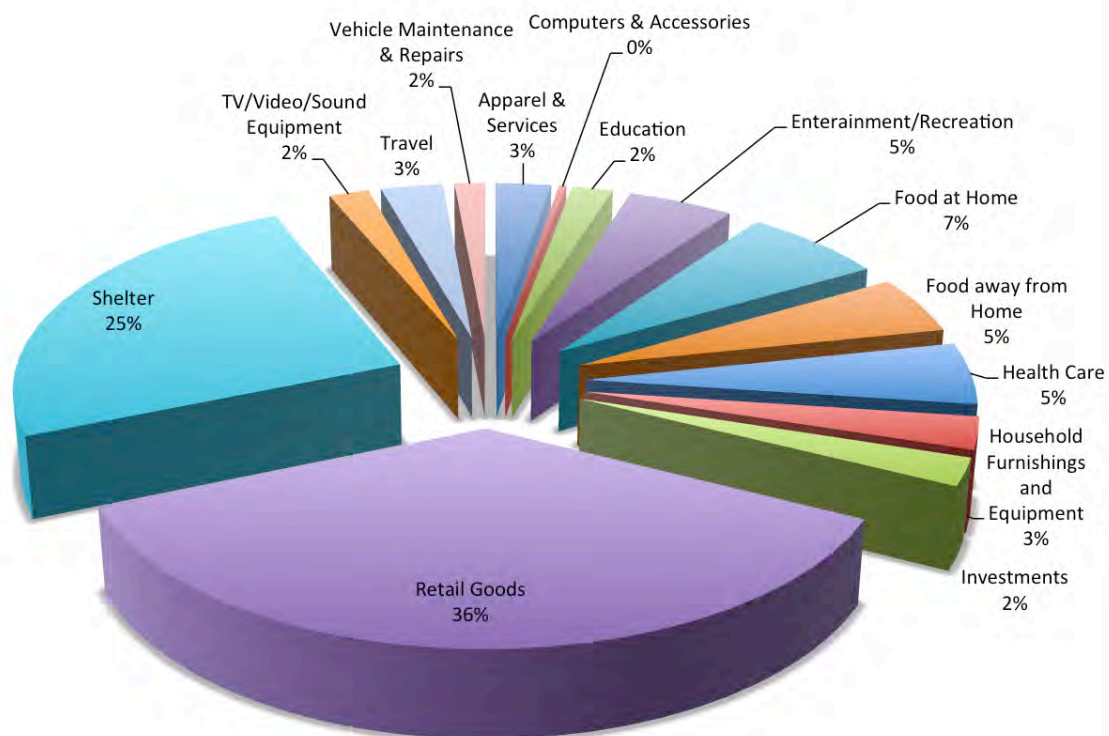
SOURCE: STATE BOARD OF EQUALIZATION, 2000; STATE BOARD OF EQUALIZATION, 2008

#### 2011 Consumer Spending

Table 3-7 identifies consumer spending patterns in 2010 for Cotati. Consumer spending data is from the ESRI Market Profile and represents the amount spent by households on a variety of goods and services. Expenditures are shown by broad budget categories that are not mutually exclusive. ESRI notes that consumer spending does not equal business revenue. For each of the categories, Table 3-7 identifies the total amount spent, average spent, and the spending potential index. The spending potential index (SPI) compares the amount spent in a specified area with the U.S. average. The SPI is useful in identifying categories where there is spending potential that is not being met. This information indicates that in most areas, Cotati's spending exceeds the U.S. average; however, there is additional spending potential in the categories of apparel and services. In areas with higher annual incomes, consumer spending may exceed US averages and there may be additional potential also in categories with an SPI that is low relative to other categories, such as household furnishings/equipment, investments, and healthcare.

Categories with the highest annual spending are retail goods (36 percent) and shelter (25 percent), followed by food at home (7 percent). Chart 3-2 depicts annual household spending by category.

**Chart 3-2: Average Annual Household Spending**



### 3. ECONOMIC DEVELOPMENT

<b>TABLE 3-7: CONSUMER SPENDING (2010)</b>		
<b>Category</b>		<b>Spending</b>
Apparel & Services:	Total	\$5,031,351
Average Spent		\$1,934.39
Spending Potential Index		81
Computers & Accessories:	Total	\$672,912
Average Spent		\$258.71
Spending Potential Index		118
Education:	Total	\$3,736,863
Average Spent		\$1,436.70
Spending Potential Index		118
Entertainment/Recreation:	Total	\$9,682,096
Average Spent		\$3,722.45
Spending Potential Index		115
Food At Home:	Total	\$13,028,592
Average Spent		\$5,009.07
Spending Potential Index		112
Food Away from Home:	Total	\$9,681,111
Average Spent		\$3,722.07
Spending Potential Index		116
Health Care:	Total	\$10,377,190
Average Spent		\$3,989.69
Spending Potential Index		107
Household Furnishings & Equip:	Total	\$5,405,676
Average Spent		\$2,078.31
Spending Potential Index		101
Investments:	Total	\$4,626,750
Average Spent		\$1,778.84
Spending Potential Index		102
Retail Goods:	Total	\$70,030,213
Average Spent		\$26,924.34
Spending Potential Index		108
Shelter:	Total	\$48,125,914
Average Spent		\$18,502.85
Spending Potential Index		117
TV/Video/Sound Equipment:	Total	\$3,653,947
Average Spent		\$1,404.82
Spending Potential Index		113
Travel:	Total	\$5,682,571
Average Spent		\$2,184.76
Spending Potential Index		115
Vehicle Maintenance & Repairs:	Total	\$2,795,173
Average Spent		\$1,074.65
Spending Potential Index		114

SOURCE: ESRI, 2011

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**SOURCES**


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California Employment Development Department, 2011. Employer database accessed via: <http://www.labormarketinfo.edd.ca.gov/> in June 2011.

California Employment Development Department, 2010. Labor Market Info, Data Library. Accessed via: <http://www.labormarketinfo.edd.ca.gov> in May and June 2011.

Center for Economic Development, 2011. Sonoma County 2011 Economic & Demographic Profile. Chico, California. 2011.

ESRI, 2011. Market Profile – Cotati City. 2011.

Lowe's, 2011. Personal communication (e-mail) with Dave Berlin, Store Manager, Cotati, CA. July 25, 2011.

Sonoma County Economic Development Board, 2010. 2010-11 City of Cotati: Local Economic Report. Santa Rosa, California, 2011.

State Board of Equalization, 2010. Sales Tax Permit data. State Board of Equalization website: <http://www.boe.ca.gov/news/tsalescont.htm>. Accessed June 2011.

State Board of Equalization, 2001. Taxable Sales in California (Sales and Use Tax) During 2001. Sacramento, CA. No year of publication listed.

State Board of Equalization, 2003. Taxable Sales in California (Sales and Use Tax) During 2003. Sacramento, CA. No year of publication listed.

State Board of Equalization, 2005. Taxable Sales in California (Sales and Use Tax) During 2005. Sacramento, CA. No year of publication listed.

State Board of Equalization, 2007. Taxable Sales in California (Sales and Use Tax) During 2007. Sacramento, CA. No year of publication listed.

State Board of Equalization, 2009. Taxable Sales in California (Sales and Use Tax) During 2009. Sacramento, CA. No year of publication listed.

U.S. Census, 2000. 2000 Decennial Census. U.S. Census Bureau. Accessed via: <http://factfinder.census.gov>.

U.S. Census, 2010. 2010 Decennial Census. U.S. Census Bureau. Accessed via: <http://factfinder2.census.gov>.





## 4. TRANSPORTATION AND CIRCULATION

The following section describes the existing regulatory, physical and operational characteristics affecting Cotati's transportation system. An overview of the circulation network's setting and regulatory framework is presented first, followed by descriptions of each transportation mode. The section concludes with an analysis of multimodal levels of service on key corridors in the City and an overview of historical safety data.

### SETTING

#### Urban Context

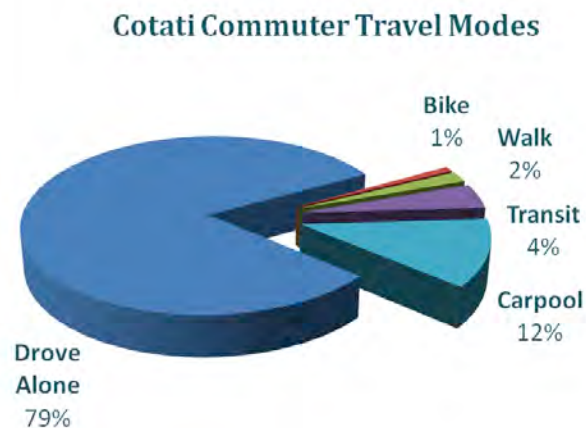
Cotati is a compact city set in a semi-rural atmosphere with a coveted "small town" feel. Cotati's rustic and agricultural roots are present and visible throughout downtown and the community's neighborhoods. The City of Cotati radiates outward from its downtown, which is known as "the Hub" both by virtue of its central location and its distinct historic central plaza which is encircled by two sets of streets that form concentric hexagons. The Hub is bisected by Old Redwood Highway and East Cotati Avenue/West Sierra Avenue, which provide north-south and east-west access respectively. Around the Hub is a thriving, historic downtown characterized by one- to two-story buildings set in a village scale environment. Since the 1998 General Plan Update, Cotati's downtown has been improved by several projects including streetscape and pedestrian improvements as well as mixed-use developments.

Cotati is located adjacent to US 101 and the Gravenstein Highway (SR 116), which provide access to other parts of Sonoma County and the greater San Francisco Bay Area. Although Sonoma State University (SSU) is not actually located within Cotati, to a large extent, Cotati is a university town. Many students live in Cotati and the downtown's restaurants, shops, and bars are popular with SSU students. Cotati is home to a clean light industrial area which is located on the west side of US 101. The City's commercial areas are laid out in a linear fashion along the major collectors of East Cotati Avenue, Gravenstein Highway and Old Redwood Highway. Housing closest to downtown is the most compact, residential neighborhoods adjacent to the hub have a typical suburban form, and development west of US 101 is appreciably less dense and rural in context. Cotati's relatively small land area and flat topography create many opportunities for residents to walk and bicycle to destinations throughout the community.

#### Travel Characteristics

##### *CENSUS JOURNEY TO WORK*

Data from the 2000 US Census was utilized to illustrate Journey to Work (JTW) statistics for Cotati. While the 2000 Census data is over 10 years old, it represents the most comprehensive and accurate data available to assess commute to work travel statistics in Cotati until 2010 US Census Journey to Work Data is released. Cotati currently has a total population of 7,265. At the time of the 2000 US Census when JTW statistics were most recently produced, Cotati's population consisted of 6,482 persons,



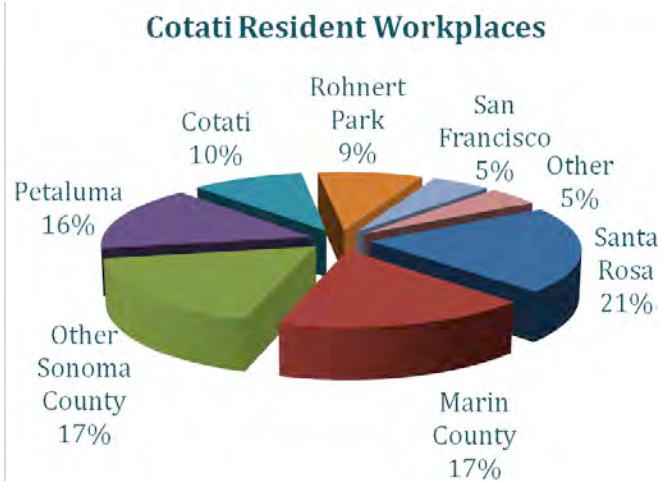
## 4. TRANSPORTATION AND CIRCULATION

including 3,426 workers in Cotati 16 years old or older. Of these, 3,369 work outside the home. Approximately 79 percent of workers in Cotati (2,714 persons) drive to work alone; approximately 12 percent of workers (404 persons) carpool, approximately 4 percent of workers (149 persons) take public transit; approximately 2 percent of workers (64 persons) walk to work; approximately 1 percent of workers (30 persons) bicycle to work, 0.2 percent of workers (8 persons) travel by motorcycle; and approximately 2 percent of workers (57 persons) worked at home. Table 4-1 provides an overview of Cotati's JTW mode split data compared to countywide statistics for Sonoma County and the State of California.

TABLE 4-1: DEMOGRAPHIC AND JOURNEY TO WORK DATA 2000 US CENSUS						
	Cotati		Countywide		California	
Population	6,482		458,614		33,871,648	
Employed persons	3,426		224,947		14,525,322	
Mode Split	Number	Percentage	Number	Percentage	Number	Percentage
Drove Alone	2,714	79.2%	168,134	74.7%	10,432,462	71.8%
Bike	30	0.9%	1,744	0.8%	120,567	0.8%
Walk	64	1.9%	6,929	3.1%	414,581	2.9%
Public Transit	149	4.3%	5,507	2.4%	736,037	5.1%
Carpool	404	11.8%	28,283	12.6%	2,113,313	14.5%
Motorcycle	8	0.2%	517	0.2%	36,262	0.2%
Other	0	0.0%	1,587	1%	115,064	1%
Worked at Home	57	1.7%	12,246	5%	557,036	4%

SOURCE: US CENSUS, 2000;

Of the 3,369 workers in Cotati 16 years old or older who work outside the home, 22 percent, or 744 workers, have a travel time to work of 15 minutes or less. Cotati has a lower than average rate of workers with a commute time of less than 15 minutes, 22 percent, when compared to the state and nation which are at 25 percent and 30 percent respectively. This data indicates that a substantial portion of the City's workers are employed outside of the community. Travel time to work for Cotati residents is shown in Table 4-2 below.



	<b>Number</b>	<b>Percentage</b>
Total Employed Persons	3,426	100%
Work at home	57	4%
Did not work at home	3,369	96%
Travel Time	Number	Percentage
Less than 15 minutes	744	22%
15 to 29 minutes	1,293	38%
30 to 44 minutes	531	16%
45 to 59 minutes	345	10%
60 minutes or more	456	14%

SOURCE: US CENSUS, 2000;

### Auto Ownership

According to the US Department of Transportation, “the amount of travel people do and the way they travel is strongly related to the availability of personal vehicles in their household.” The Bureau of Labor Statistics found that “nationally, persons in households without vehicles took approximately 1,000 trips per person in 2001, while persons in households with at least one vehicle took 1,500 trips each, and persons in households without a vehicle traveled about 6,900 miles annually, less than half the 14,900 person-miles traveled by those in households with at least 1 vehicle.” Further, households without vehicles tend to have different travel characteristics than households with vehicles. Household vehicle ownership is also closely related to the number of people living in the household. Eighteen percent of single-person households have no vehicle, as compared with only 4 percent of multi-person households. Vehicle ownership statistics for Cotati from the 2000 US Census are presented in Table 4-3.

<b>Number of Vehicles in Household</b>	<b>Owner-Occupied Housing Units (1,612 total units)</b>	<b>Renter-Occupied Housing Units (893 total units)</b>
No vehicle available	52	57
1 vehicle available	519	357
2 vehicles available	730	347
3 vehicles available	172	97
4 vehicles available	105	26
5 or more vehicles	34	9

SOURCE: US CENSUS, 2000;

### Vehicle Miles Traveled

A common indicator used to quantify the amount of motor vehicle use in a specified area is Vehicle Miles Traveled, or VMT. VMT represents the total number of miles driven by persons traveling to and

## 4. TRANSPORTATION AND CIRCULATION

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from a defined regional area, which for the purposes of this study is the City of Cotati. Many factors affect VMT including the average distance residents commute to work, school, and shopping, as well as the proportion of trips that are made by non-automobile modes. Areas that have a diverse land use mix and ample facilities for non-automobile modes, including transit, tend to generate lower VMT than auto-oriented suburban areas.

Sophisticated travel demand models are needed to produce VMT estimates. The SCTM\07 travel demand model operated by the Sonoma County Transportation Authority (SCTA) will be utilized during the General Plan update to estimate the changes in VMT resulting from buildout of the Plan. The model's "base condition" scenario, which relies on existing travel characteristics and the built environment (such as land use quantities and patterns), estimates that approximately 196,000 vehicle miles of travel are generated daily within the City of Cotati. This estimate reflects trips beginning or ending within the City of Cotati and does not include regional traffic passing through the area (such as traffic on US 101).

### REGULATORY FRAMEWORK

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

#### *COTATI GENERAL PLAN*

The Cotati General Plan is a long-range comprehensive planning document required by state law and adopted by the City in 1998 to set policy and guide future growth, development and conservation of resources. The following 1998 General Plan goals, objectives, and policies are relevant to circulation in Cotati.

**GOAL 2: DEVELOP A SYSTEM OF TRANSPORTATION FACILITIES AND SERVICES THAT PROVIDES SAFE AND EFFICIENT ACCESS TO ALL PARTS OF THE CITY, INCLUDING THOMAS PAGE SCHOOL, SONOMA STATE UNIVERSITY, AND THE REGION, AND REINFORCES THE DESIRED LAND USE PATTERN.**

*OBJECTIVE 2.1 ESTABLISH A SAFE, EFFICIENT, AND PUBLIC TRANSIT SYSTEM THAT MEETS THE MOBILITY NEEDS OF ALL AGE GROUPS IN THE CITY.*

Policies 2.1.1 through 2.1.7 support physical improvements such as added park-and-ride lots and improved transit stop amenities, as well as operational improvements such as implementation of new transit routes in the City and increased frequencies on existing routes.

*OBJECTIVE 2.2 DEVELOP A SAFE AND EFFICIENT SYSTEM OF BICYCLE AND PEDESTRIAN ROUTES THAT CONNECT NEIGHBORHOODS WITH COMMERCIAL CENTERS, TRANSIT FACILITIES, PARKS, AND THOMAS PAGE SCHOOL, THE CITY OF ROHNERT PARK, AND THE COUNTY OF SONOMA.*

Policy 2.2.1 details the contents of the Bicycle and Pedestrian Master Plan that has since been prepared by SCTA and the City of Cotati, and adopted by the City.

Policies 2.2.2 through 2.2.6 specify the need to provide adequate pedestrian and bicycle facilities as part of all new development and within already-developed areas, noting a potential exception for the residential area immediately surrounding the Hub, and emphasize the need for safe pedestrian and bicycle travel to Thomas Page School.

Policies 2.2.7 and 2.2.8 relate to pedestrian and bicycle connectivity across US 101, and indicate the potential need to design facilities to a more rural character west of the freeway.

Policy 2.2.9 states that “the City shall retain the viewpoint of the pedestrian as the primary perspective when identifying Hub-related traffic improvements.”

*OBJECTIVE 2.3 PROVIDE ADEQUATE PARKING IN COMMERCIAL AREAS, COMMUTER TRANSIT FACILITIES, AND IN AREAS DEVOTED TO PROFESSIONAL SERVICE USES TO ELIMINATE SPILLOVER PARKING IN ADJACENT RESIDENTIAL AREAS.*

Policies 2.3.1 through 2.3.4 relate to providing adequate vehicle and bicycle parking, reducing the potential for spillover parking, and potentially creating a downtown parking district in the future.

*OBJECTIVE 2.4 PROVIDE CONVENIENT AND SAFE MOVEMENT WITHIN THE CITY BY ESTABLISHING A TRAFFIC-WAY SYSTEM IN WHICH THE FUNCTION AND DESIGN OF EACH STREET IS CONSISTENT WITH THE CHARACTER AND USE OF ADJACENT LAND.*

Policy 2.4.1 emphasizes the need to seek alternatives to traditional traffic solutions, including traffic calming measures.

Policies 2.4.3 through 2.4.5 describe several segments and intersections within the City that should be prioritized for improvements based on traffic capacity assessments prepared at the time of the General Plan update.

Policy 2.4.6 provides guidance on appropriate residential street volumes and when traffic calming measures may be considered. These standards allow a maximum of 2,000 vehicles per day on improved residential streets and a maximum of 1,500 vehicles per day on residential streets which are more rural in nature.

**GOAL 3: MAINTAIN THE INTEGRITY, SAFETY, AND ENVIRONMENTAL QUALITY OF THE CITY'S RESIDENTIAL NEIGHBORHOODS RELATED TO TRANSPORTATION IMPACTS.**

Objectives 3.1 through 3.3 and Policies 3.1.1 through 3.3.8 reiterate many of the circulation-related policies stated in Goal 2, with the perspective of reducing impacts relative to air quality, noise, and pollution.

**GOAL 6: ENHANCE THE QUALITY OF LIFE OF COTATI RESIDENTS THROUGH THE CREATION AND MAINTENANCE OF WELL-DESIGNED AND APPROPRIATELY SERVED NEIGHBORHOODS.**

*OBJECTIVE 6.4 ENSURE RESIDENTIAL PROJECTS ARE DESIGNED WITH CONVENIENT ACCESS TO COMMERCIAL USES, RECREATIONAL USES, EMPLOYMENT, PUBLIC SERVICES AND OTHER DESTINATIONS THROUGH A COMBINATION OF MOTOR VEHICLE, BICYCLE AND PEDESTRIAN CIRCULATION ROUTES.*

## 4. TRANSPORTATION AND CIRCULATION

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Policies 6.4.1 through 6.4.3 indicate that site design shall minimize paved roadway surfaces while maintaining adequate emergency access, and shall minimize conflicts between vehicular traffic and pedestrian traffic to the degree possible.

### **GOAL 7: MAINTAIN A SAFE ENVIRONMENT BY PROVIDING ADEQUATE PROTECTION FROM TRAFFIC, FIRE, CRIME, NATURAL DISASTER AND HAZARDOUS MATERIALS.**

#### *OBJECTIVE 7.6 DEVELOP SAFE TRAVEL CONDITIONS FOR ALL MODES OF TRANSPORTATION.*

Policy 7.6.1 describes the need for the City to monitor high-frequency collision locations and strive to alleviate safety issues as deemed appropriate by the City Engineer.

Policy 7.6.2 specifies that a "Level of Service D" shall be the minimum Level of Service maintained at all intersections.

Policies 7.6.3 and 7.6.4 establish the need to complete safe bicycle and pedestrian facilities.

### **GOAL 11: ESTABLISH THE INNER HUB AREA AS A PRINCIPAL RETAIL AND SERVICE CENTER.**

#### *OBJECTIVE 11.1 PROMOTE SMOOTH VEHICLE AND PEDESTRIAN TRAFFIC FLOW IN THE HUB AREA THAT MINIMIZES CONGESTION.*

Policy 11.1.1 indicates that the City shall implement the Downtown Specific Plan, including the standards for traffic circulation.

Policy 11.1.2 directs the City to investigate the potential of an Assessment District to fund needed improvements to city streets, sidewalks and traffic control devices within the Hub area.

Policy 11.1.3 states that City decisions on individual site uses in the Hub shall consider potential impacts to streets including traffic volume estimates and traffic patterns.

Policy 11.1.4 relates to the Hub area and the need to provide safe walking areas for pedestrians, safe on-street parking, and adequate street width for fire safety vehicles.

#### *OBJECTIVE 11.2 INSURE THAT ADEQUATE PARKING IN THE HUB AREA IS AVAILABLE.*

Policy 11.2.1 specifies how creation of a downtown Parking Assessment District would occur. The district would fund parking behind existing and new businesses or centrally located in the Hub, creating shared parking efficiencies and minimizing entrances and exits onto Old Redwood Highway.

#### *DRAFT CITYWIDE TRAFFIC IMPROVEMENT PLAN*

The Draft *Citywide Traffic Improvement Plan*, 2005, identifies roadway improvements anticipated to be necessary upon buildout of the General Plan. Note that several of the report's recommendations have been implemented and so are not repeated below; further, some recommendations have been superseded by recommendations contained in the Downtown Specific Plan. Following is a summary of the 2005 Draft Report's recommended improvements.

- Gravenstein Highway (Redwood Drive to Alder Avenue) – Widen to two lanes in each direction plus a center turn lane.

- Old Redwood Highway/William-George Street – Install a traffic signal. Alternatively, maintain all-way stop control and accept the LOS F operation, or eliminate stop controls on Old Redwood Highway and replace them with arterial traffic calming such as narrower lanes and a median.
- Old Redwood Highway/West Sierra Avenue-East Cotati Avenue – Re-stripe the southbound approach to include two left-turn lanes and a combined through/right-turn lane, and add an overlap signal phase for the westbound right turn.
- East Cotati Avenue (Old Redwood Highway to La Salle Avenue) – Carry two eastbound lanes through the intersection with Charles Street.
- East Cotati Avenue/La Salle Avenue – Install a traffic signal.
- East Cotati Avenue/Santero Way – Install a traffic signal.
- Old Redwood Highway/Henry-Charles Streets – Install a traffic signal or single lane roundabout.

#### *DOWNTOWN SPECIFIC PLAN*

The 2009 Downtown Specific Plan includes objectives for eight circulation-related topics including context sensitive solutions (CSS), connectivity, block and street network, street design, street network, parking, transit, and pedestrian/cyclist. Following are excerpts from the plan that will directly tie to transportation and circulation in the General Plan update.

#### **Context Sensitive Solutions Objectives**

*CSS-1. The network should accommodate pedestrians, bicycles, transit, freight and motor vehicles with the allocation of right-of-way on individual streets determined through CSS.*

*CSS-6. System-wide transportation capacity should be achieved using a high level of network connectivity and appropriately spaced and properly sized thoroughfares, along with capacity offered by multiple travel modes, rather by increasing the capacity of individual thoroughfares.*

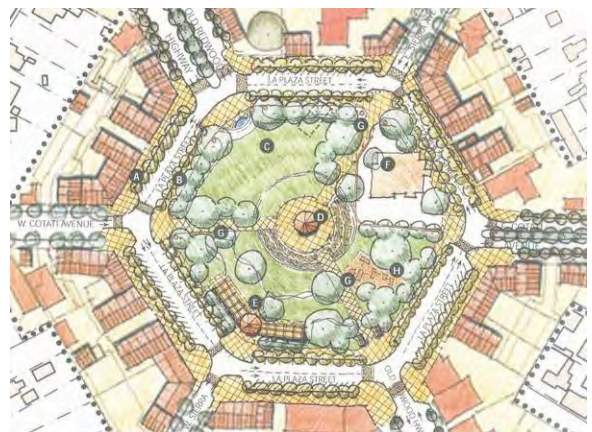
#### **Block and Street Network Objectives**

*BSN-3. [The street network shall] use the minimum width practical for each thoroughfare.*

*BSN-4. [The street network shall] be interconnected, providing for a variety of alternative paths of movement throughout the plan area.*

#### **Street Network Objectives**

*SN-1. Reconfigure [La Plaza Park] within the 1892 hexagon to become a singular, cohesive place that serves the dual purpose of place-making and resolving community-wide circulation.*



*DOWNTOWN SPECIFIC PLAN RECONFIGURATION OF LA PLAZA PARK*

## 4. TRANSPORTATION AND CIRCULATION

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- SN-2. Replace the existing 4-way intersection that bisects [La Plaza Park] and dilutes the edges of the historic hexagon with evenly spaced intersections at the outer edge.*
- SN-3. Define the reconfigured [La Plaza Park] by one-way, 2-lane streets with on-street parking and a speed of 15 miles per hour at the perimeter of the reconfigured park.*
- SN-4. Improve overall circulation and the relationship between the inside perimeter of the hexagon, [La Plaza Park], and the adjacent streets.*
- SN-5. Maintain on-street parking and slow traffic [on Old Redwood Highway south of La Plaza Park].*
- SN-7. Install intersection-control at the intersection of Henry/Charles.*
- SN-9. Make [East Cotati Avenue] more useable and friendly to pedestrians/cyclists.*
- SN-11. Make [West Sierra Avenue] more useable and friendly to pedestrians/cyclists.*
- SN-12. Transform [Old Redwood Highway north of La Plaza Park] into a memorable Downtown boulevard with a landscaped median, wide/active sidewalks, on-street parking, and bike lanes.*
- SN-14. Improve traffic flow for [the Old Redwood Highway/Gravenstein Highway] intersection while contributing to the significantly enhanced life and activity along the frontage of Old Redwood Highway.*
- SN-15. Install intersection-control [at William Street/George Street] for east-west access while accommodating the larger volumes on Old Redwood Highway.*
- SN-16. Unify and spatially define the [Commerce Avenue] streetscape and add continuous sidewalks and bike lanes.*

### **Parking Objectives**

- P-1. Strategically disperse parking to serve retail.*
- P-2. Make better use of existing parking areas and vacant lots.*
- P-3. Ensure shared parking.*
- P-4. Implement transportation demand management strategies.*
- P-5. Consider building public parking garages to augment off-street lots and on-street parking.*

### **Transit Objectives**

- T-2. Increase Transit Service.*

### **Pedestrian and Cyclist Objectives**

- P/C-1. Construct complete streets that balance all modes of travel.*
- P/C-2. Pedestrian access should occur on both sides of streets as practical.*



*P/C-3. Pursue smaller curb radii to enable pedestrian and cyclist movement and access.*

#### *BICYCLE AND PEDESTRIAN MASTER PLAN*

The 2008 Cotati Bicycle and Pedestrian Master Plan was developed as a component of the Sonoma County Transportation Authority's *Countywide Bicycle and Pedestrian Master Plan*. The Countywide Plan was prepared to foster local and regional coordination, to plan primary facilities that connect Sonoma County's communities, and to develop long-term system planning. The Plan established bicycle and pedestrian policy for Cotati and the larger Countywide Bicycle System, along with bicycle and pedestrian infrastructure projects, and programmatic improvements. The Plan was Cotati's first comprehensive bicycle and pedestrian planning effort. In 2010, the Cotati Plan was updated to reflect recently completed improvements and the addition of several new pedestrian projects.

Through a collaborative planning process, a vision, goals, and objectives were approved by all ten jurisdictions in Sonoma County, including Cotati. Each City' plan is distinct and tailored to the needs of its respective community. The plans are designed to guide the development and maintenance of bicycle and pedestrian facilities, to enhance non-motorized mobility, reduce traffic congestion, and improve safety, access, air quality, and the quality of life. The principal goals and objectives are summarized below, and the map of proposed and existing bicycle and pedestrian facilities in Cotati is shown in Figure 4-1.

***Principal Goal: To develop and maintain a comprehensive countywide bicycle and pedestrian transportation system, which includes projects, programs, and policies that work together to provide safe and efficient opportunities for bicyclists and pedestrians to access public transportation, school, work, shopping, services, recreation and residences.***

##### *Objective 1.0: The Countywide Bicycle and Pedestrian Network*

Establish a comprehensive countywide bicycle and pedestrian transportation system.

##### *Objective 2.0: Design*

Utilize accepted design standards and "best practices" for the development of bicycle and pedestrian facilities.

##### *Objective 3.0: Multimodal Integration*

Develop and enhance opportunities for bicyclists and pedestrians to easily access public transit.

##### *Objective 4.0: Comprehensive Support Facilities*

Encourage the development of comprehensive support facilities for walking and bicycling.

##### *Objective 5.0: Education and Promotion*

Develop programs and public outreach materials to promote bicycle and pedestrian safety and the positive benefits of bicycling and walking.

##### *Objective 6.0: Safety and Security*

Create countywide pedestrian and bicycle networks that are, and are perceived to be, safe and secure.

##### *Objective 7.0: Land Use*

## 4. TRANSPORTATION AND CIRCULATION

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Encourage smart growth land use strategies by planning, designing and constructing bicycle and pedestrian facilities in new development.

*Objective 8.0: Planning*

Expand the countywide bicycle and pedestrian system with ongoing planning.

*Objective 9.0: Maintenance*

Maintain and/or improve the quality, operation, and integrity of bicycle and pedestrian infrastructure.

*Objective 10.0: Funding*

Maximize the amount of funding for bicycle and pedestrian projects and programs throughout Sonoma County, with an emphasis on implementation of these objectives.

### Regional

*STATE OF CALIFORNIA COMPLETE STREETS ACT*

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

*CALTRANS*

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

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

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

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

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

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**Complete Street**  
*A transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, trucks, and motorists, appropriate to the function and context of the facility. Complete street concepts apply to rural, suburban, and urban areas.*

maintenance activities and products on the State Highway System.

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

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

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

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

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

### *CALTRANS TRAFFIC IMPACT STUDY GUIDE*

The Caltrans Guide for the Preparation of Traffic Impact Studies, 2002, includes criteria for evaluating the effects of land use development and changes to the circulation system on State highways. In Cotati, Caltrans oversees operation on US 101, Gravenstein Highway (State Route 116), and the freeway on- and off-ramps serving these two facilities. Caltrans endeavors to maintain a target level of service at the transition between LOS "C" and LOS "D" on these facilities.

### *METROPOLITAN PLANNING COMMISSION*

The current Regional Transportation Plan (RTP) produced by MTC, *Transportation 2035 Plan*, was finalized in February 2009 and updates the previous 2005 RTP. The 2035 Plan sets forth regional transportation policy and provides capital program planning for all regional, state and federally funded projects. In addition, the 2035 Plan provides strategic investment recommendations to improve regional transportation system performance over the next 25 years. Investments in regional highway, transit, local roadway, bicycle, and pedestrian projects are set forth in the 2035 Plan. These projects have been identified through regional and local transportation planning processes. Project recommendations are premised upon factors related to existing infrastructure maintenance, increased transportation system efficiencies, improved traffic and transit operations, and strategic expansions of the regional transportation system.

Projects programmed in the RTP relative to Cotati include widening of US 101 for HOV lanes from Pepper Road to Rohnert Park Expressway (Central Phase A), and improvement of local circulation at various locations in the community of Penngrove (includes improvements to Main Street, Petaluma Hill Road, Adobe Road, Old Redwood Highway and US 101/Railroad Avenue).

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### *SONOMA COUNTY TRANSPORTATION AUTHORITY*

#### COMPREHENSIVE TRANSPORTATION PLAN FOR SONOMA COUNTY

The SCTA acts as the countywide planning and programming agency for transportation related issues in Sonoma County. SCTA plays a leading role in transportation by securing funds, providing project oversight, and initiating long term planning activities. Every four years the SCTA updates the Sonoma Comprehensive Transportation Plan (CTP), a multi-modal transportation plan that documents existing conditions and prioritizes regional transportation needs throughout Sonoma County for the next 25 years. The CTP establishes countywide goals, objectives, and policies for improving mobility on Sonoma County's streets, highways, transit systems, and bicycle/pedestrian facilities, as well as strategies to reduce transportation related impacts. Major roadway projects identified in the CTP relative to Cotati include West Sierra Avenue improvements from Old Redwood Highway to Stony Point Road, including bike lanes, as well as Old Redwood Highway pavement rehabilitation from La Plaza to Gravenstein Highway.

### *MEASURE M*

Measure M, the Traffic Relief Act for Sonoma County, was passed by Sonoma County voters in November 2004. Measure M assesses a quarter-cent sales tax on purchases made throughout the County to provide direct funding for local transportation projects. The funds are dedicated to the specific programs and projects specified in the Traffic Relief Act and the 2007 Strategic Plan including maintaining local streets, fixing potholes, widening US 101, improving interchanges, restoring and enhancing transit, supporting the development of passenger rail, and building safe bicycle and pedestrian routes. Measure M provided Sonoma County and its nine cities with a new and reliable funding source for on-going local street maintenance and public transit operational needs. This increase in funding is starting to show significant benefits, as local jurisdictions have increased spending on local road maintenance projects that have improved the quality of roads, sidewalks, and bike lanes.

In 2010 in Cotati, Local Streets and Roads Funds from Measure M were used for pothole repairs, maintaining traffic and directional striping and signage, removal of encroaching vegetation along roadways for safety and access, and maintaining and repairing drainage facilities along roadways to prevent flooding.

### ROADWAY SYSTEM

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This section describes the physical characteristics of Cotati's roadway network. Figure 4-2 shows the major routes in Cotati and the surrounding roadway system.

#### **Highways**

Two highways operated and maintained by Caltrans pass through Cotati.

- US 101
- Gravenstein Highway (SR 116)

**US 101** is the primary route connecting the City of Cotati to the San Francisco Bay Area to the south and Santa Rosa to the north. Within Cotati, US 101 is a four-lane freeway with interchanges at West Sierra Avenue and Gravenstein Highway (SR 116). A Caltrans project to widen the freeway to six lanes, including one high-occupancy vehicle (HOV) lane in each direction, is scheduled to be complete in late 2011. Existing daily traffic on the freeway averages 90,000 vehicles per day.

**Gravenstein Highway (SR 116)** is a state route connecting US 101 in Cotati to SR 1 on the Sonoma Coast in Jenner. The corridor also provides primary access to the Sonoma County communities of Sebastopol, Forestville, Guerneville, and other towns along the Russian River. Within Cotati, Gravenstein Highway is a four-lane facility for one-quarter mile between US 101 and Redwood Drive, transitioning to a two-lane highway to the west. Existing daily traffic on the highway near the City limits averages 17,100 vehicles per day.

### Regional Arterials

Three corridors that pass through Cotati into the City of Rohnert Park or the County of Sonoma are designated as arterials in those neighboring jurisdictions.

- Old Redwood Highway
- East Cotati Avenue
- Commerce Boulevard

Following is a description of these corridors' characteristics at and beyond their interface with the City of Cotati.

**Old Redwood Highway** is designated as a Rural Principal Arterial by the County of Sonoma. The corridor connects the northern portion of the City of Petaluma to US 101 in Cotati via the community of Penngrove. Outside of Cotati, the facility operates as a two-lane rural highway, passing primarily through rural residential and agricultural uses. At its southern interface with the Cotati City limits, the road carries approximately 18,700 vehicles per day.

**East Cotati Avenue** is designated as a major arterial by the City of Rohnert Park, and beyond Rohnert Park as a Rural Minor Arterial by the County of Sonoma. The 2.35-mile long corridor connects Old Redwood Highway at the Cotati "Hub" to Petaluma Hill Road, serving residential neighborhoods in Cotati and Rohnert Park, as well as the southern entrance to Sonoma State University.

**Commerce Boulevard** is designated as a Minor Arterial by the City of Rohnert Park. The majority of the 2.5-mile long corridor passes through the City of Rohnert Park, paralleling the east side of US 101, with only the southernmost 0.25-mile portion passing through Cotati as it connects to Old Redwood Highway. The corridor serves retail and residential uses in both Cotati and Rohnert Park.

### Study Roadway Segments

The following street segments represent the primary auto circulation routes within the City of Cotati. These six have also been chosen for analysis of auto and multimodal LOS operation.

#### *COMMERCE BOULEVARD*

Within the study corridor, Commerce Boulevard has one through lane in each direction and a two-way left-turn lane. Strip commercial land uses prevail along the east side of the street, and US 101 parallels the west side. The posted speed limit is 25 miles per hour. A sidewalk is provided only on the eastern side of the street, except for the northernmost portion of the segment where sidewalks exist on both sides of the street. Paved shoulders of three to five feet in width exist on both sides. The Laguna bicycle path crosses the segment at a mid-block location just south of the City limits. Commerce Boulevard carries an approximate Average Daily Traffic (ADT) of 16,000 vehicles.

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### *GRAVENSTEIN HIGHWAY*

Gravenstein Highway (SR 116) includes two through lanes in each direction, plus left-turn lanes at intersections, between Redwood Drive and Old Redwood Highway. To the west of Redwood Drive, the segment narrows and becomes a two-lane highway. The posted speed limit is 35 mph to the east of West Cotati Avenue and 45 mph to the west. Bicycle lanes do not exist along the corridor. Continuous sidewalks are provided along both sides of the street between Redwood Drive and Old Redwood Highway. Gravenstein Highway carries an approximate ADT of 17,100 vehicles.

### *OLD REDWOOD HIGHWAY-NORTH OF DOWNTOWN*

The corridor extends from Commerce Boulevard on the north to West Sierra Avenue-East Cotati Avenue within the downtown “Hub” on the south. Old Redwood Highway is a five-lane arterial street with two lanes in each direction plus a two-way left-turn lane. The posted speed limit is 25 mph between East Cotati Avenue and William Street-George Street, and 30 mph between William Street-George Street and Commerce Boulevard. Continuous sidewalks exist on both sides of the street. Striped bicycle lanes are present in both directions along the corridor. Between Gravenstein Highway and William Street-George Street, the segment carries an approximate ADT of 24,000 vehicles.

### *OLD REDWOOD HIGHWAY-SOUTH OF DOWNTOWN*

The southern Old Redwood Highway segment extends from East Cotati Avenue-West Sierra Avenue to the southern City limits near Eucalyptus Avenue. The corridor passes through the core downtown commercial district between La Plaza and Henry Street-Charles Street, and includes diagonal parking, bulbouts, and other streetscape amenities in this area. The street is a two-lane roadway with left turn lanes at signalized intersections. To the north of Park Avenue, the posted speed limit is 25 mph, while to the south the posted speed limit increases to 35 mph. Bicycle lanes are provided on both sides of the street. Continuous sidewalks exist on both sides of the street in the downtown area between East Cotati Avenue and Henry Street-Charles Street, and are then provided only along the east side of the street southward to Park Avenue. Sidewalks do not exist between Park Avenue and Valparaiso Avenue, though do occur intermittently further south between Valparaiso Avenue and Eucalyptus Avenue. The corridor carries an approximate ADT of 18,700 vehicles.

### *WEST SIERRA AVENUE*

West Sierra Avenue is a two-lane street with a posted speed limit of 25 mph. Continuous sidewalks exist along the north side of the street from Old Redwood Highway to US 101. Along the south side, sidewalks exist between Old Redwood Highway and Valparaiso Avenue, and then become intermittent to the west toward US 101. Class II bicycle lanes are provided throughout the corridor within Cotati. West Sierra Avenue carries an approximate ADT of 7,500 vehicles.

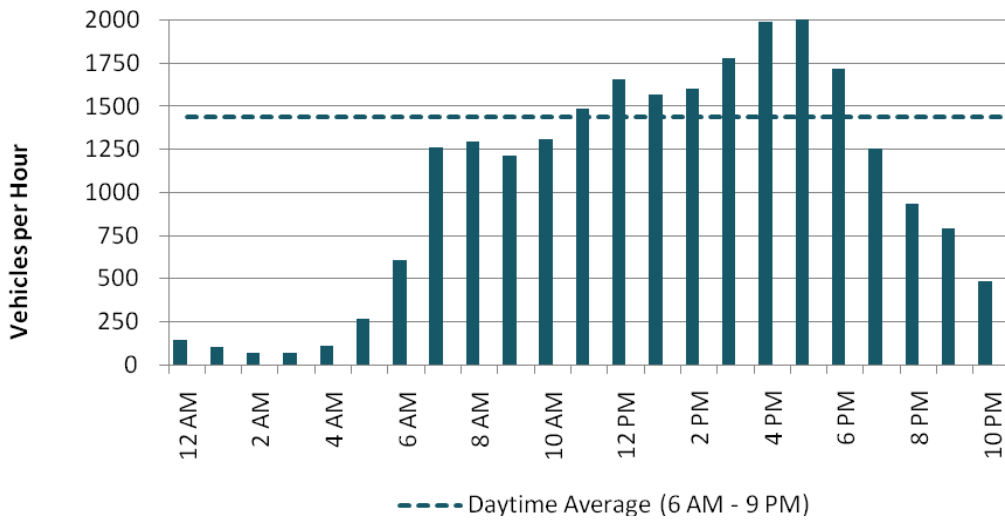
### *EAST COTATI AVENUE*

Between Old Redwood Highway and Lasalle Avenue the corridor has three lanes, with one lane in each direction plus a center two-way left-turn lane. From Lasalle Avenue and continuing east, East Cotati Avenue widens to five lanes, including two through lanes and a center two-way left-turn lane. The posted speed limit is 30 mph. Continuous sidewalks are provided along both sides of the street. Class II bike lanes are provided along the corridor. East Cotati Avenue carries an approximate ADT of 17,200 vehicles.

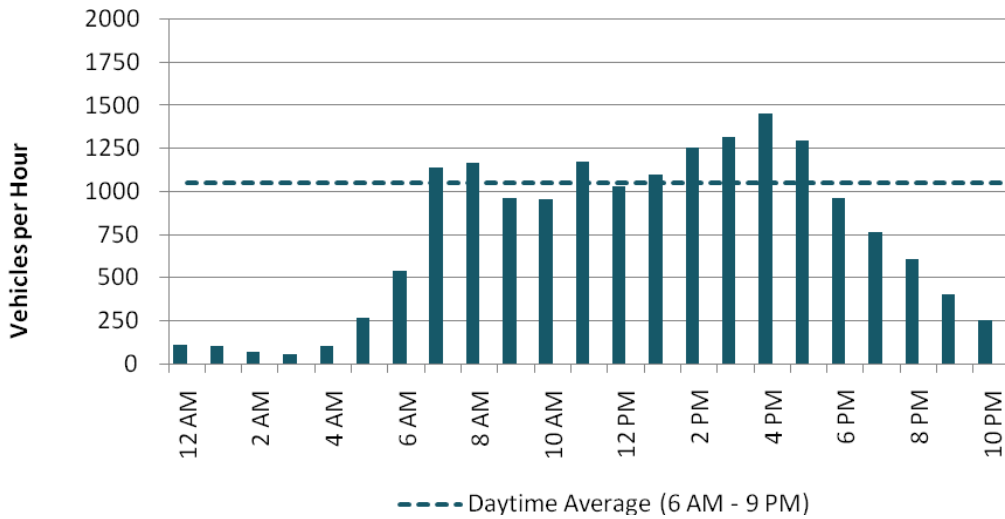
**Traffic Volume Patterns**

As in many communities, vehicular traffic volumes in Cotati tend to peak during commute periods. 24-hour traffic volume counts on Old Redwood Highway north of downtown and on East Cotati Avenue east of downtown reveal these trends. Old Redwood Highway has a particularly notable spike in traffic nearing 2,000 vehicles per hour during the afternoon commute. The daytime average traffic volume between 6 AM and 9 PM is, however, nearly 30 percent lower at 1,440 vehicles per hour. Volumes on East Cotati Avenue show a similar trend, averaging 1,450 vehicles per hour during the afternoon peak and an average of 1,050 vehicles per hour over the entire daytime. The volume trends are shown graphically in Figures 4-3 and 4-4.

**Figure 4-3**  
**Weekday Traffic Trend on Old Redwood Highway (north of downtown)**



**Figure 4-4**  
**Weekday Traffic Trend on East Cotati Avenue (east of downtown)**



## 4. TRANSPORTATION AND CIRCULATION

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### Study Intersections

The following 19 study intersections were identified as those most critical to Cotati's local circulation system and its connectivity to the regional transportation network.

1. Gravenstein Highway (SR 116)/Alder Avenue
2. Gravenstein Highway (SR 116)/West Cotati Avenue
3. Gravenstein Highway (SR 116)/Redwood Drive
4. Gravenstein Highway (SR 116)/US 101 South Ramps
5. Gravenstein Highway (SR 116)/US 101 North Ramps
6. Old Redwood Highway/Commerce Boulevard/US 101 North Onramp
7. Old Redwood Highway/Gravenstein Highway
8. Old Redwood Highway/William Street-George Street
9. Old Redwood Highway/West Sierra Avenue-East Cotati Avenue
10. Old Redwood Highway/Henry Street-Charles Street
11. Old Redwood Highway/Valparaiso Avenue-Myrtle Avenue
12. West Sierra Avenue/US 101 South Onramp-West School Street
13. West Sierra Avenue/US 101 North Onramp
14. West Sierra Avenue/East School Street
15. East Cotati Avenue/Charles Street
16. East Cotati Avenue/La Salle Avenue
17. East Cotati Avenue/Adrian Drive
18. East Cotati Avenue/Lancaster Drive
19. East Cotati Avenue/Santero Way

Traffic volumes were obtained in March and April 2011, while all area schools including Sonoma State University were in session. Operating conditions during the AM and PM peak periods were evaluated to capture the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 AM and reflects conditions during the home to work or school commute, while the PM peak hour occurs between 4:00 and 6:00 PM and typically reflects the highest level of congestion during the homeward bound commute.

The locations of the study intersections and the existing peak hour traffic volumes are shown in Figures 4-5A and 4-5B.

## PUBLIC TRANSPORTATION SYSTEM

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### Bus Transit Operations

Bus service in Cotati is provided by Sonoma County Transit (SCT) and Golden Gate Transit (GGT). An exhibit showing bus routes in and surrounding the City is provided in Figure 4-6.

#### *SONOMA COUNTY TRANSIT*

Sonoma County Transit is the primary transit provider in Cotati; it provides regularly-scheduled fixed-route service to major activity centers and transit hubs within the City limits. Four Sonoma County Transit routes serve the City of Cotati. Route 48/48X travels daily between Santa Rosa and Petaluma, and serves Rohnert Park and Cotati (on Old Redwood Highway). On weekdays, local Route 26 travels between Sebastopol and Sonoma State University, serving the Cotati Park & Ride lot on the west side of US 101 along the way. Route 10 offers local service between Old Redwood Highway in Cotati and Rohnert Park's shopping areas, Sonoma State University and, on school days, to Rohnert Park primary



and secondary schools. Route 44 provides daily service between Petaluma, Cotati, Rohnert Park, and Santa Rosa. All routes operate on approximately 45- to 90-minute headways.

Sonoma County Transit staff indicated that all service routes in Cotati operate well within maximum capacity levels. Routes 44 and 48 carry the second-highest number of revenue passengers per hour on the SCT system, with routes 10 and 12 also performing above the system's average. Systemwide, SCT carried over 1.4 million passengers in 2009, representing an approximate 1.5 percent reduction from 2008.

Sonoma County Transit maintains five shelters at Cotati bus stops. Front loading bicycle racks, which typically accommodate three bicycles, are provided on all fixed route transit buses that operate in Sonoma County. Bicycle rack spaces are available on a first come, first served basis. When the front loading racks are full, drivers can accommodate bicycles inside the bus at their discretion; however, in the event that it is the last scheduled bus of the day, bicycles are permitted inside the vehicle.

#### *GOLDEN GATE TRANSIT*

Golden Gate Transit Routes 72, 80, and 101 serve Cotati with stops located at either the Hub or the St. Josephs Park and Ride. Commute service is provided weekdays in the morning and evening hours, with approximately one hour intervals between 4:00 and 9:00 AM and 6:00 and 10:00 PM, to San Francisco with stops in various communities along the US 101 corridor including Santa Rosa to the north and various cities in Marin County to the south. Weekend service is provided hourly between approximately 4:00 AM and 10:00 PM. No capacity issues were identified on existing service routes.

#### *PARATRANSIT*

Paratransit, also known as dial-a-ride or door-to-door service, is available for those that are unable to independently use the transit system due to a physical or mental disability. Individuals must be registered and certified as ADA eligible before using the service. Paratransit operators are required by the ADA to service areas within three-quarters of a mile of their respective, public fixed-route service. Volunteer Wheels serves as the ADA paratransit operator for Sonoma County Transit and the City of Cotati. Service hours are Monday through Friday from 5:00 AM to 11:00 PM and Sunday and Sunday from 7:00 AM to 9:00 PM. Ride reservations can be scheduled daily.

### **Park and Ride Lots**

Cotati has two park and ride lots and one planned for construction in 2012. A Caltrans lot is located on the east side of US 101 on St. Josephs Way just south of the US 101/Gravenstein Highway interchange. The facility is served by Golden Gate Transit, provides bike racks and a bus shelter, and includes 185 vehicle parking spaces. The City of Cotati has long range plans to remove this facility from the immediate downtown area. A second lot is provided on the west side of US 101 on Redwood Drive south of Gravenstein Highway. The facility provides 83 parking spaces and is served by Sonoma County Transit. The City, in conjunction with Sonoma County Transit, is planning to construct a third 136-space lot in 2012 at the Cotati SMART Station.

### **SMART Rail Transit**

The Sonoma-Marin Area Rail Transit (SMART) commuter rail system is a 70-mile rail line that is planned to run from Cloverdale, at the north end of Sonoma County, to Larkspur, where the Golden Gate Ferry connects Marin County with San Francisco. Along the way, SMART will have stations at the major population and job centers of the North Bay. The 14 stations along the corridor are being designed to

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accommodate available feeder bus services, shuttle services and, in selected suburban locations, park and ride facilities. Commuter-oriented passenger train service will be provided by an estimated 14 round-trip trains per day operating at 30-minute intervals in the morning and evening peak commute hours during the week. At buildout, SMART will also provide a critical north-south transportation route for bicyclists and pedestrians, with a combination of multi-use pathways and on-street facilities located along or adjacent to the right-of-way between Cloverdale and Larkspur.

In Cotati, a SMART rail station is planned for the southwest corner of the intersection of East Cotati Avenue and the railroad tracks to the east of downtown. The station is planned as an intermodal transit facility with a depot building and park-n-ride lot with approximately 136 vehicle parking spaces, 25 short-term bicycle parking spaces, 16 bicycle lockers, and two bus bays for transit transfers. Planned amenities for the station include a raised train platform, pedestrian pathways and access from surrounding streets, a pedestrian plaza, and a photovoltaic solar array that will be configured to provide shelter for parked vehicles. New commercial development is envisioned on the northwest corner of the site, and additional parking is being considered by SMART on the east side of rail corridor.



*SMART CONCEPTUAL STATION PLAN FOR COTATI*

As of May 2010, SMART is planning to initiate rail service in 2014 on what is being referred to as the initial operating segment (IOS). The IOS runs from downtown Santa Rosa on the north to the San Rafael Civic Center on the south.

## **Taxi Service**

Taxi service in Cotati is provided by private operators that serve the greater Sonoma County area and beyond. Taxi service is available 24 hours a day, seven days a week by calling in a service request.

## **BICYCLE AND PEDESTRIAN SYSTEM**

The following section describes the bicycle and pedestrian network in Cotati. Bicycle and pedestrian volumes were collected during the weekday PM peak hour in March and April, 2011 at the same 19 intersections where vehicle volumes were obtained. These bicycle and pedestrian volumes are shown in Figure 4-7 both for the peak hour and for the calculated daily annual average, derived using factors obtained from the National Bicycle & Pedestrian Documentation Project (NBPD) count adjustment factors published in 2009 (see <http://bikepeddocumentation.org>).

## **Activity Centers**

To help understand access needs and travel patterns in Cotati, activity centers (attractors, generators, and destinations) in Cotati were identified. Activity centers were identified by reviewing information from standard sources such as maps, plans, and the City's website. Primary activity centers include downtown, the Cotati Civic Center and adjacent government buildings, La Plaza Park, other City parks, Cotati post office, Cotati park-and-ride, Thomas Page Elementary School, places of worship, shopping centers, and retail and commercial destinations along East Cotati Avenue, Old Redwood Highway, SR 116, and Redwood Drive.

### *EMPLOYMENT DESTINATIONS*

Jobs and employers are distributed throughout Cotati and largely consist of local independent retailers, food service, commercial and professional businesses, government, and light industrial. Employment centers in Cotati are generally concentrated along arterials including East Cotati Avenue, Old Redwood Highway, Redwood Road, and SR 116. Approximately 79 percent of workers in Cotati have a commute time of 15 minutes or longer, which would generally indicate travel to a place of employment outside of the Cotati city limits to destinations throughout Sonoma County and beyond.

## **Bicycle and Pedestrian Facilities**

### *BICYCLE FACILITIES*

Bicycle circulation in Cotati is supported by an existing network of multi-use paths, on-street bike lanes, and bicycle routes. Notable facilities include a segment of the Laguna de Santa Rosa bike path between Southwest Boulevard (in Rohnert Park) and the southern City limits (with one small gap just south of East Cotati Avenue), and on-street bicycle lanes within the City limits on Gravenstein Highway, West Sierra Avenue, and East Cotati Avenue. The City's Bicycle and Pedestrian Master Plan, shown in Figure 4-1, expands upon the existing network to create a robust bicycle circulation system in Cotati. The Plan includes important bicycle connections such as completion of the Laguna de Santa Rosa path within the entire City, completion of the SMART multi-use path, a completed bicycle circulation system on Old Redwood Highway including on-street bike lanes for portions of the corridor outside the historic downtown, the Valparaiso Avenue-Myrtle Avenue corridor, and the segment of West School Street between the US 101 undercrossing and Thomas Page Elementary School.

Bicycle racks for short-term bicycle parking are provided at various locations in Cotati including the Caltrans park and ride lot on St. Josephs Way, Cotati Civic Center, downtown, at numerous transit stops, shopping centers, Thomas Page Elementary School, and in multi-family housing developments. There

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are no known existing shower or locker facilities designated for bicyclists, and none are proposed at this time. Section 17.36.070 of Cotati's Zoning Ordinance specifies bicycle parking requirements, including number of spaces, locations, and specifications relating to bike parking design and devices.

### *PEDESTRIAN FACILITIES*

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal infrastructure, curb ramps, and streetscape amenities. The Cotati Bicycle and Pedestrian Master Plan identified two Pedestrian Districts in Cotati (areas of high activity where pedestrian improvements should be prioritized) including downtown/Old Redwood Highway between SR 116 and Henry Street, and the area immediately surrounding Thomas Page Elementary School. Nearly complete sidewalk coverage, accessible curb ramps, and marked crosswalks are provided along arterial streets in Cotati. High visibility crosswalk markings, pedestrian refuge islands, and in-roadway pedestrian warning signs, among other treatments, are provided at several uncontrolled mid-block crosswalk locations along East Cotati Avenue, West Sierra Avenue, and Old Redwood Highway.

Sidewalks in Cotati generally range from four to ten feet in width. Wide sidewalks and a variety of pedestrian amenities are provided throughout the downtown including accessible pedestrian ramps, pedestrian phasing at traffic signals, decorative paving and crosswalk treatments, curb extensions, pedestrian scale lights, transit shelters, benches, street trees, sidewalk dining, and public art, among others. Sidewalks are also provided in most of Cotati's single family residential neighborhoods on the east side of US 101, in multi-family residential developments, and in commercial developments in the City's northwest quadrant.

While the pedestrian network is generally well-developed in Cotati, there are some locations where gaps in the sidewalk network can be found. Short gaps exist along undeveloped properties and various frontages on Old Redwood Highway, Redwood Drive, West Sierra Avenue, and Myrtle Avenue among other locations, and sidewalks are not provided along SR 116 west of Redwood Drive. Further, traditional curb, gutter, and sidewalks are generally not provided along residential streets in west Cotati. In the past, residents in west Cotati's residential areas have supported using a more rural type of pedestrian path rather than a typical curb, gutter and sidewalk. Figure 4-8 provides an overview of sidewalk coverage in Cotati.

### **Bicycle and Pedestrian Barriers**

A variety of physical barriers exist in Cotati that both shape transportation patterns and/or inhibit access for people in cars, on foot, or on bicycle. Existing transportation corridors (such as US 101, SR 116, and the SMART Rail Corridor) as well as waterways, land use development patterns, and topography, can all impact mobility. For example, US 101 divides Cotati's east and west sides, and SR 116 is uncomfortable to navigate on (or across) by foot or bicycle. In Cotati, only two roadway undercrossings of US 101 are provided, at Gravenstein Highway and West Sierra Avenue. Class II bike lanes and sidewalks provided along both of these streets facilitate access for pedestrians and bicyclists. For bicyclists and pedestrians, a tunnel is provided under US 101 connecting East and West School Streets.

Gravenstein Highway, the primary arterial on Cotati's west side, lacks sidewalks and designated pedestrian crossings. Further, while wide shoulders are provided that serve as Class II bike lanes, existing pavement condition, traffic densities and speeds, and high speed vehicular movements associated with freeway on- and off-ramps combine to make mobility difficult. This combination of physical constraints and perceived safety concerns serves as a barrier to most potential users, and

results in a situation where only persons who are either “brave” or dependent on walking or bicycling use the corridor.

In addition to these physical obstacles, public perception plays a role in the level of bicycling and walking in communities. Vehicular traffic on arterial streets is a perceived safety concern, and high vehicle volumes and traffic speeds decrease comfort levels for both bicyclists and pedestrians. A lack of public acceptance for walking and bicycling as viable and convenient transportation modes also prevents people from walking or bicycling to nearby destinations.

### GOODS MOVEMENT SYSTEM

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A concentration of light industrial and manufacturing uses, including several freight terminals, exists on Redwood Drive, located just west of US 101 between Gravenstein Highway and the Rohnert Park city limits. Several additional industrial and freight-generating uses exist on Gravenstein Highway near the western City limits. Truck traffic originating in and destined for these areas occurs on Redwood Drive and Gravenstein Highway, with the majority of trucks traveling to and from the US 101 freeway interchange. Industrial, manufacturing, warehousing, and freight-dependent uses are very limited in Cotati to the east of US 101.

Section §10.40.110 of the Cotati Municipal Code designates truck routes on Old Redwood Highway, Gravenstein Highway, and East Cotati Avenue. The Municipal Code allows truck drivers to use other City streets as well, as long as those streets comprise the most direct route between the nearest truck route and the freight origin or destination.

### RAIL FREIGHT TRANSPORTATION

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Rail freight operation on the SMART rail corridor is overseen by the North Coast Railroad Authority (NCRA). After a nearly decade-long suspension of freight service due to storm damage, freight service resumed in July 2011 between Lombard (located in Napa County where the NCRA interfaces with the national rail system) and Windsor. Several round trip freight trains per week are expected to pass through Cotati over the next several years. Once the rail service is extended northward to Willits, up to two round trips per day (four daily rains) could pass through Cotati six days per week. Because the rail corridor passes through only a one-half mile portion of Cotati, all of which is built out or planned for non-industrial uses, no freight-related rail activities are expected in the City.

### LEVEL OF SERVICE METHODOLOGIES

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

#### **Intersections**

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for the intersections with side-street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the “Two-Way Stop-Controlled”

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intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections with stop signs on all approaches were analyzed using the "All-Way Stop-Controlled" Intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole, and is then related to a Level of Service.

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

The ranges of delay associated with the various levels of service are indicated in Table 4-4.

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

REFERENCE: HIGHWAY CAPACITY MANUAL, TRANSPORTATION RESEARCH BOARD, 2000

## Roadway Segments

The roadway segment Level of Service methodology found in Chapter 17, "Urban Street Segments," of the HCM is the basis of the automobile LOS analysis. This method does not address the capacity of a facility, but rather determines a Level of Service based the calculated percentage of the street's base free-flow speed. In essence, congestion occurs as traffic volumes increase, and the overall travel speed is reduced due to increased delay. Therefore, the slower the speed, the lower that speed is as a percentage of free-flow speed, and the lower the Level of Service.

The relationship between Level of Service and percentages of free-flow speed is presented in Table 4-5.

<b>TABLE 4-5: ROADWAY SEGMENT LEVEL OF SERVICE CRITERIA</b>	
<b>Level of Service</b>	<b>Travel Speed as a Percentage of Base Free-Flow Speed (%)</b>
LOS A	>95
LOS B	67-85
LOS C	50-67
LOS D	40-50
LOS E	30-40
LOS F	≤30

REFERENCE: HIGHWAY CAPACITY MANUAL, TRANSPORTATION RESEARCH BOARD, 2010

## Multimodal Levels of Service

In transportation/traffic studies, LOS has traditionally been determined for vehicle traffic at intersections and on roadway segments based on vehicle delay. The 2010 HCM includes methodologies to determine automobile, pedestrian, bicycle, and transit levels of service, referred to collectively as Multimodal LOS (MMLOS). Following is a description of the data and physical factors used in the methodology.

### *AUTOMOBILE*

The methodology considers the geometric configuration of the street, including the number of lanes, control delay encountered at intersections, running speed, presence of turn lanes, traffic volumes on the corridor and side streets, and numerous other factors. Automobile LOS thresholds are based on the predicted vehicle speeds as a percentage of the unimpeded free-flow speed, as described above.

### *PEDESTRIAN*

The methodology considers the presence of pedestrian facilities, lateral separation between pedestrians and vehicular traffic, width of sidewalk, speed and makeup of vehicle traffic, and number of vehicle traffic lanes. Pedestrian LOS is determined for both segments and signalized intersections. Additionally, a pedestrian midblock crossing factor is calculated, which is considered in tandem with the segment and intersection levels of service to develop an overall pedestrian LOS.

## 4. TRANSPORTATION AND CIRCULATION

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### *BICYCLE*

The methodology considers the presence of bicycle facilities, lateral separation between bicycles and vehicular traffic, speed and makeup of vehicle traffic, crossing distances at intersections, and pavement condition. Bicycle LOS is determined for both segments and intersections. The overall Bicycle LOS considers the segment and intersection results, as well as the number of unsignalized intersections and driveways per mile along the study segment (the resulting “conflict points” adjustment heavily influences the overall Bicycle LOS).

### *TRANSIT*

The methodology considers the frequency of service, in-vehicle travel time, reliability of service, load factors, and quality of pedestrian access to transit stops. Ridership elasticities based on headways and the users’ perception of travel time are also included.

### *MMLOS GRADES*

Automobile-based levels of service generally consider LOS A to represent “free flow” while LOS F represents “gridlock.” Note that a vehicle LOS A may not represent an ideal condition, since it can be associated with facilities that have excessive capacity and characteristics (such as overly-long crossing distances and higher speeds) that can be detrimental to other modes. Multimodal levels of service for pedestrian, bicycle, and transit travel are considered differently than automobile LOS. For these modes, Level of Service A should be considered to represent ease of travel and the presence of a circulation network that supports and encourages the travel mode. Level of Service F represents difficult travel conditions and a circulation network that discourages or creates barriers to that mode of travel.

### **Level of Service Standards**

Policy 7.6.2 of the Cotati General Plan indicates that LOS D shall be the minimum Level of Service maintained at all intersections. The LOS standard does not differentiate between signalized intersections and other types of controls. Since application of the LOS D standard to individual movements at two-way stop-controlled intersections may lead to recommendations which create unnecessary delay or maintenance expenses, unsignalized intersection operation is considered to be unacceptable if the LOS of any single movement falls to LOS F, indicating an average delay in excess of 50 seconds, and traffic signal warrants are met. Situations where this may apply include intersections with side street volumes that are inadequate to meet warrants indicating need for signalization and where other types of mitigation, including all-way stop controls or additional lanes, are infeasible. The City does not currently specify LOS thresholds for roadway segments or multimodal uses.

## LEVEL OF SERVICE ANALYSIS

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### **Intersections**

Currently, 18 of the 19 study intersections are operating acceptably at LOS D or better. The intersection at Old Redwood Highway/William Street-George Street is operating unacceptably at LOS E during the PM peak hour. A summary of the intersection level of service calculations is contained in Table 4-6.



**TABLE 4-6: SUMMARY OF EXISTING PEAK HOUR  
INTERSECTION LEVELS OF SERVICE**

Intersection <i>Approach</i>	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
1. Gravenstein Hwy (SR 116)/Alder Ave <i>Southbound Approach</i>	14.6	<i>B</i>	22.9	<i>C</i>
2. Gravenstein Hwy (SR 116)/West Cotati Ave <i>Northbound Approach</i>	11.8	<i>B</i>	21.0	<i>C</i>
3. Gravenstein Hwy (SR 116)/Redwood Dr	14.7	<i>B</i>	29.5	<i>C</i>
4. Gravenstein Hwy (SR 116)/US 101 South Ramps	11.9	<i>B</i>	16.9	<i>B</i>
5. Gravenstein Hwy (SR 116)/US 101 North Ramps	5.6	<i>A</i>	9.4	<i>A</i>
6. Old Redwood Hwy/Commerce Blvd/US 101 North On	8.9	<i>A</i>	6.3	<i>A</i>
7. Old Redwood Hwy/Gravenstein Hwy	20.0	<i>B</i>	38.0	<i>D</i>
8. Old Redwood Hwy/William St-George St	14.3	<i>B</i>	<b>36.4</b>	<b>E</b>
9. Old Redwood Hwy/West Sierra Ave-East Cotati Ave	32.4	<i>C</i>	32.4	<i>C</i>
10. Old Redwood Hwy/Henry St-Charles St	10.7	<i>B</i>	18.3	<i>C</i>
11. Old Redwood Hwy/Valparaiso Ave-Myrtle Ave	13.6	<i>B</i>	11.6	<i>B</i>
12. West Sierra Ave/US 101 South Onramp-West School St <i>Southbound Approach</i>	36.3	<i>E</i> <sup>1</sup>	14.2	<i>B</i>
13. West Sierra Ave/US 101 North Onramp <i>Northbound Approach</i>	11.2	<i>B</i>	10.7	<i>B</i>
14. West Sierra Ave/East School St	10.4	<i>B</i>	10.3	<i>B</i>
15. East Cotati Ave/Charles St <i>Northbound Approach</i>	12.6	<i>B</i>	33.7	<i>D</i>
16. East Cotati Ave/La Salle Ave	14.4	<i>B</i>	29.8	<i>D</i>
17. East Cotati Ave/Adrian Dr	11.1	<i>B</i>	11.2	<i>B</i>
18. East Cotati Ave/Lancaster Dr	10.3	<i>B</i>	12.1	<i>B</i>
19. East Cotati Ave/Santero Way <i>Northbound Approach</i>	13.8	<i>B</i>	14.7	<i>B</i>

NOTES: DELAY IS MEASURED IN AVERAGE SECONDS PER VEHICLE; LOS = LEVEL OF SERVICE; RESULTS FOR MINOR APPROACHES TO TWO-WAY STOP-CONTROLLED INTERSECTIONS ARE INDICATED IN ITALICS; **BOLD** = DEFICIENT OPERATION; <sup>1</sup> CONSIDERED TO BE ACCEPTABLE SINCE PEAK HOUR VOLUME WARRANT FOR SIGNALIZATION IS UNMET

### Roadway Segments

All six of the study roadway segments are operating at LOS D or better. A summary of the roadway segment automobile level of service calculations is shown in Table 4-7.

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**TABLE 4-7: SUMMARY OF ROADWAY SEGMENT  
PM PEAK HOUR LEVELS OF SERVICE**

Corridor	Northbound/Eastbound		Southbound/Westbound	
	% Free-Flow Speed	LOS	% Free-Flow Speed	LOS
Commerce Boulevard <i>North City limits to Old Redwood Hwy</i>	96.7%	A	71.8%	B
Gravenstein Highway <i>Redwood Dr to Old Redwood Hwy</i>	47.2%	D	40.1%	D
Old Redwood Highway <i>Commerce Blvd to East Cotati Ave</i>	65.7%	C	66.5%	C
Old Redwood Highway <i>East Cotati Ave to Myrtle Ave</i>	86.0%	A	72.2%	B
West Sierra Avenue <i>US 101 to Old Redwood Hwy</i>	79.4%	B	98.6%	A
East Cotati Avenue <i>Old Redwood Hwy to East City limits</i>	78.3%	B	69.7%	B

LOS = LEVEL OF SERVICE

### Multimodal

Based on review and analysis of the automobile, transit, bicycle and pedestrian conditions for the study corridors, the LOS for each mode was determined. The results are summarized in Table 4-8.

**TABLE 4-8: SUMMARY OF  
MULTIMODAL LEVELS OF SERVICE**

Corridor	Automobile	Transit	Bicycle	Pedestrian
Commerce Boulevard				
Northbound	A	B	E	C
Southbound	B	B	D	C
Gravenstein Highway				
Eastbound	D	C	D	D
Westbound	D	C	D	D
Old Redwood Hwy (north of hub)				
Northbound	C	B	E	D
Southbound	C	B	E	D
Old Redwood Hwy (south of hub)				
Northbound	B	C	C	D
Southbound	B	C	D	D
West Sierra Avenue				
Eastbound	B	B	D	B
Westbound	A	B	C	B
East Cotati Avenue				
Eastbound	B	B	D	C
Westbound	B	B	C	C

Following are brief descriptions of the multimodal LOS results by corridor. The results are shown graphically for each mode in Figures 4-9 through 4-12.

*COMMERCE DRIVE (SOUTHWEST BOULEVARD TO OLD REDWOOD HIGHWAY)*

The presence of two Golden Gate Transit bus stops, in combination with adequate pedestrian connectivity, results in LOS B for transit. Bicycle circulation is considered to be LOS D/E, and is affected by a combination of limited shoulder widths adjacent to high traffic volumes. Pedestrian circulation is LOS C, negatively affected by a lack of buffer space between moving traffic and pedestrians. The lack of sidewalks on portions of the west side of the street also affects the LOS, though the methodology may unduly penalize the LOS score in this type of condition where sidewalks would serve no purpose (as they are located between a street and freeway with no potential for fronting land uses to ever occur).

*GRAVENSTEIN HIGHWAY (REDWOOD DRIVE TO OLD REDWOOD HIGHWAY)*

Transit operates at LOS C, with Sonoma County Transit and Golden Gate Transit stops within a walkable one-quarter mile distance of the corridor. Bicycle circulation is LOS D due to a lack of bike lanes and/or shoulders in combination with high traffic volumes. For similar reasons, pedestrian circulation is also considered to be LOS D.

*OLD REDWOOD HIGHWAY (COMMERCE BOULEVARD TO WEST SIERRA AVENUE-EAST COTATI AVENUE)*

Transit operation is considered to be LOS B for this segment, which is served by several Sonoma County Transit and Golden Gate Transit routes and stops. The bicycle result of LOS E is largely attributable to the high traffic volumes adjacent to the minimum-width bike lanes, in addition to delays incurred at intersections. Pedestrian circulation is LOS D in both directions. Pedestrian LOS scores are also affected by the high traffic volumes and limited buffer space to moving vehicles, as well as delays encountered at the Old Redwood Highway/Gravenstein Highway intersection. While the frequency of unsignalized crosswalks is not included in the pedestrian LOS methodology, there is also a lack of crossing opportunities for a long segment between William Street and Gravenstein Highway, as well as a general perception of the corridor being an unpleasant walking experience.

*OLD REDWOOD HIGHWAY (WEST SIERRA-EAST COTATI AVENUES TO MYRTLE-VALPARAISO AVENUES)*

This segment Old Redwood Highway, which includes the downtown commercial district, operates at LOS C for transit. Sonoma County Transit passes through the corridor and Golden Gate Transit stops are within a walkable distance to the downtown area. Bicycle circulation is considered to be LOS C northbound and LOS D southbound, affected by minimum bike lane widths adjacent to high traffic volumes as with several of the other segments. Pedestrian circulation is LOS D in both directions; pedestrian circulation is actually reasonably good in the downtown area, but is negatively affected overall by the discontinuity of sidewalks and the distance between pedestrian crossings on the southern portion of the segment.

*WEST SIERRA AVENUE – WEST CITY LIMITS TO OLD REDWOOD HIGHWAY*

Transit operation is LOS B along the corridor, strengthened by the presence of Golden Gate Transit service along the entire segment as well as good travel speeds. Bicycle operation is currently at LOS D in the eastbound direction and LOS C in the westbound direction. Bicycle LOS is affected by the number of driveways along the segment and delays incurred at the all-way stop-controlled intersection at East School Street. Pedestrian circulation is LOS B overall, benefitting from moderate traffic volumes and a bike lane buffer between sidewalks and travel lanes.

## 4. TRANSPORTATION AND CIRCULATION

### *EAST COTATI AVENUE (OLD REDWOOD HIGHWAY TO THE EASTERN CITY LIMITS)*

This corridor has the most transit stops of any study segment, most of which include transit shelters, in combination with adequate pedestrian connectivity, resulting in LOS B for transit. Bicycle circulation is LOS D for the eastbound direction and LOS C for the westbound direction, affected by the frequency of driveways along the corridor, traffic volumes, and delays encountered at the Lasalle Avenue all-way stop-controlled intersection. Pedestrian operation is LOS C in both directions, affected by traffic volumes and the distances between protected pedestrian crossings. While not directly accounted for in the methodology, the pedestrian walking experience on this segment is perceived by most to be unpleasant.

### TRAFFIC SAFETY

The collision histories for the study intersections were reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2005, through December 31, 2009.

### Study Intersection Collision Rates

As presented in Table 4-9, the calculated collision rates for the study intersections, measured in collisions per million vehicles entering the intersection (c/mve), were compared to average collision rates for similar facilities statewide, as indicated in *2007 Accident Data on California State Highways*, California Department of Transportation. This data only includes collisions which are reported to a law enforcement agency and may not include minor collisions that the parties involved chose not to report.

<b>TABLE 4-9: INTERSECTION COLLISION RATES AND STATEWIDE COMPARISON</b>			
<b>Intersection</b>	<b>Number of Collisions 2005-2009</b>	<b>Calculated Collision Rate (c/mve)</b>	<b>Statewide Collision Rate (c/mve)</b>
1. Gravenstein Hwy (SR 116)/Alder Ave	7	<b>0.27</b>	0.14
2. Gravenstein Hwy (SR 116)/West Cotati Ave	4	<b>0.15</b>	0.14
3. Gravenstein Hwy (SR 116)/Redwood Dr	15	0.37	0.43
4. Gravenstein Hwy (SR 116)/US 101 South Ramps	9	0.21	0.43
5. Gravenstein Hwy (SR 116)/US 101 North Ramps	13	<b>0.34</b>	0.28
6. Old Redwood Hwy/Commerce Blvd/US 101 North On	14	<b>0.50</b>	0.28
7. Old Redwood Hwy/Gravenstein Hwy	22	0.43	0.43
8. Old Redwood Hwy/William St-George St	8	0.21	0.41
9. Old Redwood Hwy/West Sierra Ave-East Cotati Ave	9	0.22	0.43
10. Old Redwood Hwy/Henry St-Charles St	10	<b>0.48</b>	0.41
11. Old Redwood Hwy/Valparaiso Ave-Myrtle Ave	3	0.12	0.43
12. West Sierra Ave/US 101 South Onramp-W. School St	2	<b>0.24</b>	0.22
13. West Sierra Ave/US 101 North Onramp	2	<b>0.17</b>	0.14
14. West Sierra Ave/East School St	0	0.00	0.14
15. East Cotati Ave/Charles St	8	<b>0.25</b>	0.14
16. East Cotati Ave/La Salle Ave	6	0.18	0.41

**TABLE 4-9: INTERSECTION COLLISION RATES  
AND STATEWIDE COMPARISON**

Intersection	Number of Collisions 2005-2009	Calculated Collision Rate (c/mve)	Statewide Collision Rate (c/mve)
17. East Cotati Ave/Adrian Dr	11	<b>0.32</b>	0.28
18. East Cotati Ave/Lancaster Dr	8	0.24	0.43
19. East Cotati Ave/Santero Way	5	0.17	0.43

*c/mve = COLLISIONS PER MILLION VEHICLES ENTERING; **BOLD** INDICATES A CALCULATED COLLISION RATE HIGHER THAN THE STATEWIDE AVERAGE*

Of the 19 study intersections, nine were found to have a collision rate higher than the statewide average for similar facilities. In addition to considering the intersection collision rates, the collision histories were examined to determine if there are any apparent trends in collision types or causes. The nine intersections with higher than average collision rates are discussed below.

#### *GRAVENSTEIN HIGHWAY (SR 116)/ALDER AVENUE*

For the five-year study period, the intersection of Gravenstein Highway/Alder Avenue experienced seven reported collisions resulting in a collision rate of 0.27 c/mve, roughly double the statewide average of 0.14 c/mve for similar intersections. Of the seven collisions, six, or 85.7 percent, resulted in injury, more than the statewide average of 42.4 percent, but none of the collisions resulted in a fatality. The tee-intersection is stop-controlled on the Adler Avenue approach and turn lanes are not present on any approach. Three of the reported collisions were rear-ends, which can occur when no left turn lane is provided on an uncontrolled approach.

#### *GRAVENSTEIN HIGHWAY (SR 116)/WEST COTATI AVENUE*

A total of four collisions were reported at Gravenstein Highway/West Cotati Avenue, resulting in a calculated collision rate of 0.15 c/mve, which is slightly higher than the statewide average rate of 0.13 c/mve. Due to the overall low number of collisions and low volume of vehicles entering the intersection, there was no apparent trend in collisions at this intersection. The intersection experienced an injury rate of 25 percent, less than the statewide average of 42.4 percent, and no fatalities.

#### *GRAVENSTEIN HIGHWAY (SR 116)/US 101 NORTHBOUND OFF-RAMP*

For the five-year period studied, 13 collisions were reported at Gravenstein Highway/US 101 Northbound Off-ramp resulting in a calculated collision rate of 0.34 c/mve, slightly higher than the statewide average of 0.28 c/mve. The majority of these collisions were attributed to unsafe speed and resulted in either rear-end or broadside collisions, both of which are common for a congested intersection. Currently, as part of US 101 corridor improvements, this intersection will be rebuilt which may help improve safety performance.

#### *OLD REDWOOD HIGHWAY/COMMERCE BOULEVARD/US 101 NORTHBOUND ONRAMP*

During the study period, the intersection of Old Redwood Highway/Commerce Boulevard/US 101 Northbound Onramp experience 14 reported collisions, resulting in a calculated collision rate of 0.50 c/mve, greater than the statewide average of 0.28 c/mve. Four of the collisions were attributed to a right-of-way violation, which is likely due to the non-standard intersection configuration. Otherwise, no major trend was identified in the collision records. Although beyond the five-year study period, collisions prior to 2005 were also reviewed, and the intersection has experienced a decrease in collisions since it was signalized in 2005.

## 4. TRANSPORTATION AND CIRCULATION

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### *OLD REDWOOD HIGHWAY/HENRY STREET-CHARLES STREET*

For the five-year study period, this intersection experienced ten collisions, resulting in a calculated collision rate of 0.48 c/mve, higher than the statewide average of 0.41 c/mve. Half of the collisions resulted in injuries, slightly higher than the statewide average of 45 percent, but there were no fatalities. A review of collision data revealed no apparent trend in collisions; however, it was noted that three of the collisions involved pedestrians. The downtown nature of the intersection, which is surrounded by higher levels of pedestrian and parking activity, as well as its location near the boundary of a higher speed street environment, are both likely to be factors in the higher than average collision rate.

### *WEST SIERRA AVENUE/US 101 SOUTH ONRAMP-WEST SCHOOL STREET*

Two collisions were reported at this intersection resulting in a calculated collision rate of 0.24 c/mve, which is slightly higher than the statewide average of 0.22 c/mve. Due to the low number of collisions and the overall low traffic volume at the intersection, no collision trend was apparent.

### *WEST SIERRA AVENUE/US 101 NORTH OFF-RAMP*

During the five-year period evaluated, two collisions were reported at the intersection of West Sierra Avenue/US 101 North Off-ramp. This resulted in a calculated collision rate of 0.17 c/mve, slightly higher than the statewide average of 0.14 c/mve for similar facilities; however, due to the overall low number of collisions, no trend was apparent.

### *EAST COTATI AVENUE/CHARLES STREET*

East Cotati Avenue/Charles Street experienced eight reported collisions, resulting in a collision rate of 0.25 c/mve, higher than the statewide average of 0.14 c/mve. Five of the collisions were rear-end collision where unsafe speed was cited as the primary collision factor. It is likely that these collisions are related to drivers coming to an unexpected stop while entering the downtown area. Two of the collisions involved pedestrians and another collision involved a bicyclist. Overall 62.5 percent of the collisions resulted in injuries, which is more than the statewide of 42.4 percent, but there were no fatalities. The City installed a median “refuge island” on East Cotati Avenue in 2008 to enhance pedestrian crossing safety.

### *EAST COTATI AVENUE/ADRIAN DRIVE*

A total of six collisions were reported at this intersection over the five-year study period, which equates to a collision rate of 0.32 c/mve, greater than the statewide average of 0.28 c/mve. The majority of the collisions were broadsides followed by rear ends with the primary collision factor cited as unsafe speed or right-of-way violations. The collision rate of 45.5 percent is similar to the statewide average of 43.3 percent.

### **Corridor Collision Rates**

In addition to review of collisions at intersections, collisions were reviewed along five major corridors in Cotati. As presented in Table 4-10, the calculated collision rates for the corridors, measured in collisions per million vehicle miles traveled (c/mvm), were compared to average collision rates for similar facilities statewide. The statewide average information is based on the facility type including number of lanes; however, the character of some of these corridors changes within the study segment. Where this occurs, the prevalent configuration along the corridor was used for comparative purposes.

**TABLE 4-10: CORRIDOR COLLISION RATES  
WITHIN CITY LIMITS AND STATEWIDE COMPARISON**

Corridor	Number of Collisions 2005-2009	Calculated Collision Rate (c/mvm)	Statewide Collision Rate (c/mvm)
Commerce Boulevard	19	<b>4.34</b>	2.05
Old Redwood Highway	63	1.15	3.35
Gravenstein Highway	62	<b>3.07</b>	3.05
West Sierra Avenue	15	1.69	3.05
East Cotati Avenue	52	0.88	3.35

*c/mvm = COLLISIONS PER MILLION VEHICLE MILES; **BOLD** INDICATES A CALCULATED COLLISION RATE HIGHER THAN THE STATEWIDE AVERAGE*

The study segment of Commerce Boulevard experienced collisions at a rate more than double the statewide average for similar facilities. This may be attributable to the comparatively short segment length of one-quarter mile, the atypical configuration of the Commerce Boulevard intersection at Old Redwood Highway-US 101 North Ramps, and the prevalence of high-turnover strip commercial type uses that generate a substantial number of turning movements onto and off of the street. The segment of Gravenstein Highway experienced a collision rate similar to the statewide average with all other segments below the statewide average.

### Collision Types

The California Office of Traffic Safety (OTS) prepares an annual ranking of collision performance compared to other comparably sized cities statewide. The OTS rankings were analyzed for 2009 and broken down to the top, middle and bottom third of comparably sized cities, with the “top” third representing the best safety record, or fewest collisions. These rankings, as well as general collision trends are described for the following categories.

#### *INJURY/FATALITIES*

Of the 194 collisions reported citywide, 95, or slightly less than half of all reported collisions, resulted in injuries of varying severities. Compared to other comparably sized cities, Cotati performed in the bottom third for total fatal and injury collisions.

One collision, at the intersection of SR 116/Madrone Avenue, resulted in a fatality. This was a broadside collision with the primary collision factor cited as being a right-of-way violation. The collision occurred when a westbound driver attempted a left-turn maneuver and was hit by an eastbound driver. This intersection lacks left-turn lanes on SR 116.

#### *BICYCLISTS*

Citywide there were 13 reported collisions involving bicyclists. All except one of these collisions resulted in injuries, but no fatalities. Six of these collisions involved a bicyclist traveling the wrong way and four involved a right-of-way violation. About half of the collisions occurred along East Cotati Avenue, but they were spread out over the length of the corridor. The majority of bicycle collisions occurred in locations where either a bicycle lane or wide shoulder is provided. Compared to other comparably sized cities, Cotati performed in the bottom third for overall bicycle-involved collisions, but was in the top third for bicyclists under the age of 15 years old. A summary of bicycle collisions by location is provided in Table 4-11.

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**TABLE 4-11: BICYCLE AND PEDESTRIAN COLLISIONS**

Intersection	Total Collisions	Bicycle Collisions	Pedestrian Collisions <sup>1</sup>
East Cotati Avenue/Adrian Drive	11	1	0
East Cotati Avenue/Charles Street	8	0	2
East Cotati Avenue/Lancaster Drive	8	2	2
East Cotati Avenue/Santero Way	5	2	0
East Cotati Avenue/La Salle Avenue	6	2	0
Gravenstein Highway/Alder Avenue	7	1	0
Old Redwood Highway/Charles St.-Henry St.	10	1	3
Old Redwood Highway/George St.-William St.	8	2	0
Old Redwood Highway/Gravenstein Highway	22	1	0
Old Redwood Highway/La Plaza	10	0	1
Old Redwood Highway/East Cotati Avenue	9	1	0

<sup>1</sup>ONE ADDITIONAL PEDESTRIAN COLLISION WAS IDENTIFIED ON OLD REDWOOD HIGHWAY, THOUGH THE EXACT LOCATION COULD NOT BE DETERMINED; <sup>2</sup> COLLISIONS INCLUDE BOTH INTERSECTIONS OF LA PLAZA WITH OLD REDWOOD HIGHWAY

### PEDESTRIANS

According to OTS rankings, Cotati performed in the bottom third of comparably-sized cities overall for collisions involving pedestrians. However, for pedestrians under the age of 15 years old and over 65 years old, Cotati performed in the top third. A total of nine reported collisions involved pedestrians, all of which resulted in injuries, but none were fatal. The majority of collisions occurred within the downtown area where pedestrian activity is highest. Six of the nine collisions occurred at intersections with the remaining three occurring at a mid-block location. All of the intersections that experienced pedestrian collisions have sidewalks on all approaches as well as crosswalks. A summary of pedestrian collisions by location is provided in Table 4-11.



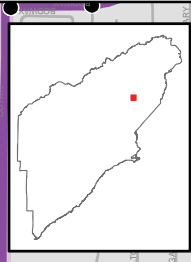
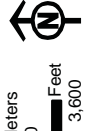
# Figure 4-1 Cotati Bicycle and Pedestrian Master Plan

- BIKE ROUTES**
- CLASS I, EXISTING
- CLASS I, PROPOSED
- Highlighted Route on the Regional Network
- CLASS II, EXISTING
- CLASS II, PROPOSED
- Highlighted Route on the Regional Network
- CLASS III, EXISTING
- CLASS III, PROPOSED
- Highlighted Route on the Regional Network
- Bicycle Boulevard
- BIKE AMENITIES**
- Bike Parking - Existing
- Bike Parking - Proposed
- Showers/Lockers - Existing
- Showers/Lockers - Proposed
- PEDESTRIAN ENHANCEMENTS**
- EXISTING CROSSING
- PROPOSED CROSSING
- PROPOSED SIDEWALK IMPROVEMENT
- PEDESTRIAN ORIENTED AREAS**
- Pedestrian Districts
- Link - EXISTING
- Link - PROPOSED
- MULTIMODAL CONNECTIONS**
- EXISTING
- PROPOSED
- Bus Stops - EXISTING
- TRANSPORTATION FEATURES**
- Street or Road
- Highway
- Freeway
- Railroad
- GEOGRAPHIC ELEMENTS**
- City Sphere of Influence
- Cotati City Limits
- Other City Limits
- Publicly Owned Land
- City Halls
- Waterway
- SCHOOLS**
- ELEMENTARY
- MIDDLE
- HIGH SCHOOL

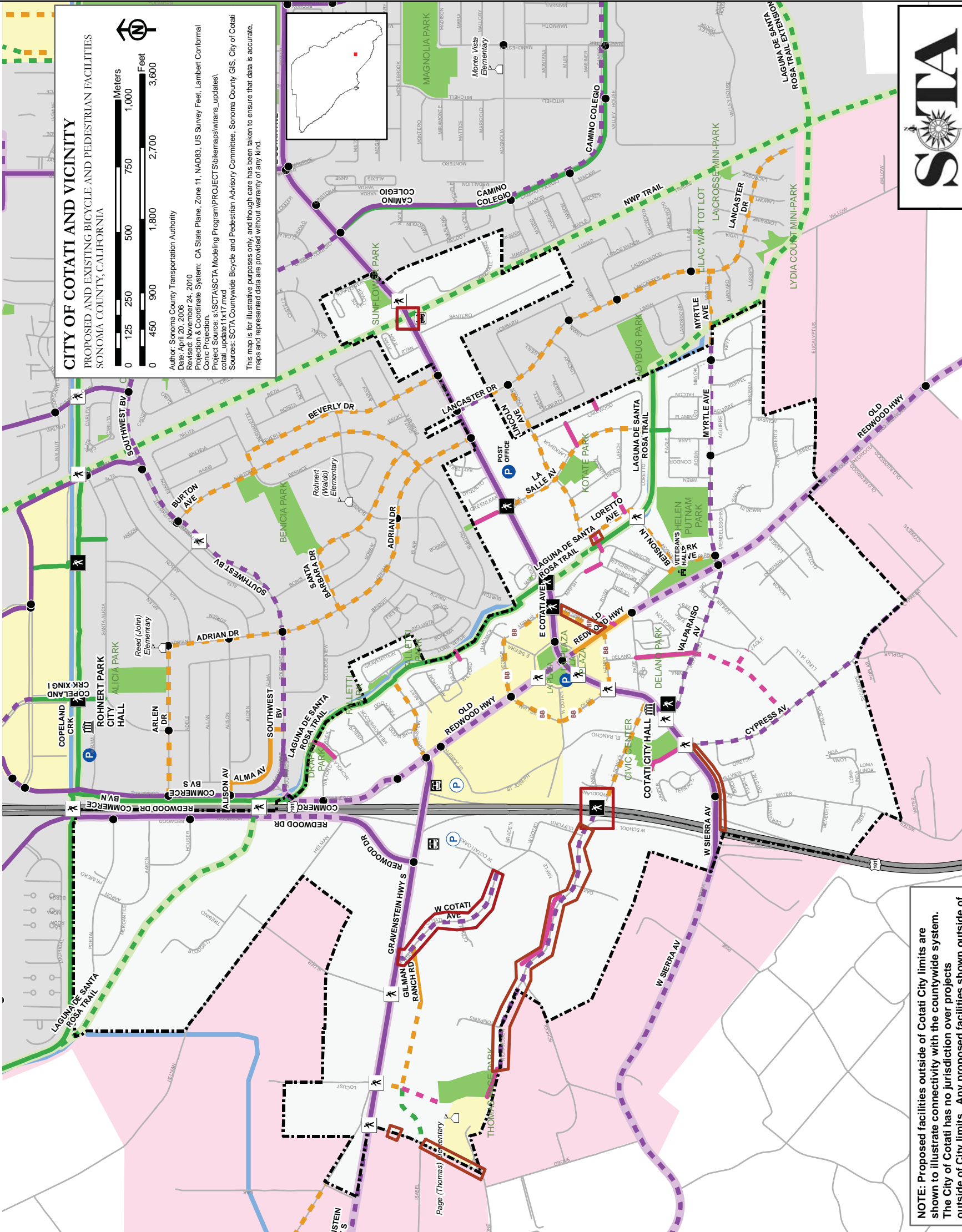


**CITY OF COTATI AND VICINITY**  
PROPOSED AND EXISTING BICYCLE AND PEDESTRIAN FACILITIES  
SONOMA COUNTY, CALIFORNIA

Author: Sonoma County Transportation Authority  
Date: April 20, 2006  
Revised: November 24, 2010  
Projection & Coordinate System: CA State Plane, Zone 11, NAD83, US Survey Feet, Lambert Conformal Conic Projection.  
Project Source: s:\SCTA\SCTA Modeling Program\PROJECTS\BikeMaps\wtrans\_updates\cotati\_updates\11717.mxd  
Sources: SCTA Countywide Bicycle and Pedestrian Advisory Committee, Sonoma County GIS, City of Cotati  
This map is for illustrative purposes only, and though care has been taken to ensure that data is accurate, maps and represented data are provided without warranty of any kind.



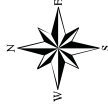
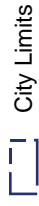
**NOTE:** Proposed facilities outside of Cotati City limits are shown to illustrate connectivity with the countywide system. The City of Cotati has no jurisdiction over projects outside of City limits. Any proposed facilities shown outside of Cotati City limits have been proposed by other jurisdictions.



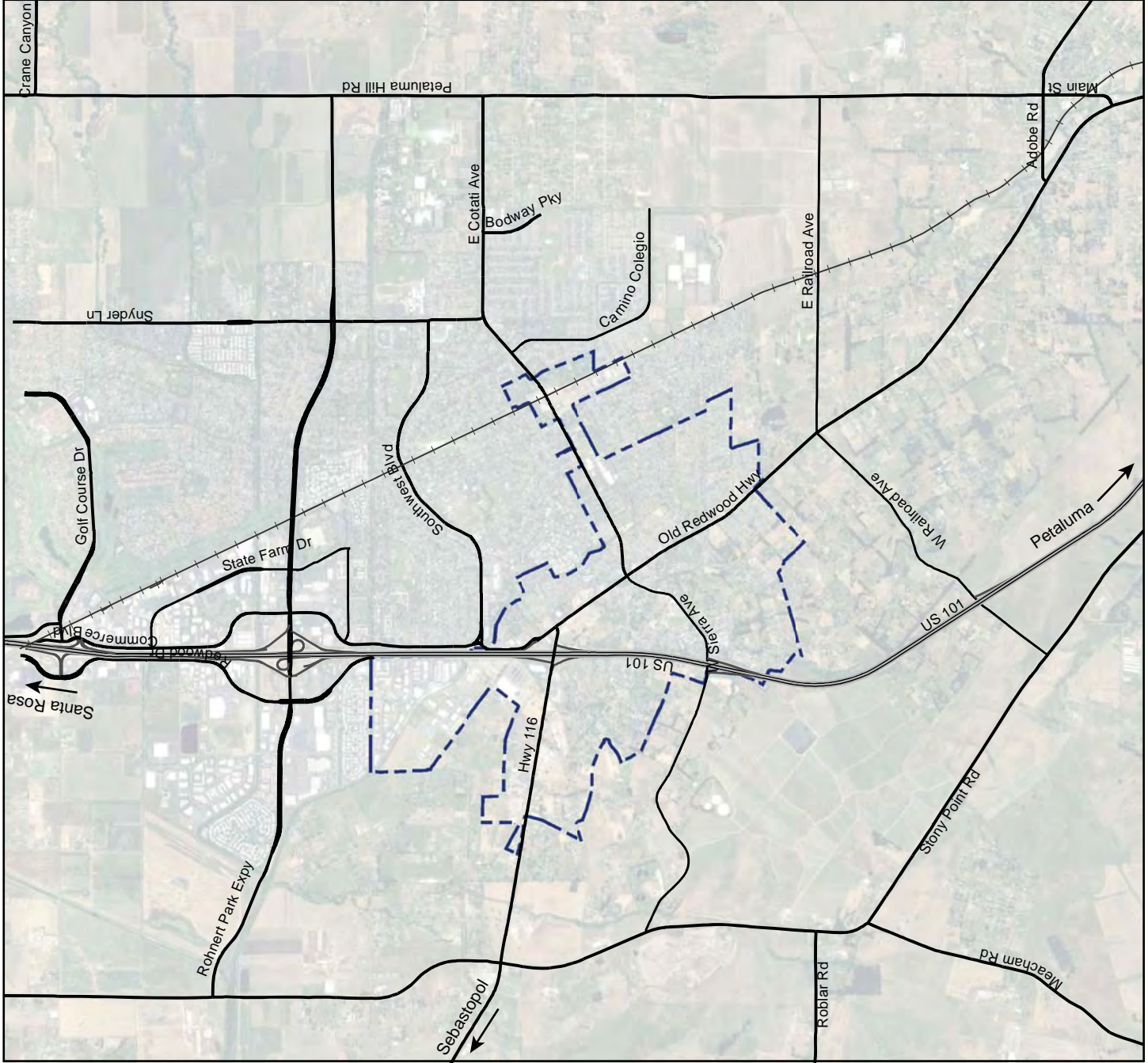


# Cotati General Plan Update

## Figure 4-2 Regional Roadway Network

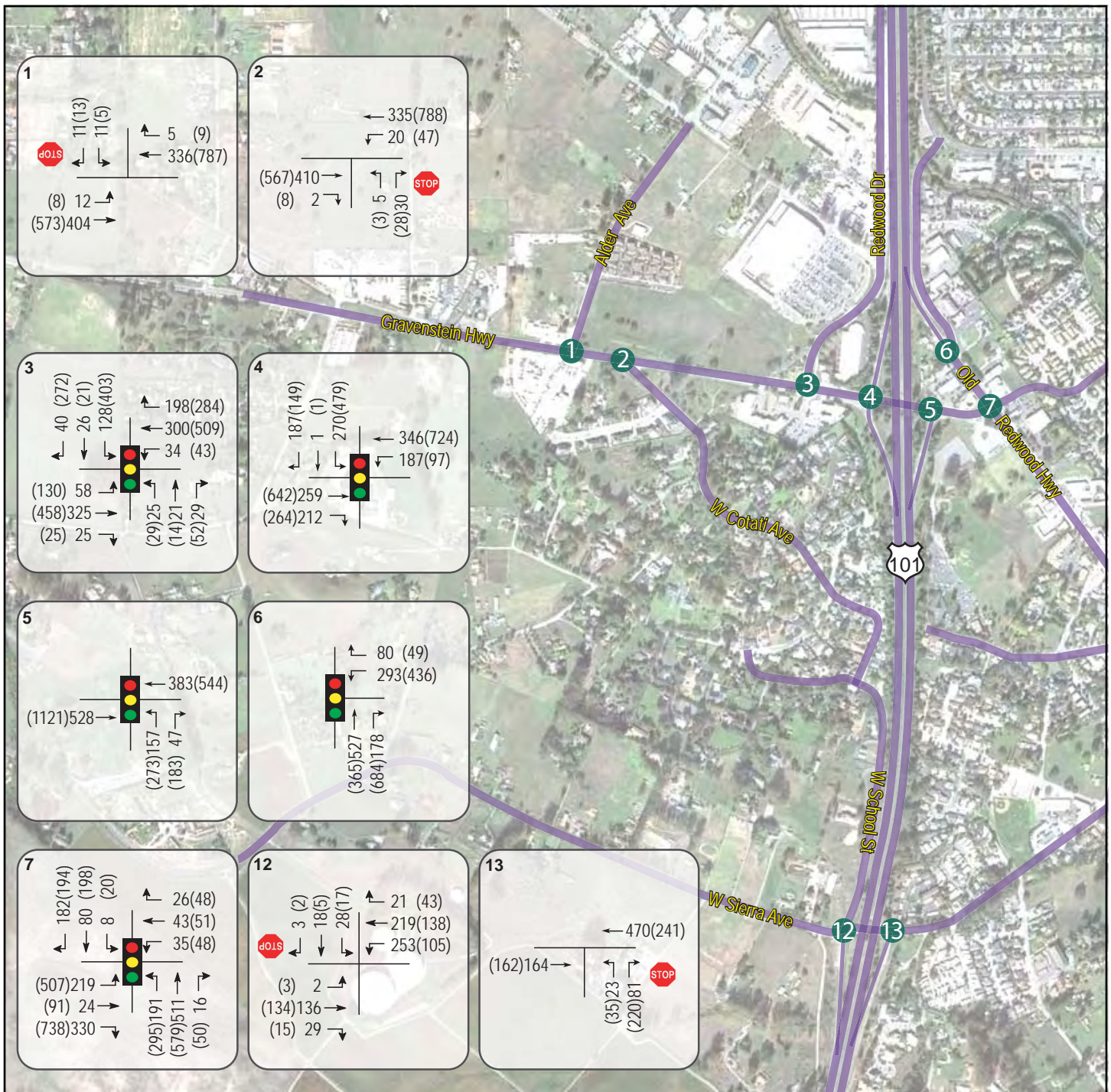


De Novo Planning Group  
A Land Use Planning, Design, and Environmental Firm









- Study Intersection
- xx A.M. Peak Hour Volume
- (xx) P.M. Peak Hour Volume

Cotati General Plan Update

**Figure 4-5A**  
**Existing Traffic Volumes**

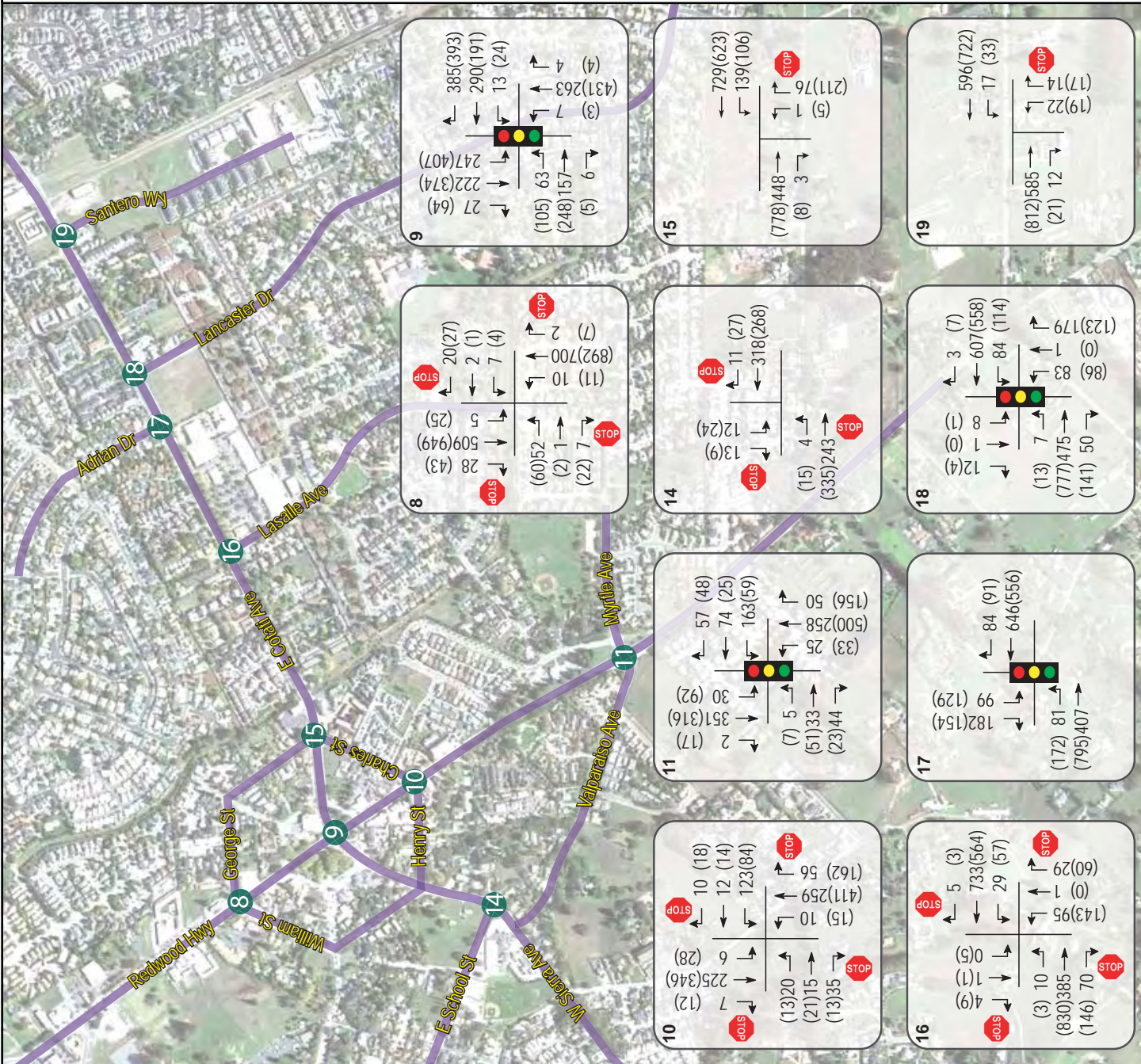
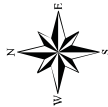






**Figure 4-5B**  
Existing Traffic Volumes








- Study Intersection
- xx A.M. Peak Hour Volume
- (xx) P.M. Peak Hour Volume

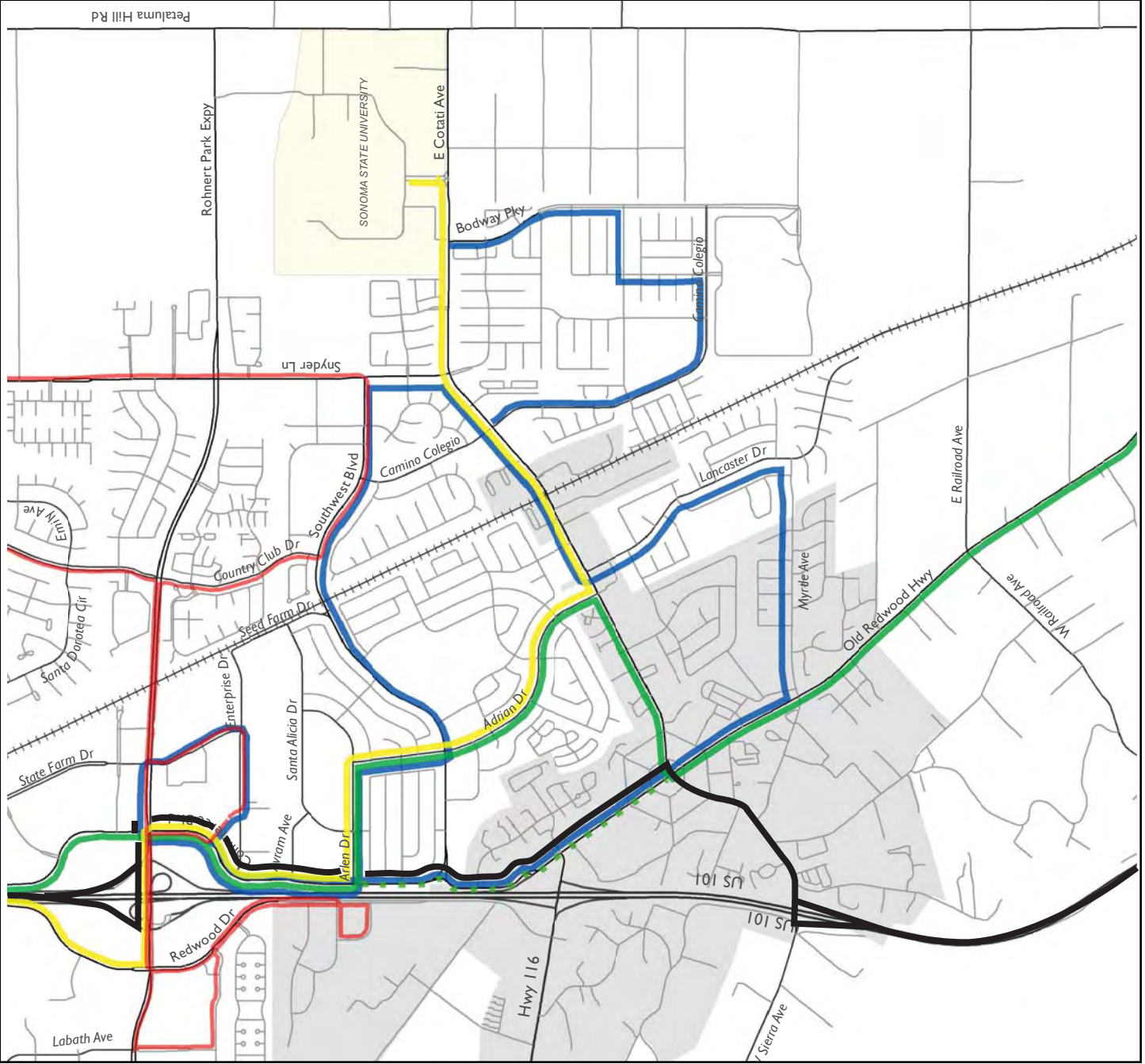






**Figure 4-6  
Bus Transit Routes**

-  City Limits
-  SCT 48 Express
-  SCT 48
-  SCT 44
-  SCT 12
-  SCT 10
-  GGT 80 and 101







● Study Intersection

Cotati General Plan Update

**Figure 4-7A**  
**Pedestrian and Bicycle Volumes**

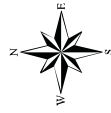










**Figure 4-7B  
Pedestrian and  
Bicycle Volumes**

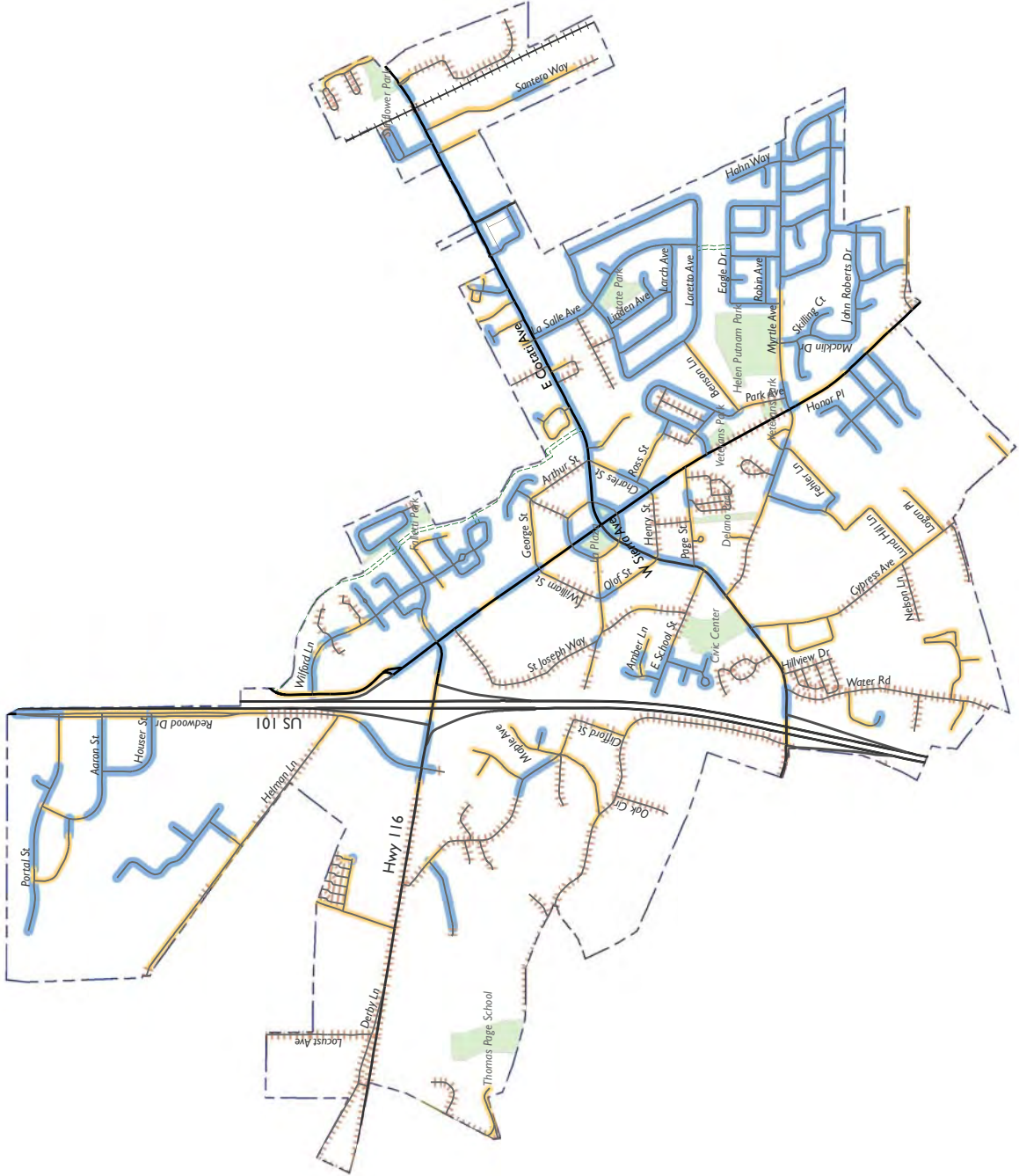
● Study Intersection





**Figure 4-8  
Sidewalk Network  
Completeness**

-  City Limits
-  Both Sides
-  One Side
-  None







**Figure 4-9**  
**Automobile Segment LOS**

- LOS A
- LOS B
- LOS C
- LOS D
- LOS E
- LOS F

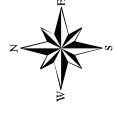
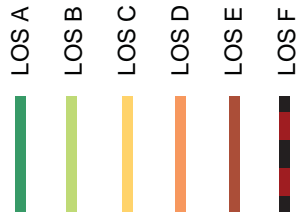






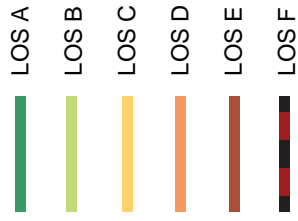
Figure 4-10  
Transit LOS







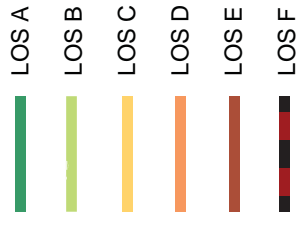
**Figure 4-11  
Bicycle LOS**







**Figure 4-12**  
**Pedestrian LOS**







## 5. PUBLIC SERVICES AND FACILITIES

This section addresses public services and facilities within the City of Cotati. Public services and facilities include the provision of fire protection, police protection, schools, parks/recreation, libraries, and other community facilities.

This chapter is divided into the following sections:

- Fire Protection (5.1)
- Police Protection (5.2)
- Schools (5.3)
- Parks and Recreation (5.4)
- Libraries and other Community Facilities (5.5)

### 5.1 FIRE PROTECTION

#### REGULATORY FRAMEWORK

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##### *STATE*

#### **California Occupational Safety and Health Administration**

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

#### **Office of Emergency Services**

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

#### **FIRE PROTECTION SERVICES**

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The City of Cotati receives fire protection services from the Rancho Adobe Fire Protection District (RAFPD). This district was formed in 1993 through the combining of two smaller districts - the Cotati Fire Protection District and the Penngrove Fire Protection District. The new district encompasses over 80 square miles. The total district population is approximately 24,000 people. The district provides service from three stations. The first is located at #1 East Cotati Avenue, in the center of La Plaza Park. The second station is situated at 11000 Main Street, Penngrove. The third station is at 99 Liberty Road, Petaluma. Station #1, located in La Plaza Park, was recently renovated, which expanded the station from a three-door to a six-door facility.<sup>1</sup> The RAFPD is a combination fire district, which has a full time paid staff that is supplemented with part time firefighters, volunteer firefighters and support volunteer members of the community. There are 15 full time staff, 15 part time firefighters, 6 volunteer

<sup>1</sup> <http://www.ci.cotati.ca.us/sections/police/fire-services.cfm>, Accessed 5/20/11.

## 5. PUBLIC SERVICES AND FACILITIES

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firefighters, 1 part time Fire Chief and an administrative assistant.<sup>2</sup> The current staff-to-population ratio is .7 firefighters per 1000 population (17 full time staff divided by 24). The ratio in 1990 was .03.

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

The PPC ratings are calculated on the following factors:

- Fire alarm and communication systems, including telephone systems, telephone lines, staffing, and dispatching systems;
- The fire department, including equipment, staffing, training, and geographic distribution of fire companies; and,
- The water-supply system, including the condition and maintenance of hydrants, and a careful evaluation of the amount of available water compared with the amount needed to suppress fires.

RAFPD, within the Cotati City limits, presently has an Insurance Service Office (ISO) rating of five (5). RAFD has an ISO rating of eight (8) on structures outside the city, and nine (9) for everything but structures outside the City limits. A rating of ten (10) usually indicates that no fire protection is provided.

The RAFPD has automatic aid agreements with neighboring districts, including the California Department of Forestry (CDF). The CDF provides automatic aid for emergency incidents in the west portions of the District and to State Responsibility Area fires. CDF will also provide fire response to anywhere in the District at the District's request.<sup>3</sup>

## 5.2 POLICE PROTECTION

### REGULATORY FRAMEWORK

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#### Emergency Response/Evacuation Plans

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

Chapter 2.24.080 of the Cotati Municipal Code states that the Cotati Disaster Council shall be responsible for the development of the city emergency plan, which plan shall provide for the effective mobilization of all of the resources of the city, both public and private, to meet any condition constituting a local emergency, state of emergency, or state of war emergency; and shall provide for the organization, powers and duties, services, and staff of the emergency organization. Such plan shall take effect upon adoption by resolution of the City Council. At the time of the writing of this report an emergency plan has not been adopted by the City.

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<sup>2</sup> <http://www.rancho-adobe-fire.org/about.html>. Accessed 5/20/11

<sup>3</sup> City of Cotati Downtown Specific Plan EIR, page 4.11-1.

## POLICE PROTECTION SERVICES

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The Cotati Police Department is charged with the enforcement of local, state, and federal laws, and with providing 24-hour protection of the lives and property of the public. The Police Department functions both as an instrument of public service and as a tool for the distribution of information, guidance and direction. It is the mission of the Police Department to facilitate and administer the laws of governing bodies, the orders of the courts, and to direct all energies and resources towards maintaining the health, welfare, and safety of not only the citizens of Cotati, but its visitors as well.

The Police Department provides a 24-hour operation, which includes dispatch, patrol, traffic enforcement, investigation, and community crime prevention.

The CPD is linked with most law enforcement agencies in Sonoma County through a common computer system. Cotati dispatchers can communicate directly via radio with other agencies, including the Sonoma County Office of Emergency Services. The CPD includes a chief, one lieutenant, two sergeants, six officers (a total of 10 officers), one police canine unit, one traffic motorcycle unit, one community services officer, five dispatchers, and one support services supervisor (Chief of Police, Michael Parish, email communication 6-2-11). The current ratio of officers to resident population is approximately 1.38 per 1,000 persons. The City has not formally adopted a police to resident population staffing ratio. Nationally, the ratio is approximately 2.3 officers per 1,000 residents, and larger cities with higher crime rates strive to maintain ratios closer to 4 officers per 1,000 residents.

### ***K-9 Program***

The Cotati Police K-9 Program started with the inception of the police department in 1963. The Department's current K-9 team includes a German Shepard and his police officer handler. The K-9 team performs duties on patrol for the Department, and is trained in tracking criminals and locating missing persons. They also have training in the recovery of evidence, the searching of buildings, and handler protection. The team has also received training in narcotics detection, and is certified to detect the presence of cocaine, heroin, marijuana, and methamphetamines. In addition to the team's general and specialty patrol duties, they assist patrol officers from both the Cotati Police Department and other neighboring departments with narcotics searches, suspect searches in buildings (or when fleeing outdoors), article searches and missing children searches. The Cotati Police Department K-9 Unit frequently provides demonstrations to the public to showcase many of the unit's capabilities.

### ***Neighborhood Watch Program***

Neighborhood Watch is a crime prevention program operated by residents of the City of Cotati, with the support of the police department. Its purpose is to create an alert citizenry by teaching residents simple crime prevention measures, and by providing both general and specific information concerning crime in each neighborhood.

### ***Volunteers in Police Service Program***

The Volunteers in Police Service (V.I.P.S), are a group of ordinary citizens dedicated to exemplary community service and public awareness through the Cotati Police Department. The Cotati Police Department volunteer program is affiliated with the National Volunteers in Police Service program, which is sponsored by the U.S. Department of Justice and the International Association of Chiefs of Police. Volunteer duties include:

- Assist stranded motorists
- Graffiti patrol
- Directing traffic at fire, accident, or crime scenes

## 5. PUBLIC SERVICES AND FACILITIES

- Enforcement of parking violations
- Assist police officers in the field
- Special enforcement and extra patrols
- Neighborhood patrols and vacation house checks
- Searching for lost or missing children
- Vehicle abatements
- Clerical & office work
- Fleet maintenance
- Crime prevention programs

### Crimes by Category in Cotati

Statistics on the number of crimes by category of crime in Cotati during each year from 2005 to 2009, as reported by the Federal Bureau of Investigation (FBI) Criminal Justice Information Services Division, are shown in Table 5.2-1 below.

Category	2005	2006	2007	2008	2009
<b>Violent Crimes</b>	44	56	34	39	32
Homicide	0	0	0	0	0
Forcible Rape	4	1	0	6	2
Robbery	3	4	5	2	4
Aggravated Assault	37	51	29	31	26
<b>Property Crimes</b>	237	148	154	111	157
Burglary	50	50	45	38	39
Larceny-Theft	175	83	90	63	104
Vehicle Theft	12	15	19	10	14
<b>Arson</b>	2	3	2	1	1

*SOURCE: FEDERAL BUREAU OF INVESTIGATION, CRIMINAL JUSTICE INFORMATION SERVICES DIVISION, OFFENSES KNOWN TO LAW ENFORCEMENT TABLES (2005, 2006, 2007, 2008 AND 2009). \*2010 DATA NOT AVAILABLE*

As shown in the table, the majority of crimes committed in Cotati consist of non-violent property crimes, primarily larceny-theft. Between 2005 and 2009, there were no homicides reported in Cotati. With the exception of vehicle thefts, crimes in Cotati have generally trended downward since 2005.

## 5.3 SCHOOLS

### REGULATORY FRAMEWORK

#### STATE

#### Leroy F. Greene School Facilities Act of 1998 (SB 50)

The “Leroy F. Greene School Facilities Act of 1998,” also known as Senate Bill No. 50 or SB 50 (Chapter 407, Statutes of 1998), governs a school district’s authority to levy school impact fees. This comprehensive legislation, together with the \$9.2 billion education bond act approved by the voters in November 1998 known as “Proposition 1A”, reformed methods of school construction financing in California. SB 50 instituted a new school facility program by which school districts can apply for state construction and modernization funds. It imposed limitations on the power of cities and counties to

require mitigation of school facilities impacts as a condition of approving new development and provided the authority for school districts to levy fees at three different levels:

- Level I fees are the current statutory fees allowed under Education Code 17620. This code section provides the basic authority for school districts to levy a fee against residential and commercial construction for the purpose of funding school construction or reconstruction of facilities. These fees vary by district for residential construction and commercial construction and are increased biannually.
- Level II fees are outlined in Government Code Section 65995.5, allowing school districts to impose a higher fee on residential construction if certain conditions are met. These conditions include having a substantial percentage of students on multi-track year-round scheduling, having an assumed debt equal to 15–30 percent of the district’s bonding capacity (percentage is based on revenue sources for repayment), having at least 20 percent of the district’s teaching stations housed in relocatable classrooms, and having placed a local bond on the ballot in the past four years which received at least 50 percent plus one of the votes cast. A Facility Needs Assessment must demonstrate the need for new school facilities for unhoused pupils is attributable to projected enrollment growth from the construction of new residential units over the next five years.
- Level III fees are outlined in Government Code Section 65995.7. If State funding becomes unavailable, this code section authorizes a school district that has been approved to collect Level II fees to collect a higher fee on residential construction. This fee is equal to twice the amount of Level II fees. However, if a district eventually receives State funding, this excess fee may be reimbursed to the developers or subtracted from the amount of state funding.

### **The Kindergarten-University Public Education Facilities Bond Act of 2002 (Prop 47)**

This act was approved by California voters in November 2002 and provides for a bond issue of \$13.05 billion to fund necessary education facilities to relieve overcrowding and to repair older schools. Funds will be targeted at areas of greatest need and must be spent according to strict accountability measures. Funds will also be used to upgrade and build new classrooms in the California Community Colleges, the California State University, and the University of California in order to provide adequate higher education facilities to accommodate growing student enrollment.

### **California Department of Education**

The California Department of Education (CDE) School Facilities Planning Division (SFPD) prepared a School Site Selection and Approval Guide that provides criteria for locating appropriate school sites in the State of California. School site and size recommendations were changed by the CDE in 2000 to reflect various changes in educational conditions, such as lowering of class sizes and use of advanced technology. The expanded use of school buildings and grounds for community and agency joint use and concern for the safety of the students and staff members also influenced the modification of the CDE recommendations.

Specific recommendations for school size are provided in the School Site Analysis and Development Guide. This document suggests a ratio of 1:2 between buildings and land. CDE is aware that in a number of cases, primarily in urban settings, smaller sites cannot accommodate this ratio. In such cases, the SFPD may approve an amount of acreage less than the recommended gross site size and building-to-ground ratio.

## 5. PUBLIC SERVICES AND FACILITIES

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Certain health and safety requirements for school site selection are governed by state regulations and the policies of the SFPD relating to:

- Proximity to airports, high-voltage power transmission lines, railroads, and major roadways;
- Presence of toxic and hazardous substances;
- Hazardous facilities and hazardous air emissions within one-quarter mile;
- Proximity to high-pressure natural gas lines, propane storage facilities, gasoline lines, pressurized sewer lines, or high-pressure water pipelines;
- Noise;
- Results of geological studies or soil analyses;
- Traffic and school bus safety issues.

### EXISTING FACILITIES

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Residents and school children in the City of Cotati are served by the Cotati-Rohnert Park Unified School District (CRPUSD). The District is comprised of six elementary schools, one middle school, a community day school, one comprehensive high school, a technology high school, one necessary small high school, and one continuation high school. According to the California Department of Education, Educational Demographics Unit, the District had a total student enrollment of 6,003 students during the 2010-11 school year.

Elementary students in Cotati, which include students in grades kindergarten through 6<sup>th</sup> grade, attend Thomas Page Elementary, located 1075 Madrone Avenue, Cotati. This is the only school located within the City limits of Cotati. Parents have the option of sending their students to other elementary schools within the District by making a request for an intra-district transfer. Intra-district transfer requests are approved if space at the requested school is available (Sandra Devine, CRPUSD, personal communication, 6-1-11).

Other elementary schools in the District include Evergreen Elementary, Marguerite Hahn Elementary, Montevista Elementary, John Reed Elementary, and Waldo Rohnert Elementary; all located in the City of Rohnert Park.

Middle school students in Cotati, which includes students in 7<sup>th</sup> and 8<sup>th</sup> grades, attend Lawrence E. Jones Middle School, located at 5154 Snyder Lane, Rohnert Park. The school site opened in newly constructed facilities in the fall of 1995 as Creekside Middle School. In 2010, the District's two middle schools were consolidated at the site and the school was renamed Lawrence E. Jones Middle School.

High school students in Cotati, which includes students in 9<sup>th</sup> through 12<sup>th</sup> grades, usually attend Rancho Cotate High School, located at 5450 Snyder Lane, Rohnert Park. Rancho Cotate High School is a comprehensive high school, offering a wide range of academic options, inter-scholastic athletics, and music programs. The CRPUSD also includes Technology High School, which is located on the Sonoma State University campus. The Technology High School provides a math and science based curriculum, and requires students to be accepted through a competitive application process. A maximum of 240 students (60 in each grade) attend each year. El Camino High School, located at 120 Southwest Boulevard, Rohnert Park is the District's continuation high school. Continuation high schools are generally attended by students considered at-risk of not graduating at a normal pace from a comprehensive high school. These students may include teens with behavioral problems, drug abuse

histories, pregnancies, or other conditions that may impede progress at a “regular” high school. The CRPUSD also operates Phoenix High School, located at 1296 Southwest Boulevard, Rohnert Park. Phoenix High School is a “Necessary High School”, which provides instruction to students with special emotional needs. The school has a maximum capacity of 32 students. (Sandra Devine, CRPUSD, personal communication 6-1-11)

Student enrollment at Thomas Page Elementary, Lawrence E. Jones Middle School, and Rancho Cotate High School is shown in Table 5.3-1 below.

School	Academic Year				
	2006-07	2007-08	2008-09	2009-10	2010-11
Thomas Page Elementary	229	208	410 <sup>1</sup>	399	440
Lawrence E. Jones Middle School	742*	717*	741*	767*	993
Rancho Cotate High School	1,746	1,631	1,594	1,549	1,523

*SOURCE: CALIFORNIA DEPARTMENT OF EDUCATION, EDUCATIONAL DEMOGRAPHICS UNIT, CALIFORNIA PUBLIC SCHOOL ENROLLMENT-SCHOOL REPORT (2006-2011)*

<sup>1</sup> *THE LARGE INCREASE IN ENROLLMENT BETWEEN 2007-08 AND 2008-09 WAS DUE TO THE CLOSURE OF LA FIESTA ELEMENTARY SCHOOL.*

*\*INDICATES ENROLLMENT AT CREEKSIDE MIDDLE SCHOOL PRIOR TO CONSOLIDATION INTO LAWRENCE E. JONES MIDDLE SCHOOL*

### Sonoma State University

Sonoma State University (SSU) is part of the California State University (CSU) System. The SSU campus is located approximately 1.5 miles east of downtown Cotati, in the City of Rohnert Park. SSU was founded in 1960, and has a student enrollment of approximately 8,000 students. SSU offers 45 bachelor’s degree programs, 16 master’s degree programs, and graduates approximately 2,200 students per year. While SSU generally accepts all qualified students who apply from high schools in its service area, 80 percent of the freshmen and 55 percent of the junior transfer students come from outside the North Bay region. With approximately 40 percent of its student body living on campus, it is one of the most residential campuses within the CSU system. SSU students live, shop, dine and play extensively within the City of Cotati.

## 5.4 PARKS AND RECREATION

### KEY TERMS

**Community park:** A park designed to serve several neighborhoods, or approximately 2,000 to 5,000 residents. Community parks may include areas suited for intense recreational facilities, such as athletic complexes and swimming pools. Such parks may also include opportunities for outdoor recreation, such as walking, viewing, picnicking, or sitting.

**Mini-park:** A small park (0.25 to 0.5 acres) designed to serve a concentrated population. Mini-parks may be targeted at serving specific groups, such as tots or senior citizens.

**Neighborhood park/playground:** A park designed for intense recreational activity to serve approximately 500 to 1,000 residents. Neighborhood facilities may include baseball fields, basketball

## 5. PUBLIC SERVICES AND FACILITIES

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courts, playground equipment, and skating facilities. These parks may also include natural areas for picnicking, viewing, or walking.

### REGULATORY FRAMEWORK

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#### *STATE*

#### **Quimby Act**

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

#### *LOCAL*

#### **City of Cotati Municipal Code, Chapter 17.76.030**

Chapter 17.76.030 of the Cotati Municipal Code provides for the dedication of land and/or the payment of fees to the City for park and recreational purposes as a condition of the approval of a tentative map. This section is enacted as authorized by the Quimby Act. As a condition of tentative map approval, the subdivider shall dedicate land and/or pay a fee, at the option of the City Council, in compliance with this section for the purpose of developing new or rehabilitating existing park or recreation facilities to serve the subdivision. This section of the Municipal Code requires that one acre of property for every 200 persons residing within the City be devoted to neighborhood and community park and recreational purposes.

### CITY PARKS

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The City’s Public Works and Engineering Department provides park maintenance services to the City’s parks and special use areas. This includes administration and supervision of contract providers and park maintenance staff for landscaping, irrigation, general maintenance, custodial and litter abatement. The primary goal of the City’s park maintenance is to provide the citizens of Cotati with parks, parkways, maintenance of common areas, parking lots and public grounds for their enjoyment and safety through proper horticulture, maintenance and cleaning of City parks and public grounds.

The adopted General Plan and the Cotati Municipal Code set a goal of one acre of recreational area per 200 residents, or five acres per 1,000 residents. The City currently provides 4.2 acres of park lands per 1,000 residents (30.4 acres for 7,265 residents).

Parks and other recreational facilities are primarily funded by the City’s general fund. Additional funding has been obtained through grants, shared use arrangements (such as with the school district), and other funding mechanisms (DSP EIR, page 4.11-5). The City also uses Quimby fees, which allow a municipality to require the payment of funds to provide for park acreage elsewhere if not provided onsite.



A summary of existing City parks, including park features, locations, and acreages is provided below in Table 5.4-1.

<b>Park</b>	<b>Location</b>	<b>Acreage</b>	<b>Facilities</b>
Civic Center/ Cader Field	East School St. & West Sierra Ave.	3.3	Baseball field, basketball courts, proposed skate park, bicycle/pedestrian path, picnic tables, BBQs, open space, restrooms. City Hall and Police Station located at this address.
Delano	Valparaiso Ave. & Page St.	1.0	Bicycle/pedestrian paths.
Draper	Wilford Ave.	1.5	Picnic tables, BBQs, bicycle/pedestrian paths.
Falletti	Gravenstein Way & Village Court	1.4	BBQs, picnic tables, playground, bicycle/pedestrian paths, open space for close-proximity games (i.e., Frisbee).
Kotate	LaSalle & Lincoln Avenues	2.3	Playground, bicycle/pedestrian paths, open space for activities requiring more space (i.e., soccer).
La Plaza	The Hub	2.2	Bandstand, picnic tables, playground, restrooms, bicycle/pedestrian pathways
Helen Putnam	Myrtle Ave.	8.3	Baseball field, dog park, picnic tables, playground, restrooms, soccer field, bicycle/pedestrian paths, BBQs, open space for close proximity games and games requiring more space.
Sunflower	East Cotati Ave. & Sunflower Dr.	1.7	Tennis Courts, open space for close-proximity games.
Veteran's	Park Ave. & Old Redwood Hwy.	2.0	BBQs, picnic tables, horseshoe pits, sand volleyball court, bicycle/pedestrian paths, restrooms.
Thomas Page	Madrone Ave.	2	Open space adjacent to Thomas Page Elementary for activities requiring more space.
Mini Park	LaSalle Ave. & the Laguna de Santa Rosa	0.1	Low-water edible garden demo park with walking and bike paths.
Santero Way	Santero Way	0.4	Benches, playground equipment, and bike/pedestrian paths.
Community Garden	La Salle Ave. & E. Cotati Ave.	0.1	Community gardens and walking path.
Falletti Ranch	175 W. Sierra Ave.	4.0	Not yet developed, currently open space, barns and one dwelling unit.
<b>Total</b>		<b>30.4</b>	

SOURCE: CITY OF COTATI, DAMIEN O' BID, DIRECTOR OF PUBLIC WORKS. EMAIL COMMUNICATION, 6/2/2011

## 5.5 LIBRARIES AND OTHER COMMUNITY FACILITIES

### EXISTING FACILITIES

#### Libraries

There are no public libraries located within the Cotati City limits. Sonoma County provides public library services throughout the County. The City of Cotati is served by the Cotati-Rohnert Park Regional Library, located at 6250 Lynne Conde Way, Rohnert Park. The library is open Tuesday and Wednesday from 10:00 a.m. to 8:00 p.m., and Monday, Thursday, Friday and Saturday from 10:00 a.m. to 6:00 p.m. The

## 5. PUBLIC SERVICES AND FACILITIES

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library offers programs for children and families, adults and teens, book sales, and book discussion forums. Sonoma County also operates library branches in Santa Rosa, Cloverdale, Forestville, Guerneville, Healdsburg, Occidental, Petaluma, Sonoma, Sebastopol, and Windsor.

### **Museums**

The Cotati Historical Society Museum is located in the west side of Cotati City Hall, in the space once occupied by the Cotati Police Department. The museum opened in February 2010. The museum is run by volunteers from the Cotati Historical Society, and includes documents and artifacts depicting local history, persons, and events. The museum is open approximately one day per week, and by appointment.

### **REFERENCES**

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California Department of Education, Educational Demographics Unit, California Public School Enrollment-School Report (2006-2011)

City of Cotati, 2011. <http://www.ci.cotati.ca.us/sections/police/fire-services.cfm>, Accessed 5/20/11.

City of Cotati, 2009. Downtown Specific Plan EIR, page 4.11-1.

Devine, Sandra. Cotati-Rohnert Park Unified School District. Personal communication, 6-1-11.

Federal Bureau of Investigation, Criminal Justice Information Services Division, Offenses Known to Law Enforcement Tables (2005, 2006, 2007, 2008 and 2009).

O’Bid, Damien. City of Cotati Director of Public Works. Email communication, 6/2/2011

Parish, Michael. City of Cotati Chief of Police. Email communication 6-2-11.

Rancho Adobe Fire District, 2011. <http://www.rancho-adobe-fire.org/about.html>. Accessed 5/20/11

## 6. UTILITIES

This section addresses utilities services within the City of Cotati. Utility services include the provision of water services, wastewater (sewer) services, solid waste disposal, electricity and natural gas.

This chapter is divided into the following sections:

- Water Services (6.1)
- Wastewater (Sewer) Services (6.2)
- Solid Waste Disposal (6.3)
- Electricity and Natural Gas (6.4)

### 6.1 WATER SERVICES

The City of Cotati owns and operates a water supply and distribution system that supplies potable water to residences and businesses within the City limits. The City's potable water supply comes primarily from water purchased from the Sonoma County Water Agency (SCWA) and water pumped from groundwater wells owned and operated by the City.

#### KEY TERMS

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

**BGS:** Below ground surface.

**GPD:** Gallons per day.

**GPM:** Gallons per minute.

**Groundwater:** Water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. Water beneath the earth's surface fills the spaces in soil, gravel, or rock formations. Pockets of groundwater are often called "aquifers" and are the source of drinking water for a large percentage of the population in the United States. Groundwater is often extracted using wells which pump the water out of the ground and up to the surface. Groundwater is naturally replenished by surface water from precipitation, streams, and rivers when this recharge reaches the water table.

**MG:** Million gallons

**MGD:** Million gallons per day

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

### REGULATORY FRAMEWORK

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#### *STATE*

#### **California Department of Health Services**

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

#### **Consumer Confidence Report Requirements**

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

#### **Urban Water Management Planning Act**

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

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

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

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

contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights and contracts.

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

### **Senate Bill (SB) 221**

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

#### *LOCAL*

### **City of Cotati General Plan (1998)**

The Quality of Life Chapter of the 1998 General Plan identifies objectives, policies, and implementation measures related to public facilities and development, including the City’s water supply.

- Objective 8.3: Provide an adequate supply of clean, fresh water.
- Policy 8.3.2: Ensure the water system is adequate to match rate of development.

### **City of Cotati Municipal Code**

Chapter 13 of the Cotati Municipal Code includes regulations regarding the process for connecting to the City’s municipal water system. This Code section includes information regarding connection applications, rates, fees, watercourse and natural drainage management, and the City’s water shortage contingency plan.

### **City of Cotati Urban Water Management Plan**

The City’s 2010 Urban Water Management Plan (UWMP) was finalized in August 2011. The purpose of the UWMP is to evaluate whether a water supplier, in this case the City, can meet the water demands of its water customers as projected over a 20- or 25-year period. This evaluation is accomplished through analysis of current and projected water supply and demand for normal or average conditions, as well as during water shortages.

### **City of Cotati Water Distribution System Master Plan**

The City of Cotati’s Water Distribution System Master Plan (WDSMP) provides a planning tool for upgrading the City’s potable water distribution system to support planned growth through the year 2035. The Water Distribution System Master Plan includes a summary of existing water system facilities,

## 6. UTILITIES

an analysis of potable water demand, an analysis of fire flow demand, the development of a hydraulic model, an analysis of existing and planned supply, an analysis of storage capacity and infrastructure, and a capital improvement plan that identifies projects and improvements needed for the water system to meet performance requirements through the year 2035. The Master Plan was finalized in September 2011.

### Sonoma County Water Agency Urban Water Management Plan

In June 2011, the SCWA approved the 2010 Urban Water Management Plan, which includes updated water supply and projection data. The SCWA UWMP describes the regulatory conditions under which it receives and distributes water, its existing and projected water supply, constraints to the water supply, and water conservation measures. A summary of the SCWA's water supplies, facilities, and water rights is provided below.

### WATER SUPPLIES

The City's main water supply is water that it receives from the SCWA. The SCWA water supply is comprised of ground water from the Russian River permitted under a surface water diversion right for infiltration and groundwater from SCWA wells. In addition to the primary SCWA water supply, the City uses local groundwater supply from three municipal well sites located within city limits. Prior to 1992, the City used groundwater to supply more than half of its demands. More recently, the City's water strategy has been to supply its demands by use of its SCWA water supply and to use its local groundwater supplies to supplement its needs during peak periods and also during periods of drought. The City's local groundwater supply is a key element of its drought contingency plan and is planned to remain as such throughout the 25-30 year planning horizon of the 2010 UWMP. (Cotati UWMP, 2011) The City actively seeks to balance the use of its SCWA water supplies and its local groundwater supplies in a way that ensures a sustainable yield of local groundwater.

Additionally, as described in the City's 2010 UWMP, the City desires to implement a system that would allow for the delivery and use of recycled wastewater that is treated at the Santa Rosa Subregional System. Table 6.1-1 summarizes the City's current water supply as well as future (planned) water supplies during normal water years through 2030.

Water Supply Sources	2010	2015	2020	2025	2030	2035
SCWA water supply	646	816	974	1,065	1,155	1,246
Supplier Produced Groundwater	295	530	530	530	530	530
Recycled Water	0	13	32	32	32	32
Future Water Conservation <sup>(A)</sup>	-	104	148	191	232	268
<b>Total</b>	<b>941</b>	<b>1,463</b>	<b>1,684</b>	<b>1,818</b>	<b>1,949</b>	<b>2,076</b>

SOURCE: CITY OF COTATI 2010 URBAN WATER MANAGEMENT PLAN, TABLE 4.6;

(A): BASED ON 2010 URBAN WATER MANAGEMENT PLAN WATER DEMAND ANALYSIS AND WATER CONSERVATION MEASURES UPDATE (MADDEUS WATER MANAGEMENT).

## SCWA WATER SUPPLY

The following description of the SCWA water system is excerpted from the SCWA's 2010 UWMP and the City's 2010 UWMP.

Most of the SCWA's water supply is from the Russian River. Water is impounded at the Coyote Valley Dam, forming the Lake Mendocino reservoir, and the Warm Springs Dam on Dry Creek, forming the Lake Sonoma reservoir. The SCWA was the local sponsor of these projects and has the right to control water supply releases from both reservoirs. These dams are federal projects under the jurisdiction of the United States Army Corps of Engineers (Corps). The SCWA owns and operates diversion facilities on the Russian River in the Wohler Bridge area, which divert water from the natural flow of the Russian River, water released from Lake Sonoma, and water released from Lake Mendocino. The SCWA contracts with the Corps for water stored and released from the water supply pool of each dam. Lake Sonoma has a design capacity of 381,000 acre-feet (AF) and a design water supply pool capacity of 245,000 AF. The water supply pool capacity of Lake Mendocino has a design capacity of 122,500 AF and a water supply pool capacity of 68,400 AF, which can be increased in the summer to 111,000 acre-feet. Lake Mendocino also captures water released into Potter Valley by Pacific Gas and Electric (PG&E), which operates a hydropower generation station at the head of Potter Valley. Water for the power station is diverted through a tunnel from the South Fork of the Eel River via the Cape Horn Dam regulation facility.

SCWA diverts water from the river near Wohler Bridge into infiltration ponds and pumps groundwater principally via six Ranney Collectors (large diameter shallow wells about 90 feet deep relative to the stream bed). A system of aqueducts, booster pumps, and tanks then distribute the water to various major water contractors and a handful of other SCWA customers located to the south of the Russian River in Sonoma and Marin counties. The water contractors operate retail water systems that provide water principally for municipal use.

The SCWA's water supply has been augmented by groundwater extracted from seven wells located in the Mirabel area. These wells are currently not operated as primary production facilities, but provide standby production and may be used as primary facilities if needed.

### Surface Water Quality

The quality of SCWA's water deliveries is regulated by the California Department of Public Health (CDPH), which requires regular collection and testing of water samples to ensure that the quality meets Federal and state regulatory standards and does not exceed maximum contaminant levels (MCLs). The SCWA's water quality testing has consistently yielded results within the acceptable regulatory limits since the late 1950s.

The SCWA treats its water supplies by chlorination for residual disinfection. The SCWA also adds sodium hydroxide for pH adjustment to prevent copper plumbing corrosion and copper in the wastewater. The SCWA's water is of high quality, due to the natural filtration process utilized by the SCWA's Ranney Collectors.

The quality of the SCWA's surface water and groundwater supply sources over the next 25 years is expected to continue to meet State and Federal regulatory standards. Surface and groundwater will continue to be treated to meet drinking water standards and no impacts to water supplies due to water quality deficiencies are foreseen to occur in the next 25 years (SCWA UWMP, 2010).

### Water Rights and City Diversion Facilities

The City takes water from the SCWA system from two turnouts located on the Cotati Intertie Aqueduct to approximately 2,500 water service connections throughout the city. Under the water supply agreement with the SCWA, the City has an entitlement maximum of 1,520 acre-feet per year (AFY). This agreement is in effect until January 30, 2040. The combined Russian River supply and SCWA groundwater supply is herein referred to as the SCWA water supply. The SCWA can provide the City SCWA water supply by either supplying 100% of that supply through its Russian River supply or supplementing that supply through the SCWA groundwater supply.

The water rights by which the City of Cotati obtains Russian River water are held by the SCWA and permitted by the California State Water Resources Control Board (SWRCB). The SCWA has the right to divert up to a total of 75,000 AFY for its water contractors and customers. The SCWA has filed an application for various petitions pertinent to the City's water supply with the SWRCB, which would include water rights diversions from the Russian River to 101,00 AFY. Water supply projections in the 2010 SCWA UWMP includes the assumption that surface water supplies from the Russian River will increase to above 75,000 AFY by 2027 to 80,000 AFY in 2035.

The City of Cotati is one of eight water contractors that have entered into a water supply agreement with the SCWA for the delivery of Russian River water to its customers. In addition to water contractors, the SCWA has multiple other water transmission system customers, including the Marin Municipal Water District and Forestville Water District. The water contractors consist of:

- City of Cotati
- City of Petaluma
- City of Rohnert Park
- City of Santa Rosa
- City of Sonoma
- Valley of the Moon Water District
- North Marin Water District
- Town of Windsor

Governance of the relationship between the water contractors and the SCWA is through the Water Advisory Committee (WAC), which is comprised of an elected official from each of the water contractors. The WAC meets quarterly and is supported by a Technical Advisory Committee (TAC). The TAC is comprised of technical staff from each of the water contractors and meets monthly or as needed. Subcommittees of the TAC are established on an ad hoc basis.

### CITY GROUNDWATER SUPPLY

There are currently three groundwater wells located within the City's water distribution system. The following provides a general summary of the wells, based on information provided by the WDSMP.

- **Well No. 1A:** Well 1, which was constructed in 1975 and subsequently renovated and changed to well 1A in the early 1990s, is equipped with a 25 horse power (HP)



vertical turbine pump. The 25 HP pump is rated for a capacity of roughly 425 gallons per minute (gpm) at approximately 125 feet of head. Well 1A was further renovated in 2010, and the iron and magnesium filter was renovated in 2011. The 25 HP pump fills a storage tank that supplies a 40 HP booster pump station with a capacity ranging from 340 gpm to 390 gpm.

- **Well No. 2:** Well 2, which was constructed in 1976 and renovated in 2009, is equipped with a 50 HP vertical turbine pump. The 50 HP pump is rated for a capacity of roughly 380 gpm at approximately 380 feet of head.
- **Well No. 3:** Well 3, which was constructed in 1979 and subsequently renovated in 2010, is equipped with a 100 HP vertical turbine pump. The 100 HP pump is rated for a capacity of roughly 700 gpm at approximately 380 feet of head. The iron and magnesium filter was renovated in 2011.

Table 6.1-2 shows the location and general information for each of the City’s three wells.

Table 6.1-2 City of Cotati Groundwater Wells				
Facility Name	Location	Pump Station Elevation (feet)	Design Capacity (gpm)	Design Head (feet)
Well 1A	90 East Sierra Avenue (in the Hub)	106	425	125
Well 1A Booster	90 East Sierra Avenue (in the Hub)	106	340-390	430
Well 2	8562 Lakewood Avenue	111.8	380	380
Well 3	Northwest corner of Cotati, near Houser Street	94.5	700	380

SOURCE: WDSMP, 2011, TABLE 5.2

### Hydrogeology

The following discussion of the hydrogeology associated with the City’s groundwater supply was derived from the 2008 *City of Cotati Groundwater Supply Assessment* (Luhdorff and Scalmanini).

The City is located in the southern portion of the Santa Rosa Plain (SRP) Subbasin, which is one of three subbasins that comprise the Santa Rosa Valley (SRV) Groundwater Basin. The SRV Groundwater Basin drains to the northwest toward the Russian River and then to the Pacific Ocean. The SRP Subbasin extends from just south of the City limits to the Russian River plain (south of Healdsburg). The City uses groundwater pumped from the SRP Subbasin for a portion of its water supply.

The SRV Groundwater Basin is in the northwest trending structural province of the Coast Ranges and contains a number of mapped folds and faults. The valley is formed by the Windsor syncline and is bounded by the Rodgers Creek fault on the east and the Meacham Hill and Tolay faults on the west. Several buried faults have been mapped within the valley, most notably the Sebastopol fault, which extends from the City of Cotati northwest to the City of Sebastopol, and the Petaluma Valley fault, which is mapped by some geologists as extending as far north as Cotati. The SRP Subbasin contains three primary water bearing units: the Wilson Grove Formation, Quaternary alluvial fan deposits, and Quaternary alluvium. City wells located east of the Sebastopol fault appear to be completed in the

## 6. UTILITIES

Quaternary alluvial fan deposits, and wells located west of the fault may be completed in older Petaluma Formation deposits.

DWR investigated the hydraulic properties of the Sebastopol fault but was unable to find clear evidence that the fault acts as a barrier to groundwater flow. An independent analysis done to support the 2008 Groundwater Supply Assessment (GSA) found some evidence to the contrary since water level hydrographs of the three City wells show similar trends to nearby Rohnert Park wells even though some of these are on opposite sides of the mapped location of the fault. Water levels in all of the City wells are influenced by Rohnert Park pumpage, which also suggests that the Sebastopol fault does not act as a significant barrier to groundwater flow in the Cotati area.

In the southern SRP Subbasin, groundwater is produced largely from the upper 800 feet of the sedimentary deposits. Geologic cross sections and well profiles provide a generalized depiction of the subsurface geologic conditions that was used to divide the aquifer into depth zones to facilitate the analysis of groundwater levels. These zones do not represent laterally extensive aquifers but are strictly depth based for purposes of evaluating hydrogeologic conditions. These designations are based on an approximate correlation to the geologic units and on water well completion depths. The vertical zones of the aquifer system were designated:

- Shallow (0 to 200 foot depth),
- Intermediate (200 to 600 foot depth),
- Deep (600 to 800 foot depth), and
- Lower (depths greater than 800 feet).

Most municipal and agricultural wells in the southern SRP Subbasin are completed primarily in the intermediate zone. This includes the City's three municipal wells, although two City wells (1A and 3) are also completed partially in the deep zone.

### **Groundwater Pumpage**

The following discussion of the groundwater pumpage associated with the City's groundwater supply was derived from the 2008 *City of Cotati Groundwater Supply Assessment* (Luhdorff and Scalmanini).

The City's total annual pumpage increased from 41 AF in 1974 to 684 AF in 1988 and has generally decreased since 1988 as SCWA surface water deliveries increased. The City's annual municipal pumpage averaged 412 AF during 1990-2003. Much greater decreases have occurred since 2003, and the 2004-2006 pumpage averaged only 78 AF. Decreased pumpage in recent years is the result of the City's water resources strategy, which is to rely primarily on SCWA water supplies and to utilize groundwater only as needed to supplement those supplies.

Non-municipal pumpage for the area located between the City limits and the urban growth boundary (UGB) is unmetered, and current annual pumpage in this area was estimated for the GSA study to be about 463 AF. This includes 162 AF for rural residential use, 35 AF for commercial use, and 266 AF for agricultural use. There is also an estimated 17 AF of non-municipal pumpage that occurs within the City limits. The total annual non-municipal pumpage (about 480 AF) is slightly more than the average municipal pumpage during 1990-2003 and considerably more than the average municipal pumpage during 2004-2006 (78 AF). If historical non-municipal pumpage is assumed to be similar to current levels,

the total pumpage in the City's UGB averaged about 892 AF for the 1990-2003 period. Divided by the area of the UGB, this represents an annual "unit" pumpage of 0.35 AF/acre.

In addition to the City, there are three other municipal pumpers in the southern portion of the SRP Subbasin. These are the City of Rohnert Park, Sonoma State University, and SCWA. Rohnert Park is the largest groundwater producer in this area, and its annual pumpage increased from 907 AF in 1970 to a high of 5,487 AF in 1995. Since 1995, Rohnert Park has decreased its reliance on groundwater due to a shift toward greater use of SCWA deliveries. As a result, Rohnert Park's annual pumpage decreased to 846 AF in 2005 and 348 AF in 2006.

Historical pumpage estimates in the SRP Subbasin were made by DWR for its 1987 study, by Todd Engineers (Todd, 2004) for the Sonoma County Canon Manor West Environmental Impact Report, and by Winzler & Kelly (W&K, 2007) for the Rohnert Park Urban Water Management Plan. The estimated unit pumpage was 0.32 to 0.36 AF/acre based on the DWR (1987) study that used an 81,000-acre study area similar to the boundaries of the SRP Subbasin. The Todd (2004) and W&K (2007) used similar study areas of 25,000 to 25,500 acres based on the upper Laguna watershed boundaries. These study areas encompassed the southern portion of the SRP Subbasin, including the Cities of Cotati and Rohnert Park. Estimated average annual pumpage for the Todd (2004) study was about 8,500 AF or 0.33 AF/acre during 1986-2001. The estimated average annual pumpage for the W&K (2007) study area during 1990-1997 was about 8,700 AF or 0.35 AF/acre. These unit pumpage values are very similar to the unit pumpage estimated for the City's UGB. These pumping rates appear to be sustainable based on review of historical groundwater levels in the SRP Subbasin.

### **Groundwater Conditions**

The following discussion of groundwater conditions associated with the City's groundwater supply was derived from the 2008 *City of Cotati Groundwater Supply Assessment* (Luhdorff and Scalmanini).

DWR (1982a) described groundwater levels in the SRP Subbasin as "about in balance, with increased ground water levels in the northeast contrasting with decreased ground water levels in the south". Groundwater conditions have improved since 1982, with groundwater levels in the north continuing to increase and groundwater levels in the south (including the Cotati area) showing large increases in recent years primarily in response to decreased municipal pumping. A total of 130 water level hydrographs in the SRV Groundwater Basin, including 120 in the SRP Subbasin, were reviewed for the GSA study, and these show no indication of overdraft conditions anywhere in the basin. The Healdsburg Area and Rincon Valley Subbasins have fewer wells with water level data, but these typically show stable to increasing water levels since water level measurements began.

Hydrographs for most shallow zone wells in the SRP Subbasin exhibit relatively stable long-term groundwater levels, indicating little response to changes in pumpage or variations in climatic conditions. Regardless of increases or decreases in pumpage or the occurrence of dry, normal, or wet years, spring water levels in the shallow zone have been essentially stable or increasing since about 1990.

Water levels measured in intermediate zone wells typically reflect confined conditions with lower depths to water and greater seasonal fluctuations. Water levels in these wells are influenced by municipal and agricultural pumping, which occurs primarily from this zone. In the southern portion of the SRP Subbasin, water levels in intermediate zone wells generally follow the trend of Rohnert Park's pumpage, with lower water levels during years of increased pumping and higher water levels during years of reduced pumping. This means that water levels were lowest in the late 1980s, stabilized in the 1990s, and have increased significantly in recent years.

The hydrographs of the three City of Cotati wells show similar trends to the nearby Rohnert Park wells. In general, water levels are lower in the City wells because the direction of groundwater flow is westerly toward the trough of the valley, which runs through the City. City Well 2 has the longest period of record, and spring water levels were relatively constant during the late 1970s and early 1980s, declined during the late 1980s, and gradually increased during the 1990s. The rate of water level rise has increased significantly since 2003 due to additional decreases in municipal pumpage by both Cotati and Rohnert Park. The spring 2006 measurement was the highest ever recorded in City Well 2.

### **Groundwater Quality**

Groundwater quality in the City's water supply wells is generally good, but two wells have elevated iron and manganese concentrations. The City's wells are sampled triennially for complete general minerals and trace elements as required by the Department of Public Health (DPH) for all public water systems, and Wells 1A and 3 are also sampled monthly for iron and manganese. Raw groundwater produced from the three City wells meets primary state drinking water standards, and treated groundwater from these wells also meets secondary drinking water standards (Cotati Groundwater Supply Assessment, 2008).

### **WATER DISTRIBUTION INFRASTRUCTURE**

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The water system is comprised of three groundwater wells, two turnouts from the Sonoma County Water Agency (SCWA), two storage facilities (only one in operation with a 1.0 million gallon capacity), and approximately 150,000 lineal feet of distribution piping ranging in size from 2-inch to 24-inch pipes. The existing water distribution system consists of a single pressure zone with an approximate hydraulic grade line elevation ranging from 288 to 294 feet (Cotati Downtown Specific Plan Water Supply Assessment, Winzler and Kelly, 2008). See Figure 6.1-1 for the service area boundary and general water system information.

### **Turnouts**

The City's water system currently has two metered turnout connections to the SCWA's 48-inch aqueduct that runs through the City along West Sierra Avenue and East Cotati Avenue. Each turnout facility is equipped with an isolation valve, a meter and a pressure reducing valve, which regulates downstream pressure to approximately 70 psi. Turnout No. 1 is located at the intersection of West Sierra Avenue and Cypress Avenue. Turnout No. 2 is located along East Cotati Avenue, east of LaSalle Avenue (WDSMP, 2011).

### **Water Storage**

The City owns two water storage tanks. The West Sierra Avenue storage tank was constructed in 1997 and is a knuckle-roofed, welded steel storage tank with a total storage capacity of 1.0 MG. The facility is located west of Highway 101, just south of West Sierra Avenue, outside of the City limits. The tank has a base elevation over 249 feet and an overflow elevation of 274 feet. The high operating water surface elevation in the tank is 272 feet and the tank has a combined inlet/outlet pipe (WDSMP, 2011).

The Cypress Avenue storage tank is a 100,000 gallon storage tank located at the end of Loma Linda Avenue. This storage tank is currently out of service and there are no current plans to return this facility to service (WDSMP, 2011).

## 6.2 WASTEWATER

The City of Cotati owns and operates a wastewater (sewer) collection and transmission system. Sewage is conveyed to the Santa Rosa Subregional Wastewater Reclamation System for treatment at the Laguna Treatment Plant.

### KEY TERMS

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**Effluent:** Effluent is an outflowing of water from a natural body of water, or from a man-made structure. Effluent in the man-made sense is generally considered to be water pollution, such as the outflow from a sewage treatment facility or the wastewater discharge from industrial facilities. In the context of waste water treatment plants, effluent that has been treated is sometimes called secondary effluent, or treated effluent.

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

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

### REGULATORY FRAMEWORK

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#### *STATE*

#### **State Water Resources Control Board/Regional Water Quality Control Board**

In California, all wastewater treatment and disposal systems fall under the overall regulatory authority of the State Water Resources Control Board (SWRCB) and the nine California Regional Water Quality Control Boards (RWQCBs), who are charged with the responsibility of protecting beneficial uses of state waters (ground and surface) from a variety of waste discharges, including wastewater from individual and municipal systems. The City of Cotati falls within the jurisdiction of the North Coastal RWQCB.

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

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

large and/or commercial or industrial on-site sewage disposal systems, depending on the volume and character of the wastewater.

### **Individual On-site Sewage Disposal System Regulations**

Regulation of individual on-site sewage disposal systems in and around the City of Cotati occurs at a variety of levels, including by the SWRCB, through the North Coast RWQCB, and locally, by the Sonoma County Permit and Resources Management Department. Recently, the State of California enacted legislation that will require the establishment of statewide standards for on-site sewage disposal systems. The following sections describe the primary regulatory mechanisms in place for on-site sewage disposal systems.

### **Regional Water Quality Control Board Basin Plan for the North Coast Region**

The North Coast RWQCB has adopted policies and requirements pertaining to on-site sewage disposal systems, commonly referred to as the Basin Plan. The most recent North Coast RWQCB Basin Plan was adopted in March 2011.

The on-site sewage disposal systems element of the Basin Plan sets forth various objectives, guidelines, general principles and recommendations for the use of on-site sewage disposal systems that cover a variety of topics. Mandatory requirements for the siting and design of on-site sewage disposal systems are reflected in the Basin Plan. Included for all on-site sewage disposal systems are specific criteria related to separation distances to groundwater, setbacks to water features, soil conditions, percolation rates, special design systems, and leachfield replacement area. Further discussion of these criteria is provided later in this section.

### **Assembly Bill 885 (AB 885)**

AB 885 was passed by the California Legislature in September 2000, and mandates the establishment of statewide standards to regulate the placement and use of on-site wastewater treatment systems (OWTS). The SWRCB has been charged with developing this critical set of uniform statewide standards for on-site sewage disposal systems that are required to be incorporated into all RWQCB Basin Plans in the near future. For the past several years the SWRCB has been in the process of developing statewide regulations for on-site wastewater treatment systems per AB 885. The key aspects of the proposed regulations include:

**Site Evaluation Practices.** The proposed regulations will mandate more thorough and consistent soil and site evaluation practices for all new and repair/replacement OWTS for verification of soil depth and groundwater levels. Current practices focus primarily on attaining minimum horizontal setbacks and determination of groundwater separation, not on determination of soil texture, structure or depth. Proposed definitions for soil (especially rock content and weathered bedrock) will require more thorough and extensive soil profile evaluations and stricter interpretations of suitability than under current practices.

**Operation and Maintenance (O&M) Manuals.** The proposed AB 885 regulations require the preparation of an O&M manual for all new and repair/replacement OWTS.

**Septic Tank Risers and Effluent Filters.** Access risers to “near” grade and the use of effluent filters will be required under the proposed regulations. These requirements will apply to new standard systems as well as supplemental treatment systems, and for any tank replacements.

**Supplemental Treatment Systems.** The proposed regulations have minimum vertical separation requirements that will lead to increased use of supplemental treatment systems. Minimum vertical separation is the depth of continuous unsaturated, undisturbed earthen material between the bottom of the dispersal system and the top of the seasonal high groundwater level, impermeable strata, or bedrock.

**Dispersal System Siting and Design Criteria.** The proposed dispersal system siting and design requirements are generally consistent with and/or less restrictive than the current RWQCB Basin Plan. Many of the requirements are structured to allow for more latitude in the use of supplemental treatment to overcome soil depth/suitability constraints for OWTS. Based on the soil definitions in the proposed regulations, there is likely to be an increased need to specify supplemental treatment systems and shallow dispersal designs (including mounds) for sites that may have been permitted for conventional trench designs under current practices.

**Groundwater Quality and Septic Tank Monitoring.** The proposed AB 885 regulations will mandate new groundwater sampling and septic tank inspections requirements for new and existing OWTS. The proposed regulations do not explicitly require the City to enforce this requirement or to collect and maintain any of the results from sampling that is performed. However, as the local agency responsible for implementing the regulations, at a minimum, Sonoma County would be obligated to provide some level of oversight for these activities, the details of which would likely have to be specified in the RWQCB MOU or the Conditional Waiver from the SWRCB.

**Record Keeping.** The proposed requirements specify only that system owners maintain copies of the Record Plan and the O&M Manual for the OWTS. Sonoma County, as the implementing authority will also be required to collect, review and maintain records of these same items.

#### *LOCAL*

### **Cotati Municipal Code**

Chapter 13.37.010 of the Cotati Municipal Code allows for the discharge of waste from any premises within the city onto land or to any natural outlet, only if the discharge complies with all requirements of the Regional Water Quality Control Board and of all other local, state and federal laws and regulations.

### **Cotati Sewer Collection System Master Plan**

The City's Sewer Collection System Master Plan (SCSMP) evaluates the adequacy of the City's sewer collection system, identifies system deficiencies (present and future), and develops prioritized recommendations to meet the City's collection needs through the year 2035. The Sewer Collection System Master Plan contains a summary of the existing sewer system facilities, an evaluation of sewage flows, an evaluation of inflow and infiltration flows, development of a hydraulic model, the identification of existing and future system deficiencies, and prioritized recommendations and cost estimates for improving the system through the year 2035. The City finalized the Sewer Collection System Master Plan in September 2011.

### **Santa Rosa Recycled Water Master Plan**

The purpose of the Santa Rose Recycled Water Master Plan is to assist the City in deciding how to manage additional wastewater flows into the Subregional Water Reclamation System resulting from updates to the general plans of cities within Sonoma County. It also must describe methods for managing current and future flows that are discharged and which are affected by new regulations, including the California Toxics Rule (CTR). The sum of these flows is the incremental flow to be

## 6. UTILITIES

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addressed by the Incremental Recycled Water Program (IRWP). The City of Santa Rosa (City) is the managing partner for the Subregional System. The Master Plan formulates a course of actions for implementing facilities under the IRWP to manage the incremental flow. All areas where these facilities would be implemented are within Sonoma County, except for a small portion of the Geysers Steamfield, which is located in Lake County.

### COTATI WASTEWATER COLLECTION SYSTEM

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The following discussion of the City's wastewater system is derived primarily from the Cotati Sewer Collection System Master Plan (Carollo, 2011).

The City owns and operates a sanitary sewer collection system that provides sanitary sewer, or wastewater, service to approximately 1,200 acres in and around the City's limits. The sanitary sewer system is comprised of four lift stations, approximately 140,300 lineal feet of collection piping ranging in size from six inches to 24 inches, approximately 484 manholes, approximately 150 cleanouts, and a 24-inch transfer interceptor which carries wastewater to the Santa Rosa Subregional Treatment Plant (also referred to as the Laguna Wastewater Treatment Plant LWWTWP) for treatment. The locations of the City's wastewater system's key facilities are shown on Figure 6.2-1.

#### **Sanitary Sewer Collection Zones**

The City's sewer collection system can be categorized into nine separate collection zones, which are summarized below.

North Central Cotati Zone: The North Central Cotati Zone is comprised of the collection network located in the development area north and northwest of the Hub, and east of Highway 101. In addition to flows originating within this zone, the zone receives flow directly from the West Hub Zone, the East Hub Zone, and the East Cotati Avenue Zone via an interceptor connection. This zone discharges directly into the Helman Lane Sanitary Sewer Interceptor.

West Hub Zone: The West Hub Zone is comprised of the western portion of the City Hub and all sewered area west of Old Redwood Highway with the exception of those included in the Gravenstein Highway Zone. In addition to flows originating within the zone, this zone also receives flow directly from the Quail Hollow Zone via the Quail Hollow Lift Station. The West Hub Zone discharges directly into the North Central Cotati Zone.

East Hub Zone: The East Hub Zone is comprised of the eastern portion of the City Hub, sewered areas east of Old Redwood Highway from Myrtle Avenue to St. Josephs Way and the area along East Cotati Avenue from the Hub to LaSalle Avenue. In addition to flows originating within this zone, the zone also receives flow directly from the Benson Lane Zone via the Benson Lane Lift Station. The East Hub Zone discharges directly into the North Central Cotati Zone.

East Cotati Avenue Zone: The East Cotati Avenue Zone is comprised of sewered areas along East Cotati Avenue east of LaSalle Avenue, the area bounded by Lincoln Avenue, Loretto Avenue, and Lakewood Avenue, and all areas within the City's limits which straddle the Northwestern Railroad tracks. In addition to flows originating within this zone, the zone also receives flow directly from the New Century Park Zone via the New Century Park Lift Station. The East Cotati Avenue Zone discharges directly into the North Central Cotati Zone via the East Cotati Avenue Sanitary Sewer Interceptor.



New Century Park Zone: The New Century Park Zone is comprised of the New Century Park Subdivision. This zone receives no upstream zone flow. The New Century Park Subdivision discharges directly into the East Cotati Avenue Zone via the New Century Park Lift Station.

Quail Hollow Zone: The Quail Hollow Zone is comprised of the Quail Hollow Subdivision and the southeast portions of the Macklin Subdivision. This zone receives no upstream zone flow. The Quail Hollow Zone discharges directly into the West Hub Zone via the Quail Hollow Lift Station.

Benson Lane Zone: The Benson Lane Zone is comprised of approximately twelve sewer connections along Benson Lane. This zone receives no upstream zone flow. The Benson Lane Zone discharges directly into the East Hub Zone via the Benson Lift Station.

Northwest Cotati Zone: The Northwest Cotati Zone is comprised of the development area bounded by Copeland Creek, Laguna de Santa Rosa Creek and Highway 101. This zone receives no upstream zone flow. The Northwest Cotati Zone discharges directly into the Helman Lane Sanitary Sewer Interceptor via the Redwood Drive Lift Station.

Gravenstein Highway Zone: The Gravenstein Highway Zone is comprised of the sewered areas along Madrone Avenue, Gravenstein Highway and Redwood Drive (south of Helman Lane). This zone receives no upstream zone flow. The Gravenstein Highway Zone discharges directly into the Helman Lane Sanitary Sewer Interceptor.

### **Sanitary Sewer Lift Stations**

The City's sewer collection system contains four lift stations, which are described below.

Redwood Drive Lift Station: The Redwood Drive Lift Station, located at 6817 Redwood Drive, was constructed in 2000 and began pumping operations in May 2001. The lift station is equipped with two 5 hp submersible sewage pumps, each capable of pumping 250 gpm at 34 feet total dynamic head (TDH). The lift station has an associated 2,500 lineal feet of 6-inch force main that discharges to a manhole located along Redwood Drive just south of Copeland Creek.

Benson Lane Lift Station: The Benson Lane Lift Station, located at 54 Benson Lane, was constructed and began pumping operations in 1974. The lift station is equipped with two 3.2 hp submersible sewage pumps, each capable of pumping approximately 130 gpm at 21 feet of TDH. The lift station has an associated 200 lineal feet of 4-inch force main which discharges to a manhole at the intersection of Benson Lane and Park Avenue.

Quail Hollow Lift Station: The Quail Hollow Lift Station, located at 230 Myrtle Avenue, was constructed and began pumping operations in 1988. The lift station is equipped with two 3.2 hp submersible pumps capable of pumping approximately 120 gpm at 27 feet of TDH. The lift station has an associated 2,400 lineal feet of 6-inch force main which discharges to a manhole at the intersection of Myrtle Avenue and Old Redwood Highway.

New Century Park Lift Station: The New Century Park Lift Station, located at 287 Eagle Drive, was constructed and began pumping operations in 1986. The lift station is equipped with two 3.2 hp submersible sewage pumps capable of pumping approximately 280 gpm at 24 feet of TDH. The lift station has an associated 350 lineal feet of 6-inch force main which discharges to a manhole at the intersection of Loretto Avenue and LaSalle Avenue.

### Sanitary Sewer Interceptors

The City's sanitary sewer system has two major gravity interceptors, which are described below.

East Cotati Avenue Sanitary Sewer Interceptor (ECASSI): Prior to 1998, wastewater flows from the New Century Park and East Cotati Avenue Zones were discharged into the City of Rohnert Park's sewer system via two outlet connections at the intersections of East Cotati Avenue and Adrian Drive; and East Cotati Avenue and Lancaster Drive. In 1998, the City constructed the ECASSI to divert the flows from the Rohnert Park system and redirect them to the North Central Cotati Zone. This 12-inch interceptor originates from a manhole at the intersection of East Cotati Avenue and Adrian Street and runs west along East Cotati Avenue to the Laguna de Santa Rosa Creek. The interceptor then turns northwest, running along the creek to a manhole at the east end of Gravenstein Lane where it discharges to the North Central Cotati Zone. The interceptor has a total length of approximately 4,260 lineal feet.

Helman Lane Sanitary Sewer Interceptor (HLSSI): Constructed in 1996, the HLSSI serves as the City's sole main transfer interceptor, carrying 100% of the City's wastewater to the LWWTP for treatment. The 24-inch interceptor originates from a manhole at the intersection of Redwood Drive and Helman Lane. The HLSSI runs northwest along Helman Lane and continues beyond the City limits to the LWWTP. The interceptor has a total length of approximately 21,300 lineal feet.

### WASTEWATER FLOWS

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Wastewater consists of dry weather flow (DWF) and wet weather flow (WWF). DWF (or base flow) is flow generated by routine water usage in the residential, commercial, business and industrial sectors of the sewer system. The other component of DWF is the contribution of dry weather groundwater infiltration (GWI) into the sewer system. Dry weather GWI will enter the sewer system when the relative depth of the groundwater table is higher than the depth of the pipeline and when the susceptibility of the sanitary sewer pipe allows infiltration through defects such as cracks, misaligned joints and broken pipelines.

WWF includes storm water inflow, trench infiltration, and GWI. The storm water inflow and trench infiltration comprise the WWF component termed I/I. The response in the sewer system to rainfall is seen immediately (as with inflow) or within hours after the storm (as with infiltration), especially near creeks or other water bodies.

GWI, which is not specific to a single rainfall event, but rather to the effects on the sewer system over the entire wet weather season. The depth of the groundwater table rising above the pipe invert elevation causes GWI. Sewer pipes within close proximity to a body of water can be greatly influenced by groundwater effects. As the groundwater table fluctuates over the wet weather season, this fluctuation is seen as a mounding effect in flow monitoring data. This may be considerable in the City's service area, particularly in sewers located near the Laguna de Santa Rosa Creek.

#### *BASE WASTEWATER FLOW*

The base wastewater flow (BWF) is the flow generated by the City's customers. The flow has a diurnal pattern that varies depending on the type of use. Commercial and industrial patterns, though they vary depending on the type of use, typically have more consistent higher flows during business hours, and lower flows at night. Furthermore, the diurnal flow pattern experienced during a weekend may vary from the diurnal flow experienced during a weekday.

*AVERAGE DRY WEATHER FLOW*

The average dry weather flow (ADWF) is the average flow that occurs on a daily basis during the dry weather season. The ADWF includes the BWF generated by the City’s residential, commercial, and industrial users, plus the dry weather GWI component.

*PEAK WET WEATHER FLOW (DESIGN FLOW)*

Peak wet weather flow (PWWF) is the highest observed hourly flow that occurs following a design storm event. Wet weather I/I causes flows in the collection system to increase. PWWF is typically used for designing sewers and lift stations.

**Existing Wastewater Flow Volumes**

The City of Cotati’s wastewater flows and projected ADWF are shown below in Table 6.2-1.

<b>Table 6.2-1 City of Cotati Wastewater Flows</b>		
	<b>Existing (2010)</b>	<b>Buildout (2035)</b>
Average Dry Weather Flow	0.46 mgd	0.66 mgd
Design Flow	3.90 mgd	4.60 mgd
Peaking Factor	8.5	7.0

*SOURCE: SCSMP, PAGE 4-16*

**WASTEWATER TREATMENT**

The City of Santa Rosa Utilities Department is responsible for managing the Subregional Wastewater Treatment and Reclamation system, which handles the wastewater treatment for the City of Cotati. Wastewater generated by the City of Cotati is treated at the Laguna Wastewater Treatment Plant, located at the south end of Santa Rosa.

**Subregional Agreement**

In 1975, the City of Santa Rosa executed an Agreement with the Cities of Rohnert Park, Sebastopol and the South Park County Sanitation District for treatment of wastewater at the Laguna Treatment Plant. At that time, Cotati’s wastewater flowed through Rohnert Park’s collection system and the combined flow continued to the Laguna Treatment Plant. In 1994, Cotati’s wastewater flow was segregated from Rohnert Park; Cotati executed the Third Amended Agreement and became a “Subregional” partner with the cities of Santa Rosa, Rohnert Park and the South Park County Sanitation District. Currently, all wastewater from Cotati flows directly to the Laguna Treatment Plant via Cotati’s Helman Lane 24-inch trunkline. The Third Amended Agreement assigned a flow allocation of 0.624 million gallons per day (mgd) to Cotati. In 2002, under the Fourth Amended Agreement, Cotati’s flow allocation was increased to 0.76 mgd to incrementally meet treatment capacity needs for its General Plan buildout (DSP EIR, page 4.13-2).

The 2035 flow is projected to be 0.82 mgd and the City will need to apply for an incremental increase to its flow allocation with the Subregional partners. The City of Santa Rosa, as the operator of the Laguna Treatment Plant, has indicated that once Cotati’s General Plan is updated beyond the current General Plan horizon of 2010, Cotati can apply to the Subregional partners for an increase to its future allocation (DSP EIR, page 4.13-2).

**Laguna Plant Wastewater Treatment Capacity**

According to the City of Santa Rosa’s 2007 Update to the Recycled Water Master Plan, the City of Santa Rosa’s current National Pollutant Discharge Elimination System (NPDES) permit allows the City to treat, reuse, and discharge the annual flow resulting from receiving a daily average dry weather flow (ADWF) of 21.34 million gallons per day (mgd) at the Laguna Plant. According to the City of Santa Rosa Utility Department website (accessed 5/3/11), the Laguna Plant has an average daily dry weather flow of 17.5 million gallons per day, which represents approximately 82 percent of the permitted capacity of the plant.

Table 6.2-2 shows the sources and volume of the ADWF treated at the Laguna Plant in 2000, which is the most recent data available in the City of Santa Rosa’s 2007 Update to the Recycled Water Master Plan.

<b>Member Entity</b>	<b>ADWF (mgd)</b>	<b>Percent</b>
Rohnert Park and Sonoma State University	3.60	20.11
Sebastopol	13.17	73.51
Santa Rosa and South Park County Sanitation District	0.63	3.54
Cotati	0.51	2.84
<b>Total</b>	<b>17.91</b>	<b>100.00</b>

*SOURCE: CITY OF SANTA ROSA’S 2007 UPDATE TO THE RECYCLED WATER MASTER PLAN, TABLE 1.*

As shown in the table above, the wastewater generated by the City of Cotati represented less than three percent of the total wastewater treated at the Laguna Wastewater Treatment Plant in the year 2000.

City of Santa Rosa’s 2007 Update to the Recycled Water Master Plan estimates that in 2020, total ADWF to the Laguna Plant will be approximately 25.89 mgd, which exceeds the current NPDES permit capacity of the plant.

**Laguna Plant Wastewater Treatment Process**

The following summary of the wastewater treatment process at the Laguna Plant was derived from the City of Santa Rosa Utility Department’s website<sup>1</sup> (accessed 5/3/11).

**Primary Treatment**

Sewage from homes, business, and industry arrives at the treatment plant by passing through large bar screens that remove wood, paper, and plastics from the water. Sand and gravel then settle out in the grit tank and are removed. Clarification tanks allow lighter materials to float to the surface and be skimmed off. Heavier material, called biosolids, falls to the bottom and is pumped to anaerobic digesters. Bacteria in the digesters break solids down, creating methane gas.

Methane powered generators serve as the source of energy for a sixth of the treatment process. Solids are digested for up to thirty days, reducing their volume by 50%. Following a dewatering process, biosolids are blended with greenwaste material to create compost, or they are applied directly to farmers’ fields as fertilizer. A small quantity is sent to the landfill.

**Secondary Treatment**

<sup>1</sup> <http://ci.santa-rosa.ca.us/departments/utilities/treatment/treatment/Pages/process.aspx>

After the majority of solids have been removed, water flows into aeration basins. The aeration basins are tanks injected with oxygen to stimulate the growth of microorganisms and their consumption of dissolved wastes. These microorganisms modify pollutants to reduce their impact on the environment.

As the water moves toward the next treatment phase, the microorganisms are removed in clarification tanks. As they settle to the bottom of the clarifiers, they are returned to the aeration basins to re-supply the self-sustaining population of microorganisms. Clean water continues on to further treatment.

### ***Tertiary Treatment and Disinfection***

The water flows through a four-foot bed of coal. This small, black, granular coal (like the type used in some fish aquariums) acts as a filter to trap fine suspended solids and some potential pathogens, or disease causing organisms. Finally, ultraviolet light (UV) removes bacteria and viruses by destroying their DNA, the genetic material needed to reproduce. The reclaimed water then leaves the plant, and is clean enough for many approved reuse purposes.

## **ON-SITE SYSTEMS**

On-site systems, commonly referred to as septic systems, are useful for handling the wastewater disposal needs of individual dwellings or commercial establishments for which connection to community facilities is not feasible. An on-site system consists of a septic tank that receives wastewater, allows the heavier solids to settle in the tank, and releases the remainder to an attached leach field. The leach field consists of underground perforated parallel lines through which water can seep into the surrounding soil. The solids which settled out of the wastewater in the septic tank must be periodically removed.

Septic tanks work well in areas of low density development where there is sufficient room to separate leach lines from potable water wells and lines. On-site systems are relatively inexpensive, easy to maintain, and contribute to water recharge in the area. However, on-site systems require certain soil conditions, topography, and water table conditions in order to work. If the proper conditions are not present, the leach field can become saturated and groundwater may become contaminated.

A serious problem associated with on-site systems is the potential for groundwater contamination. On-site systems that serve commercial or industrial establishments may dispose of chemicals that are not adequately filtered prior to being leached into the soil. For industrial properties where groundwater contamination is a concern due to chemical waste, chlorine injection or evaporation ponds must be provided in order to ensure safe disposal of sewage.

Properties in Cotati that are within 200 feet of an existing City wastewater conveyance line are required to connect to the City's wastewater system (Cotati Municipal Code Chapter 13.36.030). Property owners with parcels further than 200 feet from an existing City wastewater conveyance line wishing to install and operate a septic system must receive a permit from the Sonoma County Permit and Resource Management Department. Consistent with SRWCB requirements described above, the County's septic system application process requires applicants to provide detailed information regarding soil types, percolation rates, distances to ground water and detailed site plans.

### **6.3 SOLID WASTE**

The City of Cotati is a member of the Sonoma County Waste Management Agency (SCWMA), a joint powers authority for the nine cities and County of Sonoma, which was formed in 1992 and has a current sunset of 2017. Solid waste pickup within Cotati is currently provided by Redwood Empire Disposal.

## 6. UTILITIES

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### KEY TERMS

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

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

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

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

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Resource Conservation and Recovery Act**

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

#### *STATE*

#### **California Integrated Waste Management Act**

The California Integrated Waste Management Act of 1989 (AB 939) requires every city and county in the state to prepare a Source Reduction and Recycling Element to its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state waste diversion goals of 25 percent by 1995 and 50 percent by 2000. The purpose of AB 939 is to “reduce, recycle, and re-use solid waste generated in the state to the maximum extent feasible.” The term “integrated waste management” refers to the use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment. The Act has established a waste management hierarchy, as follows: Source Reduction; Recycling; Composting; Transformation; and Disposal. In 1995, the Sonoma County Waste Management Agency (SCWMA) was designated a regional agency as defined under Section 40970 of the California Public

Resource Code, for the purpose of implementing, monitoring and reporting programs to meet the goals established by AB 939. In addition, the SCWMA also assumed the responsibility of maintaining all AB 939 planning documents for Sonoma County jurisdictions.

### **California Integrated Waste Management Board Model Ordinance**

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

#### *LOCAL*

### **Sonoma County Integrated Waste Management Plan**

The Sonoma County Integrated Waste Management Plan is the primary local solid waste management planning document that demonstrates reduction of the amount of solid waste landfilled, long-term ability to ensure the implementation of countywide diversion programs, and provision of adequate disposal capacity for local jurisdictions through the siting of disposal and transformation facilities. This planning document is known as the Countywide Integrated Waste Management Plan (CoIWMP), and includes the Source Reduction and Recycling Element (SRRE), Household Hazardous Waste Element (HHWE), Non-Disposal Facility Element (NDFE), and the Siting Element.

### **Cotati Municipal Code, Chapter 8.08: Solid Waste Management**

Chapter 8.08 of the Cotati Municipal Code contains specific requirements related to:

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

### **SOLID WASTE GENERATION**

CalRecycle has established a per resident disposal target rate of 7.1 pounds per day (PPD) and a per employee disposal rate of 18.3 PPD for the SCWMA. The SCWMA has met and exceeded these targets in recent years, achieving a disposal rate of 3.9 PPD per resident and 10.6 PPD per employee in 2010. While current disposal rates are not available at the City level, CalRecycle’s Solid Waste Characterization Database most recent waste stream data at the City level (1999) shows that Cotati’s commercial uses disposed of 2,757 tons of waste and residential uses disposed of 2,973 tons of waste.

## 6. UTILITIES

### WASTE COLLECTION SERVICES

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Redwood Empire Disposal offers weekly garbage service to residential and commercial customers in the City. Included in the residential fee for garbage service is a weekly curbside recycling program and weekly compost service. Residents may choose from 20, 32, 68, or 95-gallon rolling garbage carts, which are collected once per week. The cost of the service is based on the size of the garbage cart. Redwood Empire Disposal offers several options for commercial accounts. Recycling is a free service for all refuse accounts. Depending on the area, commercial accounts may choose from 1.5, 2, 3, 4, 6 cubic yard bins. Commercial collection services are offered up to five times a week. Small commercial generators may subscribe to weekly cart service, but will need to bring their carts to the roadside (<http://unicycler.com/commercial/sonoma/cotati>. Accessed 5/20/11).

### WASTE DISPOSAL FACILITIES

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Information regarding waste disposal facilities has been taken from the CalRecycle website databases (<http://www.calrecycle.ca.gov/databases/>) and the Sonoma County Waste Management Agency website accessed in June 2011.

#### Central Disposal Site

Sonoma County's Central Disposal Site features a full spectrum of waste management programs to serve the 467,000 residents and thousands of businesses in Sonoma County. The 398-acre Central Disposal Site integrates reuse & recycling, household hazardous waste management services, yard debris and food waste composting, solid waste disposal, along with production of electrical energy and vehicle fuel from landfill gas in a coordinated system at a single location.

The Central Disposal Site has a permitted daily capacity of 2,500 tons. Its 172-acre waste disposal area has a total permitted capacity of 19,779,250 tons, with a remaining capacity of 9,470,629 tons (47.9 percent). The permit for this facility is scheduled to be reviewed in March 2015. The Central Disposal Site was closed in 2005 following the discovery that a damaged dump protective liner might lead to ground water contamination. The liner was repaired, and the facility re-opened in September 2010. The Central Disposal Site receives approximately 60 percent of the County's annual waste.

#### Diversification Facilities

The SCWMA is responsible for managing the central disposal site just outside of Cotati and transfer stations in Annapolis, Occidental, Sonoma, Healdsburg, and Guerneville. At all these disposal sites, the SCWMA receives both source-separated recyclables and refuse. Large transfer trailers haul refuse from the transfer stations to the central disposal site for landfilling. Other transfer trailers haul wood waste and yard debris from three of the transfer stations (Sonoma, Guerneville, and Healdsburg) to the central landfill for processing.

### WASTE CHARACTERISTICS

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Of the nearly 375,000 tons of waste disposed of in Sonoma County annually, approximately 70% consists of materials that are potentially recoverable. For waste from both residential and commercial sources, the most prevalent class of materials is *organics*, which represents approximately 51% and 42% of waste from those sectors, respectively. *Paper* is the second most prevalent material class for both sectors, at approximately 19% for the residential sector and nearly 21% for the commercial sector. Almost 64% of the self-hauled waste stream is composed of *construction and demolition materials*. The two most prevalent material classes for the County's disposed waste stream as a whole are *organics* (36.3%) and *construction and demolition materials* (27.4%). The single most prevalent material is food, which



comprises approximately 21% of the County's disposed waste stream (SCWMA, Waste Characterization Study, 2007).

Organics includes food, leaves & grass, prunings & trimmings, branches & stumps, agricultural crop residues, manures, textiles, carpet and carpet padding. Construction & demolition includes concrete, asphalt paving, asphalt roofing, clean recyclable wood, other recyclable wood, treated wood waste, clean gypsum board, rock, soil and fines. Paper includes uncoated corrugated cardboard, paper bags, newspaper, white & colored ledger paper, office paper, magazines & catalogs, phone books & directories, other recyclable and compostable paper.

### Waste Diversion

Through the requirements of AB 939, the California Department of Resources Recycling and Recovery (CalRecycle), requires the SCWMA, on behalf of the cities and the County of Sonoma, to calculate its diversion rate. The diversion rate is the percentage of total waste that a jurisdiction diverted from disposal at CalRecycle-permitted landfills and transformation facilities through reduction, reuse, recycling programs, and composting programs. Jurisdictions were required by law to achieve 50 percent diversion for the year 2000.

As of 2007, jurisdictions' diversion rates were no longer calculated by CalRecycle to determine compliance with AB 939. Instead, a per capita disposal rate was used as a benchmark of program effectiveness. The statutory change was instituted by SB 1016 (2008). Sonoma County's waste diversion rates from 2003 through 2008 are shown in Table 6.3-1. As shown below, the County has seen a steady increase in the volume of waste diverted.

<b>Year</b>	<b>Waste Diversion Rate</b>
2008	4.5 lbs/person/day <sup>1</sup>
2007	5 lbs/person/day <sup>1</sup>
2006	64%
2005	61%
2004	58%
2003	55.1%

SOURCE: SCWA WASTE STREAM PROFILES. AVAILABLE AT:

[HTTP://WWW.RECYCLENOW.ORG/AGENCY/WASTE\\_STREAM\\_PROFILES.ASP](http://www.recyclenow.org/agency/waste_stream_profiles.asp) ACCESSED JULY 1, 2011.

NOTE 1: PER CAPITA DISPOSAL RATE — THE AVERAGE AMOUNT OF WASTE DISPOSED WITHIN A COUNTY PER PERSON FOR A GIVEN YEAR. THIS BENCHMARK SIMPLY DIVIDES THE TOTAL WASTE GENERATED WITHIN A JURISDICTION BY THE POPULATION (OR SOMETIMES EMPLOYMENT DATA) AND NUMBER OF DAYS IN THE YEAR. THE SWITCH FROM A DIVERSION RATE TO A PER CAPITA DISPOSAL RATE SIMPLIFIES THE REPORTING PROCESS BETWEEN A JURISDICTION AND CALRECYCLE AND ASSISTS IN A MORE TIMELY EVALUATION OF WASTE DIVERSION PROGRESS.

### COMPOSTING

The municipal composting program is operated by Sonoma Compost Company under contract with the Sonoma County Waste Management Agency. Sonoma Compost Company is responsible for processing all yard debris and vegetative food waste collected from Refuse Disposal sites and from weekly pick up of residential curbside green waste. Activities occur on a 25-acre portion of the Central Disposal Site between Cotati and Petaluma.

## 6. UTILITIES

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The yard debris is hand-sorted to remove unacceptable materials such as plastic bags and other non-organic items and then ground, and placed in windrows for about 10-12 weeks to produce a soil amendment. Specialty soil products are created by adding chicken feathers from local poultry processors, rice hulls and duck manure.

Compost produced in the municipal program is listed as an allowed material by the Organic Materials Review Institute for use in the production of organic food and fiber. Because of this listing, compost produced by Sonoma Compost Company is used on a number of California Certified Organic Farms (CCOF). In 2008, 92,000 tons of yard debris was transformed into a valuable soil amendment.

SCWMA offers residents within its jurisdiction the option of including yard debris and many types of food items in greenwaste recycling bins, which are picked up curbside and disposed of through composting. Food items that may be included in curbside bins include: fruit and peelings, vegetables and peelings, pasta and rice, bread, tea bags, coffee grounds and filters, and eggshells. SCWMA also provides information and resources to assist residents with composting at home.

SCWMA also operates a commercial veggie scrap composting program. Vegetable food scraps that can't be donated, such as spoiled fruits and vegetables, stale bakery items and kitchen prep trimmings, can be composted into a beneficial soil amendment, thus greatly reducing the amount of material going into landfill. Restaurants, grocery stores, schools, hospitals and other facilities can benefit by participating in garbage company pick up, by directly hauling material to the municipal composting program or by composting food scraps on-site.

### *RECYCLING*

Most of Sonoma County's single-stream recycling is sorted and baled for shipping at North Bay Corporation's Materials Recovery Facility in Santa Rosa.

The process starts when giant mounds of recycling are sorted daily in a process which incorporates both mechanical and human sorting. The first sort is done by hand where large pieces of cardboard, rigid plastics, garbage, and plastic bags are removed.

Next, the material is pushed up a large conveyor belt with a row of rods that contain series of offset lobes (similar to a cam shaft) which "float" the lighter material, such as paper, to an upper belt which feeds directly to the baler where paper and other fiber products are collected and prepared for shipping.

Beverage/food/household containers and smaller bits of paper fall through the first set of cams onto another belt. These are fed up a second incline conveyor containing a smaller set of offset lobes to capture the smaller pieces of paper. That belt feeds to a baler for processing.

The beverage/food/household containers which fall through to the container line pass under a strong magnet which removes all steel cans and other magnetic materials. Remaining plastic containers are sorted into different grades by hand, and an "eddy" current pushes aluminum cans into a collection hopper.

## 6.4 ELECTRICITY AND NATURAL GAS

### REGULATORY FRAMEWORK

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#### STATE

#### Public Utilities Commission

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

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

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity, including biomass cogeneration facilities.

#### Senate Bill 14 and Assembly Bill 64

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

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

#### Title 24

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

### *LOCAL*

#### **Sonoma County Energy Independence Program**

Sonoma County's Energy Independence Program is a new opportunity for property owners to finance energy efficiency, water efficiency and renewable energy improvements through a voluntary assessment. These assessments will be attached to the property, not the owner and will be paid back through the property tax system over time, making the program not only energy efficient but also affordable. Program specific include:

- Participation in this Sonoma County program is completely voluntary.
- Energy efficiency, water conservation and renewable energy generation upgrades must be permanently attached to the property to qualify. Items not permanently attached such as dishwashers and other appliances are not allowed. Improvements like insulation, cool roofing, heating and air conditioning systems, waterless urinals, solar panels and energy efficient windows are acceptable.
- Improvements must be for existing buildings; new construction does not qualify.
- Assessments are a lien on the property itself: when the property is sold, the assessment stays with the property.
- Repayment is made through the property tax bill over time.

#### **Standardized Permit Submittal – Residential Photovoltaic Systems**

The Redwood Empire Chapter of Code Officials has developed a standardized permit submittal for residential (one and two family dwellings) roof mounted photovoltaic (PV) systems of up to 5 KW in an effort to provide consistent processing requirements among local jurisdictions. If the project is located in a historical district, or is a ground mount system, additional requirements for review may be required. The City of Cotati has adopted the standardized permit submittal requirements to encourage installation of residential PV systems.

#### **City of Cotati Green Building Requirements**

In March 2011, the City repealed its Sustainable Building Program and adopted CalGreen, including mandatory compliance with Tier 1 standards. The Tier 1 standards require approximately 15 percent increase in efficiency and green development. Tier 1 requires development projects to: comply with baseline measures, exceed 2008 Energy Efficiency Standards by 15 percent, and comply with one elective measure per the sites, water, materials, and environmental categories, as well as one additional elective measure from any of the five categories.

#### **City of Cotati Municipal Code Chapter 17.51- Resource Conservation**

This chapter provides standards to assist new development in achieving the conservation of energy and other resources within the community. This chapter also provides cross-references to other sections of Chapter 17 (land use code) that address resource conservation issues in relation to the topics of those regulations (e.g., subdivision design, exterior lighting, etc.).

Chapter 17 of the Cotati Municipal Code includes a variety of standards, in addition to those in, or referenced in this chapter, that interact to implement resource conservation goals. These standards provide for: development that is mixed use and walkable; housing for diverse family types (including

second units); street widths that are the minimum necessary to accommodate safe and convenient transportation; and the preservation of habitat, wetlands, trees and other environmental resources.

Collectively, the resource conservation standards of the land use code are intended to reduce per capita energy consumption, and its contributions to global greenhouse gas production, potable water consumption and resulting wastewater production, and solid waste production. The provisions of this chapter apply to all proposed development and new land uses.

Chapter 17.51 requires that each new structure shall be designed and constructed to achieve a minimum of fifteen percent greater energy efficiency than otherwise required by the California Code of Regulations, Title 24, and shall also implement the City's sustainable building program adopted by council resolution. Remodeling or other alterations to an existing structure shall require that the entire structure be brought into compliance with this section only if the proposed extent of change to the existing structure is sufficient that the building code would otherwise require that the entire structure comply with all applicable current building code requirements.

### EXISTING SETTING

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

Infrastructure to deliver electricity and natural gas is currently in place. PG&E generally can provide these services to newer development on request.

Since 2000, the City has permitted 27 solar installations; the majority of permits were for roof-mounted residential systems. No permits were requested from 2000 to 2004. From 2004 to 2006, 7 permits were issued. The rate of solar projects increased from 2007 through 2009 with 10 permits issued. From 2010 through April 2011, 12 permits were issued.

### REFERENCES

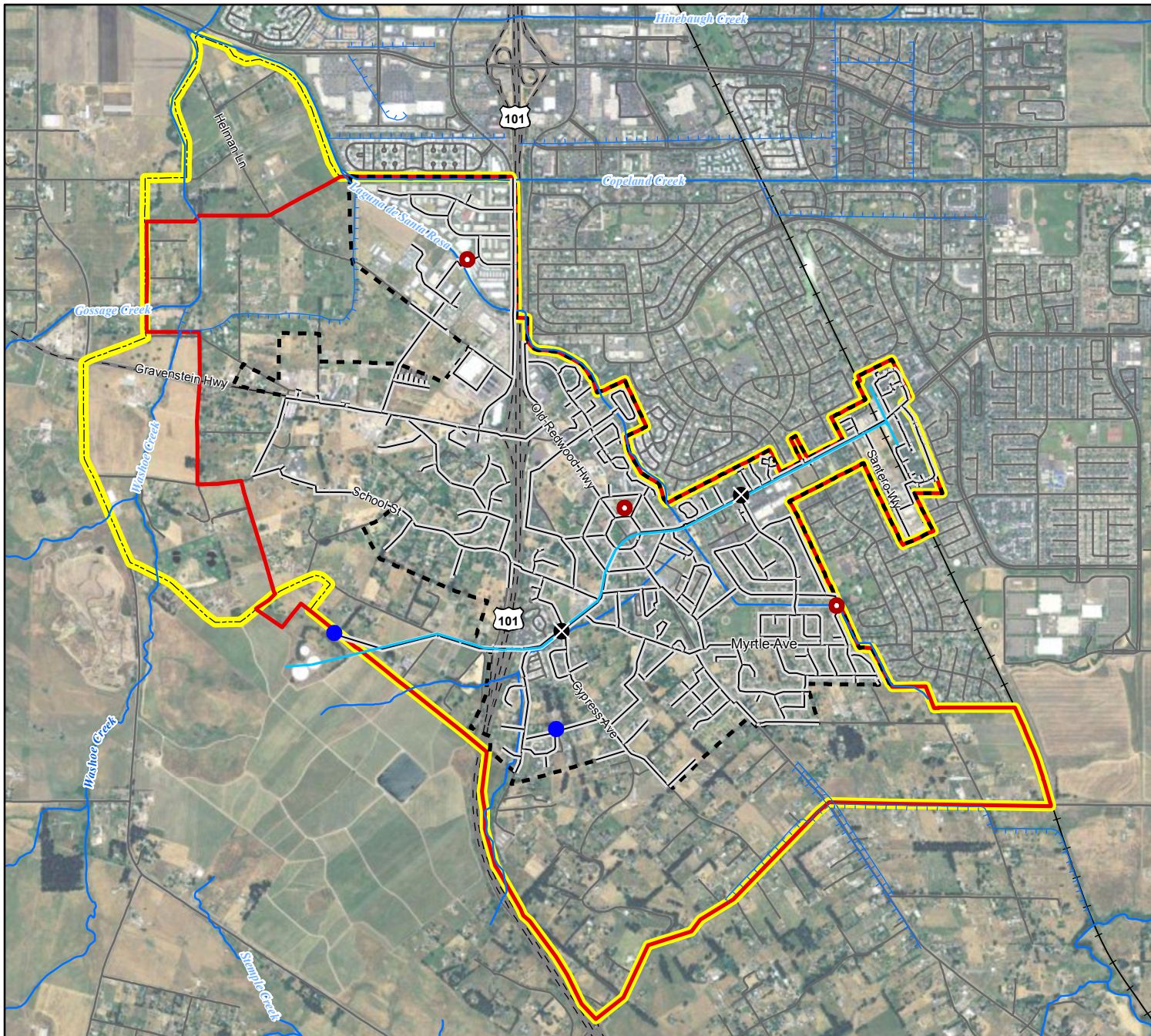
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- City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.
- City of Cotati. 2008. Downtown Specific Plan EIR.
- CalRecycle. 2011. <http://www.calrecycle.ca.gov/databases/>. Accessed June 2011.
- Carollo Engineers. 2011. City of Cotati 2010 Urban Water Management Plan.
- Carollo Engineers. 2011. City of Cotati Water System Master Plan.
- Carollo Engineers. 2011. City of Cotati Sanitary Sewer System Master Plan.
- Winzler Kelly. 2008. Cotati Downtown Specific Plan Water Supply Assessment.
- Luhdorff and Scalmanini. 2008. City of Cotati Groundwater Supply Assessment.
- Brown and Caldwell. 2006. Sonoma County Water Agency 2005 Urban Water Management Plan.
- Brown and Caldwell. 2011. Sonoma County Water Agency 2010 Urban Water Management Plan.
- Carollo Engineers. 2011. Final City of Cotati Sewer Collection System Master Plan.
- Carollo Engineers. 2011. Final City of Cotati Water Distribution System Master Plan.
- Cascadia Consulting Group. 2007. Sonoma County Waste Management Agency Waste Characterization Study.
- Sonoma County Water Agency. 2007. Sonoma Valley Groundwater Management Plan.
- R3 Consulting Group. 2003. Sonoma County 2003 Solid Waste Generation Study.
- Sonoma County Waste Management Agency. 2003. Countywide Integrated Waste Management Plan.
- O'Bid, Damien. City of Cotati Director of Public Works. Email communication, 6/2/2011
- SCWA Waste Stream Profiles. Available at:  
[http://www.recyclenow.org/agency/waste\\_stream\\_profiles.asp](http://www.recyclenow.org/agency/waste_stream_profiles.asp) Accessed July 1, 2011.
- Redwood Empire Disposal. 2011. <http://unicycler.com/commercial/sonoma/cotati>. Accessed 5/20/11.



Cotati General Plan Update

Figure 6.1-1: Water System Infrastructure



Infrastructure

- Water Well
- Water Tank
- ⊗ Water Turnout

— Aqueduct (SCWA)

— Pipeline (Cotati)

USGS Hydrography

- Stream or River
- ▬▬▬ Canal or Ditch

Planning Areas

- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary



0 500 1,000 2,000 Feet

1:30,000

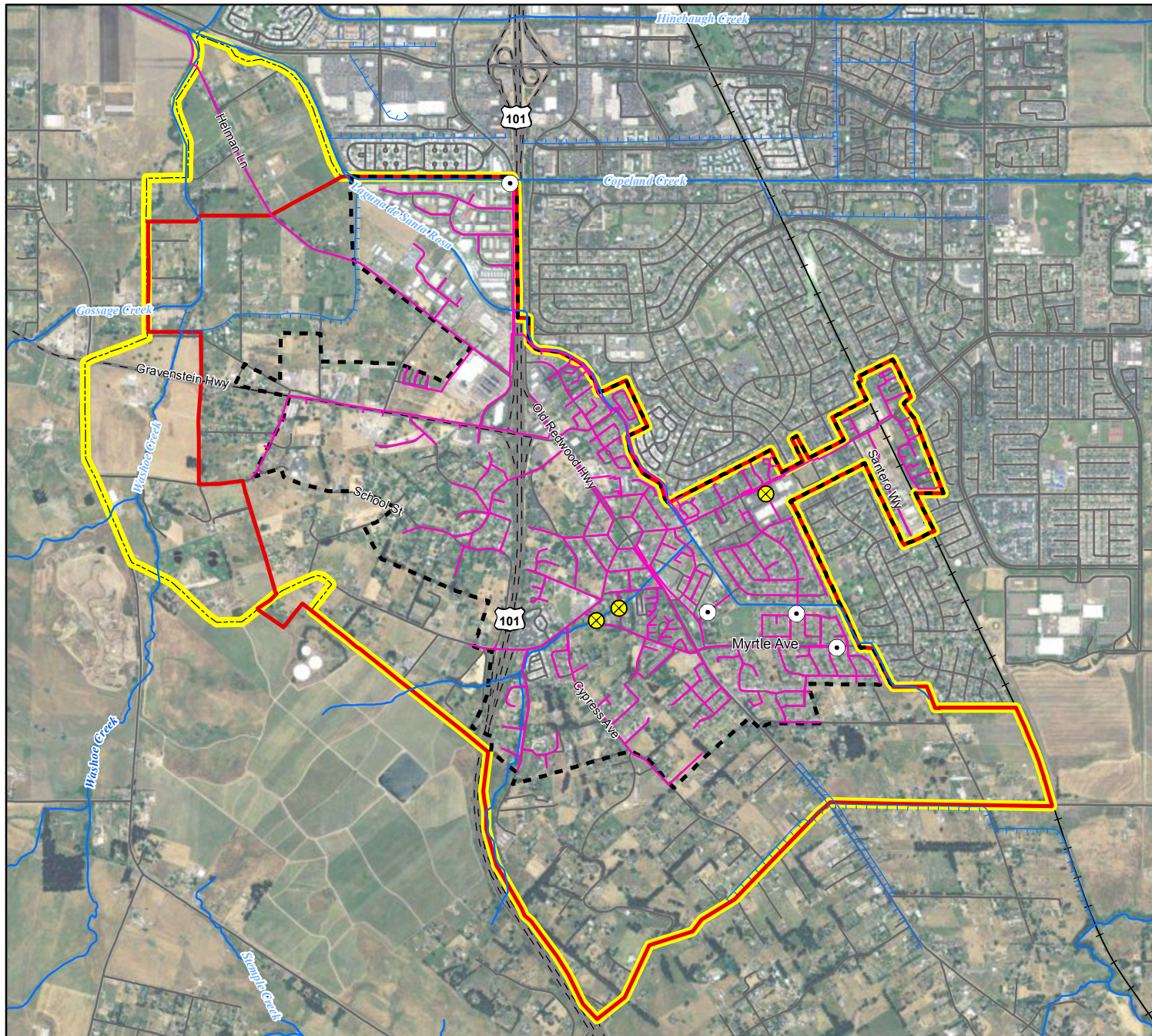
Data sources: USGS National Hydrography Dataset, FEMA, California DWR, Cotati GIS. Map date: April 28, 2011.





Cotati General Plan Update

Figure 6.2-1: Water System Infrastructure



Infrastructure

- Sewer Lift Stations
- ⊗ Sewer Siphons
- Sewer Pipelines

USGS Hydrography

- Stream or River
- ▬▬▬ Canal or Ditch

Planning Areas

- ▬▬▬ Cotati City Limits
- ▭ Sphere of Influence
- ▭ Urban Growth Boundary



0 500 1,000 2,000 Feet

1:30,000

Data sources: USGS National Hydrography Dataset, FEMA, California DWR, Cotati GIS. Map date: May 4, 2011.



## 7. HAZARDS AND SAFETY

Issues and topics related to health and safety within the City of Cotati are addressed in this chapter. Some of these hazards may be naturally induced, such as seismic, geologic, or wildfire hazards. Other health and safety hazards may be the result of natural hazards, which are exacerbated by human activity, such as development in areas prone to flooding. Additional hazards are entirely human-made, including airport crash hazards and exposure to hazardous materials.

This chapter is divided into the following sections:

- Seismic and Geologic Hazards (7.1)
- Fire Hazards (7.2)
- Flooding (7.3)
- Hazardous Materials and Waste (7.4)
- Air Traffic (7.5)

### 7.1 SEISMIC AND GEOLOGIC HAZARDS

This section addresses seismic and geologic hazards in the City of Cotati.

#### REGULATORY SETTING

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##### *FEDERAL*

#### **Earthquake Hazards Reduction Act**

The Earthquake Hazards Reduction Act of 1977 (42 USC, 7701 et seq.) requires the establishment and maintenance of an earthquake hazards reduction program by the federal government.

#### **Executive Order 12699**

Signed in January 1990, this executive order of the President implements provisions of the Earthquake Hazards Reduction Act for “federal, federally assisted or federally regulated new building construction” and requires the development and implementation of seismic safety programs by federal agencies.

##### *STATE*

#### **California Building Standards Code (CBSC)**

The CBSC is set forth in Title 24 of the California Code of Regulations (CCR). The CBSC includes codes that establish standards for new buildings, existing buildings, historical buildings, fire safety, and energy. The CBC is contained within the California Building Standards Code. Per state law, building standards are enforceable only to the extent that they are embodied in Title 24 of the CCR.

#### **CA Health and Safety Code**

Section 19100 et seq. of the California Health and Safety Code establishes the state’s regulations for earthquake protection. This section of the code requires structural designs to be capable of resisting likely stresses produced by phenomena such as strong winds and earthquakes.

#### **Alquist-Priolo Earthquake Fault Zoning Act**

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the

hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces.

Cities and counties must regulate certain development projects within the zones, which include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). Surface fault rupture is not necessarily restricted to the area within an Alquist-Priolo Zone.

### **Seismic Hazards Mapping Act**

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong groundshaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site has to be conducted and appropriate mitigation measures incorporated into the project design.

### **California Department of Transportation Highway Design Manual**

The California Department of Transportation (Caltrans) sets forth roadway design standards for seismic safety in the latest version of the *Highway Design Manual* (originally published in 1995).

#### *LOCAL*

### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to seismic and geologic hazards:

**1.1.1 Development in areas subject to liquefaction, such as along East and West Cotati Avenues, Wilford Lane, and Redwood Drive (formerly known as South Santa Rosa Avenue), shall be reviewed by qualified soils engineers and geologists in order to ensure the safety and stability of all construction. (See map 1.)**

- a) The zoning ordinance shall be amended to allow only those uses compatible with site specific geologic conditions in areas of liquefaction or slope instability. The Planning Department shall develop appropriate zoning classifications and review and amend as necessary.
- b) The City Council shall adopt a resolution requiring the submittal of soil and/or geologic reports describing any potential risks associated with the development of a project site within areas identified on Map 1. The Planning and Building Departments shall review for compliance in the plan check process.
- c) The Municipal Code shall be amended to set standards that will insure compatibility with site specific geologic conditions. The Planning Department will evaluate and amend the criteria as necessary.

**1.1.4 Development on slopes over 10% grade shall comply with special building restrictions.**

- a) The City Council shall adopt an ordinance establishing grading standards developed by the Planning Staff, Public Works Staff, and City Engineer to prevent erosion and runoff and to protect the



drainage systems of adjacent lands. The Building Department shall conduct site inspections to check for compliance.

**7.1.1 Identify all areas of potential natural hazards and areas of probable greatest jeopardy for each type of disaster and ensure that these areas are developed for hazard-compatible uses. (See map 1)**

a) Areas of the City which pose the greatest potential danger from landslides and seismic activity, including liquefaction have been identified (see map 1). Prior to development within these areas, a soils study shall be submitted for review by a qualified soils engineer.

**7.1.2 Future sites of public and critical use buildings, shall be in areas of low environmental hazards.**

a) Strict adherence to the requirements of the Uniform Building Code shall be required in all areas of the City. Public and Critical Use buildings shall not be located in areas susceptible to potential natural hazards.

**7.1.3 Critical facilities in the Cotati Planning Area shall be designed and constructed to withstand the "maximum probable" earthquake and remain in service.**

a) Any critical use building shall meet earthquake codes and standards.

**7.1.4 The structural integrity of all existing City facilities will be reviewed and those facilities found unsatisfactory will be strengthened.**

a) All building codes shall be adhered to so as to provide for maximum safety requirements. The inspection shall be made by the Building Department.

**7.3.1 Identify potential geologically hazardous areas and ensure that these areas have development limits. (See map 1)**

a) The submission of geologic and soils reports shall be required for all new developments. The geologic risk areas that are determined from these studies shall have standards established and be zoned accordingly.

**7.3.2 Natural slopes should be maintained and existing vegetation preserved, especially in areas with a slope greater than 15%. (See map 1)**

a) Through zoning and the permit process, standards shall be established and applied to those areas with potential erosion and runoff problems due to slope.

**7.3.3 Remedial measures are to be employed to reduce erosion.**

a) When a change in natural grade or removal of existing vegetation is necessary, appropriate vegetative cover to stabilize slopes and reduce erosion will be required. This shall be accomplished through the permit and design review process.

**13.1.6 Protect Cotati's ridgelines (hill tops and steep hillsides) from erosion, slope failure and development. (See map 1).**

a) The Zoning Ordinance shall be amended so as to prohibit development of structures extending above the perceived skyline of the hills. The Design Review Committee shall monitor compliance.

### **13.1.8 Development involving earth-moving shall not take place where excessive disruption of drainage patterns or excessive runoff will result.**

a) For all new development on hillsides, specific measures on erosion control shall be taken (e.g. berms, interceptor ditches, terraces, sediment traps) by the developer, as required and determined by the City Engineer.

### **13.1.9 Preserve the topography of Cotati's hills by prohibiting unnecessary leveling/grading activities prior to site-building on hillsides where development is permitted.**

a) The Municipal Code shall be amended to include engineering standards for hillside residential development to permit the use of "cut and fill" grading only if it facilitates clustering, maximum open space and the preservation of the existing visual quality of Cotati's hillsides. The Planning Department and City Engineer shall review plans to ensure adherence to this code.

## ENVIRONMENTAL SETTING

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The City of Cotati is located in Sonoma County, approximately 20 miles east of the Pacific Ocean, and 45 miles north of San Francisco. The Cotati City limits encompass approximately 1,217 acres. The City's Sphere of Influence covers an additional 1,010 acres.

### **Geomorphic Province**

California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique, defining features based on geology, faults, topographic relief and climate. These geomorphic provinces are remarkably diverse. They provide spectacular vistas and unique opportunities to learn about earth's geologic processes and history. (California Department of Conservation, 2002).

The City of Cotati lies within the Coast Range Geomorphic Province, which are northwest-trending mountain ranges (2,000 to 4,000, occasionally 6,000 feet elevation above sea level), and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. Strata dip beneath alluvium of the Great Valley. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Pt. Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands. (California Department of Conservation, 2002).

### **Regional Geology**

The topography in Sonoma County is complex, which is directly correlated to the complex geology within the region. The County has several prominent mountain ranges and valleys, as well as coastal terraces. The Cotati and Petaluma Valleys are an important region within Sonoma County. These Valleys form a wide basin that stretches from the San Pablo Bay in the south to Santa Rosa in the north. The southern portion of the basin is called the Petaluma Valley, while the northern portion is the Cotati Valley. The City of Cotati is in the southern portion of the Cotati Valley, which is bordered by the

Sonoma Mountains to the east, and a series of low hills to the west. Farther to the west are the Estero Lowlands (aka Petaluma Gap), which opens to the Pacific Ocean.

Sonoma County's complex geology can be explained in part by, the historical geological processes in the Coast Range. These geologic processes include volcanic, erosion, sedimentation, and tectonic processes. The formation of mountains with parallel valleys in Sonoma County is a result of the collision of the North American Plate with the Pacific Plate. The San Andreas Fault system forms the border of these two tectonic plates. This fault system is more than 600 miles long, extending from Pt. Arena to the Gulf of California, and is located along the western boundary of the County, just 15 miles west of the City of Cotati. The San Andreas fault system is responsible for the structural alignment and orientation of the mountains and valleys in the Coast Range, includes the Cotati Valley. (Sonoma County Water Agency, 2011).

### **Lithology and Stratigraphy**

The region is predominantly marine and nonmarine sediments of the Pliocene and Quaternary with recent alluvium. The oldest geologic units in the region are the Franciscan Complex, which is Jurassic (208 to 146 million years ago) (mya) to Early Cretaceous (146 to 106 mya). The Franciscan Complex consists of folded and faulted sandstones, shale, conglomerates, chert, greenstone, and serpentinite rocks. In some areas these rocks occur as large intact blocks, and in others may occur as a mixture of rocks. Much younger Miocene (5 to 23 mya) to Pliocene (1.8 to 5 mya) sedimentary rocks, including the Wilson Grove Formation (marine sandstone, conglomerate, and tuff) and the Petaluma Formation (mostly non-marine claystone, mudstone, and siltstone) were deposited on top of the Franciscan Complex. During Pliocene time volcanic activity created widespread deposits of the Sonoma Volcanics (basalt, andesite, rhyolite, tuff, and other volcanic rocks) in the eastern portion of the County. Pleistocene (1.8 mya to 11,000 years ago) to Holocene (<11,000 years ago) alluvium constitutes the youngest geologic unit in the region. (California Department of Water Resources, 2004).

### **Hydrogeology**

The City of Cotati is within the Santa Rosa Plain subbasin, which is the subject of recent and continuing studies. Recent studies by the USGS have revealed that the basin is subdivided into two primary compartments termed the Windsor sub-basin in the north and the Cotati sub-basin in the south, which are separated by the Trenton fault. These two areas represent the deepest parts of the basin and range from 6,000 to 10,000 feet deep.

Both unconfined and confined aquifers are found within the Santa Rosa Plain subbasin depending upon locations in the basin with respect to relatively continuous clay layers, folding and faulting. The waterbearing deposits underlying the basin include the Wilson Grove Formation, the Glen Ellen Formation, the Petaluma Formation, and a younger and older alluvium. The Wilson Grove Formation is the major water-bearing unit in the western part of the basin and ranges in thickness from 300 feet to 1,500 feet. Deposited during the Pliocene, it is a marine deposit of fine sand and sandstone with thin interbeds of clay, silty-clay and some lenses of gravel. Interbedded and interfingering with the Wilson Grove Formation are Sonoma Volcanic sediments in the eastern basin separating the water-bearing units. Aquifer continuity and water quality are considered good based on the most current and detailed reference on the hydrogeology of the subbasin. (Sonoma County Water Agency, 2011).

## Faults

Faults are classified as Historic, Holocene, Late Quaternary, Quaternary, and Pre-Quaternary according to the age of most recent movement (California Geological Survey, 2002). These classifications are described as follows:

- **Historic:** faults on which surface displacement has occurred within the past 200 years;
- **Holocene:** shows evidence of fault displacement within the past 11,000 years, but without historic record;
- **Late Quaternary:** shows evidence of fault displacement within the past 700,000 years, but may be younger due to a lack of overlying deposits that enable more accurate age estimates;
- **Quaternary:** shows evidence of displacement sometime during the past 1.6 million years; and
- **Pre-Quaternary:** without recognized displacement during the past 1.6 million years.

Faults are further distinguished as active, potentially active, or inactive. (California Geological Survey, 2002).

- **Active:** An active fault is a Historic or Holocene fault that has had surface displacement within the last 11,000 years.
- **Potentially Active:** A potentially active fault is a pre-Holocene Quaternary fault that has evidence of surface displacement between about 1.6 million and 11,000 years ago.
- **Inactive:** An inactive fault is a pre-Quaternary fault that do not have evidence of surface displacement within the past 1.6 million years. The probability of fault rupture is considered low; however, this classification does not mean that inactive faults cannot, or will not, rupture.

There are no known active or potentially active faults located within the Planning Area. However, there are numerous faults located in the region. Figure 7.1-1 illustrates the location of these faults. Below is a brief summary of the most notable faults in the region:

- **San Andreas Fault System:** The San Andreas Fault system is an active fault located approximately 15 miles west of the City of Cotati. The fault generally follows a northwest to southeast line and is capable of an 8.0 magnitude earthquakes. The fault is characterized as a right-lateral strike-slip fault. Major seismic events along this fault were recorded on April 18, 1906 (in the Northern segment) and on January 9, 1857 (in the Mojave segment). The most recent seismic event along this fault was the 1989 Loma Prieta earthquake, which occurred on October 18, 1989. The epicenter was on the San Andreas fault roughly 56 miles south of San Francisco and 10 miles northeast of Santa Cruz, near Mt. Loma Prieta in the Santa Cruz Mountains. The focal depth was 11 miles (typical California earthquake focal depths are 4 to 6 miles). Loma Prieta ruptured the southernmost 30 miles of the break that caused the 1906 San Francisco Earthquake. The Loma Prieta earthquake registered at a magnitude 6.9, and was felt as far away as San Diego and Western Nevada (California Geological Survey, 2002).
- **Rodgers Creek Fault:** The Rodgers Creek Fault is an active fault located approximately 3.5 miles to the east of the City of Cotati. The fault generally follows a path that is parallel to the San Andreas Fault and is capable of a 7.0 magnitude earthquake. This fault is considered a northern extension of the Hayward Fault System, although there is no evidence that they connect under the San Pablo Bay. The fault is characterized as a right-lateral strike slip fault. There are no



historical reports of land rupture; however, geologists estimate the most recent rupture to have occurred sometime between 1670 and 1776. (California Geological Survey, 2002).

- **Healdsburg Fault:** The Healdsburg Fault is an active fault located to the northwest of the City of Cotati. The fault generally follows a path that is parallel to the San Andreas Fault and is capable of a 7.5 magnitude earthquake. This fault is considered to be a northern extension of the Rodgers Creek Fault, which is part of the Hayward Fault System. The fault is characterized as a right-lateral strike slip fault. The last reported event was recorded on 1969. (California Geological Survey, 2002).
- **Mayacama Fault:** The Mayacama Fault is an active fault located to the northwest of the City of Cotati. The fault generally follows a path that is parallel to the San Andreas Fault and is capable of a 7.5 magnitude earthquake. This fault is considered to be the northern-most extension of Hayward Fault System. The fault is characterized as a right-lateral slip fault. There are no historical reports of land rupture; however, geologists estimate the most recent rupture to have occurred sometime between 1520 and 1660. (California Geological Survey, 2002).

### Seismic Hazards

Seismic hazards include both rupture (surface and subsurface) along active faults and ground shaking, which can occur over wider areas. Ground shaking, produced by various tectonic phenomena, is the principal source of seismic hazards in areas devoid of active faults. All areas of the state are subject to some level of seismic ground shaking.

Several scales may be used to measure the strength or magnitude of an earthquake. Magnitude scales (ML) measure the energy released by earthquakes. The Richter scale, which represents magnitude at the earthquake epicenter, is an example of an ML. As the Richter scale is logarithmic, each whole number represents a 10-fold increase in magnitude over the preceding number. The following table represents effects that would be commonly associated with Richter Magnitudes:

<b>Magnitude</b>	<b>Effects</b>
< 3.5	Typically not felt
3.5 – 5.4	Often felt but damage is rare
5.4 – < 6	Damage is slight for well-built buildings
6.1 – 6.9	Destructive potential over ±60 miles of occupied area
7.0 – 7.9	“Major Earthquake” with the ability to cause damage over larger areas
≥ 8	“Great Earthquake” can cause damage over several hundred miles

*SOURCE: ASSOCIATION OF BAY AREA GOVERNMENTS, 2011.*

Moment Magnitude (Mw) is used by the United States Geological Service (USGS) to describe the magnitude of large earthquakes in the U.S. The value of moment is proportional to fault slip multiplied by the fault surface area. Thus, moment is a measurement that is related to the amount of energy released at the point of movement. The Mw scale is often preferred over other scales, such as the Richter, because it is valid over the entire range of magnitudes. Moment is normally converted to Mw, a scale that approximates the values of the Richter scale.

Seismic ground shaking hazards are calculated as a probability of exceeding certain ground motion over a period of time, usually expressed in terms of "acceleration." The acceleration of the Earth during an earthquake can be described in terms of its percentage of gravity (g). For example, the 10% probability of exceedance in 50 years is an annual probability of 1 in 475 of being exceeded each year. This level of

ground shaking has been used for designing buildings in high seismic areas. This probability level allows engineers to design buildings for larger ground motions than what we think will occur during a 50-year interval, which will make buildings safer than if they were only designed for the ground motions that we expect to occur in the next 50 years. The California Geological Survey estimates a 10% probability of exceeding 40-50 percent of gravity at peak ground acceleration over the next 50 years in the Cotati Planning Area, as well as other communities within the Cotati and Petaluma Valleys. As you move east toward the Rodgers Creek Fault, or west toward the San Andres Fault, the estimates increase up to 60-70 percent of gravity at peak ground acceleration. The following table represents the California Geological Survey's estimates of the 10 percent probability of exceedance in 50 years for City of Cotati, as well as the foothill and mountainous regions to the east and west of the Cotati Valley.

**TABLE 7.1-2: 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS (%G)**

Cotati Planning Area	Foothills	Mountains
40-50%	50-60%	60-70%

SOURCE: CALIFORNIA GEOLOGICAL SURVEY, 2006

In contrast, other scales describe earthquake intensity, which can vary depending on local characteristics. The Modified Mercalli Scale (MM) expresses earthquake intensity at the surface on a scale of I through XII. While there are no known active faults located within the City of Cotati, the area could experience considerable ground shaking generated by faults outside City of Cotati. For example, the City of Cotati could experience intensities of MM VII to VIII generated by seismic events occurring in the region (ABAG, 2011). The following table represents the potential effects of an earthquake based on the Modified Mercalli Intensities.

**TABLE 7.1-3: MODIFIED MERCALLI INTENSITIES AND EFFECTS**

MM	Effects
I	Movement is imperceptible
II	Movement may be perceived (by those at rest or in tall buildings)
III	Many feel movement indoors; may not be perceptible outdoors
IV	Most feel movement indoors; Windows, doors and dishes will rattle
V	Nearly everyone will feel movement, sleeping people may be awakened;
VI	Difficulty walking; Many items fall from shelves, pictures fall from walls
VII	Difficulty standing; Vehicle shaking felt by drivers; Some furniture breaks
VIII	Difficulty steering vehicles; Houses may shift on foundations
IX	Well-built buildings suffer considerable damage; ground may crack
X	Most buildings and foundations and some bridges destroyed
XI	Most buildings collapse; Some bridges destroyed; Large cracks in ground
XII	Large scale destruction; Objects can be thrown into the air

SOURCE: ASSOCIATION OF BAY AREA GOVERNMENTS, 2011.

The Significant United States Earthquakes 1568 – 2004 data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, geologic effects or were felt by populations near the epicenter. No significant earthquakes are identified within City of Cotati. However, significant earthquakes are documented in the regional vicinity, as identified in the following tables.

The City of Cotati could also be subject to major earthquakes along currently inactive or unrecognized faults. Two examples include the 1983 Coalinga Quake (6.5 magnitude) and the 1994 Northridge Quake

(6.7 magnitude), which was an unknown fault, and a “blind” thrust fault over 10 miles below the surface, respectively.

**TABLE 7.1-4: SIGNIFICANT EARTHQUAKES IN THE REGION**

Magnitude	Location	Year
5.2	Yountville	2000
6.9	Loma Prieta (San Andreas)	1989
5.6	Santa Rosa (Rodgers Creek)	1969
5.7	Santa Rosa (Rodgers Creek)	1969
7.9	San Francisco (San Andreas)	1906
4.0 – 5.0	Santa Rosa	1899
6.8	Mendocino (San Andreas?)	1898
6.2	Mare Island	1898
5.1	Santa Rosa	1893
6.2	Winters	1892
6.4	Vacaville	1892
5.5	Napa – Sonoma	1891
4.0 – 5.0	Petaluma	1888
6.8	East San Francisco Bay (Hayward)	1868
6.5	Santa Cruz Mountains	1865
4.0 – 5.0	Santa Rosa	1865
6.8	San Francisco Peninsula	1838

SOURCE: CALIFORNIA GEOLOGICAL SURVEY, 2009.

## Seismic Hazard Zones

### *ALQUIST-PRIOLO FAULT ZONES*

An active earthquake fault, per California’s Alquist-Priolo Act, is one that has ruptured within the Holocene Epoch (≈11,000 years). Based on this criterion, the California Geological Survey identifies Earthquake Fault Zones. These Earthquake Fault Zones are identified in Special Publication 42 (SP42), which is updated as new fault data become available. The SP42 lists all counties and cities within California that are affected by designated Earthquake Fault Zones. The Fault Zones are delineated on maps within SP42 (Earthquake Fault Zone Maps).

There are no Alquist-Priolo Earthquake Fault Zones located within the City of Cotati; however, approximately 3.5 miles to the east lies the Rodgers Creek Fault, which is delineated as an Alquist-Priolo Fault Zone. Additionally, approximately 15 miles to the west lies the San Andres Fault, which is also delineated as an Alquist-Priolo Fault Zone. Figure 7.1-1 illustrates the location of the closest Alquist-Priolo Earthquake Fault Zone.

### *SEISMIC HAZARD ZONES*

The state Seismic Hazards Mapping Act (1990) addresses hazards along active faults. The Northern California counties affected by the Seismic Hazard Zonation Program include Alameda, San Francisco, San Mateo and Santa Clara. The Southern California counties affected by the Program include San Bernardino, Los Angeles, Orange, and Ventura. There is not currently any seismic hazard zones mapped in Sonoma County.

## Liquefaction

Liquefaction, which is primarily associated with loose, saturated materials, is most common in areas of sand and silt or on reclaimed lands. Cohesion between the loose materials that comprise the soil may be jeopardized during seismic events and the ground will take on liquid properties. Thus, liquefaction requires specific soil characteristics and seismic shaking.

In collaboration with the USGS Earthquake Hazard Program, the California Geological Survey (CGS) produces liquefaction Susceptibility Maps and identifies “Zones of Required Investigation” per the state’s Seismic Hazard Zonation Program.

The article *Mapping Liquefaction-Induced Ground Failure Potential* (Youd and Perkins, 1978) provides a generalized matrix to demonstrate the relationship between liquefaction potential and depositional landscapes. The following table, which is recreated from Youd and Perkins, demonstrates the general relationship between the nature and age of sediment and the anticipated liquefaction potential.

Sediment	Susceptibility Based on Age of Deposits (Years Before Present)			
	Modern (< 500 years)	Holocene (< 10,000)	Pleistocene (< 2Million)	Pre-Pleistocene (> 2 Million)
River Channel	Very High	High	Low	Very Low
Flood Plain	High	Moderate	Low	Very Low
Alluvial Fan/Plain	Moderate	Low	Low	Very Low
Lacustrine/Playa	High	Moderate	Low	Very Low
Colluvium	High	Moderate	Low	Very Low
Talus	Low	Low	Very Low	Very Low
Loess	High	High	High	- ? -
Glacial Till	Low	Low	Very Low	Very Low
Tuff	Low	Low	Very Low	Very Low
Tephra	High	High	- ? -	- ? -
Residual Soils	Low	Low	Very Low	Very Low
Sebka	High	Moderate	Low	Very Low
Un-compacted Fill	Very High	NA	NA	NA
Compacted fill	Low	NA	NA	NA

SOURCE: YOOD AND PERKINS, 1978

The CGS Liquefaction Susceptibility Maps and “Zones of Required Investigation” are produced per the state’s Seismic Hazard Zonation Program. In Northern California, the areas of high liquefaction potential identified by the CGS are confined to the nine counties comprising the Bay Area, which includes Sonoma County. Figure 7.1-2 illustrates the liquefaction potential in the vicinity of the Planning Area.

Liquefaction potential in the Planning Area includes designations of "Very Low" and "Moderate" potential. The area designated "Moderate" potential for liquefaction is located along the northern and eastern edge of the Planning Area, generally associated with the channelized Laguna de Santa Rosa. There is also a small area located west of US 101 and south of SR 116 that is designated "Moderate" potential for liquefaction. The remainder of the Planning Area is designated "Very Low" potential for liquefaction.

## Structural Damage

There are four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. There are more stringent design and construction standards for areas within Zones 3 and 4, which includes all of California. The City of Cotati is located in Seismic Zone 4, the most seismically active of the four seismic zones in the United States. As such, building design in the City of Cotati is subject to more stringent seismic design standards.

The susceptibility of a structure to damage from ground shaking is related to the structural design and construction quality, as well as the underlying foundation material. Newer buildings in California have generally been built to a seismic design standard that is anticipated to withstand ground shaking. However, seismic events can have particularly negative effects on older buildings constructed of unreinforced masonry, including materials such as brick, concrete and stone, pre-1940 wood frame houses, and pre-1973 tilt-up concrete buildings. In most cases, these older buildings require retrofit, or they risk significant structural damage during an earthquake.

## OTHER GEOLOGIC HAZARDS

### Soils

The soils in the Planning Area are predominately sediments and recent alluvium. The sediments are Haploxerults, Pelloxererts, and Palexeralfs, and the recent alluvium are Fluvaquentic Haploxerolls and Pelloxererts. The soil temperature regimes are mesic and thermic. Soil moisture regimes are xeric (nearly ustic) and aquic on the Santa Rosa Plain and vicinity. (Natural Resource Conservation Service, 2011).

According to the Natural Resource Conservation Service (2011), there are six different soil series located in the Cotati Planning Area. These include the Blucher, Clear Lake, Cotati, Haire, Los Osos, and Sebastopol series. Figure 7.1-3 presents a map of the soils located in the Planning Area. Information from the NRCS official soil description for these series is provided below.

- **Blucher:** The Blucher series consists of deep, somewhat poorly drained soils that formed in alluvium from mixed sources. Blucher soils are in basins and on alluvial fans and have slopes of 2 to 5 percent. The mean annual precipitation is about 40 inches. The mean annual temperature is about 60 degrees F.
- **Clear Lake:** The Clear Lake series consists of very deep, poorly drained soils that formed in fine textured alluvium derived from sandstone and shale. Clear Lake soils are in basins and in swales of drainage ways. Slopes are 0 to 2 percent. The mean annual precipitation is about 20 inches and the mean annual air temperature is about 60 degrees F.
- **Cotati:** The Cotati series consists of deep and very deep, moderately well drained soils formed in material weathered from soft sedimentary rocks. Cotati soils are on terraces and have slopes of 2 to 30 percent. The mean annual precipitation is 30 inches and the mean annual temperature is 59 degrees F.
- **Haire:** The Haire series consists of moderately well drained soils on old terraces and alluvial fans. Slope is 0 to 30 percent. These soils formed from alluvium derived from sedimentary rock. The mean annual precipitation is 25 to 30 inches, and the mean annual air temperature is 60 degrees F.

- **Los Osos:** The Los Osos series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. Los Osos soils are on uplands and have slopes of 5 to 75 percent. The mean annual precipitation is about 25 inches and the mean annual air temperature is about 60 degrees F.
- **Sebastopol:** The Sebastopol series consists of deep, well drained soils formed in material weathered from soft sandstone. Sebastopol soils are on old coastal terraces and have slopes of 2 to 30 percent. The mean annual precipitation is 40 inches and the mean annual temperature is 55 degrees F.

**Erosion**

The U.S. Natural Resources Conservation Service (NRCS) delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of erosion factors is provided by the NRCS Physical Properties Descriptions:

- Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Erosion factor Kw indicates the erodibility of the whole soil, whereas Kf indicates the erodibility of the fine soils. The estimates are modified by the presence of rock fragments.

Soil erosion data for the City of Cotati were obtained from the NRCS. Figure 7.1-4 depicts the soil erosion susceptibility in the Planning Area. As identified in the table below, the erosion factor Kf varies from 0.24 to 0.32, which is considered moderately low to moderate potential for erosion.

TABLE 7.1-7: SOIL EROSION FACTORS				
Map symbol and soil name	Kf	Representative value		
		% Sand	% Silt	% Clay
BcA—BLUCHER FINE SANDY LOAM, OVERWASH, 0 TO 2 PERCENT SLOPES	0.32	68.8	16.2	15
CeA—CLEAR LAKE CLAY, 0 TO 2 PERCENT SLOPES	0.24	22.1	27.9	50
CeB—CLEAR LAKE CLAY, 2 TO 5 PERCENT SLOPES	0.24	22.1	27.9	50
CfA—CLEAR LAKE CLAY, PONDED, 0 TO 2 PERCENT SLOPES	0.24	22.1	27.9	50
CtC—COTATI FINE SANDY LOAM, 2 TO 9 PERCENT SLOPES	0.32	68.8	16.2	15
CtD—COTATI FINE SANDY LOAM, 9 TO 15 PERCENT SLOPES	0.32	68.8	16.2	15
CtE—COTATI FINE SANDY LOAM, 15 TO 30 PERCENT SLOPES	0.32	68.8	16.2	15
HaB—HAIRE FINE SANDY LOAM, HUMMOCKY, 0 TO 5 PERCENT SLOPES	0.32	68.8	16.2	15
LoD—LOS OSOS CLAY LOAM, 2 TO 15 PERCENT SLOPES	0.32	35.4	33.6	31
LoE—LOS OSOS CLAY LOAM, 15 TO 30 PERCENT SLOPES	0.32	35.4	33.6	31
LsD—LOS OSOS CLAY LOAM, THIN SOLUM, 5 TO 15 PERCENT SLOPES	0.32	35.4	33.6	31
SbD—SEBASTOPOL SANDY LOAM, 9 TO 15 PERCENT SLOPES	0.24	65.9	19.1	15
SbE—SEBASTOPOL SANDY LOAM, 15 TO 30 PERCENT SLOPES	0.24	65.9	19.1	15

SOURCE: NATURAL RESOURCE CONSERVATION SERVICE, 2011.

## Expansive Soils

The NRCS delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of linear extensibility (aka shrink-swell potential, or expansive potential) is provided by the NRCS Physical Properties Descriptions:

*"Linear extensibility" refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.*

*The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.*

The linear extensibility of the soils within City of Cotati ranges from Low to High. Figure 7.1-5 illustrates the shrink-swell potential of soils in the Planning Area. Approximately 80 percent of the Planning Area has low expansive soils, including most of the undeveloped land. A small area in the western portion of the Planning Area has moderate expansive soils. The majority of the high expansive soils are located along the northern and eastern edge of the Planning Area. Most of the high expansive soils are located within the city limits in areas that are already developed. Only a small portion of the high expansive soils are located in undeveloped areas of the Planning Area. The areas with high expansive soils would require special design considerations due to shrink-swell potentials.

## Landslide

The California Geological Survey classifies landslides with a two-part designation based on Varnes (1978) and Cruden and Varnes (1996). The designation captures both the type of material that failed and the type of movement that the failed material exhibited. Material types are broadly categorized as either rock or soil, or a combination of the two for complex movements. Landslide movements are categorized as falls, topples, spreads, slides, or flows.

Landslide potential is influenced by physical factors, such as slope, soil, vegetation, and precipitation. Landslides require a slope, and can occur naturally from seismic activity, excessive saturation, and wildfires, or from human-made conditions such as construction disturbance, vegetation removal, wildfires, etc.

Within Sonoma County, the hillsides have a medium to high susceptibility for landslides, while the valleys have a low susceptibility. Figure 7.1-6 illustrates the landslide potential in the vicinity of the Planning Area. Given the relatively level slopes throughout the City of Cotati, the landslide potential is very low. This is not a significant constraint in the Planning Area. The landslide potential increases in the foothills and mountains to the east a west of the Planning Area.

## Naturally Occurring Asbestos

The term "asbestos" is used to describe a variety of fibrous minerals that, when airborne, can result in serious human health effects. Naturally occurring asbestos is commonly associated with ultramafic rocks and serpentinite. Ultramafic rocks, such as dunite, peridotite and pyroxenite, are igneous rocks comprised largely of iron-magnesium minerals. As they are intrusive in nature, these rocks often undergo metamorphism, prior to their being exposed on the Earth's surface. The metamorphic rock

serpentinite is a common product of the alteration process. Naturally occurring asbestos is mapped in Sonoma County, although it is all located in mountainous areas. There is no naturally occurring asbestos mapped within the City of Cotati. Figure 7.1-7 illustrates the nearest areas that are more likely to contain naturally occurring asbestos.

### **Subsidence**

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years.

The Natural Resource Conservation Service maps expected "initial subsidence," which usually is a result of drainage, and "total subsidence," which results from a combination of factors. While subsidence is an issue of concern in some areas of California, the Natural Resource Conservation Service does not identify it as an issue of concern in the City of Cotati.

### **Tsunami/Seiches**

Tsunamis and Seiches are standing waves that occur in the ocean or relatively large, enclosed bodies of water (i.e. Lake Tahoe) that can follow seismic, landslide and other events from local sources (California, Oregon, Washington coast) or distant sources (Pacific Rim, South American Coast, Alaska/Canadian coast).

The California Geological Survey notes 51 recorded tsunamis in central and southern California from 1812 to 2000. In northern California, Crescent City has had 17 recorded tsunamis in the past 60 years. Recorded tsunamis in California have ranged from less than a meter to six meters (approximately 20 feet). The most devastating tsunami to affect California in recent history was from the magnitude 9.2 Alaskan earthquake of 1964, which cause a 20-foot tall tsunami wave in northern California that flooded low-lying communities, and river valleys, killing 11 people.

An earthquake in the Cascadia subduction zone (northern California) is more likely to create tsunamis compared to the strike-slip faults south of Cape Mendocino because water is not typically thrust upward in the lateral movements caused by strike-slip faults. The City of Cotati is not within a Tsunami or Seiche hazard area.

### **Volcanism**

The USGS identifies two principal areas of volcanic hazards in Northern California: the Shasta, Medicine Lake Highland, and Lassen Peak Area and the Clear Lake Area. Mount Shasta and Lassen Peak are located at the southern terminus of the Cascade Range and the associated subduction zones along the west coast of North America. The Clear Lake Volcanic Field is markedly different in its origins and topographic characteristics. Relative to tectonic activity, the Coast Range has been subjected primarily to the lateral faulting of the San Andreas system. The largest volcanic feature within the Clear Lake Field is Mount Konocti, located along the south shore of Clear Lake.

Relative to City of Cotati, the Clear Lake Volcanic Field is the nearest source of documented volcanic hazards. In contrast to the volcanoes of the southern Cascades, such as Lassen and Shasta, the Clear Lake Field is not associated with subduction. The Clear Lake and Sonoma volcanic phenomena are within the San Andreas Fault system. According to Wood and Kienle (1990), the field is lacking eruptive centers and volcanism tends to be non-explosive.



The following table is recreated from the Summary of Holocene eruptive activity and probable greatest hazards from future eruptions at volcanic centers in California (USGS Cascade Volcano Observatory, 2000), with citations from Berry et al (1976); Hearn et al (1976); and Sims & Rymer (1975).

<b>TABLE 7.1-8: CLEAR LAKE VOLCANIC CENTER HOLOCENE ERUPTIONS</b>	
<b>Recognized Products of Recent Eruptions</b>	
<i>Lava Flows/Cinder Cones</i>	--
<i>Domes</i>	--
<i>Tephra</i>	Mafic tephtras from eruptions ±10,000 YBP
<i>Pyroclastic Flows</i>	--
<i>Blasts and Pyroclastic Surges</i>	Phreatic eruptions, hydro-magmatic explosions, base-surges
<i>Debris Flows/Avalanches</i>	--

SOURCE: USGS CASCADE VOLCANO OBSERVATORY, 2000

Sims and Rymer (1975) estimate the most recent eruption for the Clear Lake Field occurred approximately 10,000 years before present. That event is thought to have produced mafic tephra generated by phreato-magmatic explosions. The USGS identifies the Clear Lake Field's "most probable" potential hazards as phreatic explosions, phreato-magmatic explosions and base surges. These events could result in "small-volume" tephra eruptions. Therefore, given the nature of the most probable potential volcanic hazards and the distance from City of Cotati, the Clear Lake Field is not likely to generate significant impacts in the City of Cotati.

## REFERENCES

The primary sources of data referenced for this section is derived from the following:

Association of Bay Area Governments. 2010. Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area.

Association of Bay Area Governments. 2001. The Real Dirt on Liquefaction-A Guide to the Liquefaction Hazard in Future Earthquakes Affecting the San Francisco Bay Area.

Association of Bay Area Governments. 2010. On Shaky Ground. The San Francisco Bay Area – Documentation for 2003 Mapping Updated in 2010 Association of Bay Area Governments Earthquake and Hazards Program

California Department of Conservation. 2002. California Geological Survey, Note 36.

California Dept. of Water Resources. 2009. California Water Plan Update 2009, North Coast Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.

California Dept. of Water Resources. 2009. California Water Plan Update 2009, San Francisco Bay Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.

California Department of Water Resources. 2004. California's Groundwater Bulletin 118-Update, North Coast Hydrologic Region, Lower Russian River Valley Groundwater Basin. February.

California Department of Water Resources. 2003. California's Groundwater Bulletin 118-Update. October.

- California Department of Water Resources. 1982. Evaluation of Ground Water Resources in Sonoma County Volume 2: Santa Rosa Plain. DWR Bulletin 118-4.
- California Department of Water Resources. 1980. Groundwater Basins in California – A Report to the Legislature in Response to Water Code Section 12924. Bulletin 118 – 80. 73 p. January.
- California Division of Mines and Geology. 1997. Guidelines for Evaluating Seismic Hazards in California. CDMG Special Publication 117.
- California Geological Survey. 2011. Seismic Shaking Hazards in California Based on the USGS/CGS Probabilistic Seismic Hazards Assessment (PSHA) Model. 10% probability of being exceeded in 50 years. <http://redirect.conservation.ca.gov/cgs/rghm/pshamap/psha12338.html>.
- California Geological Survey. 2011. Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings.
- California Geological Survey. 1999, Revised 2002. Simplified Fault Activity Map of California. Compiled by Charles W. Jennings and George J. Saucedo.
- California Geological Survey. 1992. Fault Rupture Hazard Zones in California, Alquist-Priolo Special Studies Zone Act of 1972 with Index to Special Studies Zones Maps. California Geological Survey (formerly California Division of Mines and Geology, CDMG) Special Publication 42, Revised 1992. State of California Department of Conservation.
- California Geological Survey. 1983. Earthquake Fault Zone Maps of the Cotati 7.5 Minute Quadrangles. California Geological Survey.
- California Geological Survey. 2003. The Revised 2002 California Probabilistic Seismic Hazard Maps. Prepared by T. Cao, W.A. Bryant, B. Rowshandel, D. Branum, and C.J. Willis. California Geological Survey. June 2003.
- Cardwell, G.T. 1958. Geology and Ground Water in the Santa Rosa and Petaluma Valley Areas, Sonoma County, California, USGS Water Supply Paper 1427.
- Cardwell, G.T. 1965. Geology and Ground Water in Russian River Valley Areas and in Round, Laytonville and Little Lake Valleys, Sonoma and Mendocino Counties, California. USGS Water Supply Paper 1548.
- City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.
- Ellsworth, W.L. 1990. "Earthquake History 1769-1989." The San Andreas Fault System, California. R.E. Wallace, ed. United States Geological Survey. Professional Paper 1515. Chapter 6.
- Ford, Robert. 1975. Evaluation of Ground Water Resources: Sonoma County, Volume 1: Geologic and Hydrologic Data. Department of Water Resources. State of California Resources Agency.
- Huffman, M.E., C.F. Armstrong, and R.W. Greensfelder. 1980. Geology for Planning in Sonoma County, Seismicity, Ground Shaking, and Liquefaction Potential. California Geological Survey (formerly California Division of Mines and Geology) Special Report 120.

- Jennings, C.W. 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions. California Division of Mines and Geology (CDMG), Geologic Data Map No. 6, Map Scale 1:750,000.
- Miller, V.C. 1972. Soil Survey of Sonoma County, California. United States Department of Agriculture, Natural Resources Conservation Service (formerly the Soil Conservation Service). May.
- Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1987, Hydrologic Unit Maps: U.S. Geological Survey Water-Supply Paper 2294, 63 p.
- Sonoma County Water Agency. 2011. <http://www.scwa.ca.gov>
- United State Department of Agriculture, Natural Resource Conservation Service. 2011. Sonoma County Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>
- United States Geological Survey. 2006a. Geohydrological Characterization, Water-Chemistry, and Ground-Water Flow Simulation Model of the Sonoma Valley Area, Sonoma County, California. By Christopher D. Farrar, Loren F. Metzger, Tracy Nishikawa, Kathryn M. Koczot, and Eric G. Reichard. Scientific Investigations Report 2006-5092. In cooperation with the Sonoma County Water Agency
- United States Geological Survey. 2006b. Geohydrology and Water Chemistry of the Alexander Valley, Sonoma County, California. By Loren F. Metzger, Christopher D. Farrar, Kathryn M. Koczot, and Eric G. Reichard (Scientific Investigations Report -2006-5115). In Cooperation with the Sonoma County Water Agency. July.
- United States Geological Survey. 2002. Geologic Map and Map Database of Western Sonoma, Northernmost Marin, and Southernmost Mendocino Counties, California. By Blake, M.C., Jr., R.W. Groyer, and R.E. Stramski. Pamphlet to Accompany Miscellaneous Field Studies Map MF-2402, v.1.0.

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## 7.2 FIRE HAZARDS

This section addresses the hazards associated with wildfires in City of Cotati. The discussion of fire suppression resources is located in the Community Services and Facilities section (Section 5.1) of this Background Report.

### REGULATORY SETTING

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#### *FEDERAL*

#### **FY 2001 Appropriations Act**

Title IV of the Appropriations Act required the identification of “Urban Wildland Interface Communities in the Vicinity of Federal Lands that are at High Risk from Wildfire” by the U.S. Departments of the Interior and Agriculture.

#### *STATE*

#### **CA Government Code Section 65302**

This section, which establishes standards for developing and updating General Plans, includes fire hazard assessment and Safety Element content requirements.

#### **Assembly Bill 337**

Per AB 337, local fire prevention authorities and the California Department of Forestry and Fire Protection (CalFire) are required to identify “Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas (LRA). Standards related to brush clearance and the use of fire resistant materials in fire hazard severity zones are also established.

#### **CA Public Resources Code**

The state’s Fire Safe Regulations are set forth in Public Resources Code §4290, which include the establishment of State Responsibility Areas (SRA).

Public Resources Code §4291 sets forth defensible space requirements, which are applicable to anyone that *...owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material (§4291(a)).*

#### **Uniform Fire Code**

The Uniform Fire Code (UFC) establishes standards related to the design, construction and maintenance of buildings. The standards set forth in the UFC range from designing for access by firefighters and equipment and minimum requirements for automatic sprinklers and fire hydrants to the appropriate storage and use of combustible materials.

#### **CA Code of Regulations Title 8**

In accordance with CCR, Title 8, §1270 and §6773 (*Fire Prevention and Fire Protection and Fire Equipment*), the Occupational Safety and Health Administration (Cal OSHA) establishes fire suppression service standards. The standards range from fire hose size requirements to the design of emergency access roads.

### **CA Code of Regulations Title 14 (Natural Resources)**

Division 1.5 (Department of Forestry and Fire Protection), Title 14 of the CCR establishes a variety of wildfire preparedness, prevention and response regulations.

### **CA Code of Regulations Title 19 (Public Safety)**

Title 19 of the CCR establishes a variety of emergency fire response, fire prevention and construction and construction materials standards.

### **CA Code of Regulations Title 24 (CA Building Standards Code)**

The California Fire Code is set forth in Part 9 of the Building Standards Code. The CA Fire Code, which is pre-assembled with the International Fire Code by the ICC, contains fire-safety building standards referenced in other parts of Title 24.

### **CA Health and Safety Code and UBC Section 13000 et seq.**

State fire regulations are set forth in §13000 *et seq.* of the California Health and Safety Code, which is divided into “Fires and Fire Protection” and “Buildings Used by the Public.” The regulations provide for the enforcement of the UBC and mandate the abatement of fire hazards.

The code establishes broadly applicable regulations, such as standards for buildings and fire protection devices, in addition to regulations for specific land uses, such as childcare facilities and high-rise structures.

### **CA Health and Safety Code Division 11 (Explosives)**

Division 11 of the Health and Safety Code establishes regulations related to a variety of explosive substances and devices, including high explosives and fireworks. Section 12000 *et seq.* establishes regulations related to explosives and explosive devices, including permitting, handling, storage and transport (in quantities greater than 1,000 pounds).

### **CA Health and Safety Code Division 12.5 (Buildings Used by the Public)**

This Division establishes requirements for buildings used by the public, including essential services buildings, earthquake hazard mitigation technologies, school buildings and postsecondary buildings.

### **CA Vehicle Code §31600 (Transportation of Explosives)**

Establishes requirements related to the transportation of explosives in quantities greater than 1,000 pounds, including licensing and route identification.

#### *LOCAL*

### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to fire:

#### **7.4.1 Assure adequate staff and equipment in the Fire Protection District to accommodate population growth in Cotati.**

- a) The City Staff shall work with the Fire Protection District, on a continuing basis, on the review of staffing levels and equipment for said District, in order to ensure an adequate level of Fire Protection service.

**7.4.2 Encourage the Fire Protection District to strive to assure a four-minute response time for emergency vehicles.**

a) The Fire Protection District shall continue to investigate and recommend procedures for achieving a four-minute response time to all areas of the City, including the feasibility of establishing auxiliary fire stations. The Fire Chief shall be invited to make periodic reports to the City Council.

**7.4.3 City streets shall be maintained in such a way so as not to impede emergency vehicles.**

a) The Fire Chief and the Police Department shall survey all city streets to assure they are maintained to a degree that allows emergency vehicles ready access to all parts of the City and report any problems to the Public Works Department.

**7.4.4 New development shall be constructed to minimize the risk of fire.**

a) The Uniform Building Code and the Uniform Fire Code shall be enforced in a professional manner in order to ensure that all construction utilizes fire resistant materials where required.

**7.4.5 All new development shall be served with adequate water for fire protection.**

a) As part of the permit process, and before a building permit is issued, the Building Department shall confer with the Fire Protection District in order to determine that there is adequate water for fire protection, consistent with the level of development proposed, as stipulated by the Insurance Services Organization (ISO) and the State Fire Marshall standards.

**Sonoma-Lake-Napa Fire Plan (2005)**

The Sonoma-Lake-Napa Unit (LNU) of the CalFire prepared the Fire Management Plan as a planning tool to reduce wildfire impacts throughout Sonoma, Lake, Napa, Yolo, Solano and Colusa Counties. The Plan identifies high value, high-risk areas in the six counties comprising the LNU.

**IDENTIFYING FIRE HAZARDS**

**Fuel Rank**

Fuel rank is a ranking system developed by Calfire that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

The USFS has developed a series of fuel models, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior. In addition to fuel characteristics, slope is an important contributor to fire hazard levels. A surface ranking system has been developed by CalFire, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.

The ladder index is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species. The crown index is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index and crown index for a given area are combined in order to establish a fuel rank of medium, high or very high. Fuel rank is used by CalFire to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The City of Cotati is primarily devoid of CalFire fuel ranks. The exceptions are areas within the undeveloped Sphere of Influence and Urban Growth Boundary with grasslands that possess characteristics warranting “moderate” fuel ranks. These areas possess combustible material in sufficient quantities to pose a wildfire risk. However, the areas lack the topographic characteristics that could significantly affect fire behavior. In contrast, CalFire data for the foothill and mountain areas to the east of the City of Cotati include a preponderance of “high” and “very high” fuel ranks. (California Department of Forestry and Fire Protection, 2010).

### **Fire Threat**

The fuel rank data are used by CalFire to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme. (California Department of Forestry and Fire Protection, 2010).

### **FIRE HAZARD SEVERITY ZONES**

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The state has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the state Fire Marshall as a basis for the adoption of applicable building code standards. A portion of the land located in the Urban Growth Boundary and Sphere of Influence is located in a "Moderate" FHSZ. Fire Hazard Severity Zones in and around the City of Cotati are shown in Figure 7.2-1. (California Department of Forestry and Fire Protection, 2011).

### **Local Responsibility Areas**

Local Responsibility Areas (LRA) are concentrated in the incorporated areas of Sonoma County. The City of Cotati is an LRA that is served by the Rancho Adobe Fire Protection District, which provides services to unincorporated Penngrove, City of Cotati and unincorporated areas of Petaluma. The District's service area covers approximately 86 square miles. The District supplements work force through automatic and mutual aid agreements with neighboring fire departments. (Rancho Adobe Fire Protection District, 2011).

The City of Cotati is not categorized as a "Very High" FHSZ by CalFire. (California Department of Forestry and Fire Protection, 2011).

### **State Responsibility Areas**

State Responsibility Areas within the vicinity of the City of Cotati are primarily found to the south and west of the city limits. A portion of the Sphere of Influence and Urban Growth Boundary is included in the State Responsibility Area and is categorized as a "Moderate" FHSZ. This "Moderate" FHSZ extends to the Pacific Ocean, which is approximately 15 miles to the west of the City of Cotati. Approximately three miles to the east of the city limits is a combination of "Moderate" and "High" FHSZs. This area is generally rolling to steep slopes. The closest "Very High" FHSZ is located east of SR 12, which is over 10 miles from the eastern city limits. (California Department of Forestry and Fire Protection, 2011).

### **Federal Responsibility Areas**

There are no Federal Responsibility Areas within the vicinity of City of Cotati. (California Department of Forestry and Fire Protection, 2011).



### REFERENCES

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The primary sources of data referenced for this section is derived from the following:

California Department of Forestry and Fire Protection. 2005. Sonoma-Lake-Napa Unit Fire Management Plan.

California Department of Forestry and Fire Protection and State Board of Forestry and Fire Protection. 2010. 2010 Strategic Fire Plan for California.

California Department of Forestry and Fire Protection. 2011. GIS Data.

Rancho Adobe Fire Protection District. 2011. <http://rancho-adobe-fire.org/about.html>

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## 7.3 FLOODING

This section addresses the hazards associated with flooding in City of Cotati. The discussion of storm drainage infrastructure is located in the Community Services and Facilities section of this Background Report.

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Federal Emergency Management Agency (FEMA)**

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

#### **Rivers and Harbors Appropriation Act of 1899**

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

#### **Water Pollution Control Act of 1972**

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

#### **Clean Water Act of 1977**

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the US and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the US. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

#### **Flood Control Act**

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

#### **National Flood Insurance Program (NFIP)**

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes: *Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.*

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

### **Flood Disaster Protection Act (FDPA)**

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited federal assistance, including acquisition, construction and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction and developments within SFHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.
- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

### *STATE*

#### **Assembly Bill 162**

This bill requires the land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources (DWR). The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a state-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

#### **Assembly Bill 70**

This bill provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the state's exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped

area, as defined, that is protected by a state flood control project, unless the city or county meets specified requirements.

### **CA Government Code**

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Government Code. Key sections related to the above referenced bills are identified below.

#### Section 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

#### Section 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

### **FloodSAFE California**

FloodSAFE is a statewide program launched in 2006 by DWR in order to achieve the following goals: reduce the chance of flooding, reduce the consequences of flooding, sustain economic growth, protect and enhance ecosystems, and promote sustainability. Initial funding was provided by Propositions 1E and 84.

#### *LOCAL*

### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to flooding:

#### **1.1.2 All new development within the 100-year flood plain shall be built according to Federal Flood Insurance Agency standards. (See Map 1.)**

- a) The Municipal Code shall be amended to set standards that meet or exceed those set by the Federal Flood Insurance Agency for development in the flood plain. The Planning Department will evaluate and amend the standards as necessary.
- b) By use of a permit process the Building Department shall enforce these standards.

#### **1.1.3 Continue efforts to eliminate flooding, by upgrading and expanding the storm drainage system.**

- a) Work with the Sonoma County Water Agency to expand flood channels.
- b) Unimproved drainage may be maintained on a periodic basis by Public Works.

#### **1.5.2 The City shall encourage the clustering of residential units to preserve the continuity of open space, protect environmental features, enhance visual amenities, and insure public safety.**

- a) The Zoning Ordinance, Subdivision Regulations and Design Review Criteria shall continue to allow higher density residential clustered development.

#### **7.2.1 New development or governmental action shall not compound the potential for flooding. (See map 1)**

a) As part of the permit process, developers shall be required to make hydrological studies for all new developments as required by the City Engineer. Studies shall encompass the project site as well as the entire drainage area.

**7.2.2 All new developments in the city shall be designed to minimize vegetation removal, soil compaction, and site coverage.**

a) Through the Zoning Ordinance, the City shall establish standards to be followed by developers which specify maximum permissible vegetation removal, soil compaction, and site coverage. There shall be on-site inspections by the Building Inspector to ensure compliance.

**7.2.3 Adequate drainage and erosion control shall be provided during construction of all new developments.**

a) As part of the permit process, developers shall be required to follow drainage and erosion standards established by the City Engineer and Sonoma County Water Agency for all developments. There shall be an on-site inspection by the City to ensure compliance.

**7.2.4 Prepare Disaster Preparedness and Safety plans and distribute information to affected residents, businesses, and property owners.**

a) An emergency plan shall be developed and updated so that all citizens have access to a community shelter.

b) A public information program shall be developed by the Police Department which will provide all citizens with access to needed information concerning Disaster Preparedness and Safety.

**13.1.4 Cotati's creeks and other biotic resources shall be protected from erosion, pollution and filling.**

a) Through the environmental review process, developments will be prohibited that erode, pollute or fill creeks, or significantly impact other biotic resources. The Planning Department shall review plans to ensure adherence to this regulation.

**13.1.5 Culverts and other types of stormwater swales discharging into Cotati's creeks shall be designed to prevent erosion of the natural bed and bank material.**

a) Public Works Staff, working with the Sonoma County Water Agency and the City Engineer, shall determine which facilities are in need of repair and establish a timetable to complete the work. Public Works shall monitor the swales which flow into the creeks to ensure erosion is not a problem.

**13.1.8 Development involving earth-moving shall not take place where excessive disruption of drainage patterns or excessive runoff will result.**

a) For all new development on hillsides, specific measures on erosion control shall be taken (e.g. berms, interceptor ditches, terraces, sediment traps) by the developer, as required and determined by the City Engineer.

**15.2.3 The natural paths of creeks should not be disrupted as a consequence of development.**

- a) Channelization of creeks shall be prohibited unless deemed necessary for flood control in already developed areas. The Planning Department and City Engineer shall monitor all plans for development to insure compliance.
- b) Design Review Criteria shall be prepared to require that creeks, trees, views and features unique to the site be preserved and incorporated into design proposals. The Design Review Committee shall insure that new development meets this criteria.

### **Sonoma County Water Agency: Flood Protection Zone**

The Sonoma County Water Agency established Flood Protection Zones throughout Sonoma County as a means of financing the construction and maintenance of flood protection works within Sonoma County. Each Flood Protection Zone encompasses a major watershed. The City of Cotati is located within Zone 1A, which has a Zone Advisory Committees that annually prioritizes and approve capital improvement projects for their respective zones. The electorate of Zones 1A has authorized the levying of benefit assessments within these zones to augment funds received from general property taxes. These funds have financed the construction of flood protection and drainage facilities, the maintenance of natural waterways, the preparation of master drainage plans for areas subject to flooding, and erosion and sediment control activities. The zones have also financed the flood protection operation and maintenance activities of the Sonoma County Water Agency. (Sonoma County Water Agency, 2011).

## **ENVIRONMENTAL SETTING**

The DWR divides the state into a series of Hydrologic Regions. Each region is divided into Hydrologic Units, which are subsequently divided into Hydrologic Areas. The majority of the City of Cotati is located within the North Coast Hydrologic Region. A portion of the southern part of the City of Cotati is located within the San Francisco Bay Hydrologic Region.

### **Watersheds**

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special-status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 7.3-1 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

**TABLE 7.3-1: STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION**

Watershed Level	Approximate Square Miles (Acres)	Description
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALWATER, CALIFORNIA INTERAGENCY WATERSHED MAPPING COMMITTEE 2008

### HYDROLOGIC REGIONS

The majority of the City of Cotati is located within the North Coast Hydrologic Region. A portion of the southern part of the City of Cotati is located within the San Francisco Bay Hydrologic Region. (CalWater, 2008).

**North Coast Hydrologic Region:** The North Coast hydrologic region covers approximately 19,500 square miles and includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma counties, and small areas of Shasta, Tehama, Glenn, Colusa, and Marin counties. (California Department of Water Resources, 2009).

**San Francisco Bay Hydrologic Region:** The San Francisco Bay hydrologic region covers approximately 4,506 square miles and includes all or portions of Marin, Napa, Sonoma, Solano, San Mateo, Santa Clara, Contra Costa, Santa Cruz, and Alameda counties. (California Department of Water Resources, 2009).

### HYDROLOGIC UNITS

Within the City of Cotati there are two hydrologic units. These include the Russian and San Pablo. The majority of the City of Cotati is located in the Russian Hydrologic Unit, which covers approximately 950,249 acres. A small portion of the southern part of the City of Cotati is located in the San Pablo Hydrologic Unit, which covers approximately 785,049 acres. Figure 7.3-1 illustrates the boundaries of the Sphere of Influence and City Limits relative to the boundaries of the hydrologic units.

### HYDROLOGIC AREAS

For purposes of planning on a region-wide basis, hydrologic areas are generally considered to be the appropriate watershed planning level. As a planning area becomes smaller the hydrologic area level may be too large in terms of scale, and a hydrologic subarea may be considered more appropriate. The City of Cotati is located within 2 hydrologic subareas. These include: Upper Laguna de Santa Rosa subarea (Russian) and the Petaluma River subarea (San Pablo). Table 7.3-2 and 7.3-3 provides a breakdown of the acreages of each watershed within the City of Cotati.



**TABLE 7.3-2: WATERSHED INFORMATION--RUSSIAN**

Hydrologic Information	Description	Acres	Square Miles	Percent of Watershed
HUC8 (Catalog Unit)	Russian	950,249	1,485	100%
HUC10 (Hydrologic Area)	Mark West Creek	162,784	254	17%
HUC12 (Hydrologic Sub Area)	Upper Laguna de Santa Rosa	39,712	62	4%

SOURCE: CALWATER 2.1.1, NATIONAL RESOURCES CONSERVATION SERVICE, IWMC.

**TABLE 7.3-3: WATERSHED INFORMATION--SAN PABLO**

Hydrologic Information	Description	Acres	Square Miles	Percent of Watershed
HUC8 (Catalog Unit)	San Pablo	785,049	1,227	100%
HUC10 (Hydrologic Area)	Petaluma River - Frontal San Pablo Bay Estuaries	126,657	198	16%
HUC12 (Hydrologic Sub Area)	Petaluma River	28,711	45	4%

SOURCE: CALWATER 2.1.1, NATIONAL RESOURCES CONSERVATION SERVICE, IWMC.

### FEMA Flood Zones

FEMA mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The Citywide FEMA Firm Map is shown on Figure 7.3-2. The California Department of Water Resources has recently completed work to map the 200-year floodplain for many areas of California. Areas within the 200-year floodplain are also shown in Figure 7.3-2.

Areas that are subject to flooding are indicated by a series of alphabetical symbols, indicating anticipated exposure to flood events:

- **Zone A:** Subject to 100-year flooding with no base flood elevation determined. Identified as an area that has a one percent chance of being flooded in any given year.
- **Zone AE:** Subject to 100-year flooding with base flood elevations determined.
- **Zone AH:** Subject to 100-year flooding with flood depths between one and three feet being areas of ponding with base flood elevations determined.
- **Zone AO:** Subject to 100-year flooding with flood depths between one and three feet being subject to sheet flow on sloping terrain with average depths determined.
- **Zone X (unshaded):** Area of minimal flood hazard. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.
- **Zone X (shaded):** Subject to 500-year flooding. Identified as an area that has a 0.2 percent chance of being flooded in a given year.
- **Zone D:** Areas where flood hazards are yet to be determined.

The City of Cotati is subject to flooding problems along the natural creeks and drainages that traverse the area. The Laguna de Santa Rosa and Cotati Creek are the most prominent drainages in Cotati that are subject to flooding. The 100-year flood plain extends onto many properties that are located

immediately adjacent to these drainages. Additionally, land to the west of US 101 in the northern part of the City, and a portion of the Downtown Specific Plan Area, is within the 500 year floodplain. The flood hazards in Cotati are illustrated in Figure 7.3-2. Table 7.3-4 presents a breakdown of the acreage and percentage of the City, Sphere of Influence, and Urban Growth Boundary that are designed as a FEMA flood zone.

**Table 7.3-4: FEMA Flood Zone Surface Areas in City of Cotati**

Zone	Acres - City	% of City	Acres - SOI	% of SOI	Acres - UGA	% of UGA
X (shaded) (500yr)	187.10	15.4%	0.48	0.0%	30.32	8.5%
AE (100yr)	58.87	4.8%	0.21	0.0%	27.64	7.7%
X (unshaded)	971.55	79.8%	1009.44	99.9%	299.35	83.8%
<b>TOTAL</b>	<b>1217.53</b>	<b>100.0%</b>	<b>1010.13</b>	<b>100.0%</b>	<b>357.30</b>	<b>100.0%</b>

*SOURCE: USGS NATIONAL HYDROGRAPHY DATASET, FEMA, CALIFORNIA DWR, COTATI GIS. MAP DATE: MARCH 22, 2011.*

Approximately 4.8 percent of the land within the city limits is located within an area with a FEMA flood zone AE, which is an area that is subject to 100-year flooding (a one percent chance of being flooded in any given year). There is no land within the Sphere of Influence located within this zone, but 7.7 percent of the land within the Urban Growth Boundary is located within the AE zone. These areas are considered high flood hazards.

Approximately 15.4 percent of the land within the city limits is located within an area with a FEMA flood zone X (shaded), which is an area that is subject to 500-year flooding (a .2 percent chance of being flooded in any given year). There is no land within the Sphere of Influence located within this zone, but 8.5 percent of the land within the Urban Growth Boundary is located within the X (shaded) zone. These areas are considered low to moderate flood hazards.

Approximately 79.8 percent of the land within the city limits is located within an area with a FEMA flood zone X (unshaded), which is an area that is determined to be outside the 500-year flood and protected by levee from 100-year flood. Approximately 99.9 percent of the land within the Sphere of Influence, and 83.8 percent of land within the Urban Growth Boundary is located within the X (unshaded) zone. These areas are considered to be areas of minimal flood hazards.

**Dam Inundation**

Earthquakes centered close to a dam are typically the most likely cause of dam failure. Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. The City of Cotati is not within a dam inundation area. Additionally, per DWR publications Dams Owned and Operated by a Federal Agency and Dams within the Jurisdiction of the State of California, there are no dams operated by the federal government within City of Cotati.

**REFERENCES**

The primary sources of data referenced for this section is derived from the following:

California Department of Conservation. 2002. California Geological Survey, Note 36.

California Dept. of Water Resources. 2009. California Water Plan Update 2009, North Coast Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.

California Dept. of Water Resources. 2009. California Water Plan Update 2009, San Francisco Bay Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.

California Dept. of Water Resources. 2010. Final 2010 Integrated Report (CWA Section 303(d) List / 305(b) Report).

California Dept. of Water Resources. 2011. Dams Owned and Operated by a Federal Agency and Dams within the Jurisdiction of the State of California. [www.water.ca.gov/damsafety/damlisting/index](http://www.water.ca.gov/damsafety/damlisting/index)

CalWater, California Interagency Watershed Mapping Committee. 2008. California Watershed Boundary Dataset (WBD).

Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1987, Hydrologic Unit Maps: U.S. Geological Survey Water-Supply Paper 2294, 63 p.

Sonoma County Water Agency. 2011. <http://www.scwa.ca.gov/flood-protection-zones/>

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## 7.4 HAZARDOUS MATERIALS AND WASTE

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)**

This act, commonly associated with the term “Superfund,” established:

- Regulations concerning closed and abandoned hazardous waste sites
- Liability of parties responsible for any releases of hazardous waste at these sites
- Funding for cleanup when responsible parties can not be identified

#### **Resource Conservation and Recovery Act (RCRA)**

This act established EPA’s “cradle to grave” control (generation, transportation, treatment, storage and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

#### **Clean Air Act**

Per the Clean Air Act, the EPA has established National Emissions Standards for Hazardous Air Pollutants. Exceeding the emissions standard for a given air pollutant may cause an increase in illnesses and/or fatalities.

#### **Clean Water Act**

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the US and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the US. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

### *STATE*

#### **CA Health & Safety Code**

Division 20 of the Health and Safety Code establishes Department of Toxic Substances Control (DTSC) authority and sets forth hazardous waste and underground storage tank regulations. In addition, the division creates a state superfund framework that mirrors the federal program.

Division 26 of the Health and Safety Code establishes California Air Resources Board (CARB) authority. The division designates CARB as the air pollution control agency per federal regulations and charges the Board with meeting Clean Air Act requirements.

#### **Food and Agriculture Code**

Division 6 of the CA Food and Agricultural Code (FAC) establishes pesticide application regulations. The division establishes training standards for pilots conducting aerial applications as well as permitting and certification requirements.

#### **Water Code**

Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Water Quality Control Act, created the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (SWRCB). In addition, water quality responsibilities are established for the SWRCB and RWQCBs.

#### **CA Code of Regulations**

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, the weather, the treated lands and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application
- Damage non-target crops or animals or any other public or private property
- Contaminate public or private property or create health hazards on said property

Title 8 of the CCR establishes California Occupational Safety and Health Administration (Cal OSHA) requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials and accident prevention. Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport and disposal of hazardous waste.

Title 26 of the CCR is a medley of state regulations pertaining to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment and disposal. Finally, staff training standards are set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation and maintenance of the state's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special and hazardous).

#### LOCAL

### City of Cotati General Plan

The existing City of Cotati General Plan identifies the following policies related to hazardous materials and waste:

#### **7.5.1 Producers and users of hazardous materials shall be encouraged to reduce the amounts generated.**

- a) The City shall, through participation as a member of the Sonoma County Waste Management Agency, work to educate the community about alternative products.

#### **7.5.2 Hazardous Waste generated within the City of Cotati shall be disposed of in a safe manner.**

- a) The City shall continue to support the creation of a permanent hazardous waste storage facility by the Sonoma County Waste Management Agency.

#### **7.5.3 Hazardous materials shall be stored on site in a safe manner.**

- a) The Fire District shall keep a list of all hazardous materials stored at each business and shall ensure that each material is stored in a manner consistent with the requirements of the Sonoma County Environmental Health Department.

### ENVIRONMENTAL SETTING

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The EPA Toxic Release Inventory (TRI) does not list data on disposal or other releases of over toxic chemicals in the City of Cotati. (USEPA 2010).

The CA Department of Toxic Substances Control (DTSC) maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. There is one site listed in the database in the vicinity of the City of Cotati, although it is located in unincorporated Sonoma County at 7395 Stony Point Road. From 1958 until 1996, the site was leased by the Cotati Rod and Gun Club, which operated three firing ranges and a trap shooting range at the location. Club activity over the period of operation resulted in deposition of bullets/shot and clay pigeons in soil. These materials contained lead and polycyclic aromatic hydrocarbons, respectively, resulting in shallow soil contamination. Preliminary investigations indicated that groundwater and surface water on the site were not affected. The site involved a voluntary cleanup that was certified by the DTSC in 2006. The site details are listed in Table 7.4-1 below. (California Department of Toxic Substances Control, 2011).

**Table 7.4-1: DTSC Envirostor Data Management System**

Envirostor	Site/Facility	Type	Status	City
49090001	Cotati Rod & Gun Club	Voluntary	Inactive - Cleanup was certified on 4/20/2006.	Cotati

SOURCE: DTSC ENVIROSTOR DATA MANAGEMENT SYSTEM, 2011.

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Integrated Waste Management Board (CIWMB). The SWIS data identifies active, planned and closed sites. The City of Cotati does not have any active or planned solid waste facilities listed in the database. There is one closed solid waste facility listed in the database for the City of Cotati. The property is owned by the County of Sonoma Public Works Department and is inspected three times per year. The inspections of this closed facility show no violations or areas of concern. The site details are listed in Table 7.4-2 below. (California Department of Resources Recycling and Recovery, 2011)

**Table 7.4-2: CIWMB Closed Facilities/Sites**

Number	Name	Activity	Regulatory	Status
49-AA-0352	Cotati Corporation Yard	Solid Waste Disposal Site	Pre-regulations	Closed

SOURCE: CALIFORNIA DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY, 2011.

## REFERENCES

The primary sources of data referenced for this section is derived from the following:

United State Environmental Protection Agency. 2011. Release Year 2009 National Analysis data set released to the public in December 2010. <http://www.epa.gov/tri/>

California Department of Toxic Substances Control. 2011. Envirostor Database. <http://www.envirostor.dtsc.ca.gov/public/>

California Department of Resources Recycling and Recovery. 2011. Solid Waste Information System (SWIS). <http://www.calrecycle.ca.gov/SWFacilities/Directory/>



## 7.5 AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. This data is much more detailed and specific than data currently available from the FAA and the National Transportation Safety Board (NTSB). According to the California Airport Land Use Planning Handbook (2002), prepared by the State Division of Aeronautics, 18.2 percent of general aviation accidents occur during takeoff and initial climb and 44.2 percent of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability.

### Approach and Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phase of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77 percent of accidents during this phase of flight occur during touchdown onto the runway or during the roll-out. These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions. (California Division of Aeronautics, 2002).

The remaining 23 percent of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern. Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway. (California Division of Aeronautics, 2002).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed. (California Division of Aeronautics, 2002).

### Takeoff and Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65 percent of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway.

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem. (California Division of Aeronautics, 2002).

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Aviation Act of 1958**

The federal Aviation Act resulted in the creation of the Federal Aviation Administration (FAA). The FAA was charged with the creation and maintenance of a National Airspace System.

#### **Federal Aviation Regulations (CFR, Title 14)**

The Federal Aviation Regulations (FAR) establish regulations related to aircraft, aeronautics and inspections and permitting.

#### *STATE*

#### **Aeronautics Act (Public Utilities Code §21001)**

The Caltrans Division of Aeronautics bases the majority of its aviation policies on the Aeronautics Act. Policies include permits and annual inspections for public airports and hospital heliports and recommendations for schools proposed within two miles of airport runways.

#### **Airport Land Use Commission Law (Public Utilities Code §21670 et seq.)**

The law, passed in 1967, authorized the creation of Airport Land Use Commissions (ALUC) in California. Per the Public Utilities Code, the purpose of an ALUC is to protect *public health, safety, and welfare by encouraging orderly expansion of airports and the adoption of land use measures that minimizes exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses* (§21670). Furthermore, each ALUC must prepare an Airport Land Use Compatibility Plan (ALUCP). Each ALUCP, which must be based on a twenty-year planning horizon, should focus on broadly defined noise and safety impacts.

### ENVIRONMENTAL SETTING

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#### **Facilities Located in the City of Cotati**

The City of Cotati does not have any airport facilities located within the city limits, sphere of influence, of urban growth boundary.

#### **Facilities Located Near the City of Cotati**

**Petaluma Municipal Airport:** The Petaluma Municipal Airport is located at the northeast edge of the City of Petaluma. This airport is the closest airport to Cotati, located approximately 8 miles southeast of the

Cotati city limits. The Petaluma Municipal Airport is operational 24 hours a day and staffed Monday through Friday 8:00 am to 5:00 pm and Saturday and Sunday from 8:00 am to 4:00 pm and including Holidays. Airport operations encompass a host of services for the orderly and safe departure and arrival of aircraft. Approximately 60,000 take-offs and landings are recorded at the Petaluma Municipal Airport each year. There are 180 aircraft storage hangars and 130 tie down spaces for 240 based aircraft. (City of Petaluma, 2011).

The City of Cotati does not lie within the Runway Protection Zone, Inner/Outer Safety Zones, Inner Turning Zone, Sideline Safety Zone, or Traffic Pattern Zone. (Sonoma County Airport Land Use Commission, 2001).

### **National Transportation Safety Board Aviation Accident Database**

The National Transportation Safety Board Aviation Accident Database identifies 0 accidents within the City of Cotati between January of 1950 to June 2011. (National Transportation Safety Board, 2011).

### **REFERENCES**

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The primary sources of data referenced for this section is derived from the following:

California Department of Transportation, Division of Aeronautics. 2001. California Airport Land Use Planning Handbook.

City of Petaluma, Public Works. 2011. <http://cityofpetaluma.net/pubworks/airport.html>

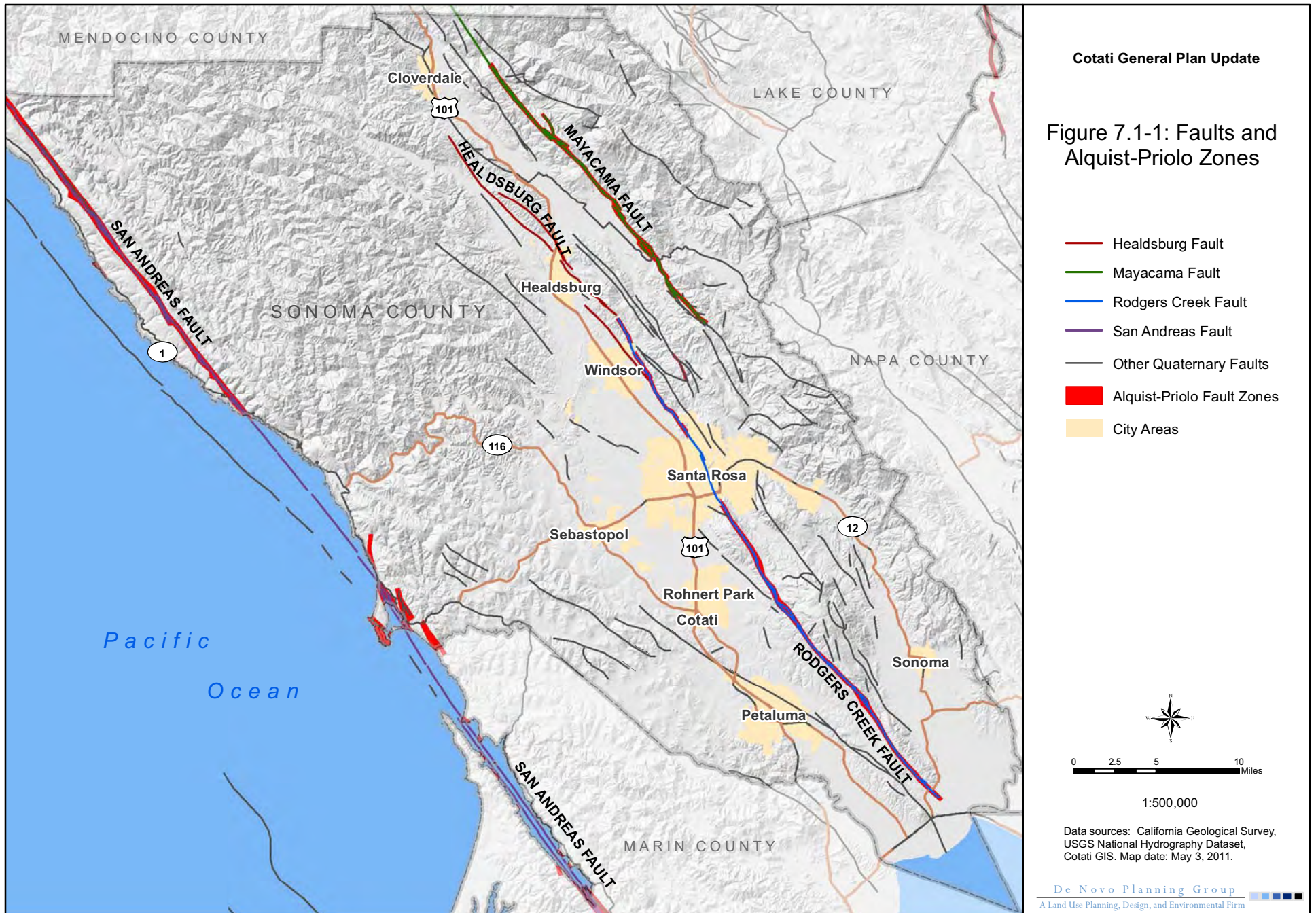
National Transportation Safety Board. 2011. <http://www.nts.gov/aviationquery/index.aspx>

Sonoma County Airport Land Use Commission. 2001. Comprehensive Air Port Land Use Plan for Sonoma County.



Cotati General Plan Update

Figure 7.1-1: Faults and Alquist-Priolo Zones

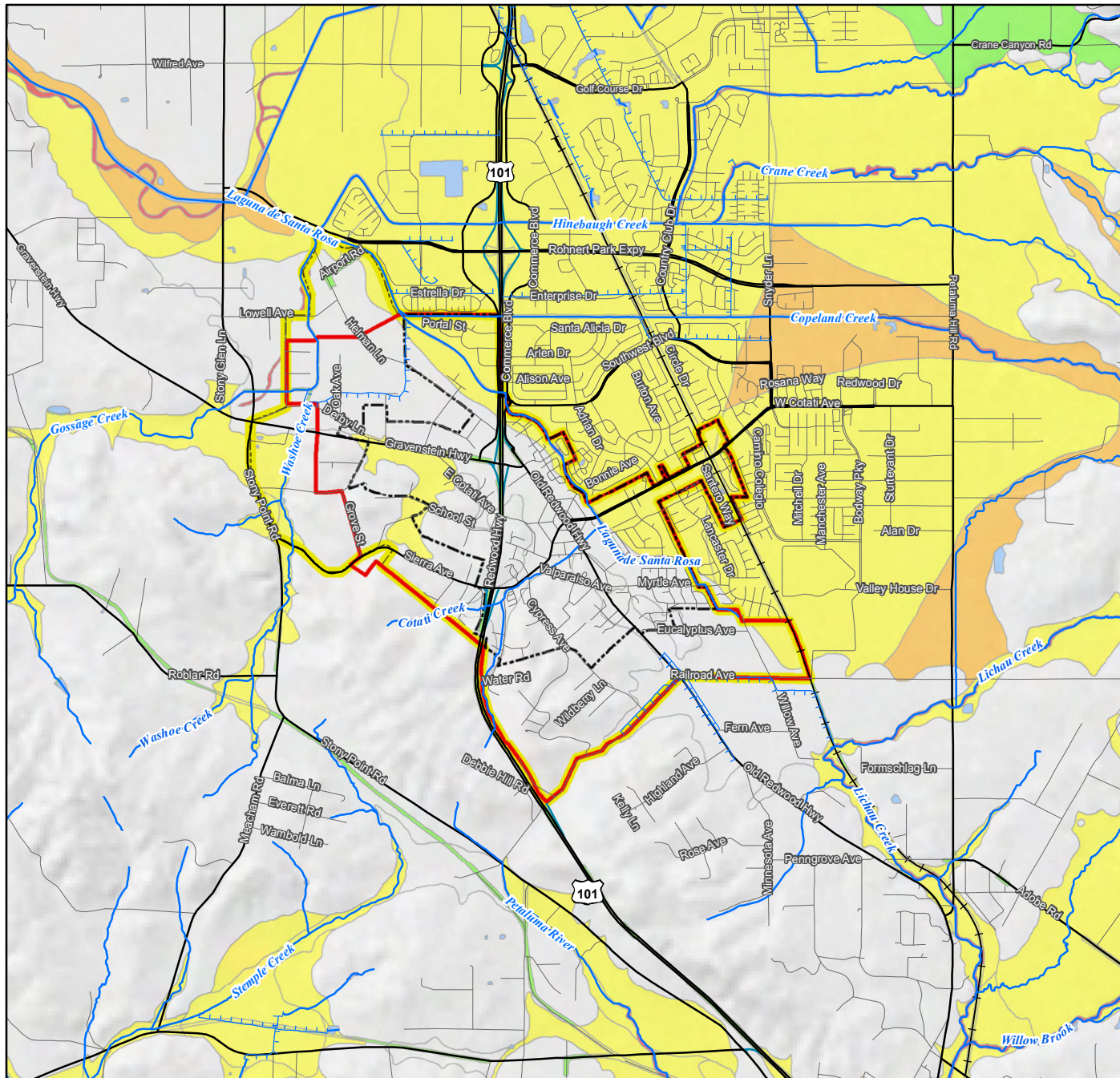






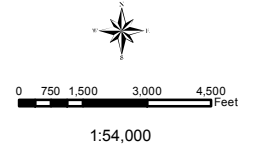
Cotati General Plan Update

Figure 7.1-2: Liquefaction Susceptibility



- Susceptibility**
- Very High
  - High
  - Moderate
  - Low
  - Very Low
  - Water

- Planning Areas**
- Cotati City Limits
  - Sphere of Influence
  - Urban Growth Boundary



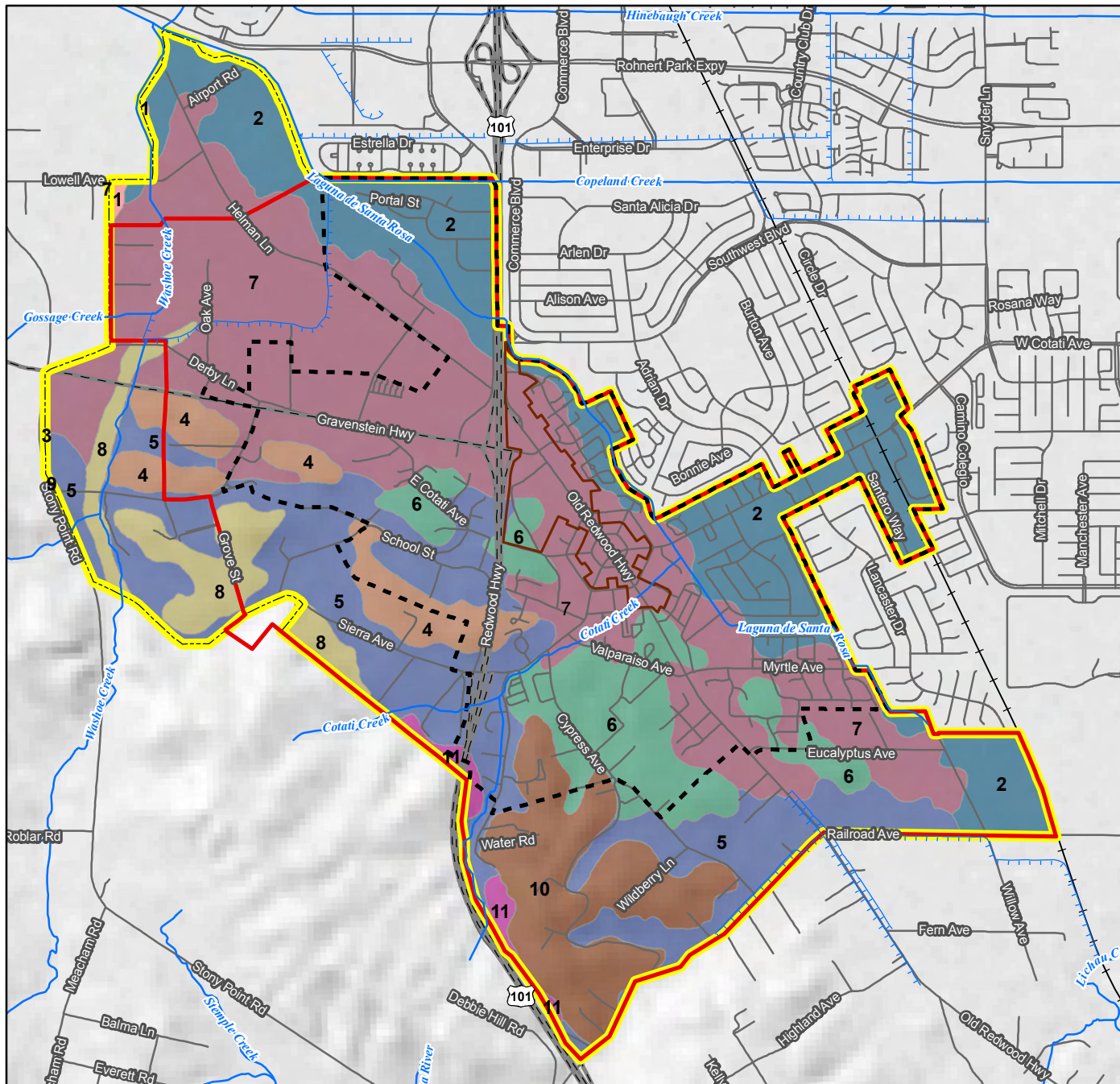
Data sources: U.S. Geological Survey in cooperation with the California Geologic Survey Open File Report 06-1037: Liquefaction Susceptibility, 2000. Cotati GIS. Map date: July 15, 2011.








Cotati General Plan Update

Figure 7.1-3: Soils Map



Label	Description
1	Blucher fine sandy loam, over wash, 0-2% slopes
2	Clear Lake clay, 0-2% slopes
3	Clear Lake clay, 2-5% slopes
4	Cotati fine sandy loam, 15-30% slopes
5	Cotati fine sandy loam, 2-9% slopes
6	Cotati fine sandy loam, 9-15% slopes
7	Hair fine sandy loam, hummocky, 0-5% slopes
8	Los Osos clay loam, 15-30% slopes
9	Los Osos clay loam, thin solum, 5-15% slopes
10	Sebastopol sandy loam, 15-30% slopes
11	Sebastopol sandy loam, 9-15% slopes

Planning Areas

-  Cotati City Limits
-  Sphere of Influence
-  Urban Growth Boundary



0 500 1,000 2,000 Feet

1:30,000





Data sources: National Resource Conservation Service Soil Data Mart; USGS National Hydrography Dataset; Cotati GIS. Map date: May 12, 2011.



Cotati General Plan Update




Figure 7.1-4: Soil Erosion Susceptibility

Susceptibility to Soil Erosion (Kf)

-  Very Low (0.05 - 0.10)
-  Low (0.10 - 0.20)
-  Moderately Low (0.20 - 0.30)
-  Moderate (0.30 - 0.40)

Kf values from 0.40 to 0.69 are considered to have moderately high to very high susceptibility to erosion, however there are no soils with values greater than 0.37 within the map extent

Planning Areas

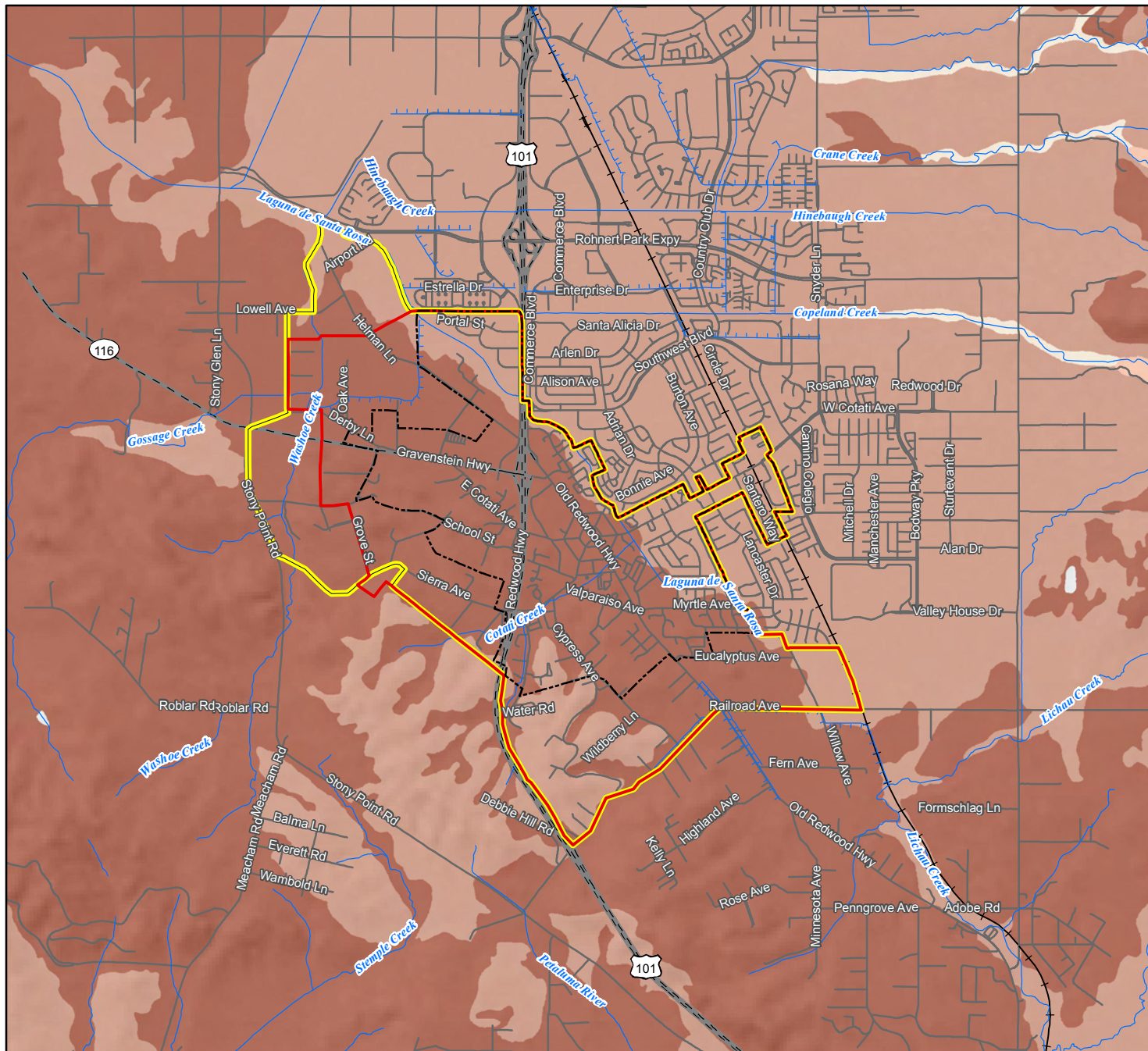
-  Cotati City Limits
-  Sphere of Influence
-  Urban Growth Boundary



0 600 1,200 2,400 3,600 4,800 Feet

1:48,000

Data sources: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Sonoma, California, available online at <http://soildatamart.nrcs.usda.gov>, accessed June 2011; USGS National Hydrography Dataset; Cotati GIS. Map date: July 15, 2011.

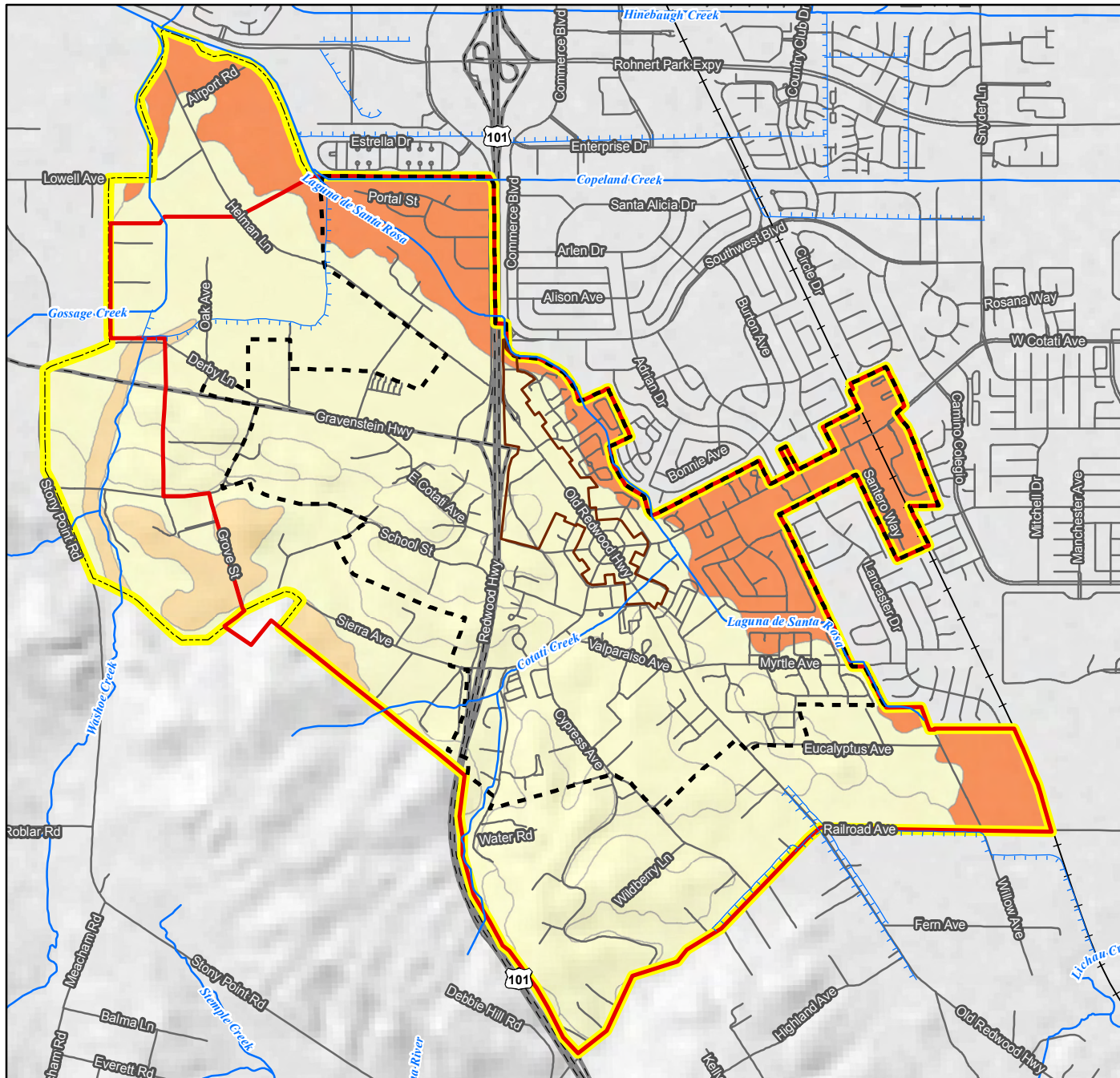






Cotati General Plan Update

Figure 7.1-5: Shrink-Swell Potential of Soils



Shrink-Swell Potential (Linear Extensibility)

- Low potential (<3%)
- Moderate potential (3%-6%)
- High potential (6%-9%)

Planning Areas

- Downtown Special Plan Area
- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary

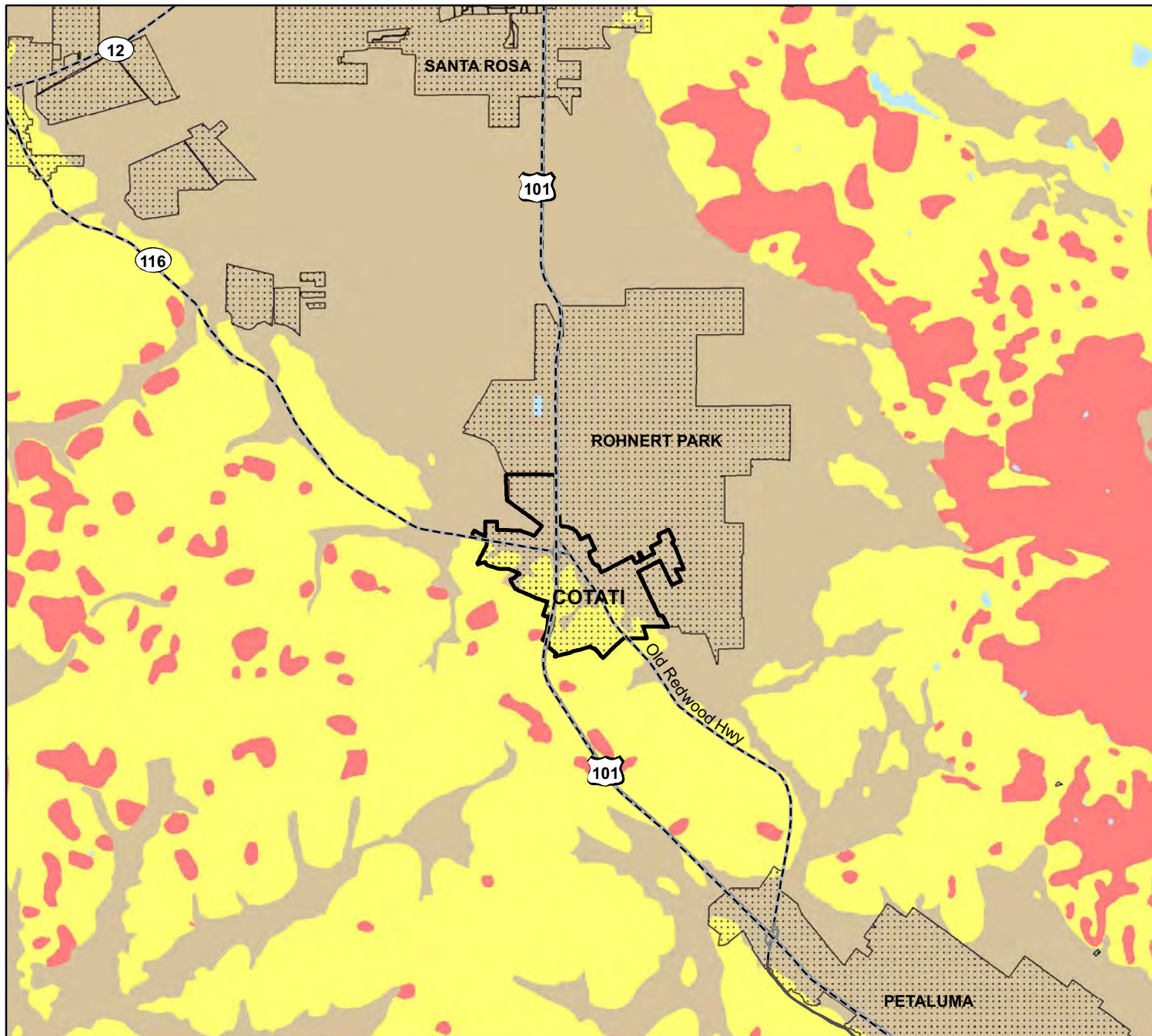


0 500 1,000 2,000 3,000 Feet

1:30,000

Data sources: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Geographic (SSURGO) Database for Sonoma, California, available online at <http://soildatamart.nrcs.usda.gov>, accessed June 2011; USGS National Hydrography Dataset; Cotati GIS. Map date: June 27, 2011.

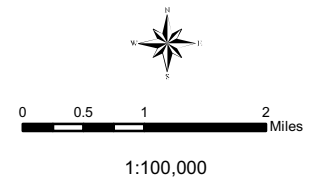




Cotati General Plan Update

Figure 7.1-6: Landslide Potential

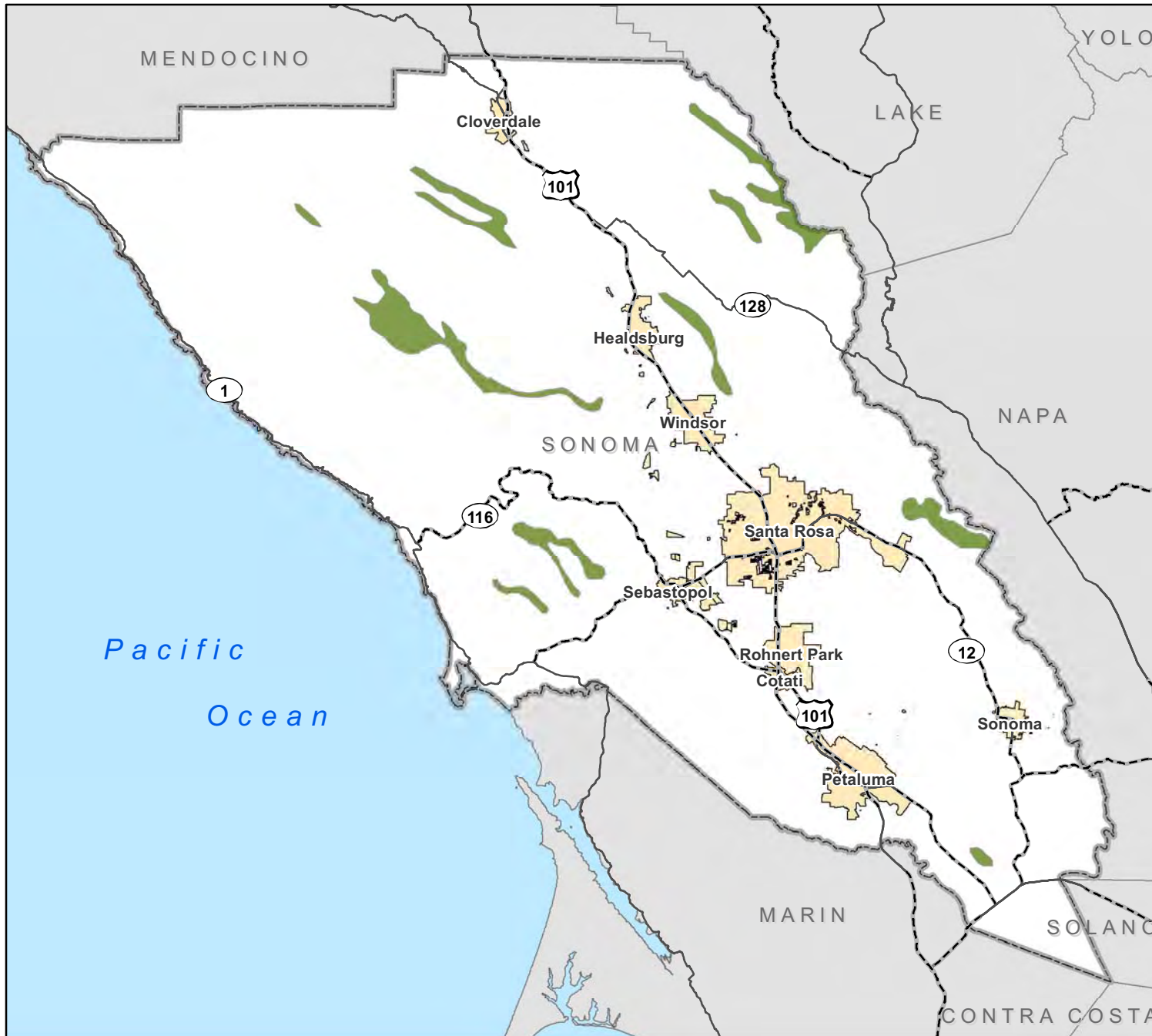
- Very High
- High
- Moderate
- Low
- Very Low
- Water



Data sources: U.S. Department of the Interior, U.S. Geological Survey Open File Report 97-745 C; Sonoma County GIS.  
Map date: June 27, 2011.







Cotati General Plan Update

Figure 7.1-7: Areas More Likely to Contain Naturally Occurring Asbestos

- Ultra-Mafic Rocks\*
- City Areas



0 1 2 4 6 8 10 Miles

1:550,000

Data sources: "A General Guide for Ultra-Mafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos," published by California Department of Conservation, Division of Mines and Geology, August, 2000. Map date: June 23, 2011.

\* Ultramafic rocks are dunite, peridotite, pyroxenite, and less common in California, hornblende (IGUS classification of ultramafic rocks, in Philpotts, 1990\*). These igneous rocks contain 90 percent or more of the dark colored iron-magnesium silicate minerals olivine, augite, hypersthene, or less commonly hornblende. Ultramafic rocks form in high temperature environments well below the surface of the earth. By the time they are exposed at the surface by uplift and erosion, ultramafic rocks may be partially to completely altered to serpentinite, a type of metamorphic rock. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in bodies of ultramafic rock or along their boundaries. Note--occurrences of non-ultramafic rock types, such as gabbro or diabase, may be included within some of the ultramafic rock areas shown on this map. Asbestos is much less likely to be associated with these non-ultramafic rock types.



Cotati General Plan Update

Figure 7.2-1:  
Fire Hazards Map

State Responsibility Areas (SRA)

- Moderate
- High
- Very High

Local Responsibility Area (Bates)

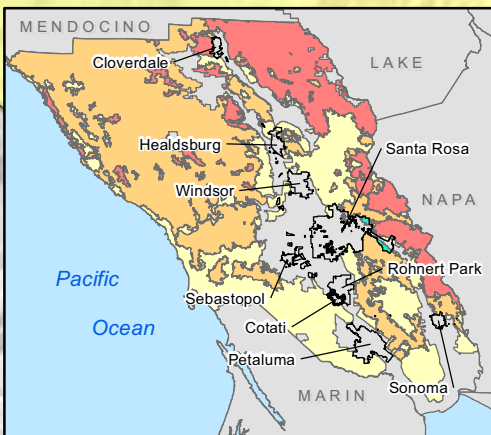
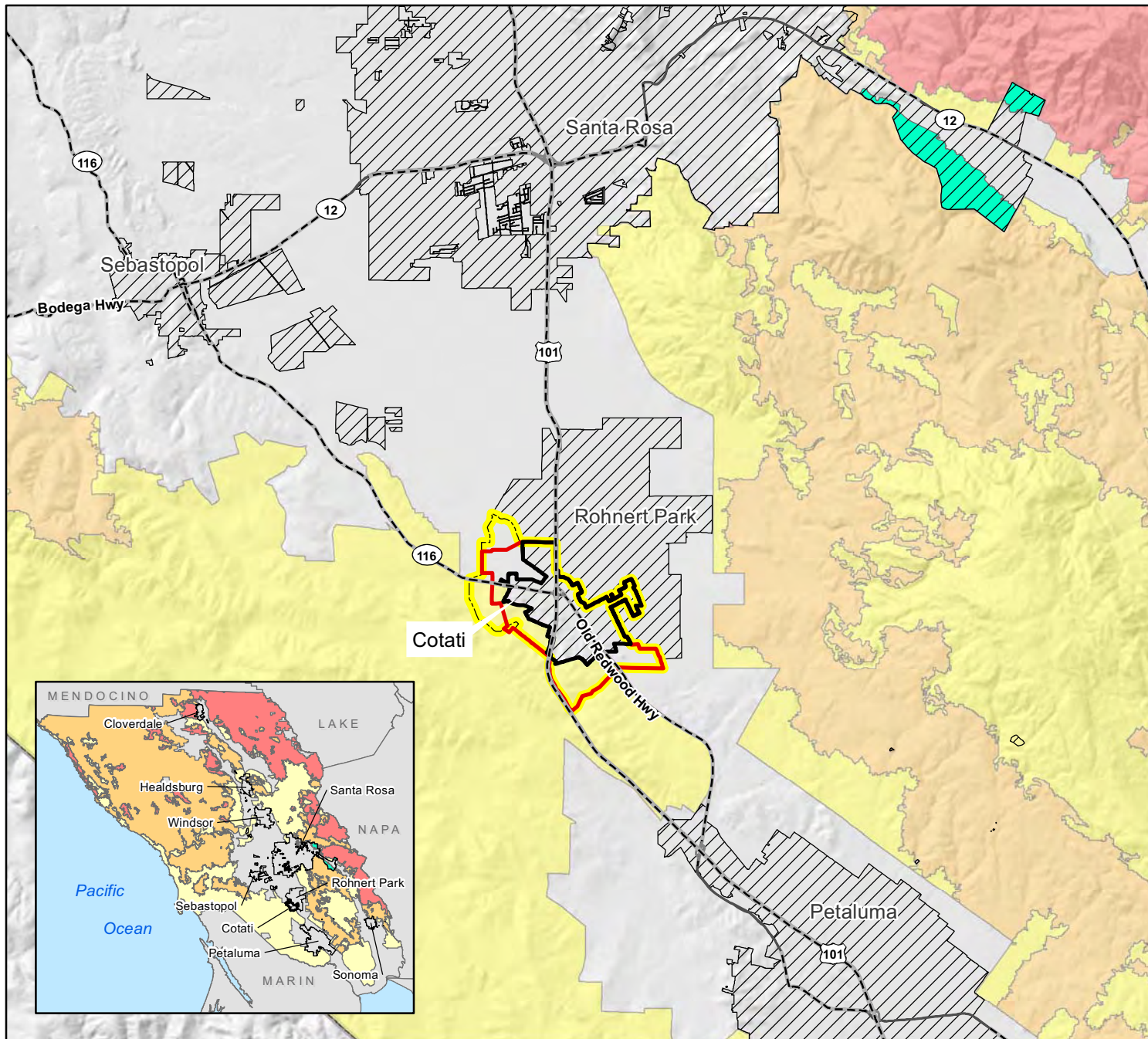
- Very High

USGS Hydrography

- Stream or River
- Canal or Ditch

Planning Areas

- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary
- City Areas



1:150,000

Data sources: California Department of Forestry and Fire Protection; Cotati GIS. Map date: May 12, 2011.





Cotati General Plan Update

Figure 7.3-1:  
Watersheds

USGS Hydrography

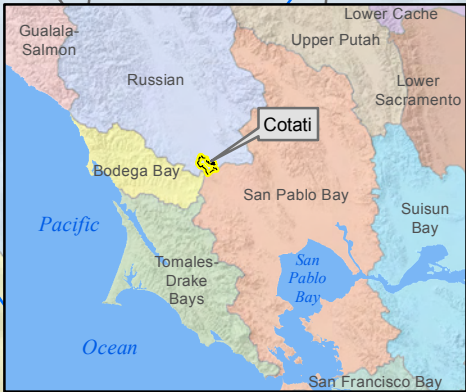
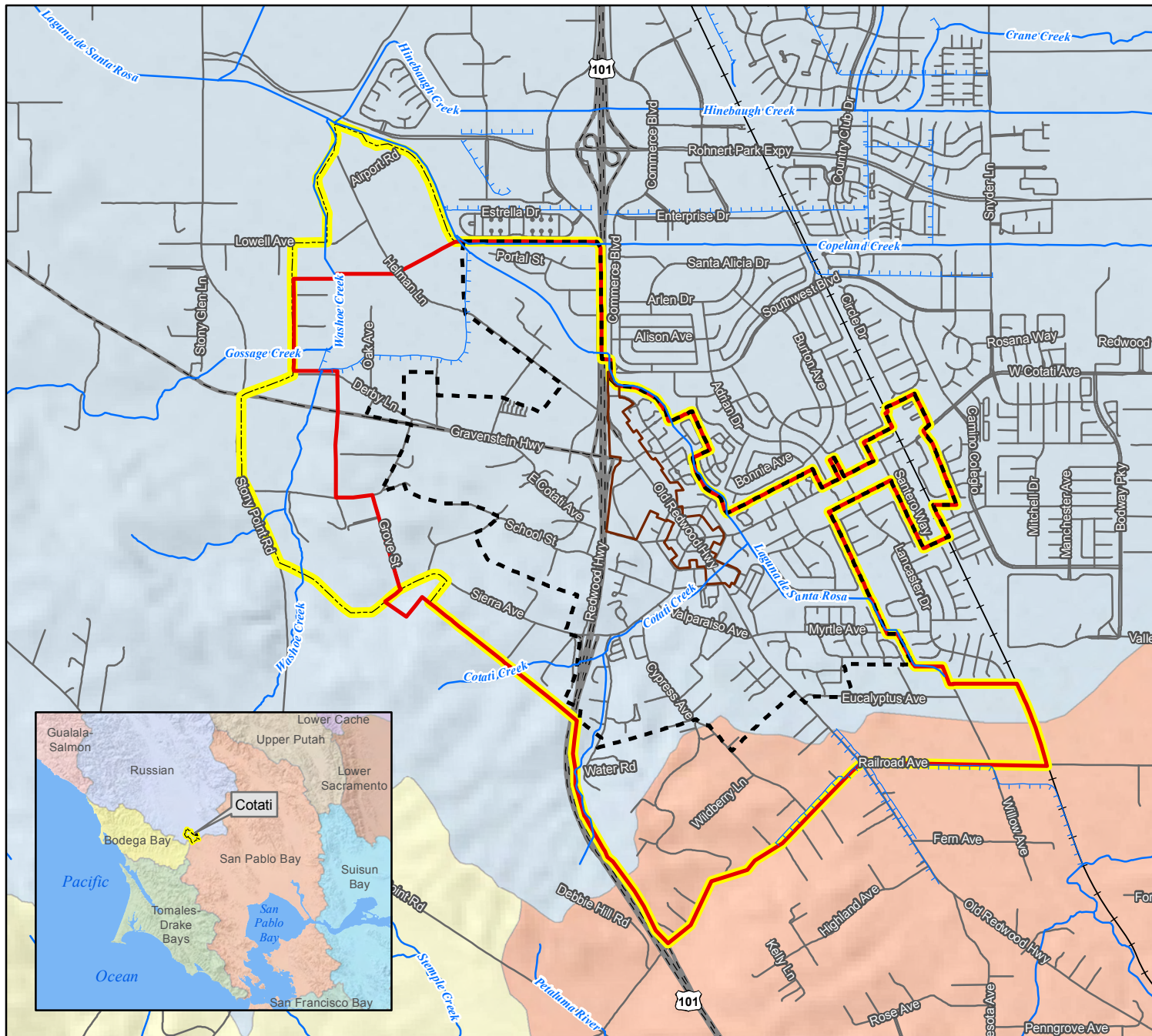
- Stream or River
- Canal or Ditch

Watersheds

- Bodega Bay
- Gualala-Salmon
- Lower Cache
- Lower Sacramento
- Russian
- San Francisco Bay
- San Pablo Bay
- Suisun Bay
- Tomales-Drake Bays
- Upper Putah

Planning Areas

- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary



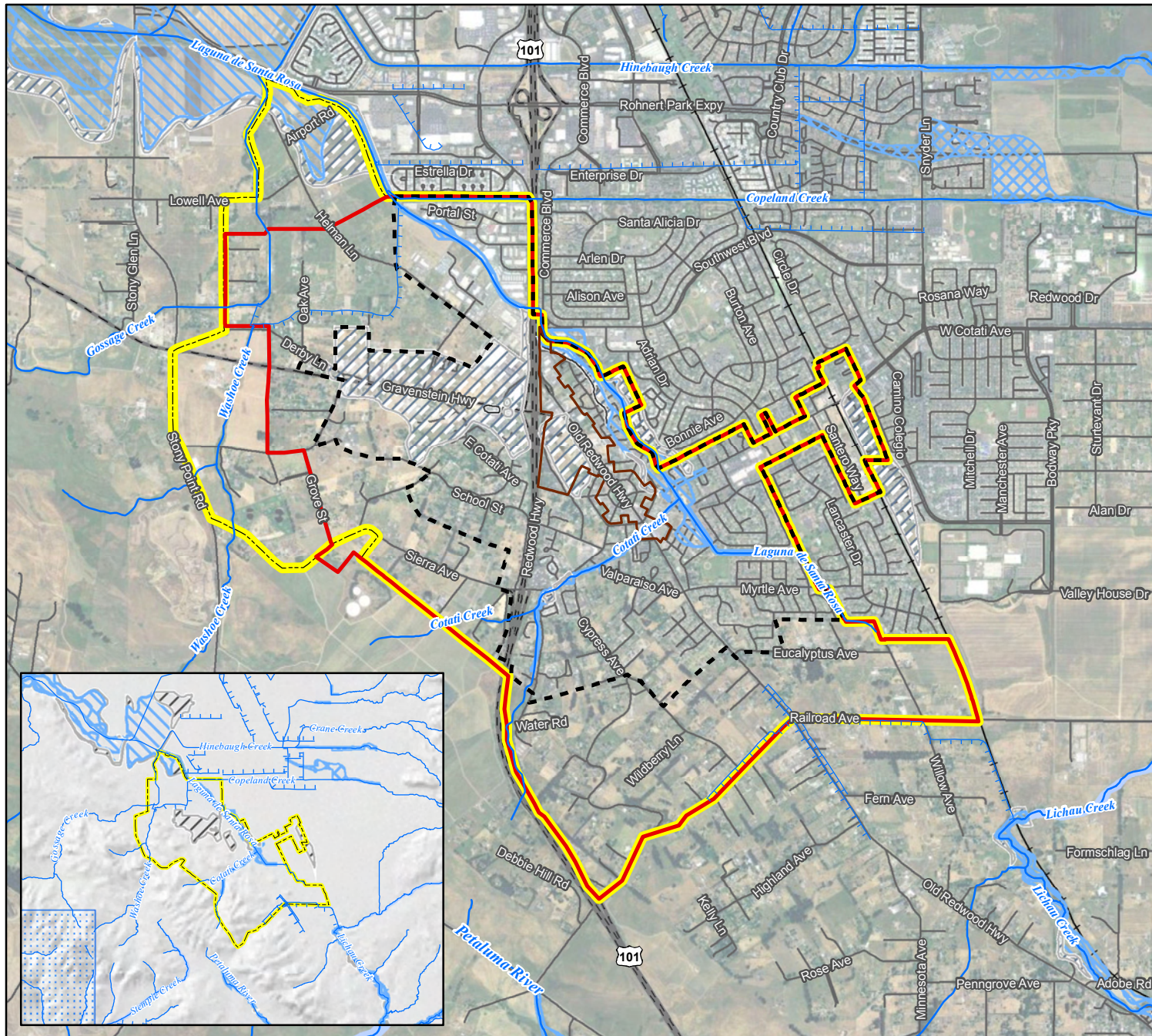
1:36,000

Data sources: USGS National Hydrography Dataset; CalWater 2.1.1, National Resources Conservation Service, WMC; Cotati GIS. Map date: July 15, 2011.












Figure 7.3-2:  
Flood Hazard Map



USGS Hydrography

-  Stream or River
-  Canal or Ditch





FEMA Flood Zone Designations

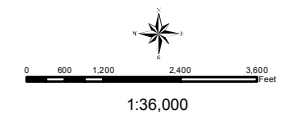
-  500-yr Flood Zone (0.2% annual chance flood hazard)
-  AE - 100-yr Flood Zone (BFE provided)
-  AO - 100-yr Flood Zone (stream/river)
-  D - Possible but Undetermined Flood Hazard (Inset Only)
-  X (unshaded) - Minimal Flood Hazard Area

DWR Flood Zone Designation

-  200-yr Flood Awareness Area

Planning Areas

-  Downtown Special Plan Area
-  Cotati City Limits
-  Sphere of Influence
-  Urban Growth Boundary



Data sources: USGS National Hydrography Dataset, FEMA, California DWR, Cotati GIS. Map date: July 15, 2011.





## 8. NOISE

Noise is a significant and ubiquitous part of a community's environment. The noise environment is a result of land use decisions, competing regional and community goals and limited local controls. This section presents background information on the existing noise environment in the City of Cotati. The purpose of this section is to present and characterize the sources of noise and the different noise settings within the City. This background information will serve as the basis for completing the first and fundamental step in updating the Noise Element, the requirement for local governments to “analyze and quantify noise levels and the extent of noise exposure through actual measurement or the use of noise modeling.”

This section has been organized to provide information on the fundamentals of environmental noise and definitions of technical terms to assist the reader in understanding these issues and the City's current noise guidelines, a summary of the results of the noise monitoring survey, and a discussion of the major noise sources affecting the noise environment in Cotati. Issues to consider when updating the goals and policies in the Noise Element are presented.

### KEY TERMS

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<b>Acoustics</b>	The science of sound.
<b>Ambient Noise</b>	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
<b>Attenuation</b>	The reduction of noise.
<b>A-Weighted, dBA</b>	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
<b>Decibel, dB</b>	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
<b>CNEL</b>	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
<b>Frequency, Hz</b>	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
<b>Intrusive</b>	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

## 8. NOISE

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<b>L<sub>dn</sub></b>	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
<b>L<sub>eq</sub></b>	The average A-weighted noise level during the measurement period.
<b>L<sub>max</sub></b>	The maximum and minimum A-weighted noise level during the measurement period.
<b>L<sub>(n)</sub></b>	The A-weighted noise levels that are exceeded N% of the time during the measurement period.
<b>Loudness</b>	A subjective term for the sensation of the magnitude of sound.
<b>Noise</b>	Unwanted sound.
<b>Sound Pressure Level</b>	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
<b>SEL</b>	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event

### REGULATORY FRAMEWORK

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#### *FEDERAL*

#### **Federal Highway Administration (FHWA)**

The FHWA has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

#### **Environmental Protection Agency (EPA)**

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an L<sub>eq</sub> of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an L<sub>eq</sub> of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA L<sub>dn</sub> as the basic goal for residential environments. However, other federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA L<sub>dn</sub>, have generally agreed on the 65 dBA L<sub>dn</sub> level as being appropriate for residential uses. At 65 dBA L<sub>dn</sub> activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

Department of Housing and Urban Development (HUD). HUD was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Housing and Urban Development Act of 1965 (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA  $L_{dn}$  or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA  $L_{dn}$  but not exceeding 75 dBA  $L_{dn}$  - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA  $L_{dn}$  area and 10 dBA of attenuation in a 70 to 75 dBA  $L_{dn}$  area.
- Exceeding 75 dBA  $L_{dn}$  - an unacceptable zone in which projects would not, as a rule, be approved.

HUD’s regulations do not include interior noise standards. Rather a goal of 45 dBA  $L_{dn}$  is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA  $L_{dn}$  or less, the interior level will be 45 dBA  $L_{dn}$  or less. Thus, structural attenuation is assumed at 20 dBA. However HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependant on work conditions and is addressed through a facility’s or construction contractor’s health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

#### *STATE*

#### **California Department of Transportation (Caltrans)**

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

#### **Governor’s Office of Planning and Research (OPR)**

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 1998). The guidelines include land use compatibility guidelines for noise exposure.

### *LOCAL*

#### **City of Cotati General Plan**




**Current City of Cotati Noise Element Standards:** Community noise within the City of Cotati is presently covered by the guidelines established in the General Plan. The City's Noise Element currently contains guidelines to evaluate the compatibility of various land uses with the noise environment. The maximum acceptable outdoor noise level in new residential areas is 60 dBA  $L_{dn}$ . The criteria are applied where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreation areas in multi-family housing projects. The outdoor criteria should not normally be applied to the small decks associated with apartments and condominiums). Inside new housing, the noise level shall not exceed 45 dBA  $L_{dn}$ . Other buildings similarly sensitive to noise include hotels and motels, schools, libraries, churches, hospitals, and nursing homes. Retail and commercial land uses, which are primarily indoor spaces, are less sensitive to environmental noise.

**Policies:** The existing City of Cotati General Plan identifies the following policies related to noise:

#### **3.3.1 Encourage the maintenance of the Noise and Land Use Compatibility Standards indicated in Table 3.1 (as summarized in Table 8-1 below).**

- a) The City shall review all land use and development proposals for compliance with the Noise and Land Use Compatibility Standards.
- b) The City shall use a standard of 45 dBA  $L_{dn}$  for indoor noise levels for all new residential development, including hotels and motels.
- c) The City shall require an acoustical study for all new projects with potential noise impacts. The study shall describe how the project will comply with Noise and Land Use Compatibility Standards and indoor noise level standards.

**TABLE 8-1: LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENT**

Land Use Category	Exterior Noise Exposure, L <sub>dn</sub> or CNEL, dB					
	55	60	65	70	75	80
Residential, Hotels, and Motels						
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds						
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches						
Office Buildings, Business Commercial, and Professional						
Auditoriums, Concert Halls, Amphitheaters						
Industrial, Manufacturing, Utilities and Agriculture						
	<b>NORMALLY ACCEPTABLE</b> Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements.					
	<b>CONDITIONALLY ACCEPTABLE:</b> Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.					
	<b>UNACCEPTABLE:</b> New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.					

### 3.3.2 Control Non-Transportation Related Noise from Site Specific Noise Sources.

a) The City shall ensure that the noise resulting from new sources shall not exceed the standards in Table 3.2 (as summarized in Table 8-2 below) as measured at the exterior property line of an affected residential land use.

**TABLE 8-2: ALLOWABLE NOISE EXPOSURE FROM NON-TRANSPORTATION NOISE SOURCES**

	Daytime (7:00 am - 10:00 pm)	Nighttime (10:00 pm - 7:00 am)
Hourly L <sub>eq</sub> , dB	50	45
Maximum Level, dB	70	65
Maximum Level, dB (Impulsive Noise)	65	60

#### Guidelines for Use of Table 8-2

1. The measurements are made at the property line of the receiving land use. The effectiveness of noise mitigation measures should be determined by applying the standards on the receptor side of noise barriers or other property line noise mitigation measures.
2. The nighttime standards apply only when the receiving land use operates or is occupied during nighttime hours.
3. Sound level measurements to determine maximum level noise shall be made with "slow" meter response.
4. Sound level measurements for impulsive noise sources shall be made with "fast" meter response. Impulsive noises are defined as those which have sharp, loud peaks in decibel levels, but which quickly disappear. Examples include a dog's bark, a hammer's bang and noise with speech or music content.

### **3.3.3 Develop and enforce a City of Cotati Noise Ordinance.**

a) The City shall develop a Noise Ordinance. Prior to a City Ordinance being developed the State of California Model Noise Ordinance shall be implemented.

### **3.3.4 Local truck traffic, including loading and unloading, shall be limited to specific routes, times and speeds appropriate to each zoning district.**

a) The Police Department shall continue to implement the truck ordinance which limits truck traffic routes, times, and speeds in areas where it will effectively reduce noise pollution.

### **3.3.5 Encourage the enforcement of sections of the California Vehicle Code relating to adequate vehicle mufflers, and modified exhaust systems.**

a) The Police Department shall work with the California Highway Patrol to actively enforce the California Vehicle Code as it relates to adequate vehicle mufflers, and modified exhaust systems.

### **3.3.6 Work with Caltrans to ensure that adequate noise studies are prepared and alternative noise mitigation measures are considered in State projects.**

a) Planning staff shall remain in communication with Caltrans requesting that Caltrans obtain City concurrence prior to initiating any noise mitigation project in Cotati or affecting Cotati.

### **3.3.7 Require acoustical studies and mitigation measures for new developments and transportation improvements that affect noise sensitive uses such as schools, hospitals, libraries, group care facilities, convalescent homes, and residential areas.**

a) Planning staff, through the environmental review process, shall ensure that acoustical studies are performed and mitigation measures implemented when noise sensitive uses are affected.

### **3.3.8 Stationary equipment, such as air compressors, shall be located as far away as feasible from sensitive noise receptors, and shall be shielded. Construction equipment shall be fitted with effective mufflers. The hours for construction operations shall be limited to the weekdays and the daytime where extreme noise sources are found.**

a) The Building inspector shall determine, during the environmental review process, if proposed construction will constitute a significant impact on nearby residents and require limited construction hours.

## FUNDAMENTALS OF ACOUSTICS

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

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

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

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the composite noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The day/night average level ( $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to  $L_{dn}$ , but includes a +3 dB penalty for evening noise.

## 8. NOISE

Table 8-3 lists several examples of the noise levels associated with common situations.

TABLE 8-3: TYPICAL NOISE LEVELS		
Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL, OCTOBER 1998.

### Effects of Noise on People

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

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

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

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

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



Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

#### *ANNOYANCE*

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The  $L_{dn}$  as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA  $L_{dn}$ . At an  $L_{dn}$  of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the  $L_{dn}$  increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is an increase of about two percent per dBA between an  $L_{dn}$  of 60-70 dBA. Between an  $L_{dn}$  of 70-80 dBA, each decibel increase results in about a three percent increase of the population being highly annoyed. People appear to respond more adversely to aircraft noise. When the  $L_{dn}$  is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about three percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a four percent increase in the percentage of the population highly annoyed.

#### *SLEEP AND SPEECH INTERFERENCE*

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA  $L_{dn}$ . Typically, the highest steady traffic noise level during the daytime is about equal to the  $L_{dn}$  and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA  $L_{dn}$  with open windows and 65-70 dBA  $L_{dn}$  if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

### EXISTING NOISE LEVELS

#### **Vehicular Noise**

The primary source of environmental noise within the City of Cotati is generated by vehicular traffic on US 101 and the major roadways in the community, including the Gravenstein Highway (SR 116), Old Redwood Highway, West Sierra Avenue, East Cotati Avenue, and Commerce Boulevard. Vehicular traffic on smaller local roads also contributes to the noise environment along these roadways.

Illingworth & Rodkin, Inc. completed a comprehensive noise monitoring survey for the Downtown Specific Plan Project in 2005. The sites for measurements were selected to provide information on the 24-hour distribution of noise levels along the streets and highways and to determine the level of baseline ambient noise levels in the quiet residential areas of the City away from identifiable noise sources. Standard measuring practices were followed; sound level meters were calibrated before and after each survey, microphones were fitted with windscreens, and data were gathered during good weather when it is not raining or too windy.

Long-term noise measurements (over a continuous 24-hour period) were made at 10 locations selected to represent noise levels along both large and small thoroughfare transportation corridors. Illingworth & Rodkin, Inc. updated the data collected at each of the 2005 noise measurement sites in May 2011 through a series of short-term noise measurements (30-minute durations). Figure 8.1-1 shows the locations of the noise measurements made in 2005 and 2011.

The results of the 2005 and 2011 measurements are shown in Table 8-4. The 24-hour day/night average noise level ( $L_{dn}$ ) is shown for each of the long-term measurements. The equivalent sound level ( $L_{eq}$ ) during each hour as well as selected statistical descriptors representing near maximum noise levels ( $L_{01}$  and  $L_{10}$ ), median noise levels ( $L_{50}$ ) and background noise levels ( $L_{90}$ ) are also provided to describe the range of noise levels that occurred during the measurements. Charts containing the noise measurement data are included in Appendix A. A comparison of the 2005 and 2011 data shows that transportation noise levels in the City of Cotati have not changed substantially since 2005. One exception to this general conclusion was noted at Site LT-1, as the repaving of Old Redwood Highway resulted in traffic noise levels approximately 4 dBA lower than those measured in 2005.

Other noise sources in the community include noise resulting from residential maintenance activities, residential air conditioning units and swimming pool pumps, commercial business activities, and light industrial facilities. These non-transportation noise sources are local and typically only affect their adjacent neighbors. Commercial and light industrial uses can generate noise due to regular operations such as fans, blowers, chillers, compressors, boilers, pumps, and air conditioning systems which may run for 24 hours a day. Other sources of noise in these areas, such as horns, buzzers, and loading activities may be intermittent. These noise sources are of greatest concern when they are close to noise sensitive receptors, since the combination of transportation noise and commercial has the potential for producing noise impacts on these receptors.

Other potential significant sources of noise within the City include entertainment venues, fire station, child-care centers, gas stations, car washes, school playgrounds, and public parks. When located near residential or other noise sensitive uses, these types of land uses can be sources of irritation and complaints.

Another source of noise in Cotati relates to intermittent construction activities. Construction noise can be significant for short periods of time at any particular location as a result of public improvement projects, private development projects, remodeling, etc.

The City has no commercial, military, or general aviation airports. There are, therefore, no significant aircraft operations or ancillary airport-related noise sources that affect the noise environment in Cotati.

**TABLE 8-4: NOISE MEASUREMENT SUMMARY**

Location	Time of Day	Sound Levels, dBA						
		L <sub>01</sub>	L <sub>10</sub>	L <sub>eq</sub>	L <sub>50</sub>	L <sub>90</sub>	2005L <sub>dn</sub>	2011L <sub>dn</sub>
LT-1: 50 feet from the centerline of Old Redwood Highway, south of Myrtle Avenue	Daytime	78	74	70	68	58	72	68 <sup>1</sup>
	Nighttime	74	67	64	60	50		
LT-2: 45 feet from the centerline of Old Redwood Highway, north of Page Street	Daytime	79	71	69	66	58	72	71
	Nighttime	76	67	64	59	50		
LT-3: 45 feet from the centerline of West Sierra Avenue between Page and Olaf Streets	Daytime	74	68	65	62	54	67	67
	Nighttime	70	63	59	53	49		
LT-4: 100 feet from the centerline of East Cotati Avenue between La Plaza and Charles Street	Daytime	70	66	63	62	57	66	67
	Nighttime	67	62	59	56	51		
LT-5: 35 feet from the centerline of La Salle Avenue	Daytime	68	58	56	51	49	58	58
	Nighttime	58	50	50	48	47		
LT-6: 85 feet from the centerline of East Cotati Avenue near Santero Way	Daytime	73	69	66	65	57	67	68
	Nighttime	68	63	59	55	44		
LT-7: 205 feet from the centerline of Hwy 101 near the end of St. Joseph Way	Daytime	73	69	66	66	62	70	TBD <sup>2</sup>
	Nighttime	71	66	63	61	57		
LT-8: 170 feet from the centerline of Old Redwood Highway south of Hwy 116	Daytime	67	63	61	60	57	64	65
	Nighttime	63	59	56	55	51		
LT-9: 45 feet from the centerline of Hwy 116 west of Alder Lane	Daytime	82	77	7	73	64	77	76
	Nighttime	77	73	70	68	63		
LT-10: 30 feet from the centerline of Wilford Lane	Daytime	66	59	56	53	51	61	63
	Nighttime	62	55	54	52	50		

SOURCE: ILLINGSWORTH & RODKIN, INC., 2005 AND 2011.

### Preliminary Considerations

Because ground transportation noise is the dominant source of noise in Cotati and major improvements are virtually complete, it is unlikely that proposed actions would cause a substantial increase in noise in

<sup>1</sup> Old Redwood Highway has been repaved since 2005, resulting in substantially lower traffic noise levels.

<sup>2</sup> Highway 101 in Cotati is currently under construction. According to Caltrans, the "Central Project" will widen a five-mile stretch of U.S. Route 101 in Sonoma County, from just north of Pepper Road in Cotati to Rohnert Park Expressway, building one new High-Occupancy Vehicle (HOV) lane in each direction. In addition to the new lanes, the project will also provide new sound walls along the highway; will widen existing bridges at Copeland Creek, Laguna de Santa Rosa Creek; and will replace the interchange of Highways 101 and 116 and improve the Sierra Avenue undercrossing. Post-project noise levels will be quantified at this location prior to completing the Noise Element Update project.

the community. There is currently research ongoing on the effects of different type of pavement surfaces on the noise generated by vehicular traffic. The interaction of tires and pavement is the main source of traffic noise. The City of Cotati has no jurisdiction over the noise generated by automobiles, the types of tires drivers select, etc., but the City can select the type of pavement that it uses to repave its streets. One study completed by Illingworth & Rodkin, Inc. showed a 3 to 5 decibel reduction in vehicular traffic noise could be achieved when repaving a street in relatively poor condition with a “quiet” pavement such as an open-grade asphalt concrete or rubberized asphalt<sup>3</sup>. This noise reduction is consistent with that observed at Site LT-1 along a segment of Old Redwood Highway. The consideration of quiet pavement surfaces in the City’s repaving plans provides an opportunity to make a noticeable reduction in traffic noise along City streets in Cotati.

Placing residents in proximity to non-residential land uses can result in isolated noise problems. For instance, outdoor music played at outdoor dining areas or bars can annoy adjacent residences and be a source of ongoing complaints. Other urban noise sources, such as the collection of large garbage dumpsters early in the morning, the noise of heating, ventilating, and air conditioning equipment, and outdoor maintenance activities, are all more frequent in an urban setting. The purpose of a quantitative noise ordinance is to address these types of issues. The review and update of applicable City ordinances is something the City could consider in the future if the change in land use patterns results in conflicts, which cannot be resolved through existing regulations.

The most common noise issue that is likely to be faced by the City is the same as it has been historically, and that is to evaluate land use proposals in noisy areas and incorporate into these projects the noise control treatments necessary to control noise to acceptable levels.

### **Stationary Noise Sources**

The production of noise is a result of many processes, even when the best available noise control technology is applied. Noise exposures within facilities are controlled by federal and state employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from stationary noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment

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<sup>3</sup> *Noise Evaluation of the Pavement Rehabilitation on the 4<sup>th</sup> Street “Miracle Mile”*, Paul R. Donovan, Sc.D., Illingworth & Rodkin, Inc., December 2003.

- Loading Docks
- Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: processing facilities, pump stations, industrial facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, recycling centers, electric generating stations, landfills, sand and gravel operations, special events such as concerts, and athletic fields.

From a land use planning perspective, stationary source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise producing uses. The second goal can be met by requiring that new noise sensitive uses in proximity to noise producing facilities include mitigation measures that would ensure compliance with noise performance standards.

### **Aviation Noise Sources**

The City of Cotati does not have any airport facilities located within the Planning Area. The Petaluma Municipal Airport is the closest airport to Cotati, located approximately 8 miles southeast of the Cotati city limits. The Petaluma Municipal Airport is operational 24 hours a day and staffed Monday through Friday 8:00 am to 5:00 pm and Saturday and Sunday from 8:00 am to 4:00 pm and including Holidays. Approximately 60,000 take-offs and landings are recorded at the Petaluma Municipal Airport each year.

General aviation and occasional high altitude jet aircraft overflights are audible throughout the Planning Area, but do not make a substantial contribution to community noise levels. Noise Impacts and contours associated with the Petaluma Municipal Airport are addressed in the Comprehensive Air Port Land Use Plan for Sonoma County. The noise contours do not include land within the Planning Area. (City of Petaluma, 2011 and Sonoma County Airport Land Use Commission, 2001).

### **Railroad Noise Sources**

The rail corridor in Sonoma County, commonly known as the Northwestern Pacific Railroad (NWP), generally parallels US 101 running north-south in Sonoma and Marin Counties. The NWP corridor is owned by the Sonoma Marin Area Rail Transit (SMART) District from Milepost (MP) 68.22 in Healdsburg southward to MP 11.4 in Corte Madera. North of Healdsburg, the NWP is owned by the North Coast Railroad Authority (NCRA) and is used predominately for freight.

The SMART District is proposing implementation of passenger rail service along the approximately 68.22 mile existing rail corridor that they currently own. The City of Cotati is one of the incorporated local jurisdictions in the proposed SMART rail corridor project. The project would include a rail station in Cotati located at MP 46, which is south of East Cotati Avenue between Windhill Farms Drive and Santero Way. The rail station would have 24 weekday stops and 8 weekend stops. Half of these stops are northbound, and half are southbound.

The SMART corridor is not currently an active railroad operation, thus there is no noise generated from the rail corridor in the Planning Area at present. It is, however, anticipated that the SMART corridor will be in service by 2014-2015. Within the Planning Area, about half of the land adjacent to the SMART corridor is already developed, and the other half is undeveloped. The undeveloped land is located

## 8. NOISE

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outside the city limits, but within the sphere of influence and urban growth boundary. It will be important for any development proposals adjacent to the railroad tracks to consider the potential impacts of future railroad noise.

Noise levels associated with rail operations will vary depending on the type of vehicle used and whether noise alternative measures are incorporated into the SMART project. In order to quantify noise exposure from the train operations, a continuous (24-hour) noise level will need to be calculated for the rail operations once SMART established the project details. The purpose of the noise level estimates will be to determine typical sound exposure levels (SEL) for railroad line operations, while accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. The day/night average ( $L_{dn}$ ) railroad contours can be calculated as follows:

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

SEL is the mean Sound Exposure Level of the event,  $N_{eq}$  is the sum of the number of daytime events (7 a.m. to 10 p.m.) per day, plus 10 times the number of nighttime events (10 p.m. to 7 a.m.) per day, and 49.4 is ten times the logarithm of the number of seconds per day. With this information the distances to the  $L_{dn}$  noise level contours can be established.

### REFERENCES

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The primary sources of data referenced for this section is derived from the following:

California Department of Transportation. 2009. Technical Noise Supplement.

California Department of Transportation. 2011. 101 Widening between Cotati and Rohnert Park.  
<http://www.dot.ca.gov/dist4/101centralproject/>

City of Cotati. 1998. 1998 General Plan Update.

Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control, Third Edition.

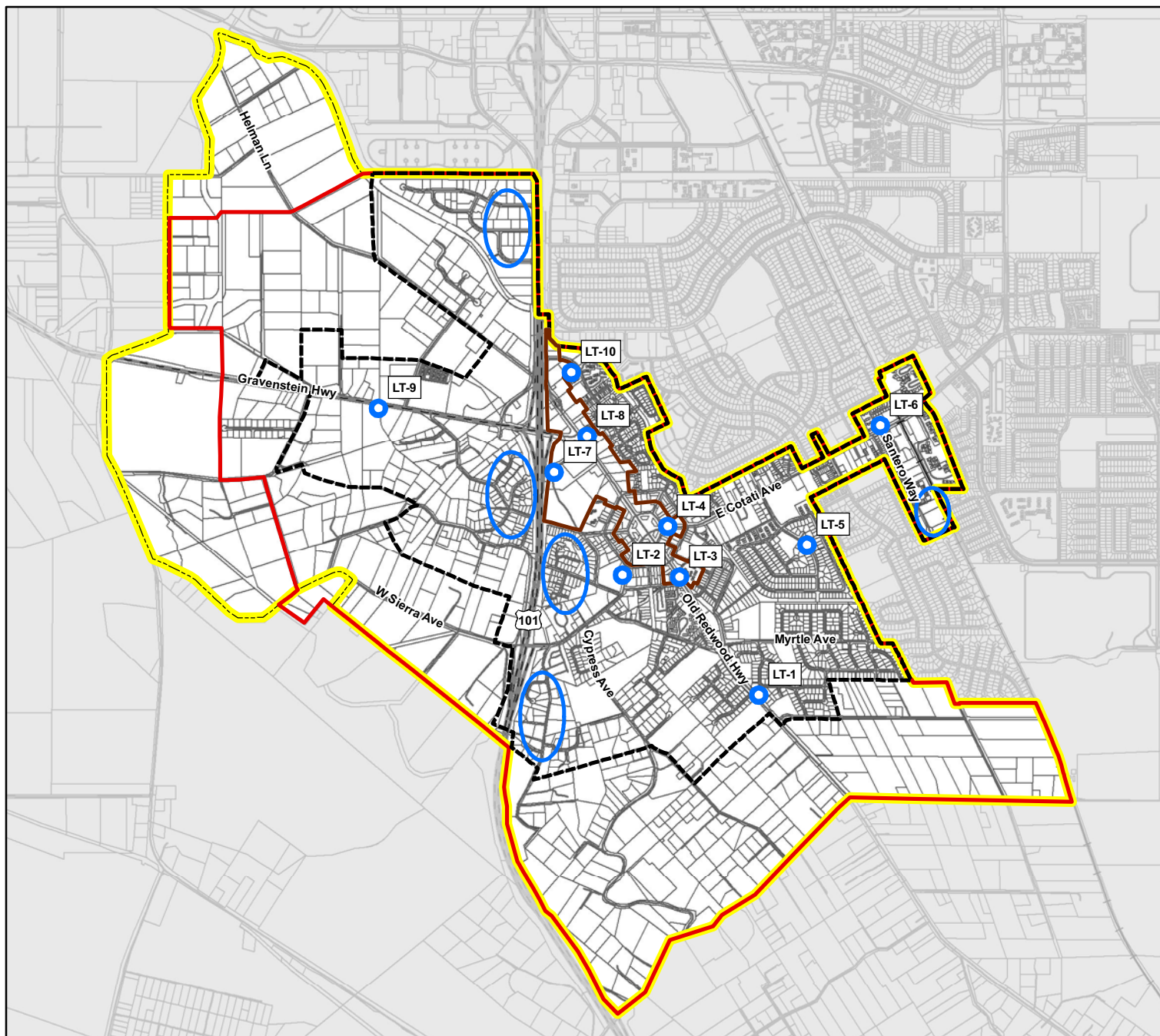
Illingworth & Rodkin, Inc. 2005. City of Cotati General Plan Update Noise Assessment, Setting Section.

Illingworth & Rodkin, Inc. 2003. Noise Evaluation of the Pavement Rehabilitation on the 4th Street  
"Miracle Mile".

US Environmental Protection Agency. 1978. Protective Noise Levels, Condensed Version of EPA Levels Document, EPA 550/9-79-100.

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Figure 8.1-1: Noise Monitoring Locations



- Previous Measurement Locations
- Possible Areas for New Measurement Locations

- Planning Areas
- ▭ Downtown Specific Plan Area
  - - - Cotati City Limits
  - ▭ Sphere of Influence
  - ▭ Urban Growth Boundary



0 1,000 2,000 3,000 Feet

1:30,000

Data source: Cotati GIS. Map date: June 29, 2011.





## 9. CONSERVATION AND NATURAL RESOURCES

Natural resources form an important part of the City's unique character. In an effort to identify and understand the key natural resources of the Planning Area, this chapter is divided into the following sections:

- Cultural Resources (9.1)
- Biological Resources(9.2)
- Hydrology and Water Quality (9.3)
- Scenic Resources (9.4)
- Air Quality and Climate Change (9.5)

### 9.1 CULTURAL RESOURCES

Cultural Resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the City's cultural heritage should be considered when planning for the future.

#### KEY TERMS

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**Archaeology.** The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

**Paleontology.** The science of the forms of life existing in former geologic periods, as represented by their fossils.

**Ethnography.** The study of contemporary human cultures.

**Complex.** A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

**Midden.** A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

#### REGULATORY SETTING

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##### *FEDERAL REGULATIONS*

#### **National Historic Preservation Act**

Most regulations at the federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

### **American Indian Religious Freedom Act and Native American Graves and Repatriation Act**

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

### **Other Federal Legislation**

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

#### *STATE REGULATIONS*

### **California Register of Historic Resources (CRHR)**

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

### **California Environmental Quality Act (CEQA)**

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historical Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are

steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources,
- evaluate the significance of the cultural resources found,
- evaluate the effects of the project on cultural resources, and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

### **State Laws Pertaining to Human Remains**

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

### **Senate Bill 18 (Burton, Chapter 905, Statutes 2004)**

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places (“cultural places”) through local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §653524, and §65562.5 to the Government Code; also requires the Governor’s Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments for how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

## **ENVIRONMENTAL SETTING**

### **Prehistory**

Archeological evidence shows that California was inhabited at least 12,000 years ago and possibly as much as 15,000 years ago (Erlandson et al. 2007), with people living along the Laguna de Santa Rosa west of Cotati by 11,000 years ago (Dowdall and Origer 1997).

Information generated by numerous regional site investigations provided Fredrickson (1974, 1994) with data used to develop one of the more recent chronologies applicable to this portion of California’s North Coast Ranges. The following chronology is based largely on Fredrickson’s (1974, 1994) research with modifications based on recent research.

#### *PALEO-INDIAN PERIOD (CA. 8,000 – 12,000+ YEARS AGO)*

This is the time when humans first entered California. Lakeside sites established with probable emphasis on hunting. Milling technology is lacking. Exchange of goods on a one to one basis and not regularized.

Social units consisted of extended families that were largely self-reliant, and moved to resources as they became available and were needed.

### *ARCHAIC PERIOD (CA. 1,000 – 8,000 YEARS AGO)*

Lower Archaic Period characteristics include lakes drying due to climatic changes. Abundant milling stones suggest emphasis on plants/small seeds for food, and little hunting occurred. Limited exchange took place, and there was a reliance on the use of local materials. Wealth was not emphasized, and the dominant social unit appears to be the extended family.

Middle Archaic Period characteristics include a change in the climate, which became more benign. Economy became more diverse. Acorn use was introduced as suggested by mortars and pestles. Hunting was important as evidenced by the abundance of dart tips. Sedentism began along with increased population and expansion.

Upper Archaic Period characteristics include the growth of social-political complexity with status distinctions based on wealth. Shell beads gain importance and they appear to serve as indicators of both exchange and wealth. Group-oriented religious organizations emerge with possible origin of Kuksu religious system. Exchange systems became more complex with regularized sustained exchanges occurring between groups. Territorial boundaries were fluid.

### *EMERGENT PERIOD (CA. 200 – 1,000 YEARS AGO)*

Lower Emergent Period characteristics included the introduction of the bow and arrow, which largely replaced the dart and atlatl. South coast marine adaptations flourished. Territorial boundaries became well established, and regularized exchange between groups continued with increased goods being exchanged. Increasing evidence is found of distinctions in social status linked to wealth.

Upper Emergent Period characteristics include the appearance of the clam disk bead money economy. Increasingly, more goods were moved farther. Local specialization with regard to production and exchange of goods grew. South and central exchange systems were interpenetrated.

## **Ethnology**

### *COAST MIWOK*

At the time of European incursion, the Coast Miwok occupied a territory that extended from the Golden Gate north into southern Sonoma County, and from the Pacific Ocean to the ridge dividing Sonoma and Napa counties. Over 40 named villages were identified within this territory during the early 20<sup>th</sup> century (Kroeber 1925). This area encompassed what is now the City of Cotati, which takes its name from the Miwok village that was located north of the current town.

Politically, the Coast Miwok were organized in “territorial, multi-family, landholding communities” or tribelets, each with multiple villages of relatively even size (Milliken 2010). Territories were vaguely defined, but included fishing and gathering areas used by the group. Tribelets had a headman, who advised the people. This was not a hereditary position. Two female leaders saw to the co-ordination and execution of major group activities such as dances, ceremonial activities, and construction of a new dance house. One of these was said to be in charge of everyone, even the headman (Kelly 1978:419).

Fish, mussels, clams, and seaweeds were major food sources, with winter runs of salmon and steelhead being especially important. Land mammals including deer, bears, rabbits, wood rats, and gophers were

also eaten. Acorns were a staple food source, with tan oak (*Lithocarpus densiflora*) being preferred for mush, and valley oak (*Quercus lobata*) for bread.

### Historic Period Background

The earliest attempt at non-native settlement in the area was by John Reed in 1827, who built a house and planted a grain crop. However, his crop fell victim to the Native American practice of seasonally burning the grassland to improve the seed production. Reed left the area, settling in Marin County and becoming quite successful.

The Cotate Rancho remained relatively intact during Page's lifetime despite the fact that some 4,500 acres of land was siphoned off by squatters, some of whom eventually paid Page for their land. Upon his death in 1872, Page left his heirs the Cotate grant stipulating that the rancho could not be divided until his youngest son, William, reached the age of 25. When William Page reached the appointed age in 1892 the sons were ready to begin dividing the rancho. Settlement in this southern Sonoma County community centered on newly formed Cotati, whose town plan was designed by Newton Smyth circa 1892. Unique for its hexagonal form, this was one of only two such town plats in the United States. In the 1898 county atlas (Reynolds and Proctor 1898:36), the San Francisco-based Cotati Company advertised 8,000 acres of the rancho for sale.

During the latter part of the nineteenth century, there was a notable trend toward division of large holdings in and around the Cotati General Plan area. The earliest of these subdivisions broke large tracts of land into smaller farm parcels "large enough to accommodate a successful farming venture" (Praetzellis *et al.* 1989:18). The Cotati Company capitalized on this trend beginning in 1892 as the Page heirs divided the rancho lands into progressively smaller farm lots, with town lots focused around the plaza.

As the twentieth century progressed, lots created through these subdivisions were generally too small to provide a family's primary source of income. Work outside the home became increasingly necessary to sustain a family's economic viability, and there was greater reliance on goods sold at retail outlets. Where, in the past, large farms and ranches were relatively self-sufficient, families living on these small farms could not meet all their own needs.

A boon to the Cotati Company was the chicken ranching phenomenon that swept southern Sonoma County at the end of the 19th and beginning of the 20th centuries. While it was always a farming community, many families were drawn to the area by contemporary booster literature proclaiming poultry raising to be a profitable and near effortless pursuit. During the early part of the twentieth century, small-scale family-owned chicken ranches appeared throughout the southern part of the county, and Cotati, following on the heels of Petaluma, was a prime poultry area. The following excerpt appeared in a brochure published by The California Promotion Committee during the early part of the twentieth century.

*"Cotati's chief industry is poultry and eggs. Cotati ships over 500 cases of eggs weekly, while from her outskirts and suburbs, many other hundreds are shipped. On every side and slope, in sun and shade, by brook and glade, can be heard and seen the lay of the Leghorn hen. In Cotati every phase of the chicken industry is carried on as its profitable side appeals to the person so engaged. Here can be seen ranches varying in size from 5 to 50 acres, and from 500 to 10,000 or 12,000 hens. The widow, the spinster, the bachelor, the man of family can all be found in Cotati, and all engaged in the poultry business [The California Promotion Committee circa 1900]."*

Division of rural lands also brought with it an increase in the number of people living in areas isolated from amenities readily found in town. As families began moving into the newly created rural subdivisions, the need for nearby groceries and supplies also grew. It was during this time frame that many small rural stores and shops opened their doors to provide needed supplies and services.

During the early years of the 20th century, the nearest railroad access for Cotati farmers was the Petaluma and Santa Rosa electric railroad that traveled along Stony Point Road, west of town. Farmers were forced to leave their products on the side of the track to await shipment because there was no depot. A group known as The Cotati Progressive League convinced the Northwestern Pacific Railroad that a depot was needed in Cotati, and in 1907 the Cotati Depot was opened at the former 'Page's Station' (Breen 1914). For a while, it looked like the Petaluma & Santa Rosa line might send a spur into Cotati but the plan eventually was dropped.

In the next decade, work on State Highway 1 (now 101) commenced, and by 1929 the Redwood Highway was paved from the Sausalito Ferry terminal to Cloverdale (LeBaron and Mitchell 1993:35). For a while it was not clear whether Cotati would profit from the highway, as an alternate route was proposed that would have shifted the present-day alignment to the east. Once the decision was made to route the new road through Cotati, local businesses rallied to make the town an interesting stop, if not the largest along the Redwood Highway. Old businesses were expanded, and new shops sprang up in Cotati, many incorporating the Spanish Revival architecture promoted for use along the highway.

In the early 1960s, two important events occurred in the Cotati area: the state chose a tract of land at the end of East Cotati Avenue as the site of a new state college, and Cotati incorporated as a city. When Sonoma State University opened the doors of its new campus in 1966, Cotati saw an immediate increase in its population, and the town became a popular gathering area for students. During the 1970s, it was a magnet for counter culture groups, and many downtown businesses catered to the student crowd.

### **Cultural Resources in Cotati**

There have been 75 cultural resources studies completed within the Sphere of Influence (SOI). These studies cover approximately ten percent of the Planning Area. Twenty-three buildings in downtown Cotati are considered noteworthy by local residents, and have been included in a self-guided walking tour brochure. These buildings are not sufficiently closely grouped or thematically related to be considered as a historic district; however, they do comprise a substantial concentration of early 20<sup>th</sup> century structures in a relatively localized area. Additional buildings old enough to be potentially eligible for inclusion on the California Register are found in the greater downtown area. Only the Plaza itself has been formally determined to be a historical resource.

Table 9.1-1 lists 47 buildings from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries that have the potential to meet criteria for inclusion on the California Register of Historical Resources. Those with an HPD notation in the 'Notes' column have been evaluated for the National Register of Historic Places, but have not been considered for state or local listing. The buildings at 100 Valparaiso were evaluated and the house appeared eligible for listing on the California Register, however, a fire destroyed much of the historic fabric, and its eligibility has been compromised. The remaining buildings have not been evaluated for any form of listing. In each case, these buildings should be formally evaluated prior to substantial changes or development of the properties. In addition, the land surrounding these buildings (the "toft" or area around the building complex) should be considered sensitive for historical archaeological deposits.

**TABLE 9.1-1: BUILDINGS POTENTIALLY ELIGIBLE FOR THE CALIFORNIA REGISTER**

House	Street	Year Built	Notes
8167	Arthur Street	1920	Not evaluated
8186	Arthur Street	1920	Not evaluated
7582	Commerce Blvd	1927	Not evaluated
7560	Commerce Blvd	1947	HPD 6Y
7600	Commerce Blvd	1920	HPD 6Y
8779	Cypress Ave	1885	Not evaluated
7400	Gravenstein Hwy	1909	HPD 6Y
7960	Gravenstein Hwy	1927	HPD 6Y
8028	Gravenstein Hwy	1910	HPD 6Y
8260	Gravenstein Hwy	1900	Not evaluated
363	Helman Lane	1910	Not evaluated
45	Henry Street	1904	Not evaluated
85	La Plaza	1910	7N
8140	La Plaza	1910	Not evaluated
8150	La Plaza	1910	Not evaluated
8200	La Plaza	1954	Not evaluated
896	Madrone Ave	1905	Not evaluated
355	Maple Ave	1915	Not evaluated
8154	Olaf Street	1910	Not evaluated
8156	Olaf Street	1920	Not evaluated
800	Old Redwood Hwy	1905	Not evaluated
8015	Old Redwood Hwy	1910	Not evaluated
8045	Old Redwood Hwy	1910	Not evaluated
8201	Old Redwood Hwy	1915	Not evaluated
8220	Old Redwood Hwy	1923	Not evaluated
8480	Park Ave	1905	HPD 6J
855	Richardson Lane	1920	Not evaluated
490	School Street	1910	Not evaluated
550	School Street	1921	Not evaluated
100	Valparaiso Ave	1914	Severely damaged by fire
301	Valparaiso Ave	1925	Not evaluated
50	W Cotati Ave	1910	Not evaluated
65	W Cotati Ave	1916	Not evaluated
70	W Cotati Ave	1905	Not evaluated
79	W Cotati Ave	1905	Not evaluated
683	W Cotati Ave	1924	Not evaluated
36	W Sierra Ave	1924	Not evaluated
61	W Sierra Ave	1914	Not evaluated
78	W Sierra Ave	1920	Not evaluated
175	W Sierra Ave	1905	Not evaluated
425	W Sierra Ave	1910	Not evaluated
8655	Water Road	1903	HPD 6Y
8750	Water Road	1914	Not evaluated
21	William Street	1910	Not evaluated
50	William Street	1915	Not evaluated
58	William Street	1914	Not evaluated
70	William Street	1908	Not evaluated

SOURCE: SOURCE: NORTHWEST INFORMATION CENTER, SONOMA STATE UNIVERSITY, 2011

La Plaza is listed as a California Historical Landmark (number 879) for its hexagonal shape. It is one of only two town centers in the U.S designed on the six-sided form.

Thirty-six resources have been recorded within the SOI. Of these seven are prehistoric Native American archaeological sites, two are historic-period archaeological sites, and 27 are built environment resources. All but five of these resources are within the city limits.

It has been generally held that prehistoric Native American sites are most likely to occur where several environmental factors combine to provide readily available resources, such as at the interface between valley and hills. However, recent work has shown that sites do occur on the plain between US 101 and Petaluma Hill Road, where the soil drains poorly, and previous wisdom would not have anticipated such deposits. This suggests that the entire Planning Area should be considered sensitive for prehistoric Native American archaeological sites.

Figure 9.1-1 shows the area considered sensitive for prehistoric Native American archaeological deposits, and the segment of the downtown area considered to have potential for historical interpretation.

### **Consultation**

Letters were sent to the Native American Heritage Commission, the Federated Indians of Graton Rancheria, and the Cotati Historical Society to request information regarding the Planning Area. The Native American Heritage Commission responded with a letter dated May 25, 2011 indicating that they had no specific information regarding cultural resources within the Planning Area.

The Federated Indians of Graton Rancheria responded in a letter dated May 23, 2011 indicating that because the General Plan Update falls under SB18 they would initiate consultation directly with the City.

We met with Ms. Prudence Draper, President of the Cotati Historical Society, who reiterated their concern for preservation of the historical character of downtown Cotati. She acknowledged that this could present challenges in terms of maintaining a viable commercial center, and expressed her hope to remain involved during the development of policies that could be sensitive to both needs.

### **REFERENCES**

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The primary sources of data referenced for this section is derived from the following:

Adams, J. 1978. An Archaeological Survey of the West Sierra Avenue Improvement Project, Cotati, Sonoma County, California. Document S-1171 on file at the Northwest Information Center, Sonoma State University.

Anthropological Studies Center. 2005. An Archaeological Evaluation for a Portion of CA-SON-1016, Cotati, Sonoma County, California. Document S-30404 on file at the Northwest Information Center, Sonoma State University.

Archaeological Resource Service. 2010. Letter report to Martin O'Rourke regarding an historic structures evaluation of 8710 Cypress Avenue in Cotati, Sonoma County, California. Document S-37438 on file at the Northwest Information Center, Sonoma State University.



- Barrett, S. 1908. *The Ethno-Geography of the Pomo and Neighboring Indians*. University of California Publications in American Archaeology and Ethnology Vol. 6, No. 1. University of California Press, Berkeley.
- Beard, V. 1991. *An Archaeological Study of the Stich Property at 7946 Gravenstein Highway, (APN 144-090-01), Cotati, Sonoma County, California*. Document S-12400 on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 1992. *An Archaeological Study for the Proposed Alder Avenue Industrial Park Subdivision, (APN 046-111-08 and 09), Cotati, Sonoma County, California*. Document S-13749 on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 1995. *A Cultural Resources Survey for the Cotati Drainage Plan – West Area Extension, Sonoma County, California*. Document on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 1995. *A Cultural Resources Survey for the Eucalyptus Avenue Specific Plan Cotati, Sonoma County, California*. Document on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 1998. *Cultural Resources Study of a 6.05-acre Parcel at 503 West Railroad Avenue, Cotati, Sonoma County, California*. Document on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 1998. *Cultural Resources Study of a 10.94 acre Parcel at 595 Helman Lane, Cotati, Sonoma County, California*. Document S-20240 on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 1999. *A Cultural Resources Inventory for the West Sierra Gateway Project, Cotati, Sonoma County, California*. Document on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 2000. *A Cultural Resources Survey for the Twin Creeks Subdivision, 8691 Water Road, Cotati, Sonoma County, California*. Document S-22835 on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 2000. *A Cultural Resources Survey for the Wilford Lane Housing Project, Cotati, Sonoma County, California*. Document on file at the Northwest Information Center, Sonoma State University.
- Beard, V. 2007. *Historic Property Survey Report for a Class I bicycle and pedestrian path between Loretto Avenue and Eagle Drive, Cotati, Sonoma County California*. Document S-23723 on file at the Northwest Information Center, Sonoma State University.
- Breen, J. 1914. *The Building of "The Cotati."* *The Press Democrat*. Serial published March through May, 1914.
- Bryne, S. 1993. *A Cultural Resources Survey of the Cotati Tank No. 4 Site Alternative, Sonoma County, California*. Document S-16876 on file at the Northwest Information Center, Sonoma State University.

- Busby, C. and W. Hill. 2005. Cultural Resource Assessment 100 Valparaiso Road (APN 144-450-002), City of Cotati, Sonoma County. Document S-31878 on file at the Northwest Information Center, Sonoma State University.
- California Promotion Committee, The. 1900. Cotati, Sonoma County, California. The California Promotion Committee, San Francisco.
- Caltrans, District-04. 1993. Historic Property Survey Report for Roadway Rehabilitation on State Route 116 between Elphick Rd. in Sebastopol and Redwood Drive in Cotati, Sonoma County. Document S-29245 on file at the Northwest Information Center, Sonoma State University.
- Caltrans, District-04. 1994. Evaluation of Properties and Finding of Effect for the Proposed Improvements to Highway 116 between Sebastopol and Cotati, Sonoma County. Document S-29355 on file at the Northwest Information Center, Sonoma State University.
- Chattan, C. 2000. A Cultural Resource Evaluation of the Mardel/Cotati Property, Cotati, Sonoma County, California. Document S-22913 on file at the Northwest Information Center, Sonoma State University.
- Chattan, C. 2002a. A Cultural Resources Evaluation of the Property Located at 910 East Cotati Avenue, Cotati, Sonoma County, California. Document S-25987 on file at the Northwest Information Center, Sonoma State University.
- Chattan, C. 2002b. A Cultural Resources Evaluation of the Property Located at 100 Valparaiso Avenue, Cotati, Sonoma County, California. Document S-26609 on file at the Northwest Information Center, Sonoma State University.
- Chattan, C. 2003. A Cultural Resources Evaluation of the / Santero Court Project, Located at 690 East Cotati Avenue, Cotati, Sonoma County. Document S-27789 on file at the Northwest Information Center, Sonoma State University.
- Cole, W. 1981. An Archaeological Survey of a Proposed Widening Project of an Existing Flood Control Channel near Rohnert Park, Sonoma County, California. Document S-5746 on file at the Northwest Information Center, Sonoma State University.
- Daunell, K. 2005. Results of Archaeological Monitoring at the Gaige House Expansion. Document S-29839 on file at the Northwest Information Center, Sonoma State University.
- David Chavez & Associates. 2005. Archaeological Survey Report, Highway 101 Widening and Improvements Project from Old redwood Highway in the City of Petaluma to Rohnert Park Expressway in the City of Rohnert Park, Sonoma County, California: 04-SON-101 KP12.1/22.4 (PM 7.5/13.9). Document S-33908 on file at the Northwest Information Center, Sonoma State University.
- Douglass, T. and T. Origer. 2001. A Cultural Resources Survey for the Heritage Gardens Subdivision on East Cotati Avenue, Cotati, Sonoma County, California. Report S-24793 on file at the Northwest Information Center, Sonoma State University.
- Dowdall, K. 1995. Negative Archaeological Survey Report, 04-SON-101, Post Mile 2.82/12.79. Document S-17803 on file at the Northwest Information Center, Sonoma State University.

- Dowdall, K. and T. Origer. 1997. A View of Crescents from Sonoma County. Paper presented at the 31st Annual Meeting of the Society for California Archaeology, Rohnert Park.
- Earth Metrics Incorporated. 1991. La Plaza Specific Plan and Environmental Impact Report.
- Elliott, B. 2005. A Cultural Resources Study of the Cypress Hill Tank Project Location, Cotati, Sonoma County, California. Document S-31120 on file at the Northwest Information Center, Sonoma State University.
- Erlandson, J. T. Rick, T. Jones, and J. Porcasi. 2007. One if by Land, Two if by Sea: Who were the first Californians?. In California Prehistory T. Jones and K. Klar editors. Altamira Press. Lanham, MD.
- Ferneau, J. 1994. Archaeological Monitoring of an approximately 80' portion of Cotati Creek Near Page Street, Cotati, Sonoma County, California. Document S-16155 on file at the Northwest Information Center, Sonoma State University.
- Ferneau, J. 1995. An Archaeological Study of 13.18 Acres at 6700 Stony Point Road, Cotati, Sonoma County, California. Document S-17530 on file at the Northwest Information Center, Sonoma State University.
- Flynn, K. 1996. A Cultural Resources Evaluation of the of (sic) Property Located at 374 W. School Street, APN 144-330-02 & APN 144-230-012, Cotati. Document S-25979 on file at the Northwest Information Center, Sonoma State University.
- Flynn, K. 1996. A Cultural Resources Evaluation of the Cowan Property Located at 8920 Water Road, APN 144-420-012, Cotati. Document S-19033 on file at the Northwest Information Center, Sonoma State University.
- Fredrickson, D. 1984. The North Coastal Region. In California Archaeology, edited by M. Moratto. Academic Press, San Francisco.
- Greene, R. 2005. A Cultural Resources Evaluation of the Lands of Agilent, Rohnert Park, Sonoma County, California. Document S-30307 on file at the Northwest Information Center, Sonoma State University.
- Greene, R. 2005. A Cultural Resources Evaluation of the Property at 9020 Water Road, Cotati, Sonoma County, California. Document S-30404 on file at the Northwest Information Center, Sonoma State University.
- General Land Office. 1857. Plat of the Cotate Rancho. Department of the Interior, Washington, D.C.
- Historic Resource Associates, 2005. Cultural Resources Study of the E. Cotati Project, Cingular Wireless Site No. SNFCCA1998A, 8959 Old Redwood Highway, Cotati, Sonoma County, California 94931. Document S-33272 on file at the Northwest Information Center, Sonoma State University.
- Holson, J. 2002. Letter report to John Wharff regarding Archaeological Survey and Record Search Results for the Cingular SF-462-02 Cotati Fire Department Project. Document S-25997 on file at the Northwest Information Center, Sonoma State University.
- Hoover, M., H. Rensch, E. Rensch, W. Abeloe, and D. Kyle. 1990. Historic Spots in California. 4th edition, Stanford University Press. Stanford.

- Huberland, A. 1985. An Archaeological Investigation of the Lands of Nelson, AP#46-092-17, 1390 Madrone Avenue, Cotati, Sonoma County, California. Document S-7248 on file at the Northwest Information Center, Sonoma State University.
- Jordan, L. 1990. Archaeological Archival Study for the City of Santa Rosa Waste Water Project Alternatives Sonoma, California. Document S-12123 on file at the Northwest Information Center, Sonoma State University.
- Kelly, I. 1978. Coast Miwok. In California edited by R. Heizer, pp. 414-425. Handbook of North American Indians, Vol. 8, W. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
- Kelly, I. 1991. Interviews with Tom Smith and Maria Copa: Isabel Kelly's notes on the Coast Miwok Indians of Marin and Southern Sonoma Counties, California. MAPOM Occasional Papers Number 6. Miwok Archaeological Preserve of Marin. Novato, CA.
- Keswick, J. 1988. An Archaeological Study of the 183 Acre West Cotati Annexation of the Lands of Grill. Document S-10218 on file at the Northwest Information Center, Sonoma State University.
- King, T. 1973. Archaeological Impact Evaluation: Stony Point Road between Gravenstein Highway and Meacham Road. Document S-123 on file at the Northwest Information Center, Sonoma State University.
- King, T. and J. Rauschkolb II. 1973. Archaeological Impact Evaluation: The Proposed Cotati Creek Project. Document S-30 on file at the Northwest Information Center, Sonoma State University.
- King, T., R. King, and B. Goerke. 1973. The Russian River Water Supply Project: A Preliminary Synthesis of Archaeological Data. Document S-126 on file at the Northwest Information Center, Sonoma State University.
- LeBaron, G. and J. Mitchell. 1993. Santa Rosa: A Twentieth Century Town. Historia, Ltd.
- Loyd, J. and T. Origer. 1994. A Cultural Resources Study for the Gravenstein Highway Corridor Specific Plan, Sonoma County, California. Document on file at the Northwest Information Center, Sonoma State University.
- MacDonald, C. and M. Newland. 2004. Archaeological Survey Report for the Proposed Cotati Commons Project on California State Highway 116, Cotati, Sonoma County, California. Document S-29653 on file at the Northwest Information Center, Sonoma State University.
- McLachlan, K. 2006. A Cultural Resources Evaluation of the Rosen Ranch Subdivision, 8830 Old Redwood Highway, Cotati, Sonoma County, California. Document S-32068 on file at the Northwest Information Center, Sonoma State University.
- Massey, S. 2005. A Cultural Resources Study for the Eastside Sewer Project, City of Rohnert Park, Sonoma County, California. Document S-31044 on file at the Northwest Information Center, Sonoma State University.
- Massey, S. 2006. Historical Resources Compliance Report for the Cotati Commons SR 116 Phase 2 Improvements, Cotati, Sonoma County, California. Document S-31850 on file at the Northwest Information Center, Sonoma State University.

- Massey, S. and A. Praetzellis. 2005. Archaeological Survey Report for the Proposed Cotati Commons Project on State Highway 116 Cotati, Sonoma County, California (Addendum). Document S-30672 on file at the Northwest Information Center, Sonoma State University.
- Milliken, R. 1995. *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area*. Ballena Press, Menlo Park, California.
- Moratto, M. 1984. *California Archaeology*. Academic Press, San Francisco. Office of Historic Preservation. 2005. *Historic Property Directory*. Office of Historic Preservation, Sacramento.
- Newland, M. 1988. *An Archaeological Study for East Cotati Avenue Sanitary Sewer Interceptor, Cotati, Sonoma County, California*. Document S-19940 on file at the Northwest Information Center, Sonoma State University.
- Newland, M. 1999. *Cultural Resource Record Search and Literature Review for stations, sidings and bridges on the Northwestern Pacific Railroad, between Cloverdale and Larkspur, Sonoma and Marin Counties*. Document S-22086 on file at the Northwest Information Center, Sonoma State University.
- Offermann, Janis. 1976. *An Archaeological Survey of North Cotati, California, Between Old Redwood Hwy. and Cotati Creek*. Document S-254 on file at the Northwest Information Center, Sonoma State University.
- Office of Historic Preservation. 2011. *Historic Property Data File Directory*.
- Origer, T. 1988. *An Archaeological Survey of the Helman Lane Sewer Interceptor Line, Cotati, Sonoma County, California*. Document S-10167 on file at the Northwest Information Center, Sonoma State University.
- Origer, T. 1989. *An Archaeological Survey of the Agnes Wilfert Property at 896 Madrone Avenue, Cotati, Sonoma County, California*. Document S-14676 on file at the Northwest Information Center, Sonoma State University.
- Origer, T. 1990. *An Archaeological Survey of A 19-Acre Parcel Belonging to James Grill, Cotati, Sonoma County, California*. Document S-11584 on file at the Northwest Information Center, Sonoma State University.
- Origer, T. 1990. *An Archaeological Survey for the Thysen Project Area Cotati, Sonoma County, California*. Document S-11585 on file at the Northwest Information Center, Sonoma State University.
- Origer, T. and D. Fredrickson. 1980. *The Laguna Archaeological Research Project, Sonoma County, California*. Document S-2043 on file at the Northwest Information Center, Sonoma State University.
- Painter Preservation and Planning. 2007. *100 Valparaiso Avenue, Cotati, California, Sonoma County: Historic Resource Report & Peer Review*. Document S-35298 on file at the Northwest Information Center, Sonoma State University.
- Parsons. 2005. *Highway 101 HOV Lane Widening and Improvement Project: Old Redwood Highway, Petaluma to Rohnert Park Expressway, Rohnert Park 04-SON-101 KP 12.1/R22.4 (PM 7.6/R13.9) Sonoma County, California. (Volumes 1 and 2) Document S-30873 on file at the Northwest Information Center, Sonoma State University.*

- Peron, R. 1983. An Archaeological Investigation of a 6 Acre Parcel at 5820 Locust Avenue, Cotati, California. Document S-6047 on file at the Northwest Information Center, Sonoma State University.
- Praetzellis, M. and A. Praetzellis. 1976. An Archaeological Survey of the Russian River to Cotati Intertie. Document S-272 on file at the Northwest Information Center, Sonoma State University.
- Praetzellis, M., S. Stewart, A. Praetzellis, D. Harris, and D. Fredrickson. 1989. Historic Property Survey Report, Stony Point Road Reconstruction Project, located between Petaluma and Santa Rosa, Sonoma County, California. Document S-11709 on file at the Northwest Information Center, Sonoma State University.
- Praetzellis, M., A. Praetzellis, S. Stewart, D. Harris, and D. Fredrickson. 1989. Historic Architectural Survey Report, Stony Point Road Reconstruction Project, located between Petaluma and Santa Rosa, Sonoma County, California. Document S-11710 on file at the Northwest Information Center, Sonoma State University.
- Quinn, J. and T. Origer. 2000. A Cultural Resources Survey for Two Parcels, APN 046-102-017 and -018, in Cotati, Sonoma County, California. Document S-22845 on file at the Northwest Information Center, Sonoma State University.
- Reynolds, W. and T. Proctor. 1898. Illustrated Atlas of Sonoma County, California. Reynolds and Proctor, Santa Rosa.
- Rippey, D. 1982. An Archaeological Investigation of the Portal Street Property Project, Cotati, Sonoma County, California – A.P.N. 114-010-46 & 47/P.A. #1/82. Document S-2896 on file at the Northwest Information Center, Sonoma State University.
- Roop, W. 1993. Final Report: A Cultural Resources Evaluation of the Cotati Creek Channel Improvement Project. Document S-15565 on file at the Northwest Information Center, Sonoma State University.
- Rumph, L. 1978. An Archaeological Survey of the Weber Property, 6000 Locust Avenue, Cotati, California, County File #MS 6343. Document S-826 on file at the Northwest Information Center, Sonoma State University.
- Rumph, L. 1978. An Archaeological Survey of the Klink Property, Poplar Avenue, Cotati, California, County File Number MS 5456. Document S-827 on file at the Northwest Information Center, Sonoma State University.
- Solari, E-M. 1992. Letter report to Rob O’Neill regarding an Evaluation of Archaeological Sites CA-SON-1705H, 1706H, and 1748H. Document S-14186 on file at the Northwest Information Center, Sonoma State University.
- Steen, E. and T. Origer. 2005. A Cultural Resources Survey for the Habitat for Humanity Project 20 Woodland Hills Drive, Cotati, Sonoma County, California. Report on file at the Northwest Information Center, Sonoma State University.
- Stewart, S. 1989. Test Excavations and Evaluations of CA-SON-1795 Stony Point Road Reconstruction Project Sonoma County, California. Document S-11957 on file at the Northwest Information Center, Sonoma State University.

- Stradford, R. 1975. Archaeological Survey Report of a Land Parcel Adjacent to Park Avenue near Cotati, Sonoma County, California. Document S-157 on file at the Northwest Information Center, Sonoma State University.
- Strother, E. 1999. A Cultural Resources Evaluation of the Property at 8861 Cypress Avenue, Cotati, Sonoma County, MNS 98-0044. Document S-21446 on file at the Northwest Information Center, Sonoma State University.
- Thompson, N. 1978. Archaeological Survey of the Proposed Asher Estates Subdivision, Cotati, California. Document S-903 on file at the Northwest Information Center, Sonoma State University.
- Upson, W. 1973. The Gossage-Washoe Archaeological Project: Excavations at SDA-30A and 4-Son-518. Document S-279 on file at the Northwest Information Center, Sonoma State University.
- Van Dusen, W. 1977. An Archaeological Survey of Three Dam Sites for the Rohnert Park Land Disposal Project, Sonoma County, California. Document S-636 on file at the Northwest Information Center, Sonoma State University.
- Watts, D. 1979. Archaeological Survey Report 04-Son-101 P.M. 2.9/19.6 Proposed Landscaping Improvements along Route 101, Sonoma County 04223 – 380351. Document S-2280 on file at the Northwest Information Center, Sonoma State University.
- Watts, D. 1980. Archaeological Reconnaissance Report, 04-Son-101, 12.7, Proposed Construction of Fringe Parking Lot for Car Pool Use, Cotati, Sonoma County. Document S-2165 on file at the Northwest Information Center, Sonoma State University.
- Wilson, K. 1999. Letter report to Laurie Kochain regarding a Review of Historic Resources for site SF-434-02, 900 Railroad Avenue, Cotati, Sonoma County, California. Document S-21723 on file at the Northwest Information Center, Sonoma State University.

## 9.2 BIOLOGICAL RESOURCES

This section describes biological resources in the Planning Area from both a qualitative and quantitative perspective. The results of this assessment may be used in planning and management decisions that may affect biological resources in the Planning Area.

### KEY TERMS

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The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

**Hydric Soils.** One of the three wetland identification parameters, according to the federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

**Hydrophytic Vegetation.** Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

**Sensitive Natural Community.** A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, are structurally complex, or are in other ways of special concern to local, state, or federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Game (CDFG) tracks sensitive natural communities in the California Natural Diversity Database (CNDDDB).

**Special-Status Species.** Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term "special status" includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- State listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the CDFG as a species of concern (USFWS), rare (CDFG), or of special concern (CDFG);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);



- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik 1994).

**Waters of the U.S.** The federal government defines waters of the U.S. as "lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows" [33 C.F.R. §328.3(a)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

**Wetlands.** Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The federal government defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Wetlands require wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to waters of the U.S.

## REGULATORY SETTING

There are a number of regulatory agencies whose responsibility includes the oversight of the natural resources of the state and nation including the CDFG, USFWS, USACE, and the National Marine Fisheries Service. These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the federal, state and local regulations that are applicable to implementing the General Plan.

### *FEDERAL REGULATIONS*

#### **Federal Endangered Species Act**

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a "take" unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

#### **Migratory Bird Treaty Act**

To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

### **Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act (16 USC Section 668) protect these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews federal agency actions that may affect these species.

### **Clean Water Act – Section 404**

Section 404 of the CWA regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §323.2(f)].

Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows [33 C.F.R. §328.3(a)]. Wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” [33 C.F.R. §328.3(b)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” [33 C.F.R. §328.3(e)].

The USACE is the agency responsible for administering the permit process for activities that affect waters of the U.S. Executive Order 11990 is a federal implementation policy, which is intended to result in no net loss of wetlands.

### **Clean Water Act – Section 401**

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the water quality certification, the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the state.

### **Department of Transportation Act - Section 4(f)**

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

*It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state,*

*or local significance, or land of a historic site of national, state, or local significance (as determined by the Federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.*

#### STATE REGULATIONS

### **Fish and Game Code §2050-2097 - California Endangered Species Act**

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

### **Fish and Game Code §1900-1913 California Native Plant Protection Act**

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the state. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFG 10 days in advance of approving a building site.

### **Fish and Game Code §3503, 3503.5, 3800 - Predatory Birds**

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called "raptors," are protected. The law indicates that it is unlawful to take, possess, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

### **Fish and Game Code §1601-1603 – Streambed Alteration**

Under the California Fish and Game Code, CDFG has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a "Streambed Alteration Agreement" from CDFG prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFG may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements are usually initiated through the local CDFG warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

### **Public Resources Code § 21000 - California Environmental Quality Act**

The California Environmental Quality Act (CEQA) identifies that a species that is not listed on the federal or state endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e. candidate, or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of “Species of Special Concern,” developed by the CDFG. Additionally, the California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

### **Public Resources Code § 21083.4 - Oak woodlands conservation**

In 2004, the California legislature enacted SB 1334, which added oak woodland conservation regulations to the Public Resources Code. This new law requires a County to determine whether a project, within its jurisdiction, may result in a conversion of oak woodlands that will have a significant effect on the environment. If a County determines that there may be a significant effect to oak woodlands, the County must require oak woodland mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining an appropriate number of replacement trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the County.

### **California Oak Woodland Conservation Act**

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California’s oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the state.

### **California Wetlands Conservation Policy**

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

### *LOCAL*

#### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to biological resources:

#### **1.5.2 The City shall encourage the clustering of residential units to preserve the continuity of open space, protect environmental features, enhance visual amenities, and insure public safety.**

- a) The Zoning Ordinance, Subdivision Regulations and Design Review Criteria shall continue to allow higher density residential clustered development.

#### **7.2.2 All new developments in the city shall be designed to minimize vegetation removal, soil compaction, and site coverage.**

- a) Through the Zoning Ordinance, the City shall establish standards to be followed by developers which specify maximum permissible vegetation removal, soil compaction, and site coverage. There shall be on-site inspections by the Building Inspector to ensure compliance.

#### **7.2.3 Adequate drainage and erosion control shall be provided during construction of all new developments.**

- a) As part of the permit process, developers shall be required to follow drainage and erosion standards established by the City Engineer and Sonoma County Water Agency for all developments. There shall be an on-site inspection by the City to ensure compliance.

#### **9.2.3 A deciduous tree program that does not interfere with solar access, and is located on the park strip, shall be required in all new development.**

- a) The Subdivision Regulations shall be amended to require that new streets, or developments along existing streets, include an approved shade tree program. The Design Review Committee shall review plans for compliance.
- b) Applications for single family homes shall require participation in this program.

#### **9.2.4 Encourage private sector participation in tree planting.**

- a) The City shall adopt a landscape and tree ordinance that will give preference to native and drought tolerant species and which includes guidelines and standards to preserve and protect historic trees. The Planning Department shall review and revise as necessary.

b) The City Council shall establish, with the help of civic and social groups, and in conjunction with local nurseries, an annual tree planting day.

### **9.5.2 Drought-tolerant and native plants shall be encouraged for use in landscaping.**

a) Amend the Subdivision Regulations and Design Review Criteria to include a list of drought-tolerant and native plants appropriate for use in Cotati. Adherence to this list in new development and other projects requiring design approval will be reviewed by the Design Review Committee.

### **12.1.5 Preserve agricultural use on lands designated as rural within the City of Cotati land use map, primarily in the western and southern sections of the City.**

a) Encourage cluster development to preserve agricultural uses in rural designated properties.

### **13.1.1 Open space land shall be protected from development. (See map 8).**

a) The City Planning Department shall work with the Sonoma County Planning Department to ensure that environmentally sensitive lands in the Cotati sphere of influence are zoned appropriately as agricultural preserves, parks, and other limited development or recreational uses.

### **13.1.4 Cotati's creeks and other biotic resources shall be protected from erosion, pollution and filling.**

a) Through the environmental review process, developments will be prohibited that erode, pollute or fill creeks, or significantly impact other biotic resources. The Planning Department shall review plans to ensure adherence to this regulation.

### **13.1.5 Culverts and other types of stormwater swales discharging into Cotati's creeks shall be designed to prevent erosion of the natural bed and bank material.**

a) Public Works Staff, working with the Sonoma County Water Agency and the City Engineer, shall determine which facilities are in need of repair and establish a timetable to complete the work. Public Works shall monitor the swales which flow into the creeks to ensure erosion is not a problem.

### **13.1.6 Protect Cotati's ridgelines (hill tops and steep hillsides) from erosion, slope failure and development. (See map 1).**

a) The Zoning Ordinance shall be amended so as to prohibit development of structures extending above the perceived skyline of the hills. The Design Review Committee shall monitor compliance.

### **13.4.1 Continue a no tree cutting policy throughout Cotati, except when a permit has been obtained.**

a) Continue implementing the City of Cotati Tree Protection Ordinance. The City Staff will monitor through a tree cutting permit process.

b) The City shall periodically undertake a citywide notification program to notify the citizen's of Cotati and tree surgeons doing business within the city limits on the City's tree cutting policy.

### **13.4.5 Protect native trees.**

a) Require tree replacement of native trees at a 3:1 ratio.

b) During the planning process, discourage the loss of native trees.

**15.2.3 The natural paths of creeks should not be disrupted as a consequence of development.**

- a) Channelization of creeks shall be prohibited unless deemed necessary for flood control in already developed areas. The Planning Department and City Engineer shall monitor all plans for development to insure compliance.
- b) Design Review Criteria shall be prepared to require that creeks, trees, views and features unique to the site be preserved and incorporated into design proposals. The Design Review Committee shall insure that new development meets this criteria.

**Cotati Creek Critters**

Cotati Creek Critters (CCC) is a grassroots citizens' group working to restore a section of the upper reach of the Laguna de Santa Rosa that runs through Cotati and a small section of Rohnert Park. CCC began as an all-volunteer group in 1998, and in 2005, they received a grant from the California Department of Water Resources to involve the local community in planting native trees and shrubs along a one-mile section of the Laguna de Santa Rosa. Over 2,000 volunteers and many partners, collaborators and supporters were involved in planting, caring for the plants and raising awareness. The volunteer group has included people of all ages from three year olds (the Cotati Co-op Nursery School) to high school students, to students from Santa Rosa Junior College (SRJC) and Sonoma State University (SSU), to professionals and retired people, and a range of community groups.

**Laguna de Santa Rosa Foundation**

The Laguna Foundation was formed in 1989 and incorporated as a tax-exempt nonprofit organization the following year. From 1990 to 2002 a volunteer group implemented small restoration projects, and actively participated in public policy dialogue concerning the Laguna. The volunteer effort included providing comments on policy issues, convening stakeholders to develop a Coordinated Resource Management Plan, and developing an educational program. In 2002 the Laguna Foundation hired staff to expand the education program and pursue larger restoration projects.

**ENVIRONMENTAL SETTING**

The City of Cotati is located in Sonoma County, California approximately 20 miles east of the Pacific Ocean, and 45 miles north of San Francisco. The Cotati city limits encompass approximately 1,217 acres. There is little biological diversity within the city limits, which is limited to agriculture (63 acres), annual grassland (87 acres), and freshwater emergent wetland (2 acres). Approximately 1,064 acres of the City is developed (87 percent).

The City's Sphere of Influence covers an additional 1,010 acres, of which approximately 646 acres are developed (64 percent). There is slightly more biological diversity within the Sphere of Influence, relatively speaking, which has agriculture (85 acres), annual grassland (279 acres), and freshwater emergent wetland (<1 acre).

The climate is mild with average high temperatures ranging from 58-83 degrees Fahrenheit (F), and average lows ranging from 38-52. The average annual precipitation is 25 inches, most of which comes in the form of winter rain. Summer coastal fog often reaches Cotati through the coastal valleys to the west.

**Geomorphic Provinces**

California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique,

defining features based on geology, faults, topographic relief and climate. These geomorphic provinces are remarkably diverse. They provide spectacular vistas and unique opportunities to learn about earth's geologic processes and history. (California Department of Conservation, 2002). The City of Cotati is located in portions of the Coast Range and Great Valley geomorphic provinces of California.

**Coast Ranges:** The Coast Ranges are northwest-trending mountain ranges (2,000 to 4,000, occasionally 6,000 feet elevation above sea level), and valleys. The ranges and valleys trend northwest, subparallel to the San Andreas Fault. Strata dip beneath alluvium of the Great Valley. To the west is the Pacific Ocean. The coastline is uplifted, terraced and wave-cut. The Coast Ranges are composed of thick Mesozoic and Cenozoic sedimentary strata. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The northern Coast Ranges are dominated by irregular, knobby, landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Pt. Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands. (California Department of Conservation, 2002).

### Bioregions

The City of Cotati county is located within the Bay Area/Delta bioregion. A brief description of the Bay Area/Delta bioregion is presented below.

**Bay Area/Delta Bioregion:** The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras counties. The bioregion is bounded by the Klamath/North Coast on the north and the Central Coast Bioregion to the south. The Bay Area/Delta Bioregion is one of the most populous areas of the state, encompassing the San Francisco Bay Area and the Sacramento-San Joaquin River Delta. The water that flows through the Delta supplies two-thirds of California's drinking water, irrigating farmland, and sustaining fish and wildlife and their habitat. The bioregion fans out from San Francisco Bay in a jagged semi-circle that takes in all or part of 12 counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, and parts of Sacramento, and Yolo. The habitats and vegetation of the Bay Area/Delta Bioregion are as varied as the geography.

### CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM

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The California Wildlife Habitat Relationship (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988, the classification scheme had 53 habitats. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

According to the California Wildlife Habitat Relationship System there are four cover types (wildlife habitat classifications) in the City of Cotati out of 59 found in the state. These include: Agricultural, Annual Grassland, Fresh Emergent Wetland, and Urban. An additional three cover types are located in the vicinity, but outside the City Sphere of Influence. These include: Barren, Eucalyptus, and Riverine. Table 9.2-1 identifies the total area by acreage for each cover type (wildlife habitat classification) found



in the City of Cotati. Figure 9.2-1 illustrates the location of each cover type (wildlife habitat classification) within the City of Cotati. A brief description of each cover type follows.

**TABLE 9.2-1: COVER TYPES - CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM**

Cover Types	Acres within City	Acres within SOI	Acres with UGB
Agriculture	63.46	148.89	324.75
Annual Grassland	87.29	366.01	523.17
Freshwater Emergent Wetland	1.97	2.47	2.47
Urban	1064.80	1710.29	1723.56
<b>Total Acres</b>	<b>1217.53</b>	<b>2227.66</b>	<b>2573.95</b>

SOURCE: SOURCE: CASIL GIS DATA, 2011, CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM, 2011

## Developed

**Agricultural** land may be defined broadly as land used primarily for production of food and fiber. This habitat can generally be broken into the following categories: cropland, dryland grain crops, irrigated grain crops, irrigated hayfield, irrigated row and field crops, rice, orchard - vineyard, deciduous orchard, evergreen orchard, and vineyard. On satellite imagery, the chief indications of agricultural activity are distinctive geometric field and road patterns on the landscape and the traces produced by livestock or mechanized equipment. However, pasture and other lands where such equipment is used infrequently may not show as well-defined shapes as other areas. The number of building complexes is smaller and the density of the road and highway network is much lower in Agricultural land than in Urban land.

**Urban** habitats are not limited to any particular physical setting. Three urban categories relevant to wildlife are distinguished: downtown, urban residential, and suburbia. The heavily-developed downtown is usually at the center, followed by concentric zones of urban residential and suburbs. There is a progression outward of decreasing development and increasing vegetative cover. Species richness and diversity is extremely low in the inner cover. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species.

## Herbaceous

**Annual Grassland** habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost free season averages 250 to 300 days (18 to 21 fortnights). Annual precipitation is highest in northern California.

**Fresh emergent wetland** habitats occur on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed. In some areas organic soils (peat) may constitute the primary growth medium. Climatic conditions are highly variable and range from the extreme summer heat to winter temperatures well below freezing.

## Other Habitats in the Vicinity of Cotati

**Barren** habitat is defined by the absence of vegetation. Any habitat with <2% total vegetation cover by herbaceous, desert, or nonwildland species and <10% cover by tree or shrub species is defined this way.

The physical settings for permanently barren habitat represent extreme environments for vegetation. An extremely hot or cold climate, a near-vertical slope, an impermeable substrate, constant disturbance by either human or natural forces, or a soil either lacking in organic matter or excessively saline can each contribute to a habitat being inhospitable to plants.

**Eucalyptus** habitats have been extensively planted throughout the state since their introduction in 1856. They are found in highly variable site characteristics, but generally on relatively flat or gently rolling terrain, occasionally in the foothills. Climatic conditions are typically Mediterranean, characterized by hot, dry summers and cool, mild winters. Precipitation ranges from approximately 12 to 24 inches. Temperature regimes range from a 43 F to 73 F.

**Riverine** habitats can occur in association with many terrestrial habitats. Riparian habitats are found adjacent to many rivers and streams. Riverine habitats are also found contiguous to lacustrine and fresh emergent wetland habitats. This habitat requires intermittent or continually running water generally originating at some elevated source, such as a spring or lake, and flows downward at a rate relative to slope or gradient and the volume of surface runoff or discharge. Velocity generally declines at progressively lower altitudes, and the volume of water increases until the enlarged stream finally becomes sluggish. Over this transition from a rapid, surging stream to a slow, sluggish river, water temperature and turbidity will tend to increase, dissolved oxygen will decrease and the bottom will change from rocky to muddy.

**SPECIAL-STATUS SPECIES**

The following discussion is based on a background search of special-status species that are documented in the CNDDb, the CNPS Inventory of Rare and Endangered Plants, and the USFWS endangered and threatened species lists. The background search was regional in scope and focused on the documented occurrences within 10 miles of the City of Cotati.

**Special Status Plants**

The search revealed documented occurrences of the 51 special status plant species (including one non-vascular plant) within 10 miles of the City of Cotati. Table 9.2-2 provides a list of special-status plant species that are documented within 10 miles of the City of Cotati, their habitat, and current protective status. Figure 9.2-2 illustrates the special status species located within one mile of the City of Cotati. Figure 9.2-3 illustrates the special status species located within 10 miles of the City of Cotati.

<b>TABLE 9.2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COTATI</b>		
<b>Species</b>	<b>Status</b>	<b>Habitat</b>
<b>Plants</b>		
<i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion	--;--;1B	Cismontane woodland, valley and foothill grassland. Clay soils; often on serpentine. Dry hillsides. 100-300M.
<i>Alopecurus aequalis</i> var. <i>sonomensis</i> Sonoma alopecurus	FE;--;1B	Freshwater marshes and swamps, riparian scrub. Wet areas, marshes, and riparian banks with other wetland species. 5-360M.
<i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo	--;--;1B	Broadleaved upland forest, chaparral, cismontane woodland. Openings in forest or woodland or in chaparral. 150-2000M
<i>Amsinckia lunaris</i> bent-flowered fiddleneck	--;--;1B	Cismontane woodland, valley and foothill grassland. 50-500M.

**TABLE 9.2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COTATI**

Species	Status	Habitat
<i>Astragalus tener</i> var. <i>tener</i> alkali milk-vetch	--;--;1B	Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 1-170M.
<i>Arctostaphylos canescens</i> ssp. <i>sonomensis</i> Sonoma canescent manzanita	--;--;1B	Chaparral, lower montane coniferous forest. Sometimes found on serpentine. 180-1700M.
<i>Arctostaphylos densiflora</i> Vine Hill manzanita	--;CE;1B	Chaparral. Acid marine sand. 50-100M.
<i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> Rincon Ridge manzanita	--;--;1B	Chaparral. Highly restricted endemic to red rhyolites in Sonoma County. 75-310M.
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> Big-scale balsamroot	--; --;1B	Chaparral, cismontane woodland, and valley and foothill grassland (Open, grassy slopes, and valleys, sometimes on serpentine soils)
<i>Blennosperma bakeri</i> Sonoma sunshine	FE;CE;1B	Vernal pools, valley and foothill grassland. Vernal pools and swales. 10-100M.
<i>Brodiaea californica</i> var. <i>leptandra</i> narrow-anthered California brodiaea	--;--;1B	Broadleaved upland forest, chaparral, lower montane coniferous forest. 110-915M.
<i>California macrophylla</i> round-leaved filaree	--;--;1B	Cismontane woodland, valley and foothill grassland. Clay soils. 15-1200M.
<i>Campanula californica</i> swamp harebell	--;--;1B	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, freshwater marsh, N. Coast coniferous forest. Bogs and marshes in a variety of habitats; uncommon where it occurs. 1-405M.
<i>Carex albida</i> white sedge	FE;CE;1B	Freshwater marsh, bogs and fens, meadows and seeps. Wet meadow and marshes. 35-55M.
<i>Ceanothus confusus</i> Rincon Ridge ceanothus	--;--;1B	Closed-cone coniferous forest, chaparral, cismontane woodland. Known from volcanic or serpentine soils, dry shrubby slopes. 75-1065M.
<i>Ceanothus divergens</i> Calistoga ceanothus	--;--;1B	Chaparral, cismontane woodland. Rocky, serpentine or volcanic sites. 165-950M.
<i>Ceanothus foliosus</i> var. <i>vineatus</i> Vine Hill ceanothus	--;--;1B	Chaparral. Sandy, acidic soil in chaparral. 45-85M.
<i>Ceanothus masonii</i> Mason's ceanothus	--;CR;1B	Chaparral. Serpentine ridges or slopes in chaparral or transition zone. 180-460M.
<i>Ceanothus purpureus</i> holly- leaved ceanothus	--;--;1B	Chaparral. Rocky, volcanic slopes. 120-640M.
<i>Ceanothus sonomensis</i> Sonoma ceanothus	--;--;1B	Chaparral. Sandy, serpentine or volcanic soils. 210-800M.

**TABLE 9.2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COTATI**

Species	Status	Habitat
<i>Centromadia parryi</i> ssp. <i>parryi</i> pappose tarplant	--;--;1B	Coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernal mesic, often alkaline sites. 2-420M.
<i>Chorizanthe valida</i> Sonoma spineflower	FE;CE;1B	Coastal prairie. Sandy soil. 10-50M.
<i>Delphinium bakeri</i> Baker's larkspur	FE;CE;1B	Coastal scrub, grasslands. Only occurs on NW-facing slope, on decomposed shale. Historically known from grassy areas along fence lines too. 90-205M.
<i>Delphinium luteum</i> golden larkspur	FE;CR;1B	Chaparral, coastal prairie, coastal scrub. North-facing rocky slopes. 0-100M.
<i>Downingia pusilla</i> dwarf downingia	--;--;2	Valley and foothills grasslands (mesic sites), vernal pools. Erna Lake and pool margins with a variety of associates. In several types of vernal pools. 1-485M.
<i>Erigeron greenei</i> Greene's narrow-leaved daisy	--;--;1B	Chaparral. Serpentine and volcanic substrates, generally in shrubby vegetation. 75-1060M.
<i>Fritillaria liliacea</i> fragrant fritillary	--;--;1B	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; various soils reported though usually clay, in grassland. 3-410M.
<i>Gilia capitata</i> ssp. <i>tomentosa</i> woolly-headed gilia	--;--;1B	Coastal bluff scrub. Rocky outcrops on the coast. 15-155M.
<i>Hemizonia congesta</i> ssp. <i>congesta</i> seaside tarplant	--;--;1B	Coastal scrub, valley and foothill grassland. Grassy valleys and hills, often in fallow fields. 25-200M.
<i>Horkelia tenuiloba</i> thin-lobed horkelia	--;--;1B	Coastal scrub, chaparral. Sandy soils; mesic openings. 45-500M.
<i>Lasthenia burkei</i> Burke's goldfields	FE;CE;1B	Vernal pools, meadows and seeps. Most often in vernal pools and swales. 15-580M.
<i>Lasthenia californica</i> ssp. <i>bakeri</i> Baker's goldfields	--;--;1B	Closed-cone coniferous forest, coastal scrub. Openings. 60-520M.
<i>Lasthenia conjugens</i> Contra Costa goldfields	FE;--;1B	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; Extremely endangered. Vernal pools, swales, low depressions, in open grassy areas. 1-445M.
<i>Legenere limosa</i> legenere	--; --;1B	Vernal pools. Many historical occurrences are extirpated. In beds of vernal pools. 1-880M.
<i>Leptosiphon jepsonii</i> Jepson's leptosiphon	--;--;1B	Chaparral, cismontane woodland. Open to partially shaded grassy slopes. On volcanic or the periphery of serpentine substrates. 100-500M.
<i>Lilium pardalinum</i> ssp. <i>pitkinense</i> Pitkin Marsh lily	FE;CE;1B	Cismontane woodland, meadows and seeps, freshwater marsh. Saturated, sandy soils w/ grasses and shrubs. 35-65M.
<i>Limnanthes vinculans</i> Sebastopol meadowfoam	FE;CE;1B	Mesic meadows, vernal pools, valley and foothill grassland. Swales, wet meadows and marshy areas in valley oak savanna; on poorly drained soils of clay and sandy loam. 15-115M.

**TABLE 9.2-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN COTATI**

Species	Status	Habitat
<i>Microseris paludosa</i> marsh microseris	--;--;2	Closed-cone coniferous forest cismontane woodland, coastal scrub, valley and foothill grassland. 5-300M.
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	--;--;1B	Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales, adobe or alkaline soils. 5-950M.
<i>Plagiobothrys mollis</i> var. <i>vestitus</i> Petaluma popcorn-flower	--;--;1A	Presumed extinct. Valley and foothill grassland, coastal salt marsh. Wet sites in grassland, possibly coastal marsh margins. 10-50M.
<i>Pleuropogon hooverianus</i> North Coast semaphore grass	--;CT;1B	Broadleaved upland forest, meadows and seeps, north-coast coniferous forest. Wet grassy, usually shady areas, sometimes freshwater marsh; associated with forest environments. 10-1150M.
<i>Potentilla uliginosa</i> Cunningham Marsh cinquefoil	--;--;1A	Presumed extinct. Freshwater marshes and swamps. Found in oligotrophic wetlands.30-40 M.
<i>Rhynchospora californica</i> California beaked-rush	--;--;1B	Bogs and fens, marshes and swamps, lower montane coniferous forest, meadows and seeps. Freshwater seeps and open marshy areas. 45-1000M.
<i>Rhynchospora capitellata</i> brownish beaked-rush	--;--;2	Lower montane coniferous forest, meadows and seeps, marshes and swaps, upper montane coniferous forest. Mesic sites. 455-2000M.
<i>Rhynchospora globularis</i> var. <i>globularis</i> round-headed beaked-rush	--;--;2	Marshes and swamps, freshwater marsh. 45-60M.
<i>Sidalcea calycosa</i> ssp. <i>rhizomata</i> Point Reyes checkerbloom	--;--;1B	Marshes and swamps. Freshwater marshes near the coast. 5-75(245)M.
<i>Sidalcea oregana</i> ssp. <i>valida</i> Kenwood Marsh checkerbloom	FE;CE;1B	Marshes and swamps. Edges of freshwater marshes. 115-150M.
<i>Triquetrella californica</i> coastal triquetrella	--;--;1B	Coastal bluff scrub, coastal scrub, valley and foothill grasslands. Grows within 30 M from the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, and rocky slopes.
<i>Trifolium amoenum</i> showy rancheria clover	FE;--;1B	Valley and foothill grassland, coastal bluff scrub. Sometimes on serpentine soil, open sunny sites, swales. Most recently sited on roadside and eroding cliff face. 5-560M.
<i>Trifolium hydrophilum</i> saline clover	--;--;1B	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0-300M.
<i>Viburnum ellipticum</i> oval-leaved viburnum	--;--;2	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1400M.

SOURCE: DFG CNDDDB 2011

ABBREVIATIONS:

- FE FEDERAL ENDANGERED
- FT FEDERAL THREATENED
- CE CALIFORNIA ENDANGERED SPECIES
- CT CALIFORNIA THREATENED

## 9 CONSERVATION AND NATURAL RESOURCES

CR	CALIFORNIA RARE (PROTECTED BY NATIVE PLANT PROTECTION ACT)
1B	CNPS - RARE, THREATENED, OR ENDANGERED
2	CNPS - RARE, THREATENED, OR ENDANGERED IN CALIFORNIA, BUT MORE COMMON ELSEWHERE
4	CNPS - PLANTS OF LIMITED DISTRIBUTION - A WATCH LIST

### Special Status Animals

The search revealed documented occurrences of the 26 special status animal species within 10 miles of the City of Cotati. This includes: three amphibians, eight birds, two fish, eight invertebrates, four mammals, and one reptile. Table 9.2-3 provides a list of the special-status animal species that are documented within 10 miles of the City of Cotati, their habitat, and current protective status; these species are considered present or potentially present in Cotati. Figure 9.2-3 illustrates the location of each occurrence documented by the CNDDDB.

TABLE 9.2-3: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN COTATI		
Species	Status	Habitat
<b>Amphibians</b>		
<i>Ambystoma californiense</i> California tiger salamander	FT/CT	Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.
<i>Rana aurora draytoni</i> California red-legged frog	FT/CSC	Permanent and semi-permanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May estivate in rodent burrows or cracks during dry periods.
<i>Rana boylei</i> foothill yellow-legged frog	FSC;CSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying. Need at least 15 weeks to attain metamorphosis.
<b>Birds</b>		
<i>Agelaius tricolor</i> tricolored blackbird	FSC;CSC	Highly colonial species, most numerous in central valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.
<i>Athene cuniculari</i> Burrowing owl	FSC; CSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
<i>Coccyzus americanus occidentalis</i> Western yellow-billed cuckoo	FSC/FC; CE	Nesting restricted to river bottoms and other mesic habitats where humidity is high.
<i>Elanus leucurus</i> white-tailed kite	MBTA; CP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated dense-topped trees for nesting and perching.
<i>Geothlypis trichas sinuosa</i> saltmarsh common yellowthroat	FSC; CSC	Resident of the San Francisco Bay region, in fresh and saltwater marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.
<i>Laterallus jamaicensis coturniculus</i> California black rail	--/CT	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations
<i>Melospiza melodia samuelis</i> San Pablo song sparrow	--; CSC	Resident of salt marshes along the north side of San Francisco and San Pablo Bays. Inhabits tidal sloughs in the salicornia marshes; nests in grindelia bordering slough channels.

**TABLE 9.2-3: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN COTATI**

Species	Status	Habitat
<i>Rallus longirostris obsoletus</i> California clapper rail	FE;CE	Salt-water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.
<b>Fish</b>		
<i>Pogonichthys macrolepidotus</i> Sacramento splittail	--/CSC	Endemic to the lakes and rivers of the central valley, but now confined to the Delta, Suisun Bay and associated marshes. Slow moving river sections, dead end sloughs. Requires flooded vegetation for spawning and foraging for young.
<i>Oncorhynchus mykiss irideus</i> steelhead - central California coast DPS	FT/--	From Russian River, south to Soquel Creek and to, but not including, Pajaro River. Also San Francisco and San Pablo Bay basins.
<b>Invertebrates</b>		
<i>Andrena blennospermatis</i> Blennosperma vernal pool andrenid bee	--;--	This bee is oligolectic on vernal pool blennosperma. Bees nest in the uplands around vernal pools.
<i>Caecidotea tomalensis</i> Tomales isopod	--;--	Inhabits localized fresh-water ponds or streams with still or near-still water in several Bay Area Counties.
<i>Hydrochara rickseckeri</i> Ricksecker's water scavenger beetle	--;--	Aquatic.
<i>Hydroporus leechi</i> Leech's skyline diving beetle	--;--	Aquatic.
<i>Lindleriella occidentalis</i> California lindleriella	--;--	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity, conductivity, and TDS.
<i>Syncaris pacifica</i> California freshwater shrimp	FE;FE	Shallow Pools away from main streamflow. Winter: undercut banks w/exposed roots. Summer: leafy branches touching water. Endemic to Marin, Napa, and Sonoma Counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy.
<i>Speyeria zerene myrtleae</i> Myrtle's silverspot	FE;--	Restricted to the foggy, coastal dunes/hills of the Point Reyes Peninsula; extirpated from coastal San Mateo County. Larval foodplant thought to be <i>Viola adunca</i> .
<i>Tryonia imitator</i> mimic tryonia (=California brackishwater snail)	--;--	Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County. Found only in permanently submerged areas in a variety of sediment types; able to withstand a wide range of salinities.
<b>Mammals</b>		
<i>Arborimus pomo</i> Sonoma tree vole	--;CSC	North coast fog belt from Oregon border to Sonoma Co. in Douglas-fir, redwood and montane hardwood-conifer forests. Fees almost exclusively on Douglas-fir needles. Will occasionally take needles or grand-fir, hemlock or spruce.
<i>Antrozous pallidus</i> Pallid bat	--;CSC	Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts
<i>Reithrodontomys raviventris</i>	FE;CE	Only in saline emergent wetlands of San Francisco Bay and its

**TABLE 9.2-3: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN COTATI**

Species	Status	Habitat
salt-marsh harvest mouse		tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.
<i>Taxidea taxus</i> American badger	--;CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Need sufficient food, friable soils and open, uncultivated ground. Prey on burrowing rodents. Dig burrows.
<b>Reptiles</b>		
<i>Actinemys marmorata</i> western pond turtle	--;CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.

SOURCE: DFG CNDDDB 2011

**ABBREVIATIONS:**

- FE FEDERAL ENDANGERED
- FT FEDERAL THREATENED
- FC FEDERAL CANDIDATE
- FSC FEDERAL SPECIES OF CONCERN
- FD FEDERAL DELISTED
- MBTA PROTECTED BY MIGRATORY BIRD TREATY ACT
- CE CALIFORNIA ENDANGERED SPECIES
- CT CALIFORNIA THREATENED
- CP CALIFORNIA FULLY PROTECTED UNDER §3511, 4700, 5050 AND 5515 FG CODE
- CSC CDFG SPECIES OF SPECIAL CONCERN

**Sensitive Natural Communities**

The search revealed 16 documented occurrences of the five sensitive natural communities within 10 miles of the City of Cotati. This includes Coastal and Valley Freshwater March, Coastal Brackish Marsh, Northern Hardpan Vernal Pool, Northern Vernal Pool, and Valley Needlegrass Grassland. Of these 16 documented occurrences, none are located within the Urban Growth Boundary for the City of Cotati. A brief description of each sensitive natural community follows. Figure 9.2-3 illustrates the location of each sensitive natural community.

**Coastal and Valley Freshwater Marsh.** Coastal and Valley Freshwater Marsh is found along the coast and in coastal valleys near river mouths and around the margins of lakes and springs, and they are the most extensive in the upper portion of the Sacramento-San Joaquin River Delta. This natural community is common in the river oxbows and other areas of a flood plain. This natural community is found in areas that lack significant stream/river current and are permanently flooded by fresh water (rather than brackish, alkaline, or variable). Prolonged saturation permits accumulation of deep, peaty soils. Perennial, emergent monocots up to 4-5m tall dominate this habitat. They often form completely closed canopies. (Holland, 1986).

There are no documented occurrences of Coastal and Valley Freshwater Marsh within the City of Cotati, or its Urban Growth Boundary. While this sensitive natural community is not documented within the CNDDDB, it occurs throughout the region along the margins of creeks sometimes as small isolated marshes, and sometimes as a more expansive marsh. The more expansive marshes are generally well documented, while the smaller isolated marshes can be discovered in areas that have not been previously surveyed, which may include parcels within the Urban Growth Boundary.



**Coastal Brackish Marsh.** Coastal brackish marsh is usually at the interior edges of coastal bays and estuaries or in coastal lagoons, and adjacent to salt marshes. They are most extensive around Suisun Bay at the mouth of the Sacramento-San Joaquin Delta. This natural community is dominated by perennial, emergent, herbaceous monocots to 2m tall. Cover is often complete and dense with some plants characteristic of freshwater marsh and salt marsh. Water salinity may vary considerably, and may increase at high tide or during seasons of low freshwater runoff. (Holland, 1986).

There are no documented occurrences of Coastal Brackish Marsh within the City of Cotati, or its Urban Growth Boundary. There are several factors preclude this sensitive natural community from occurring in the City of Cotati.

**Northern Hardpan Vernal Pool.** Northern hardpan vernal pool is typically found on old, very acidic, Fe-Si cemented hardpan soils. The microrelief on these soils typically is hummocky, with mounds intervening between localized depressions. Winter rainfall perches on the hardpan, forming pools in the depressions and evaporation empties the pools in spring. Vegetation is a low, amphibious, herbaceous plant community that is dominated by annual herbs and grasses. Germination and growth begin with winter rains, often continuing even when inundated. Rising spring temperatures evaporate the pools, leaving concentric bands of vegetation that colorfully encircle the drying pool. (Holland, 1986).

There are no documented occurrences of Northern Hardpan Vernal Pool within the City of Cotati, or its Urban Growth Boundary. While this sensitive natural community is not documented within the CNDDB, it occurs throughout the region and can vary in size (small isolated vernal pools to large vernal pool complexes). The larger complexes are generally well documented, while the smaller isolated vernal pools can be discovered in areas that have not been previously surveyed, which may include parcels within the Urban Growth Boundary.

**Northern Vernal Pool.** Northern vernal pool is a general classification of vernal pools that may occur on a variety of soil types and in a variety of plant communities. Northern vernal pool can occur singly or in complexes, but requires an impervious substrate that varies from hardpan or claypan to basalt or other materials that prevent percolation of water. Winter rainfall perches on the impervious substrate, forming pools in the depressions and evaporation empties the pools in spring. Vegetation varies, but is typically low, amphibious, herbaceous plant community that is dominated by annual herbs. Germination and growth begin with winter rains, often continuing even when inundated. Rising spring temperatures evaporate the pools, leaving concentric bands of vegetation that encircle the drying pool. (Holland, 1986).

There are no documented occurrences of Northern Vernal Pool within the City of Cotati, or its Urban Growth Boundary. Similar to the Northern Hardpan Vernal Pool, the Northern Vernal Pool occurs throughout the region and can vary in size (small isolated vernal pools to large vernal pool complexes). The larger complexes are generally well documented, while the smaller isolated vernal pools can be discovered in areas that have not been previously surveyed, which may include parcels within the Urban Growth Boundary.

**Valley Needlegrass Grassland.** Valley Needlegrass Grassland is a mid-height (to 2 feet) grassland dominated by perennial, tussock-forming purple needlegrass (*Nassella pulchra*). Native and introduced annuals occur between the perennials, often exceeding the bunchgrasses in cover. They are usually found on fine-textured (often clay) soils, moist or even waterlogged during the winter, but very dry in the summer. Often associated with Oak Woodlands on moister, better drained sites. (Holland, 1986).

There are no documented occurrences of Valley Needle Grassland within the City of Cotati, or its Urban Growth Boundary. While Valley Needle Grassland is not documented within the CNDDDB, there are 523.17 acres of annual grassland documented within the Urban Growth Boundary, and it is not uncommon to find small patches of Valley Needle Grassland in areas that are documented as annual grassland. This sensitive natural community may be present in the Urban Growth Boundary where the ground is relatively undisturbed and has not been surveyed on foot.

### **Other Special Habitat**

**Laguna de Santa Rosa.** The Laguna de Santa Rosa is the largest freshwater wetlands complex on the northern California coast. The Laguna's fourteen-mile channel forms the largest tributary to the Russian River, draining a 254-square-mile watershed which encompasses nearly the entire Santa Rosa Plain. This includes parts of the communities of Windsor, Santa Rosa, Rohnert Park, Cotati, Forestville, and Sebastopol.

Laguna de Santa Rosa is important in maintaining water quality and flood control for the region. It provides an important overflow area for the Russian River during periods of heavy winter rain, serving as a natural holding basin which captures and slows floodwaters, easing their impact on lower Russian River communities. Additionally, Laguna de Santa Rosa provides a unique ecological system for the region. With over 30,000 acres, the Laguna provides a mosaic of creeks, open water, perennial marshes, seasonal wetlands, riparian forests, oak woodland and grassland. It is home to hundreds of species of birds, mammals, fish, amphibians, reptiles, and invertebrates. The Laguna de Santa Rosa provides habitat for a range of species, including several rare and endangered species. (Laguna de Santa Rosa Foundation, 2011).

### **REFERENCES**

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The primary sources of data referenced for this section is derived from the following:

Barbour and Major. 1988. Terrestrial vegetation of California.

California Department of Conservation. 2002. California Geological Survey, Note 36.

California Dept. of Fish and Game. 2011. "Special Animals List." Natural Diversity Database.

California Dept. of Fish and Game. 2011. "Special Plants List." Natural Diversity Database.

California Dept. of Fish and Game. 2011. "Special Vascular Plants, Bryophytes, and Lichens List." Natural Diversity Database.

California Dept. of Water Resources. 2009. California Water Plan Update 2009, North Coast Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.

California Dept. of Water Resources. 2009. California Water Plan Update 2009, San Francisco Bay Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.

California Dept. of Water Resources. 2010. Final 2010 Integrated Report (CWA Section 303(d) List / 305(b) Report).

CalWater, California Interagency Watershed Mapping Committee. 2008. California Watershed Boundary Dataset (WBD).

- City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.
- Cotati Creek Critters. 2011. <http://www.cotaticreekcritters.info/>
- Hickman, James C. 1993. Jepson Manual: Higher Plants of California.
- Holland, R.F., 1986. Preliminary descriptions of the terrestrial natural communities of California. State of California, The Resources Agency, Nongame Heritage Program, Dept. Fish & Game, Sacramento, Calif. 156 pp.
- Laguna de Santa Rosa Foundation. 2011. [http://www.lagunadesantarosa.org/foundation\\_history.htm](http://www.lagunadesantarosa.org/foundation_history.htm)
- Sawyer, John and Todd Keeler-Wolf. 1995. A Manual of California Vegetation.
- Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1987, Hydrologic Unit Maps: U.S. Geological Survey Water-Supply Paper 2294, 63 p.
- Skinner, Mark W. and Bruce M. Pavlik, Eds. 2001. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California.
- State of California, California Biodiversity Council. 2008. Interagency Natural Areas Coordinating Committee (INACC)-Working Bioregions. Website accessed May 9, 2011. [http://ceres.ca.gov/geo\\_area/bioregions/Bay\\_Delta/about.html](http://ceres.ca.gov/geo_area/bioregions/Bay_Delta/about.html).
- United States Army Corps of Engineers. 1987. Wetland Delineation Manual.

### 9.3 HYDROLOGY AND WATER QUALITY

This section addresses hydrology and water quality in the City of Cotati. The discussion of water and storm water infrastructure is located in the Community Services and Facilities section of this Background Report (Section 6).

#### REGULATORY SETTING

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##### *FEDERAL REGULATIONS*

#### **Clean Water Act (CWA)**

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). The SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for small Municipal Separate Storm Sewer Systems (MS4s) covered under the CWA to efficiently regulate numerous storm water discharges under a single permit. Permittees must meet the requirements in Provision D of the General Permit, which require the development and implementation of a Storm Water Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable. The SWMP must include the following six minimum control measures:

- 1) Public Education and Outreach on Storm Water Impacts
- 2) Public Involvement/Participation
- 3) Illicit Discharge Detection and Elimination
- 4) Construction Site Storm Water Runoff Control
- 5) Post-Construction Storm Water Management in New Development
- 6) Redevelopment and Pollution Prevention/Good Housekeeping for Municipal Operations

#### **National Pollutant Discharge Elimination System (NPDES)**

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, the ocean, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the EPA Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the Federal Clean Water Act and the Act's implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti- degradation. In general, the discharge of pollutants is to be eliminated or reduced

as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWC.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the RWQCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issues general permits for stormwater runoff from construction sites statewide. Stormwater discharges from industrial and construction activities in the North Coast Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

### *STATE REGULATIONS*

#### **California Water Code**

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

#### **Water Quality Control Plan for the Central Valley Region**

The Water Quality Control Plan for the North Coast Region (Basin Plan) includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term "water quality standards," as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The RWQCB regulates waste discharges to minimize and control their effects on the quality of the region's ground and surface water. Permits are issued under a number of programs and authorities. The terms and conditions of these discharge permits are enforced through a variety of technical, administrative, and legal means. Water quality problems in the region are listed in the Basin Plan, along

with the causes, where they are known. For water bodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan reflects, incorporates, and implements applicable portions of a number of national and statewide water quality plans and policies, including the California Water Code and the Clean Water Act.

### *LOCAL REGULATIONS*

#### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to hydrology and water quality:

##### **1.1.2 All new development within the 100-year flood plain shall be built according to Federal Flood Insurance Agency standards. (See Map 1.)**

a) The Municipal Code shall be amended to set standards that meet or exceed those set by the Federal Flood Insurance Agency for development in the flood plain. The Planning Department will evaluate and amend the standards as necessary.

b) By use of a permit process the Building Department shall enforce these standards.

##### **1.1.3 Continue efforts to eliminate flooding, by upgrading and expanding the storm drainage system.**

a) Work with the Sonoma County Water Agency to expand flood channels.

b) Unimproved drainage may be maintained on a periodic basis by Public Works.

##### **7.2.1 New development or governmental action shall not compound the potential for flooding. (See map 1)**

a) As part of the permit process, developers shall be required to make hydrological studies for all new developments as required by the City Engineer. Studies shall encompass the project site as well as the entire drainage area.

##### **7.2.2 All new developments in the city shall be designed to minimize vegetation removal, soil compaction, and site coverage.**

a) Through the Zoning Ordinance, the City shall establish standards to be followed by developers which specify maximum permissible vegetation removal, soil compaction, and site coverage. There shall be on-site inspections by the Building Inspector to ensure compliance.

##### **7.2.3 Adequate drainage and erosion control shall be provided during construction of all new developments.**

a) As part of the permit process, developers shall be required to follow drainage and erosion standards established by the City Engineer and Sonoma County Water Agency for all developments. There shall be an on-site inspection by the City to ensure compliance.

##### **7.3.3 Remedial measures are to be employed to reduce erosion.**

a) When a change in natural grade or removal of existing vegetation is necessary, appropriate vegetative cover to stabilize slopes and reduce erosion will be required. This shall be accomplished through the permit and design review process.

**9.5.1 Promote water conservation among residential and commercial water users.**

a) The Public Works Staff shall establish a water consumption budget for each type of structure depending on size and use, and maintain two rates for water consumption, with a significantly higher rate for those customers exceeding their established budget, and a lower rate for those using less water. Adherence to this shall be monitored by the Public Works billing department.

b) The City Engineer shall develop a guide on appropriate re- use and conservation of water. This guide shall be made readily available to residents through local commercial outlets, City Hall, senior centers, churches, and through local school curriculum.

**13.1.4 Cotati's creeks and other biotic resources shall be protected from erosion, pollution and filling.**

a) Through the environmental review process, developments will be prohibited that erode, pollute or fill creeks, or significantly impact other biotic resources. The Planning Department shall review plans to ensure adherence to this regulation.

**13.1.5 Culverts and other types of stormwater swales discharging into Cotati's creeks shall be designed to prevent erosion of the natural bed and bank material.**

a) Public Works Staff, working with the Sonoma County Water Agency and the City Engineer, shall determine which facilities are in need of repair and establish a timetable to complete the work. Public Works shall monitor the swales which flow into the creeks to ensure erosion is not a problem.

**13.1.6 Protect Cotati's ridgelines (hill tops and steep hillsides) from erosion, slope failure and development. (See map 1).**

a) The Zoning Ordinance shall be amended so as to prohibit development of structures extending above the perceived skyline of the hills. The Design Review Committee shall monitor compliance.

**13.1.8 Development involving earth-moving shall not take place where excessive disruption of drainage patterns or excessive runoff will result.**

a) For all new development on hillsides, specific measures on erosion control shall be taken (e.g. berms, interceptor ditches, terraces, sediment traps) by the developer, as required and determined by the City Engineer.

**15.2.3 The natural paths of creeks should not be disrupted as a consequence of development.**

a) Channelization of creeks shall be prohibited unless deemed necessary for flood control in already developed areas. The Planning Department and City Engineer shall monitor all plans for development to insure compliance.

b) Design Review Criteria shall be prepared to require that creeks, trees, views and features unique to the site be preserved and incorporated into design proposals. The Design Review Committee shall insure that new development meets this criteria.

### **Sonoma County Water Agency**

Sonoma County Water Agency was created as a special district in 1949 by the California Legislature to provide flood protection and water supply services. The Sonoma County Water Agency currently manages and maintains a water transmission system that provides naturally filtered Russian River water to nine cities and special districts that in turn delivers drinking water to more than 600,000 residents in portions of Sonoma and Marin counties.

The Sonoma County Water Agency is responsible for providing flood protection to much of Sonoma County. They have partnered with federal agencies to build and manage a variety of flood protection projects, including Warm Springs Dam, Spring Lake, Coyote Valley Dam, Matanzas Creek Reservoir, Piner Creek Reservoir, Brush Creek Middle Fork Reservoir and Spring Creek Reservoir. They also manage a proactive stream maintenance program that maintains more than 80 miles of creeks throughout the County.

In 1995 the Sonoma County Water Agency assumed responsibility from the County of Sonoma for managing the county sanitation zones and districts, which provide wastewater collection and treatment, and recycled water distribution and disposal services for approximately 22,000 residences and businesses. The zones include Airport/Larkfield/Wikiup, Geyserville, Penngrove and Sea Ranch. The sanitation districts include the Occidental, Russian River, Sonoma Valley, and South Park County Sanitation Districts. (Sonoma County Water Agency, 2011).

## ENVIRONMENTAL SETTING

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### **Location and Climate**

The City of Cotati is located in Sonoma County, California approximately 20 miles east of the Pacific Ocean, and 45 miles north of San Francisco. The Cotati city limits encompass approximately 1,217 acres. The City's Sphere of Influence covers an additional 1,010 acres.

The climate in Cotati is mild with average high temperatures ranging from 58-83 degrees Fahrenheit (F), and average lows ranging from 38-52. The average annual precipitation is 25 inches, most of which comes in the form of winter rain. Summer coastal fog often reaches Cotati through the coastal valleys to the west.

### **Watersheds**

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special-status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State of California uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 9.3-1 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.



**TABLE 9.3-1: STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION**

Watershed Level	Approximate Square Miles (Acres)	Description
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALWATER, CALIFORNIA INTERAGENCY WATERSHED MAPPING COMMITTEE 2008

### HYDROLOGIC REGIONS

The majority of the City of Cotati is located within the North Coast Hydrologic Region. A portion of the southern part of the City of Cotati is located within the San Francisco Bay Hydrologic Region. (CalWater, 2008).

**North Coast Hydrologic Region:** The North Coast hydrologic region covers approximately 19,500 square miles and includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma counties, and small areas of Shasta, Tehama, Glenn, Colusa, and Marin counties. (California Department of Water Resources, 2009).

**San Francisco Bay Hydrologic Region:** The San Francisco Bay hydrologic region covers approximately 4,506 square miles and includes all or portions of Marin, Napa, Sonoma, Solano, San Mateo, Santa Clara, Contra Costa, Santa Cruz, and Alameda counties. (California Department of Water Resources, 2009).

### HYDROLOGIC UNITS

Within the City of Cotati there are two hydrologic units. These include the Russian and San Pablo. The majority of the City of Cotati is located in the Russian Hydrologic Unit, which covers approximately 950,249 acres. A small portion of the southern part of the City of Cotati is located in the San Pablo Hydrologic Unit, which covers approximately 785,049 acres. Figure 9.3-1 illustrates the boundaries of the Sphere of Influence and City Limits relative to the boundaries of the hydrologic units.

### HYDROLOGIC AREAS

For purposes of planning on a region-wide basis, hydrologic areas are generally considered to be the appropriate watershed planning level. As a planning area becomes smaller the hydrologic area level may be too large in terms of scale, and a hydrologic subarea may be considered more appropriate. The City of Cotati is located within 2 hydrologic subareas. These include: Upper Laguna de Santa Rosa subarea (Russian) and the Petaluma River subarea (San Pablo). Table 9.3-2 and 9.3-3 provides a breakdown of the acreages of each watershed within the City of Cotati.

**TABLE 9.3-2: WATERSHED INFORMATION--RUSSIAN**

Hydrologic Information	Description	Acres	Square Miles	Percent of Watershed
HUC8 (Catalog Unit)	Russian	950,249	1,485	100%
HUC10 (Hydrologic Area)	Mark West Creek	162,784	254	17%
HUC12 (Hydrologic Sub Area)	Upper Laguna de Santa Rosa	39,712	62	4%

SOURCE: CALWATER 2.1.1, NATIONAL RESOURCES CONSERVATION SERVICE, IWMC.

**TABLE 9.3-3: WATERSHED INFORMATION--SAN PABLO**

Hydrologic Information	Description	Acres	Square Miles	Percent of Watershed
HUC8 (Catalog Unit)	San Pablo	785,049	1,227	100%
HUC10 (Hydrologic Area)	Petaluma River - Frontal San Pablo Bay Estuaries	126,657	198	16%
HUC12 (Hydrologic Sub Area)	Petaluma River	28,711	45	4%

SOURCE: CALWATER 2.1.1, NATIONAL RESOURCES CONSERVATION SERVICE, IWMC.

## Water Quality

### IMPAIRED WATER BODIES

Section 303(d) of the federal Clean Water Act requires States to identify waters that do not meet water quality standards or objectives and thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish Water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

The City of Cotati has one water body listed on the 2010 Section 303(d) list of impaired water bodies. The Laguna de Santa Rosa is listed as a Category 5 segment, which means it is a water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment. The pollutants listed for the segment and their list date include: indicator bacteria (2008), mercury (2006), nitrogen (1992), dissolved oxygen (1990), phosphorous (1992), sedimentation/siltation (1998), and temperature (2002). The TMDL is scheduled for completion on each of these pollutants in 2012, except for mercury, which is scheduled for 2019. (Department of Water Resources, 2010).

## Water Purveyors

### SONOMA COUNTY WATER AGENCY

The City of Cotati is one of eight water contractors that have entered into a water supply agreement with the Sonoma County Water Agency for the delivery of Russian River water to its customers through a transmission system. The Water Agency's diversion facilities extract Russian River underflow, which is reported under the Water Agency's surface water rights.

The Sonoma County Water Agency's transmission system extends from the their Russian River diversion facilities located near Forestville to the Santa Rosa, Petaluma, and Sonoma valleys. The transmission system consists of over 85 miles of pipelines that range in diameter from 16 to 54 inches, seven booster pump stations, and 18 storage tanks with a combined storage capacity of 129 million gallons. The major pipelines that comprise the system are known as the Santa Rosa Aqueduct (built in 1959), the Sonoma

Aqueduct (built in 1963), the Petaluma Aqueduct (built in 1962), and the Russian River to Cotati Intertie (built in 1977). The City receives water directly from two turnouts located on the Russian River to Cotati Intertie.

Since 1999 the Sonoma County Water Agency has added a groundwater supply source to supplement the Russian River supply that it delivers to its customers, including Cotati. The Sonoma County Water Agency is expected to augment its groundwater supply source in future years to supplement the Russian River supply.

The water rights by which the City of Cotati obtains Russian River water are held by the SCWA and permitted by the California State Water Resources Control Board (SWRCB). The SCWA has the right to divert up to a total of 75,000 acre-feet per year for its water contractors and customers. Under the water supply agreement with the SCWA, the City is entitled to receive up to 1,520 acre-feet per year.

#### *CITY OF COTATI*

In addition to the water supply from Sonoma County Water Agency, the City uses local groundwater supply from three municipal well sites located within the city limits. Prior to 1992, the City used groundwater to supply more than half of its demands; however, more recently, the City's water strategy has been to supply its demands by use of its Sonoma County Water Agency water supply and to use its local groundwater supplies to supplement demands during peak periods and also during periods of drought. The City's local groundwater supply is a key element of its drought contingency plan and is planned to remain as such throughout the foreseeable future.

### **Water Source**

The City's water comes from both surface water and groundwater. Prior to 1992, the City of Cotati used groundwater to supply more than half of its demands. More recently, the City's water strategy has been to supply its demands by use of its Sonoma County Water Agency water supply and to use its local groundwater supplies to supplement its needs during peak periods and also during periods of drought. The City's local groundwater supply is a key element of its drought contingency plan and is planned to remain as such throughout the planning horizon.

Most of the City's water is purchased from the Sonoma County Water Agency, which operates an extensive water supply distribution system in the region. Most of the water in the Sonoma County Water Agency distribution system is obtained from the Russian River, although they are beginning to blend groundwater into their system.

#### *SURFACE WATER*

**Russian River:** The Russian River watershed drains an area of 1,485 square miles that includes much of Sonoma and Mendocino counties. The headwaters of the Russian River are located in central Mendocino County, approximately 15 miles north of Ukiah. The Russian River is approximately 110 miles in length and flows generally southward to Mirabel Park, where it changes course and flows westward to the discharge point at the Pacific Ocean near Jenner, approximately 20 miles west of Santa Rosa. (Sonoma County Water Agency, 2011).

Two federal projects impound water in the Russian River watershed: the Coyote Valley Dam on the Russian River east of the city of Ukiah in Mendocino County (forming Lake Mendocino), and the Warm Springs Dam on Dry Creek (a tributary of the Russian River) northwest of the City of Healdsburg in Sonoma County (forming Lake Sonoma). Because the Sonoma County Water Agency was the local

sponsor for the dams and partially financed their construction, the Sonoma County Water Agency has the right to control releases from the water supply pools of both reservoirs. The Water Agency diverts water from the Russian River near Forestville and conveys the water via its transmission system (including diversion facilities, treatment facilities, aqueducts, pipelines, water storage tanks, and booster pump stations) to its customers, which includes the City of Cotati. (Sonoma County Water Agency, 2011).

### *GROUNDWATER*

**Santa Rosa Plain Subbasin:** The Santa Rosa Plain is a subbasin of the Santa Rosa Valley Basin. The Santa Rosa Plain drains northwest toward the Russian River, and is thus part of the North Coast Hydrologic Region. Several small hills near Cotati mark a drainage divide that separate the Santa Rosa Valley Basin from the Petaluma Valley Groundwater Basin, which drains to the southeast toward the San Francisco Bay.

The geology of the Santa Rosa Plain Subbasin is complex and the stratigraphic relationships are the subject of recent and continuing studies. Recent studies by the USGS have revealed that the basin is subdivided into two primary compartments termed the Windsor sub-basin in the north and the Cotati sub-basin in the south, which are separated by the Trenton fault. These two areas represent the deepest parts of the basin and range from 6,000 to 10,000 feet deep.

Both unconfined and confined aquifers are found within the Santa Rosa Plain subbasin depending upon locations in the basin with respect to relatively continuous clay layers, folding and faulting. The waterbearing deposits underlying the basin include the Wilson Grove Formation, the Glen Ellen Formation, the Petaluma Formation, and a younger and older alluvium. The Wilson Grove Formation is the major water-bearing unit in the western part of the basin and ranges in thickness from 300 feet to 1,500 feet. Deposited during the Pliocene, it is a marine deposit of fine sand and sandstone with thin interbeds of clay, silty-clay and some lenses of gravel. Interbedded and interfingered with the Wilson Grove Formation are Sonoma Volcanic sediments in the eastern basin separating the water-bearing units. Aquifer continuity and water quality are considered good based on the most current and detailed reference on the hydrogeology of the subbasin.

In 1982, a Department of Water Resources study concluded that groundwater levels in the south part of the Santa Rosa Plain (near Cotati and Rohnert Park) had decreased; however, recent studies indicate that groundwater levels in this area have either stabilized or exhibited trends of recovery, as both the City of Cotati and Rohnert Park have increased the use of surface water provided by the Sonoma County Water Agency. This recovery trend in groundwater levels in the southern Santa Rosa Plain began around 2003 and has continued to the present. An estimated 10,500 permitted water-supply wells are located within the Santa Rosa Plain. These wells provide irrigation water for agriculture, industrial water supplies, rural residential, as well as municipal water supplies (i.e. City of Cotati). (Sonoma County Water Agency, 2011).

### REFERENCES

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The primary sources of data referenced for this section is derived from the following:

California Department of Conservation. 2002. California Geological Survey, Note 36.

California Dept. of Water Resources. 2011. Dams Owned and Operated by a Federal Agency and Dams within the Jurisdiction of the State of California. [www.water.ca.gov/damsafety/damlisting/index](http://www.water.ca.gov/damsafety/damlisting/index)

- California Dept. of Water Resources. 2010. Final 2010 Integrated Report (CWA Section 303(d) List / 305(b) Report).
- California Dept. of Water Resources. 2009. California Water Plan Update 2009, North Coast Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.
- California Dept. of Water Resources. 2009. California Water Plan Update 2009, San Francisco Bay Integrated Water Management, Volume 3, Regional Reports, Bulletin 160-09.
- CalWater, California Interagency Watershed Mapping Committee. 2008. California Watershed Boundary Dataset (WBD).
- California Department of Water Resources. 2004. California's Groundwater Bulletin 118-Update, North Coast Hydrologic Region, Lower Russian River Valley Groundwater Basin. February.
- California Department of Water Resources. 2003. California's Groundwater Bulletin 118-Update. October.
- California Department of Water Resources. 1982. Evaluation of Ground Water Resources in Sonoma County Volume 2: Santa Rosa Plain. DWR Bulletin 118-4.
- California Department of Water Resources. 1980. Groundwater Basins in California – A Report to the Legislature in Response to Water Code Section 12924. Bulletin 118 – 80. 73 p. January.
- Cardwell, G.T. 1958. Geology and Ground Water in the Santa Rosa and Petaluma Valley Areas, Sonoma County, California, USGS Water Supply Paper 1427.
- Cardwell, G.T. 1965. Geology and Ground Water in Russian River Valley Areas and in Round, Laytonville and Little Lake Valleys, Sonoma and Mendocino Counties, California. USGS Water Supply Paper 1548.
- City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.
- Cotati Creek Critters. 2011. <http://www.cotaticreekcritters.info/>
- Ford, Robert. 1975. Evaluation of Ground Water Resources: Sonoma County, Volume 1: Geologic and Hydrologic Data. Department of Water Resources. State of California Resources Agency.
- Laguna de Santa Rosa Foundation. 2011. [http://www.lagunadesantarosa.org/foundation\\_history.htm](http://www.lagunadesantarosa.org/foundation_history.htm)
- Seaber, P.R., Kapinos, F.P., and Knapp, G.L., 1987, Hydrologic Unit Maps: U.S. Geological Survey Water-Supply Paper 2294, 63 p.
- Sonoma County Water Agency. 2011. <http://www.scwa.ca.gov/flood-protection-zones/>
- United States Geological Survey. 2006a. Geohydrological Characterization, Water-Chemistry, and Ground-Water Flow Simulation Model of the Sonoma Valley Area, Sonoma County, California. By Christopher D. Farrar, Loren F. Metzger, Tracy Nishikawa, Kathryn M. Koczot, and Eric G. Reichard. Scientific Investigations Report 2006-5092. In cooperation with the Sonoma County Water Agency
- United States Geological Survey. 2006b. Geohydrology and Water Chemistry of the Alexander Valley, Sonoma County, California. By Loren F. Metzger, Christopher D. Farrar, Kathryn M. Koczot, and Eric

## 9 CONSERVATION AND NATURAL RESOURCES

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G. Reichard (Scientific Investigations Report -2006-5115). In Cooperation with the Sonoma County Water Agency. July.

United States Geological Survey. 2002. Geologic Map and Map Database of Western Sonoma, Northernmost Marin, and Southernmost Mendocino Counties, California. By Blake, M.C., Jr., R.W. Groyer, and R.E. Stramski. Pamphlet to Accompany Miscellaneous Field Studies Map MF-2402, v.1.0.

Winzler Kelly. 2006. City of Cotati Final Urban Water Management Plan.

## 9.4 SCENIC RESOURCES

This section addresses the scenic resources in and around the City of Cotati. The discussion of community character is located in the Land Use and Community Character section of this Background Report (Section 1).

### REGULATORY SETTING

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#### *STATE*

#### **California Department of Transportation – California Scenic Highway Program**

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and map showing their locations may be obtained from the Caltrans Scenic Highway Coordinators.

If a route is not included on a list of highways eligible for scenic highway designation in the Streets and Highways Code Section 263 et seq., it must be added before it can be considered for official designation. A highway may be designated scenic depending on the extent of the natural landscape that can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

When a local jurisdiction nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. A scenic corridor is the land generally adjacent to and visible from the highway. A scenic highway designation protects the scenic values of an area. Jurisdictional boundaries of the nominating agency are also considered, and the agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

To receive official designation, the local jurisdiction must follow the same process required for official designation of State Scenic Highways. The minimum requirements for scenic corridor protection include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping; and
- Careful attention to design and appearance of structures and equipment.

#### *LOCAL*

#### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to visual resources:

**1.5.2 The City shall encourage the clustering of residential units to preserve the continuity of open space, protect environmental features, enhance visual amenities, and insure public safety.**

a) The Zoning Ordinance, Subdivision Regulations and Design Review Criteria shall continue to allow higher density residential clustered development.

**13.1.7 Commercial and industrial development in scenic resource areas shall be prohibited. (See map 8).**

a) The Zoning Ordinance shall be amended to prohibit commercial and industrial development in designated scenic resources areas.

**13.1.10 Recognize the role of the County General Plan in the preservation of Cotati's scenic resources.**

a) The Planning Department shall evaluate all proposals involving County land, within or adjacent to our Sphere of Influence, to ensure adequate preservation of open space and scenic resources.

**13.1.11 Preserve existing scenic resources both inside and outside of the Cotati City limits as resources critical to Cotati's community identity and character.**

a) City staff will work with the County of Sonoma to discourage parcelization and/or land divisions within the City of Cotati Sphere of Influence.

b) Work with Sonoma County Planning staff to discourage any industrial and commercial development in these areas.

**13.2.1 Site lay-out, fencing and materials used on lots adjacent to scenic roads shall be consistent with the natural character of the such roads.**

a) The Design Review Criteria shall be prepared to include comprehensive design standards (including setback of buildings, fences, landscaping requirements, pedestrian/bicycle paths, parking bays, width of lanes) for scenic roadways in Cotati. The Design Review Committee will monitor compliance with design standards for all improvements and new construction.

b) City Council shall hold local public meetings in conjunction with the General Plan standards for scenic residential roads to allow neighborhoods situated along a proposed scenic residential road to provide input on its status.

**13.4.1 Continue a no tree cutting policy throughout Cotati, except when a permit has been obtained.**

a) Continue implementing the City of Cotati Tree Protection Ordinance. The City Staff will monitor through a tree cutting permit process.

b) The City shall periodically undertake a citywide notification program to notify the citizen's of Cotati and tree surgeons doing business within the city limits on the City's tree cutting policy.

**13.4.2 Landscaping in parking areas shall be designed to achieve visual screening, while maintaining the ability of the Police Department to provide adequate security.**

a) Through the use of public funds, where available, provide for the screening of public parking areas through the use of trees, shrubs, berms and evergreen plants. The Planning Staff shall work with the



Police Department to ensure that the landscaping will not inhibit the ability of the Police Department to provide adequate security.

#### **14.1.1 Depict local history through the use of murals.**

a) The City Council shall designate possible sites around the community that are suitable for murals. All murals shall be approved by the Design Review Committee. The Design Review Committee shall evaluate the mural for cultural and artistic quality.

#### **14.3.3 Plant a combination of deciduous native trees and more flower beds consisting of native flowers, if possible, so that there is a continuous show of flowers throughout the year in La Plaza Park.**

a) Redevelopment funds and other funding sources will be used to pay for the acquisition of trees and flowers for the park which Public Works Staff will plant and maintain.

## **ENVIRONMENTAL SETTING**

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Sonoma County possesses numerous scenic resources, many of which are found in the natural areas within the unincorporated county, while they are visible from both unincorporated and incorporated areas. These resources not only enhance the quality of life for residents, but are a significant attraction that brings tourists to the region. Landscapes can be defined as a combination of four visual elements: landforms, water, vegetation, and man-made structures. Scenic resource quality is an assessment of the uniqueness or desirability of a visual element.

The City of Cotati is located in the Cotati Valley, north of Petaluma, and south of Rohnert Park. The Cotati Valley is the northern portion of a north-south valley that extends from the San Pablo Bay to Santa Rosa. The southern portion of the valley is called the Petaluma Valley. The Cotati Valley is bordered by the Sonoma Mountains to the east, and a series of low hills to the west. Farther to the west are the Estero Lowlands (aka Petaluma Gap), which opens to the Pacific Ocean.

### **Community Identity**

Every community has an identity. An identity distinguishes a community from its neighbors, and is an important component of the culture and history of each community. It also provides a sense of place and is what causes people to remember the community. The community identity is largely defined by the visual elements that are present, including natural amenities and the design of man-made amenities.

The City of Cotati is largely defined by its small town atmosphere, that combines rural openness and a vibrant blend of urban amenities. Residents and visitors alike, have long appreciated Cotati for the scenic beauty of its rolling hillsides. The areas to the south and west of Cotati serve an important function by providing a visual break from Petaluma and Penngrove to the south and Sebastopol to the west. These open space areas function as a community separator, and provide important open space elements to the community experience. These open space elements are both agricultural and natural.

Cotati has established itself as the "Hub" of Sonoma County. The community is showcased by its hexagonal plaza and street layout that was designed in the 1890s by Newton Smyth as an alternative to the traditional grid layout. This design is one of only two hexagonal town layouts in the United States, and is designated as a California Historical Landmark (Number 879). The hexagonal plaza serves as the center of the community and is followed by concentric zones of urban development. There is a general progression outward of decreasing development and increasing vegetative cover. The structure of urban

vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species.

### **Open Space**

There is a variety of open space in and around the City of Cotati. They include: agricultural land, grassland, chaparral, woodlands, riverine, and wetlands, as well as improved urban parkland. Below is a brief description of each of these open space types.

**Agricultural** land is predominately intended to be used for production of food and fiber. This land can generally be broken into the following categories: cropland, dryland grain crops, irrigated grain crops, irrigated hayfield, irrigated row and field crops, rice, orchard - vineyard, deciduous orchard, evergreen orchard, and vineyard. The number of building complexes in agricultural areas is smaller and the density of the road and highway network is much lower in these areas.

**Grassland** occurs mostly on flat plains to gently rolling foothills. These areas are often, but not always, used for livestock grazing. Similar to agricultural lands, the number of building complexes in annual grassland areas is smaller and the density of the road and highway network is much lower in these areas.

**Chaparral** is dominated by shrubs, but often includes grasses, herbs, and trees. Chaparral is often the result of natural disturbance, such as fire or livestock browsing, in an area that might otherwise be a woodland or forest. Chaparral is commonly found on slopes where soils are thin with little accumulation of organic materials.

**Woodlands** are a low-density forest that forms from trees in open habitats with plenty of sunlight and limited shade. Woodlands often support an understory of shrubs and herbaceous plants including those found in an annual grassland.

**Riverine** environments can occur in association with many terrestrial habitats. Riparian areas are found adjacent to many rivers and streams. Riverine environments are also found contiguous to lacustrine (lakes) and wetlands. This environment requires intermittent or continually running water generally originating at some elevated source, such as a spring or lake, and flows downward.

**Wetlands** occur on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes.

### **Scenic Highways**

The Cotati Valley offers a variety of scenic views, many of which are visible from roadways. The California Department of Transportation maintains and implements a Scenic Highway Program for California.

The State of California has officially designated two Scenic Highways in Sonoma County that have a total length of approximately 40 miles. The criteria for official designation and eligibility includes the scenic quality of the landscape, how much of the natural landscape can be seen by travelers, and the extent to which development intrudes upon the traveler's enjoyment of the view. Below is a brief summary of each designated scenic highway, neither of which is located in the City of Cotati.

**Officially Designated Scenic Highway**

1. SR 12 from Danielli Avenue (east of Santa Rosa) to London Way (near Aqua Caliente) (post mile 22.450 to 34.02). This segment is 11.6 miles long and was designated on December 17, 1974. This highway segment includes travel through the Valley of the Moon, where there are mountains to the north, east, and southwest, and extensive vineyards and oak trees. .
2. SR 116 from SR 1 to the south city limit of Sebastopol (post mile 0.0 to 27.817). This segment is 27.8 miles long and was designated on September 20, 1988. This highway segment includes travel along the Russian River, and passes a historic resort area, redwood forests, and eucalyptus groves.

**County Scenic Corridor**

Sonoma County has also designated various highways and roadways throughout the unincorporated County as Scenic Corridors. Below is a list of designated scenic corridors by Sonoma County that are located in the vicinity of Cotati.

**County Designated Scenic Corridor**

- State Route 101
- State Route 116 (Gravenstein Highway)
- Petaluma Hill Road
- Crane Canyon Road
- Adobe Road

**REFERENCES**

The primary sources of data referenced for this section is derived from the following:

California Department of Transportation. 2011. State Scenic Highway Program.  
<http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm>

City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.

Nichols Berman. 2006. Sonoma County GP 2020 Draft EIR.

### 9.5 AIR QUALITY

This section discusses the overall regulatory framework for air quality management in California and the region, including national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS), and describes existing air quality conditions in the City of Cotati. This section also includes a discussion of climate change and greenhouse gasses. Information presented in this section is based in part on information gathered from the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (CARB).

#### REGULATORY SETTING

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##### *FEDERAL REGULATIONS*

##### **Clean Air Act**

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The EPA is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

##### **Energy Policy and Conservation Act**

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

##### **Energy Policy Act of 1992 (EPAct)**

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty

AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

### **Energy Policy Act of 2005**

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

### **Federal Climate Change Policy**

According to the EPA, “the United States government has established a comprehensive policy to address climate change” that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, “the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science.” The federal government’s goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including “ENERGY STAR”, “Climate Leaders”, and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

#### *STATE REGULATIONS*

### **California Clean Air Act**

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state’s air quality goals, planning and regulatory strategies, and performance. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code [§39606(b)], which are similar to the federal standards.

### **Air Quality Standards**

NAAQS are determined by the EPA. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM<sub>10</sub>) and lead. In addition, California has created standards for pollutants that are not covered by federal standards. The state and federal primary standards for major pollutants are shown in Table 9.5-1.

Like the EPA, CARB also designates areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant in air quality data shows that a State standard for the

pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard, and are not used as a basis for designating areas as nonattainment.

### **CARB Mobile-Source Regulation**

The State of California is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which required auto manufacturers to phase in less polluting vehicles.

### **Tanner Air Toxics Act**

California regulates Toxic Air Containments (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

### **California Strategy to Reduce Petroleum Dependence (AB 2076)**

In response to the requirements of AB 2076 (Chapter 936, Statutes of 2000), the CEC and the CARB developed a strategy to reduce petroleum dependence in California. The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and CARB in 2003. The strategy recommends that California reduce on-road gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles (SUVs); and increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

### **Assembly Bill 1493**

In response to AB 1493, CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing motor vehicle emission standards. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37 percent lower than during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight (GVW), GHG emissions are reduced approximately 24 percent between 2009 and 2016.

CARB requested a waiver of federal preemption of California's Greenhouse Gas Emissions Standards. The intent of the waiver is to allow California to enact emissions standards to reduce carbon dioxide and other greenhouse gas emissions from automobiles in accordance with the regulation amendments to the CCRs that fulfill the requirements of AB 1493. The EPA granted a waiver to California to implement its greenhouse gas emissions standards for cars.

### **California Executive Orders S-3-05 and S-20-06, and Assembly Bill 32**

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the year 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

### **Assembly Bill 1007**

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) directed the CEC to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepared the State Alternative Fuels Plan in consultation with the state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

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

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

percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

### **Governor's Low Carbon Fuel Standard (Executive Order #S-01-07)**

Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard is incorporated into the State Alternative Fuels Plan and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

### **Climate Action Program at Caltrans**

The California Department of Transportation, Business, Transportation, and Housing Agency, prepared a Climate Action Program in response to new regulatory directives. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO<sub>2</sub> from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that "the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards)."

### **Senate Bill 97 (SB 97)**

Senate Bill 97 (Chapter 185, 2007) required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. OPR prepared its recommended amendments to the State CEQA Guidelines to provide guidance to public agencies regarding the analysis and mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions in draft CEQA documents. The Amendments became effective on March 18, 2010.

### **Senate Bill 375**

SB 375 requires the CARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. The 18 MPOs in California will prepare a "sustainable communities strategy" to reduce the amount of greenhouse gas emission in their respective regions and demonstrate the ability for the region to attain CARB's reduction targets. CARB would later determine if each region is on track to meet their reduction targets. In addition, cities would get extra time -- eight years instead of five -- to update housing plans required by the state.



*LOCAL AND REGIONAL REGULATIONS***Bay Area Air Quality Management District**

The Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for assuring that the National and California Ambient Air Quality Standards (NAAQS and CAAQS, respectively) are attained and maintained in the San Francisco Bay Area. The BAAQMD's jurisdiction includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo and Santa Clara counties, and the southern portions of Solano and Sonoma counties. The BAAQMD's responsibilities in improving air quality in the region include: preparing plans for attaining and maintaining air quality standards; adopting and enforcing rules and regulations; issuing permits for stationary sources of air pollutants; inspecting stationary sources and responding to citizen complaints; monitoring air quality and meteorological conditions; awarding grants to reduce mobile emissions; implementing public outreach campaigns; and assisting local governments in addressing climate change.

BAAQMD takes on various roles in the CEQA process, depending on the nature of the proposed project. For projects in the City of Cotati they generally serve as a Responsible or Commenting Agency as described below:

- **Responsible Agency** – BAAQMD acts as a Responsible Agency when it has limited discretionary authority over a portion of a project, but does not have the primary discretionary authority of a lead agency. As a Responsible Agency, BAAQMD may coordinate the environmental review process with the lead agency regarding BAAQMD's permitting process, provide comments to the lead agency regarding potential impacts, and recommend mitigation measures.
- **Commenting Agency** – BAAQMD may act as a Commenting Agency when it is not a Lead or Responsible Agency (i.e., it does not have discretionary authority over a project), but when it may have concerns about the air quality impacts of a proposed project or plan. As a Commenting Agency, BAAQMD may review environmental documents prepared for development proposals and plans in the region, such as local general plans, and provide comments to the lead agency regarding the adequacy of the air quality impact analysis, determination of significance, and mitigation measures proposed.

**BAAQMD CEQA Guidelines**

The Bay Area Air Quality Management District (BAAQMD) prepared California Environmental Quality Act (CEQA) Guidelines to assist lead agencies in evaluating air quality impacts of projects and plans proposed in the San Francisco Bay Area Air Basin (SFBAAB). The Guidelines provides BAAQMD-recommended procedures for evaluating potential air quality impacts during the environmental review process consistent with CEQA requirements. The BAAQMD updated these Guidelines in May 2011. The revised Guidelines supersede the BAAQMD's previous CEQA guidance titled *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans* (BAAQMD, 1999).

The Guidelines contain instructions on how to evaluate, measure, and mitigate air quality impacts generated for project-level and plan-level activities. The Guidelines focus on criteria air pollutant, greenhouse gas (GHG), toxic air contaminant, and odor emissions generated from plans or projects. The Guidelines are intended to help lead agencies navigate through the CEQA process. The Guidelines offer step-by-step procedures for a thorough environmental impact analysis of adverse air emissions in the Bay Area.

### **Bay Area 2010 Clean Air Plan**

The Bay Area 2010 Clean Air Plan (CAP) provides a comprehensive plan to improve Bay Area air quality and protect public health. The 2010 CAP was prepared in close collaboration with the Air District's regional agency partners, and was informed by extensive outreach to the public and interested stakeholders.

The CAP defines a control strategy that the Air District and its partners will implement to: (1) reduce emissions and decrease ambient concentrations of harmful pollutants; (2) safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and (3) reduce greenhouse gas (GHG) emissions to protect the climate.

The legal impetus for the CAP is to update the most recent ozone plan, the Bay Area 2005 Ozone Strategy, to comply with state air quality planning requirements as codified in the California Health & Safety Code. Although steady progress in reducing ozone levels in the Bay Area was made, the region is designated as non-attainment for both the one-hour and eight-hour state ozone standards. In addition, emissions of ozone precursors in the Bay Area contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the CAP to include all feasible measures to reduce emissions of ozone precursors and to reduce transport of ozone precursors to neighboring air basins.

The Bay Area was recently designated as non-attainment for the national 24-hour fine particulate matter (PM<sub>2.5</sub>) standard, and will be required to prepare a PM<sub>2.5</sub> State Implementation Plan (SIP) pursuant to federal air quality guidelines by December 2012. The 2010 CAP is not a SIP document and does not respond to federal requirements for PM<sub>2.5</sub> or ozone planning. However, in anticipation of future PM<sub>2.5</sub> planning requirements, the CAP control strategy also aims to reduce PM emissions and concentrations. In addition, U.S. EPA is currently reevaluating national ozone standards, and is likely to tighten those standards in the near future. The control measures in the CAP will also help in the Bay Area's continuing effort to attain national ozone standards.

### **City of Cotati General Plan**

The existing City of Cotati General Plan identifies the following policies related to air quality:

#### **3.1.1 Reduce automobile trips and local traffic congestion.**

- a) The City shall continue to promote transit use through the construction of new bus shelters and relocation of existing bus shelters that serve both county and regional transit systems.
- b) As State funding becomes available, and through a City contract with Sonoma County Transit, the City shall continue to provide more frequent bus service when warranted by ridership. The City will review and renew the contract when necessary.
- c) The City shall work with Sonoma County Transit to create an effective Rider Awareness Program that will educate the public on existing transit systems.
- d) Traffic signals, or other traffic calming devices, shall be installed at congested intersections with appropriate signal warrants in order to minimize traffic queues.
- e) The City shall cooperate with State and local agencies to support future rail service on the Northwestern Pacific Rail right-of-way including actively pursuing a transit center on Industrial Avenue.

- f) The City shall continue to implement the City of Cotati Bicycle Master Plan.
- g) Planning staff shall continue to work to improve existing sidewalks and construct new sidewalks. The City shall work with Caltrans to provide pedestrian and bicycle access under Gravenstein Highway and West Sierra Avenue interchanges.
- h) The City shall implement the five transportation control measures (TCMs) that are included in the Bay Area '97 Clean Air Plan that apply to cities:
- TCM 1: Support Voluntary Trip Reduction Programs.
  - TCM 9: Improve Bicycle Access and Facilities
  - TCM 12: Improve Arterial Traffic Management
  - TCM 19: Pedestrian Travel
  - TCM 20: Promote Traffic Calming Measures
- i) California Environmental Quality Act guidelines and Bay Area Air Quality Management District standards shall evaluate and mitigate local and cumulative air quality impacts of new development.
- j) Planning staff shall ensure that new fireplaces, wood stoves and/or heaters meet current EPA standards.
- k) Planning staff shall ensure that dust emissions from all construction sites shall be controlled.
- l) Planning staff shall continue to review all new industrial and commercial development projects for potential air quality impacts to residences and other sensitive receptors. Adequate buffers between new industrial uses and sensitive receptors shall be required to avoid potential air quality and nuisance impacts.

**6.2.1 All new development should conserve land resources and incorporate energy conserving design features.**

- a) The Design Review Committee shall review all proposed developments to assist in promoting energy and land conserving designs and site layouts.

**9.1.1 Require minimum energy conserving measures in site layout, construction, space conditioning, and lighting in new development.**

- a) The Zoning Ordinance shall be reviewed to consider minimum energy conserving standards for setbacks, building heights and vegetation. The Design Review Committee shall monitor adherence to these regulation.
- b) The Building code shall be amended to include a requirement that all new swimming pools be solar heated. Adherence to this regulation shall be reviewed by the building permit/plan check process.
- c) Through the permit process the Building Inspector shall strictly enforce the state energy consumption standards.

**9.1.2 Promote use of alternative energy sources in new development.**

- a) The City Council shall consider the adoption of a Resolution whereby all new City facilities shall be built to exceed state energy consumption standards, including the use of passive solar design and

solar heated hot water. Adherence to this resolution shall be reviewed in the building permit/plan check process.

b) Amend the Zoning Ordinance to require appropriate lower impact “green” site and building practices that are designed to reduce environmental impacts. This shall be monitored through the design review approval process.

### **9.2.1 Ensure protection of solar access.**

a) The Zoning Ordinance shall be amended to provide for solar access and view protection. The Design Review Committee shall review plans to ensure compliance.

### **9.2.2 Street layout and design shall minimize use of pavement in order to reduce cooling energy needs.**

a) The Subdivision Regulations shall be amended to include standards for City streets that minimize width, subject to safety service requirements, and require a primarily east-west orientation of streets in new developments, where feasible. The Design Review Committee shall review plans for compliance.

b) The Zoning Ordinance shall be amended to include provisions for alternative parking lot surfaces, e.g. turf block, where appropriate. The Design Review Committee shall review plans for compliance.

### **9.3.1 Encourage widespread use of trees as windbreaks and maximize the effects of cooling westerly winds.**

a) The Design Review Committee in their Plan Review process shall encourage the use of trees for windbreaks and wind channeling in new development.

### **9.3.2 Minimize use of pavement and utilize deciduous trees to help reduce summer temperatures.**

a) Site designs shall minimize paved surfaces and roadway lengths while providing adequate access for normal circulation and emergency vehicles.

b) A deciduous tree program that does not interfere with solar access, and is located on the park strip, shall be required in all new development.

### **9.3.3 Encourage the development of well-located green open spaces.**

a) Amend the Subdivision Regulations to include specifications for type and amount of open space within new developments. The Planning Department in their plan check process shall ensure this is followed.

### **9.5.4 Promote the continuation of the City-wide recycling program.**

a) The City shall work with the refuse collection contractor to continue and expand an effective recycling program of glass, paper, aluminum, plastic, and other recyclable materials.

b) The City's contractor shall be responsible for periodic press releases which remind residents about the recycling program.

c) The City shall work with the refuse collection contractor to provide a higher level of recycling service for multiple family projects.

**9.5.5 Reduce solid waste by 25% by 1995 and 50% by the year 2000.**

a) The City shall work with the solid waste refuse collector to implement a program for separating solid waste materials into recyclable and non-recyclable.

b) The City shall work with the solid waste refuse collector to continue a compost program for organic materials.

c) The City shall undertake a solid waste reduction education program.

**13.4.4 Continue to implement the City of Cotati's Water Conservation Ordinance for commercial and industrial development.**

a) Through the planning process the City shall implement the Water Conservation Ordinance.

**14.3.2 Improve and maintain landscaping around commercial areas in order to minimize the "heat island" effect, provide shade, soften the harshness of such commercial areas, and create a more leisurely ambience.**

a) Redevelopment funds shall be used to finance a public tree-planting project.

**Policy H-1.4 Energy Conservation Improvements: Promote energy conservation improvements for existing and proposed residential units.**

**Cities for Climate Protection Program**

The City of Cotati passed Resolution 02-21 in April 2002 endorsing the Cities for Climate Protection Campaign which includes a five milestone program to reduce greenhouse gas and air pollution emissions. The five milestones are as follows:

1. Conduct a baseline greenhouse gas emissions inventory and forecast to determine the sources and quantity of greenhouse gas emissions in the jurisdiction;
2. Establish a greenhouse gas emissions reduction target;
3. Develop a climate action plan consisting of both existing and future actions which, when implemented, will meet the local greenhouse gas reduction target;
4. Implement the action plan; and
5. Monitor and report progress.

The City fulfilled these five milestones as follows:

1. In September 2003 the City reported their municipal baseline emissions in *Standing Together for the Future: Greenhouse Gas Emission Inventories for Eight Cities in Sonoma County, California*.
2. In October 2004 the City passed Resolution 04-88, which adopted a goal of a 20% Reduction in Greenhouse Gas Emissions from City of Cotati Municipal Operations from 2000 to 2010. In August 2005 the City adopted Resolution 05-66 which established a community-wide reduction goal of 30 percent below 1990 levels by 2015.
3. In May 2008 the City finalized the City of Cotati Greenhouse Gas Emissions Reduction Action Plan Analysis.

4. The City continues to take actions in accordance with their plans and programs that support the reduction of greenhouse gas emissions.

### **City of Cotati Greenhouse Gas Emissions Reduction Action Plan Analysis**

The City of Cotati developed a Greenhouse Gas Emissions Reduction Action Plan Analysis as a way to reduce GHG emissions, reduce energy costs, address equipment problems, and reduce the uncertainty of the city's future annual energy costs.

### **CALGreen**

CALGreen is a set of mandatory green building standards for new construction that went into effect throughout California on January 1, 2011. These building standards apply to all new public and privately-constructed commercial and residential buildings. CALGreen is referred to officially as the California Green Building Standards Code and includes a matrix of mandatory requirements tailored to residential and non-residential building classifications, as well as two sets of voluntary measures (CALGreen Tier 1 and Tier 2) that provide a host of more stringent sustainable building practices and features. Among the key mandatory provisions are requirements that new buildings:

- reduce indoor potable water use by at least 20% below current standards;
- recycle or salvage at least 50% of construction waste;
- utilize low VOC-emitting finish materials and flooring systems;
- install separate water meters tracking non-residential buildings' indoor and outdoor water use;
- utilize moisture-sensing irrigation systems for larger landscape areas;
- receive mandatory inspections by local officials of building energy systems, such as HVAC and mechanical equipment, to verify performance in accordance with specifications in non-residential buildings exceeding 10,000 square feet; and
- earmark parking for fuel-efficient and carpool vehicles.

Cotati's City Council rescinded Cotati's Sustainable Building Program and replaced it with CALGreen Mandatory Tier 1, which includes a detailed list of green building features that address energy efficiency, water efficiency, waste reduction, material conservation and indoor air quality. The requirements apply to newly constructed residential and non-residential facilities. Additions, alterations, repairs and existing structures may be subject to the requirements of CALGreen. Existing site and landscaping improvements that are not otherwise disturbed are not subject to the requirements of CALGreen.

### **Water Conservation Program**

The City of Coati developed a Water Conservation Program in 2003 that includes free indoor/outdoor water use surveys, free efficiency showerheads and faucet aerators, residential clothes washer rebate program, residential and nonresidential toilet replacement program, and education on outdoor water conservation and watershed protection. Additionally, the City implemented the Cash for Grass Turf rebate program where the City offers residential and commercial customers rebates in return for reducing the amount of lawn area in their landscapes and replacing with low water use landscapes. Ancillary benefits to the water conservation program includes electricity savings at the City's water and wastewater facilities.

## SAN FRANCISCO BAY AREA AIR BASIN

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The City of Cotati is located within the San Francisco Bay Area Air Basin (Air Basin). The Air Basin encompasses approximately 5,600 square miles and includes all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties, and portions of southwestern Solano and southern Sonoma counties. The Air Basin is characterized by a large, shallow basin surrounded by coastal mountain ranges tapering into sheltered inland valleys. The combined climatic and topographic factors result in increased potential for the accumulation of air pollutants in the inland valleys and reduced potential for buildup of air pollutants along the coast. The Air Basin is bounded by the Pacific Ocean to the west and includes complex terrain consisting of coastal mountain ranges, inland valleys and bays.

### Cotati and Petaluma Valleys

The valley that stretches from Santa Rosa to the San Pablo Bay is known as the Cotati Valley at the north end and the Petaluma Valley at the south end. Some maps show the whole area as the Petaluma Valley. The largest city in the Cotati Valley is Santa Rosa and in the Petaluma Valley is Petaluma. To the east, the valley is bordered by the Sonoma Mountains, with the San Pablo Bay at the southeast end of the valley. To the immediate west are a series of low hills and further west are the Estero Lowlands, which opens to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay is known as the Petaluma Gap. This low-terrain area is a major transport corridor allowing marine air to pass into the Bay Area. (BAAQMD, 2011).

**Air Patterns:** Air patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap. The predominant wind pattern in this region is for marine air to move eastward through the Petaluma Gap, then to split into northward and southward paths as it moves into the Cotati and Petaluma valleys. The southward path crosses the San Pablo Bay and moves eastward through the Carquinez Straits. Consequently, although Santa Rosa and Petaluma are only 16 miles apart, their predominate wind patterns are quite different. Santa Rosa's prevailing winds are out of the south and southeast, while Petaluma's prevailing winds are out of the northwest. When the ocean breeze is weak, a bay breeze pattern can also occur, resulting in east winds near the bay. Strong winds from the east occur as part of a larger scale pattern and often carry pollutants picked up along the trajectory through the Central Valley and the Carquinez Straits. During these periods, upvalley flows can carry the polluted air as far north as Santa Rosa. (BAAQMD, 2011).

Winds are usually stronger in the Petaluma Valley than the Cotati Valley because it is part of the Petaluma Gap. The low terrain in the Petaluma Gap does not offer much resistance to the marine air as it flows to the San Pablo Bay. Consequently, even though Petaluma is 28 miles from the ocean, its climate is similar to areas closer to the coast. Average annual wind speeds at the Petaluma Airport are seven mph. This is almost identical to the average annual wind speed measured in Valley Ford, 5 miles from the coast. Winds are light in the morning in the Petaluma Valley, and become windy in the afternoon as the sea breeze arrives. The Cotati Valley, being slightly north of the Petaluma Gap experiences lower wind speeds. In Santa Rosa, the annual average wind speed is 5.4 mph. (BAAQMD, 2011).

**Inversions:** During summer afternoons, the fetch across the Petaluma Gap is sufficiently long so that the marine air is warmed and the fog evaporated before it reaches the Petaluma and Cotati valleys. As the surface heating weakens in the late afternoon, the marine layer becomes less heated with distance, and eventually fog is able to form in these valleys. The fog may then persist until late in the morning the next day. (BAAQMD, 2011).

**Temperatures:** Air temperatures are very similar in the two valleys. Summer maximum temperatures for this region are in the low 80's, while winter maximum temperatures are in the high 50s to low 60s. Summer minimum temperatures are 50-51 degrees, and wintertime minimum temperatures are 36-40 degrees. (BAAQMD, 2011).

**Precipitation:** Rainfall averages range from 24 to 30 inches. Rainfall in the Cotati Valley is higher because the air is lifted and cooled in advance of the Sonoma Mountains, thereby causing condensation of the moisture. Consistent with the Bay Area Mediterranean climate, over 80 percent of the annual rainfall occurs from November through March. (BAAQMD, 2011).

**Air Pollution:** The Cotati Valley lacks a gap to the sea, accommodates a larger population, and has a natural barrier at its northern and eastern ends; therefore it has a higher pollution potential than does the Petaluma Valley. During stagnant conditions, polluted air carried up the Cotati Valley by diurnal upvalley flow, and added to by local emissions, could be trapped against the mountains to the north and east. (BAAQMD, 2011).

### CRITERIA POLLUTANTS

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The EPA uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Each criteria pollutant is described below.

**Ozone (O<sub>3</sub>)** is a photochemical oxidant and the major component of smog. While O<sub>3</sub> in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O<sub>3</sub> at ground level are a major health and environmental concern. O<sub>3</sub> is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O<sub>3</sub> levels occur typically during the warmer times of the year. Both VOCs and NO<sub>x</sub> are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops and other sources using solvents.

The reactivity of O<sub>3</sub> causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O<sub>3</sub> not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O<sub>3</sub> for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

**Carbon monoxide (CO)** is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks.

**Nitrogen dioxide (NO<sub>2</sub>)** is a brownish, highly reactive gas that is present in all urban atmospheres. NO<sub>2</sub> can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O<sub>3</sub>) and acid rain, and may affect both



terrestrial and aquatic ecosystems. The major mechanism for the formation of NO<sub>2</sub> in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO<sub>x</sub>). NO<sub>x</sub> plays a major role, together with VOCs, in the atmospheric reactions that produce O<sub>3</sub>. NO<sub>x</sub> forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

**Sulfur dioxide (SO<sub>2</sub>)** affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children and the elderly. SO<sub>2</sub> is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO<sub>2</sub> results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills and from nonferrous smelters.

**Particulate matter (PM)** includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO<sub>2</sub> and VOCs are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO<sub>2</sub>) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death.

**Respirable particulate matter (PM<sub>10</sub>)** consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter in Colusa County is caused primarily by dust from grading and excavation activities, from agricultural uses (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM<sub>10</sub> causes a greater health risk than larger particles, since these fine particles can more easily penetrate the defenses of the human respiratory system.

**Fine particulate matter (PM<sub>2.5</sub>)** consists of small particles, which are less than 2.5 microns in size. Similar to PM<sub>10</sub>, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM<sub>10</sub>, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the EPA created new Federal air quality standards for PM<sub>2.5</sub>.

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly and children. Particulate matter also soils and damages materials, and is a major cause of visibility impairment.

**Lead (Pb)** exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil or dust. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

### ODORS

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Typically odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

### NATURALLY OCCURRING ASBESTOS

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The EPA Region 9 office is working in areas of California to address concerns about potential effects of naturally occurring asbestos. Naturally occurring asbestos can take the form of long, thin, separable fibers. Natural weathering or human disturbance can break naturally occurring asbestos down to microscopic fibers, easily suspended in air. There is no health threat if asbestos fibers in soil remain undisturbed and do not become airborne. When inhaled, these thin fibers irritate tissues and resist the body's natural defenses. Asbestos, a known carcinogen, causes cancers of the lung and the lining of internal organs, as well as asbestosis and other diseases that inhibit lung function.

Asbestiform minerals occur naturally in rock and soil as the result of natural geologic processes, often in veins near earthquake faults in the coastal ranges and the foothills of the Sierra Nevada mountains. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in bodies of ultramafic rock or along their boundaries. Asbestos is much less likely to be associated with non-ultramafic rock types.

Ultramafic rocks are igneous rocks that form in high temperature environments well below the surface of the earth. By the time they are exposed at the surface by uplift and erosion, ultramafic rocks may be partially to completely altered to serpentinite, a type of metamorphic rock. Asbestos is the generic term

for the naturally occurring fibrous (asbestiform) varieties of six silicate minerals, including chrysotile which is found in serpentinite and is the most common in California.

Serpentinite is an ultramafic rock that has a greasy or waxy appearance and may be dark to light green, brown, yellow or white. Small amounts of chrysotile asbestos are common in serpentinite. Other forms of asbestos such as amphibole asbestos also occur with serpentinite, but such occurrences are less common than chrysotile asbestos.

Because of the correlation of asbestos and ultramafic rocks, the location of ultramafic rocks provides insight to the potential for naturally occurring asbestos in each county. The California Department of Conservation, Division of Mines and Geology mapped the location of ultramafic rocks within California, which is limited to the foothill regions of the Sierra Nevada, Coastal Range, and Cascade Range. Ultramafic rocks are known to occur in the foothill regions of Sonoma County, although none are mapped within the City of Cotati.

**SENSITIVE RECEPTORS**

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals and schools.

**AMBIENT AIR QUALITY**

Both the EPA and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

The federal and state ambient air quality standards are summarized in Table 9.5-1 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the state standards are more stringent. This is particularly true for ozone and particulate matter between 2.5 and 10 microns in diameter.

**TABLE 9.5-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	--	0.09 ppm
	8-Hour	0.075 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	--	0.03 ppm
	1-Hour	0.53 ppm	0.18 ppm
Sulfur Dioxide	Annual	0.03 ppm	--
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	--	0.25 ppm
PM10	Annual	--	20 ug/m3
	24-Hour	150 ug/m3	50 ug/m3
PM2.5	Annual	35 ug/m3	12 ug/m3
	24-Hour	15 ug/m3	--
Lead	30-Day Avg.	--	1.5 ug/m3
	3-Month Avg.	1.5 ug/m3	--

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2011. NOTES: PPM = PARTS PER MILLION, UG/M3 = MICROGRAMS PER CUBIC METER

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, CARB staff recommended lowering the level of the annual standard for PM<sub>10</sub> and establishing a new annual standard for PM<sub>2.5</sub>. The new standards became effective on July 5, 2003, with another revision on November 29, 2005.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within Sonoma County and the entire BAAQMD are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

### **Attainment Status**

In accordance with the California Clean Air Act (CCAA), the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An “attainment” designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A “nonattainment” designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An “unclassified” designation signifies that the data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The EPA designates areas for ozone (O<sub>3</sub>), carbon monoxide (CO), and nitrogen dioxide (NO<sub>2</sub>) as “does not meet the primary standards,” “cannot be classified,” or “better than national standards.” For sulfur dioxide (SO<sub>2</sub>), areas are designated as “does not meet the primary standards,” “does not meet the secondary standards,” “cannot be classified,” or “better than national standards.” However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

The City of Cotati has a national designation of Nonattainment for ozone and PM<sub>2.5</sub>, and either Unclassified or Attainment for all criteria pollutants. The City has a state designation as non-attainment for ozone, PM<sub>10</sub>, and PM<sub>2.5</sub>, and either attainment or unclassified for all criteria pollutants.

**TABLE 9.5-2: STATE AND NATIONAL ATTAINMENT STATUS**

Criteria Pollutants	State Designations	National Designations
8-Hour Ozone	Nonattainment	Nonattainment
PM10	Nonattainment	Unclassified
PM2.5	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Attainment
Sulfates	Attainment	No Federal Standard
Lead	Attainment	No Federal Standard
Hydrogen Sulfide	Unclassified	No Federal Standard
Visibility Reducing Particles	Unclassified	No Federal Standard

SOURCES: CALIFORNIA AIR RESOURCES BOARD (2011). [WWW.ARB.CA.GOV/DESIG/ADM/ADM.HTM](http://WWW.ARB.CA.GOV/DESIG/ADM/ADM.HTM)

### Air Quality Monitoring

The Bay Area Air Quality Management District and CARB maintain two air quality monitoring site in Sonoma County. The first is located on Fifth Street in the City of Santa Rosa. This monitoring station monitors Ozone (1-hr and 8-hr), PM10, and PM2.5. The second is located at the Healdsburg Airport. This monitoring station monitors Ozone (1-hr and 8-hr) only. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. Data obtained from the 5th Street monitoring site over the last 3-year period is shown in **Tables 9.5-3 and 9.5-4**.

**TABLE 9.5-3: AMBIENT AIR QUALITY MONITORING DATA (SANTA ROSA - 5TH STREET)**

Pollutant	Cal.	Fed.	Year	Max Concentration	Days (samples) State/Fed Standard Exceeded
	Primary Standard				
Ozone (O3) (1-hour)	0.09 ppm for 1 hour	NA	2007	0.071	0/NA
			2008	0.076	0/NA
			2009	0.086	0/NA
Ozone (O3) (8-hour)	0.07 ppm for 8 hour	0.075 ppm for 8 hour	2007	0.060	0/0
			2008	0.065	0/0
			2009	0.066	0/0
Particulate Matter (PM10)	50 ug/m3 for 24 hours	150 ug/m3 for 24 hours	2007	37.2	0/0
			2008	49.9	0/0
			2009	NA	*/*
Particulate Matter (PM2.5)	NA	35 ug/m3 for 24 hours	2007	32.0	NA/0
			2008	30.8	NA/0
			2009	29.0	NA/0

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2007, 2008, AND 2009.

**NOTES:**

PPM = PARTS PER MILLION.

UG/M3 = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

\* = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE

**TABLE 9.5-4: AMBIENT AIR QUALITY MONITORING DATA (SANTA ROSA - HEALDSBURG AIRPORT)**

Pollutant	Cal.	Fed.	Year	Max Concentration	Days (samples) State/Fed Standard Exceeded
	Primary Standard				
Ozone (O3) (1-hour)	0.09 ppm for 1 hour	NA	2007	0.070	0/NA
			2008	0.080	0/NA
			2009	0.070	0/NA
Ozone (O3) (8-hour)	0.07 ppm for 8 hour	0.075 ppm for 8 hour	2007	0.067	0/0
			2008	0.065	0/0
			2009	0.064	0/0

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2007, 2008, AND 2009.

**NOTES:**

PPM = PARTS PER MILLION.

UG/M3 = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

**CLIMATE CHANGE AND GREENHOUSE GASSES**

**Greenhouse Gases and Climate Change Linkages**

Various gases in the Earth’s atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth’s surface temperature. Solar radiation enters Earth’s atmosphere from space, and a portion of the radiation is absorbed by the Earth’s surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), ozone (O<sub>3</sub>), water vapor, nitrous oxide (N<sub>2</sub>O), and chlorofluorocarbons (CFCs).

Human-caused emissions of these GHGs, in excess of natural ambient concentrations, are responsible for enhancing the greenhouse effect (Ahrens 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2006a).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is the 12th to 16th largest emitter of CO<sub>2</sub> in the world and produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (California Energy Commission 2006a).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO<sub>2</sub> were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (California Energy Commission 2006a). This category was followed by the electric power sector (including both in-state and out of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (California Energy Commission 2006a).

### **Effects of Global Climate Change**

The effects of increasing global temperature are far reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs is anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to a California Energy Commission report, the snowpack portion of the supply could potentially decline by 70 to 90 percent by the end of the 21<sup>st</sup> century (CEC 2006c). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and, according to the CEC report, it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (CEC 2006c). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (CEC 2006c). As the existing climate throughout California changes over times, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (California Climate Change Center 2006), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

**PUBLIC HEALTH.** Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25 to 35 percent under the lower warming range, to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

**WATER RESOURCES.** A vast network of man-made reservoirs and aqueducts capture and transport water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The state's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major state fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25 percent of the water supply they need; decrease the potential for hydropower production within the state (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as 1 month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70 to 90 percent. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

**AGRICULTURE.** Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development will change, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

**FORESTS AND LANDSCAPES.** Global warming is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent,



which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30 percent toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90 percent.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

**RISING SEA LEVELS.** Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

## ENVIRONMENTAL SETTING

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The City of Cotati oversaw completion of the Greenhouse Gas Emissions Reduction Action Plan Analysis, Final Report in May 2008. As described above, the City is implementing a five milestone reduction plan, which consists of creating a GHG inventory, setting a reduction target, creating a mitigation plan to meet the reduction target, implementing the reduction plan, and monitoring the results.

The analysis, and resulting GHG emissions reduction plans prepared by the City in conjunction with Sonoma County Energy Watch, incorporates many opportunities in the various contributing sectors of City operations (Building Efficiency, Fleet, Commute, Water/Sewer, Streetlights, and Photovoltaic), as identified by the City Staff utilizing the best available information at the time of research. The results provide an emissions impact estimate for five plans with the corresponding financial analysis. The results for each plan include GHG emissions reductions expressed in tons of CO<sub>2</sub>e, which are equivalent CO<sub>2</sub> emissions.

The City of Cotati GHG inventory as a percentage of the 2000 total is shown below:

- Vehicle Fleet: 44 percent
- Employee Commute: 24 percent
- Buildings: 13 percent
- Streetlights: 11 percent
- Water and Wastewater 8 percent

## REFERENCES

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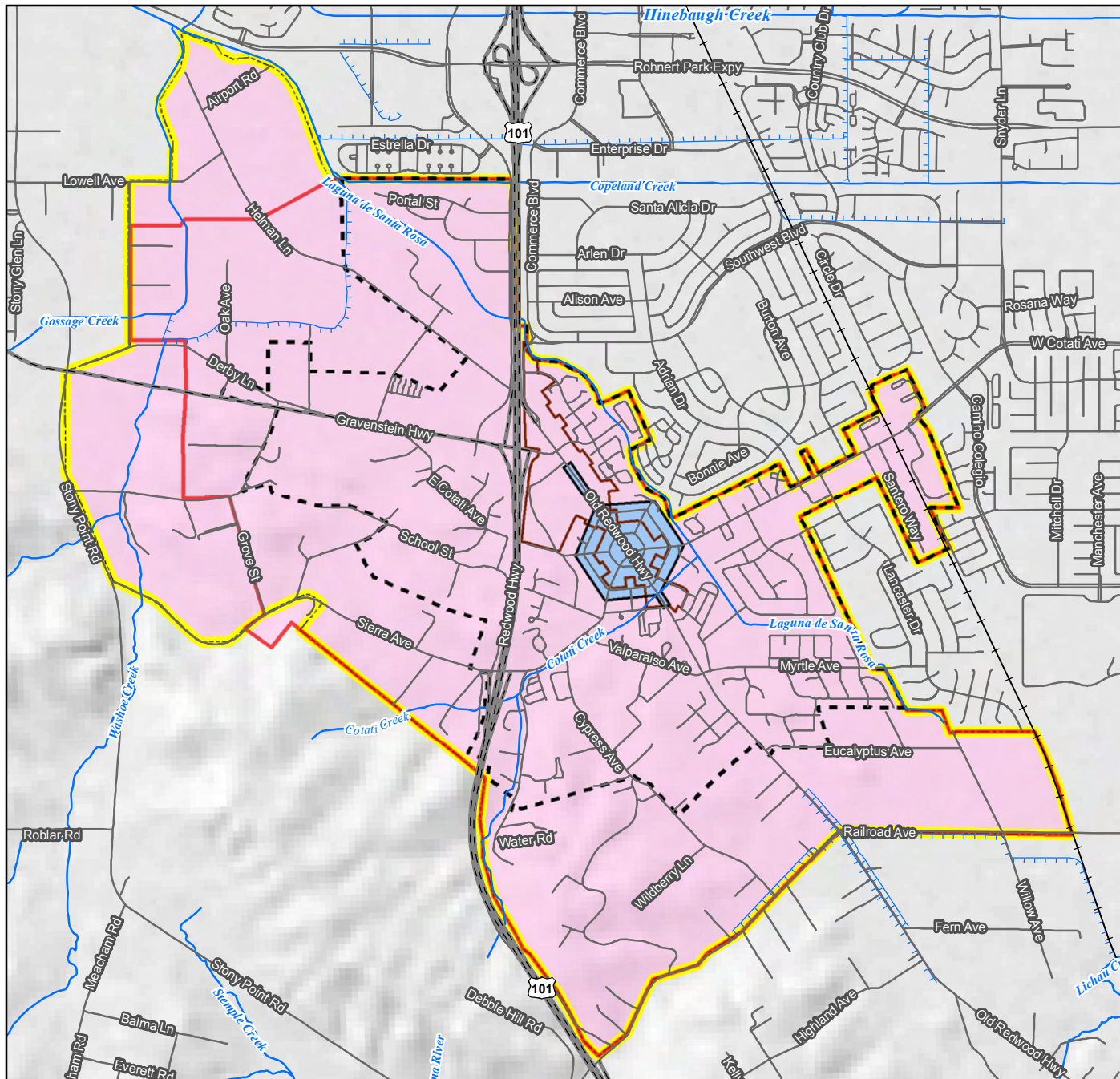
The primary sources of data referenced for this section is derived from the following:


Bay Area Air Quality Management District. 2010. Bay Area 2010 Clean Air Plan Adopted September 15, 2010.


- Bay Area Air Quality Management District. 2011. California Environmental Quality Act Air Quality Guidelines Updated May 2011.
- Bay Area Air Quality Management District. 1999. BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans.
- Bay Area Air Quality Management District. 2010. <http://www.baaqmd.gov/>
- C Donald Ahrens. 2006. Meteorology Today: An Introduction to Weather, Climate, & the Environment.
- California Air Resources Board. 2006. ARB Databases: Aerometric Data Analysis and Management System (ADAM). Updated: 2006. Available: <<http://www.arb.ca.gov/html/databases.htm>>. Accessed: February 21, 2007.
- California Energy Commission. 2005. Global Climate Change: In Support of the 2005 Integrated Energy Policy Report. (CEC-600-2005-007.) June Available: <<http://www.energy.ca.gov/2006publications/CEC-600-2005-007/CEC-600-3005-007-SF.PDF>>.
- California Energy Commission. 2006. Inventory of California Green house Gas Emissions and Sinks 1990 to 2004. (CEC-600-2006-013-SF.) December. Available: <<http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF>>.
- City of Cotati. 2009. 1998 General Plan Update, City of Cotati, as amended.
- Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: The Physical Science Basis, Summary for Policy Makers. (Working Group 1 Fourth Assessment Report.) February. Available: <<http://www.ipcc.ch/SPM2feb07.pdf>>.
- MSI Integrated Solutions, Inc. 2008. City of Cotati Greenhouse Gas Emissions Reduction Action Plan Analysis, Final Report.
- Sonoma County Climate Protection Campaign. 2003. Standing Together for the Future: Greenhouse Gas Emission Inventories for Eight Cities in Sonoma County, California
- Sonoma County Climate Protection Campaign. 2008. Sonoma County Climate Action Plan.
- The Weather Channel, LLC. 2011. <http://www.weather.com>.

Cotati General Plan Update

Figure 9.1-1: Sensitive Archaeological Areas




 Areas considered sensitive for prehistoric archaeological sites

 Historic Corridor

Planning Areas

 Downtown Special Plan Area

 Cotati City Limits

 Sphere of Influence

 Urban Growth Boundary



0 500 1,000 2,000  
Feet

1:30,000

Data sources: Tom Origer and Associates, USGS National Hydrography Dataset, Cotati GIS. Map date: July 15, 2011.










Cotati General Plan Update



Figure 9.2-1:  
Land Cover Map

Wildlife-Habitat Relationship System




WHR Name

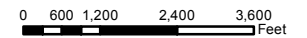
-  Agriculture
-  Annual Grassland
-  Barren
-  Eucalyptus
-  Freshwater Emergent Wetland
-  Urban
-  Water

USGS Hydrography

-  Stream or River
-  Canal or Ditch

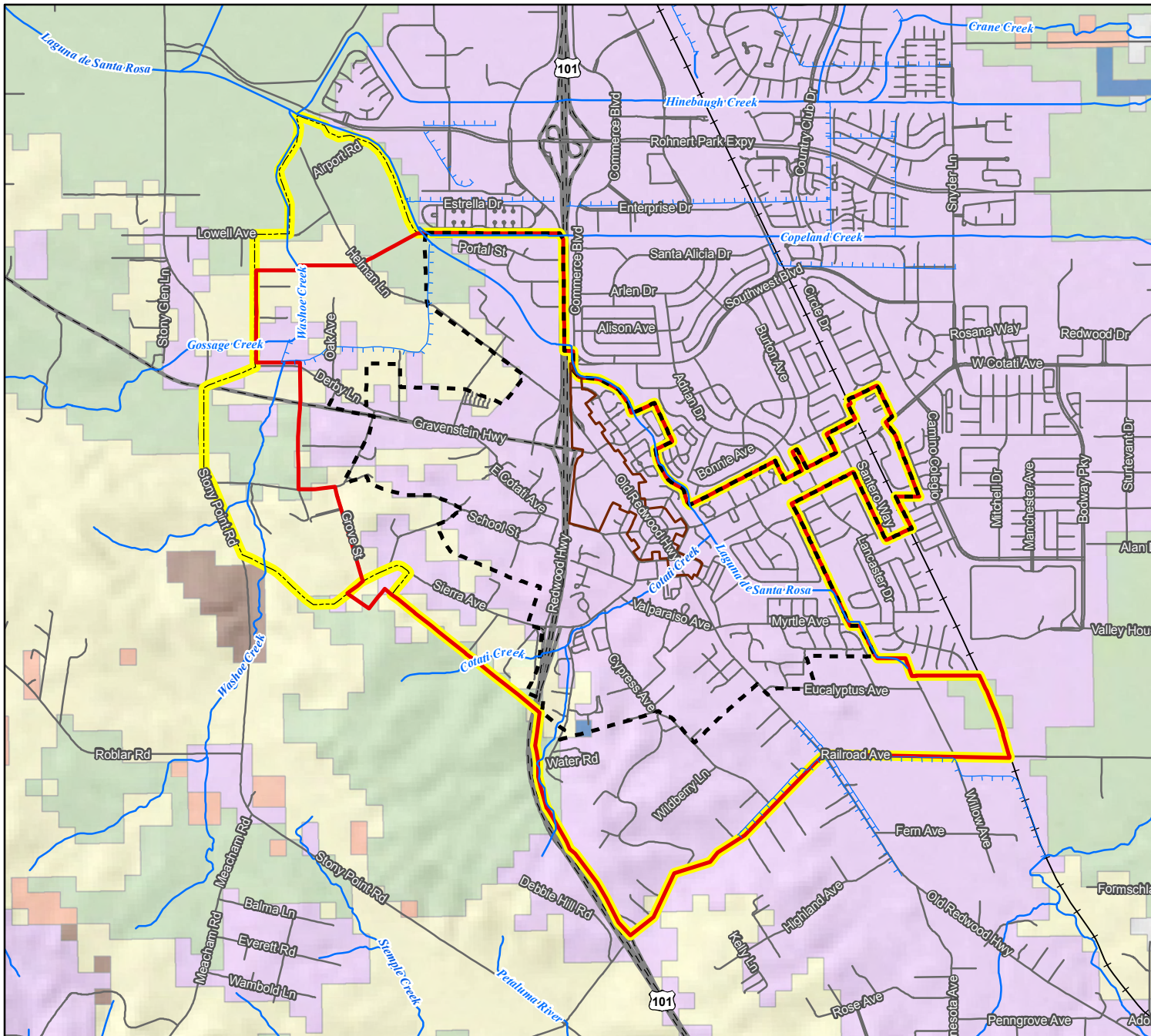
Planning Areas

-  Cotati City Limits
-  Sphere of Influence
-  Urban Growth Boundary



1:36,000

Data sources: USGS National Hydrography Dataset;  
California Department of Forestry and Fire Protection,  
Multi-Source Landcover data, 2002; Cotati GIS.  
Map date: July 15, 2011.

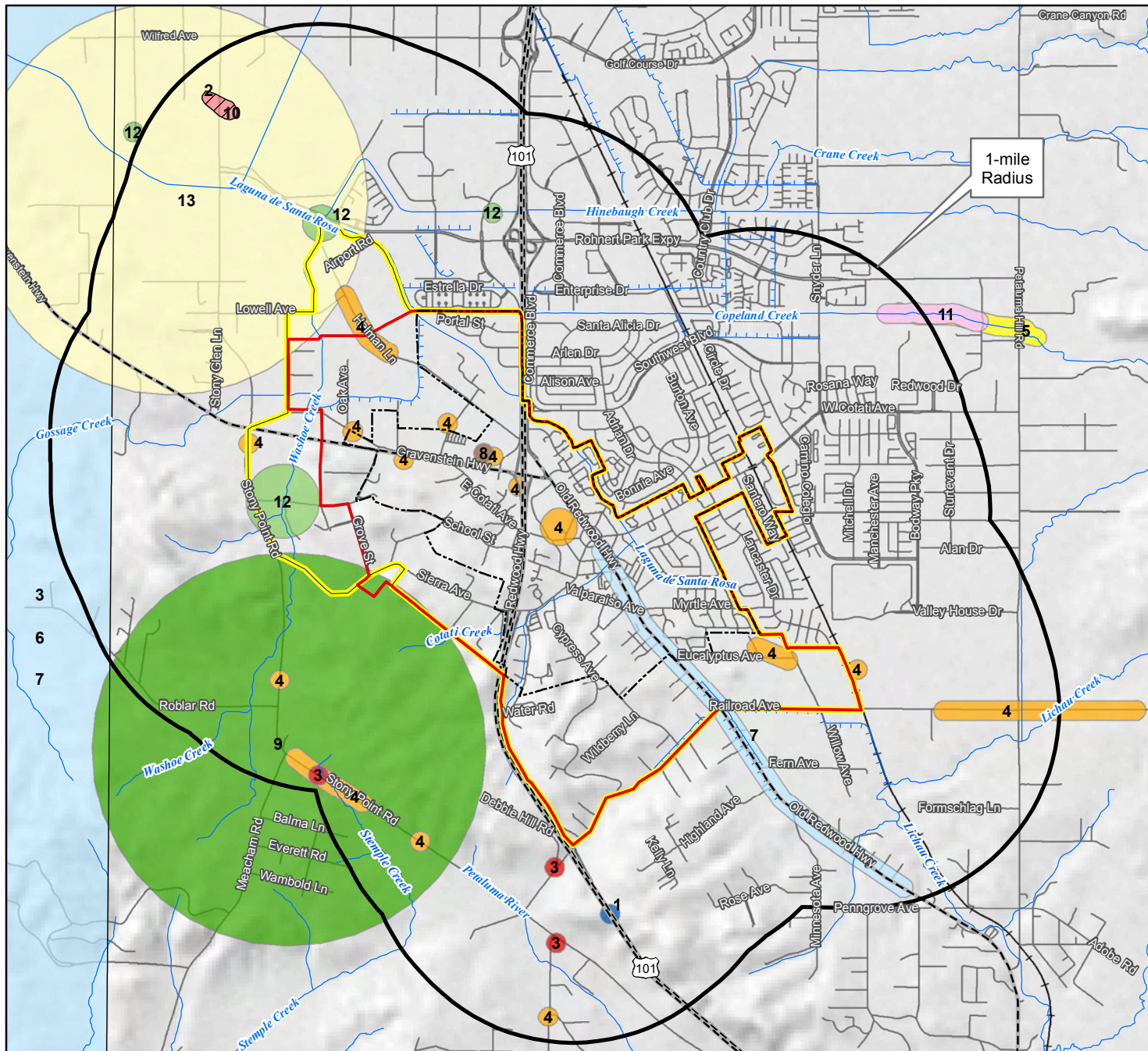






Cotati General Plan Update

Figure 9.2-2:  
Special Status Species  
1-mile Radius

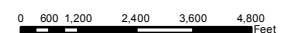


CNDDDB Species and Occurrence Count

- 1: American badger (1)
- 2: Burke's goldfields (1)
- 3: California red-legged frog (4)
- 4: California tiger salamander (15)
- 5: foothill yellow-legged frog (1)
- 6: Pitkin Marsh lily (1)
- 7: seaside tarplant (2)
- 8: Sebastopol meadowfoam (1)
- 9: showy rancheria clover (1)
- 10: Sonoma sunshine (1)
- 11: tricolored blackbird (1)
- 12: western pond turtle (4)
- 13: western yellow-billed cuckoo (1)
- Areas of Multiple Species Occurrence (2)

Planning Areas

- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary



1:48,000

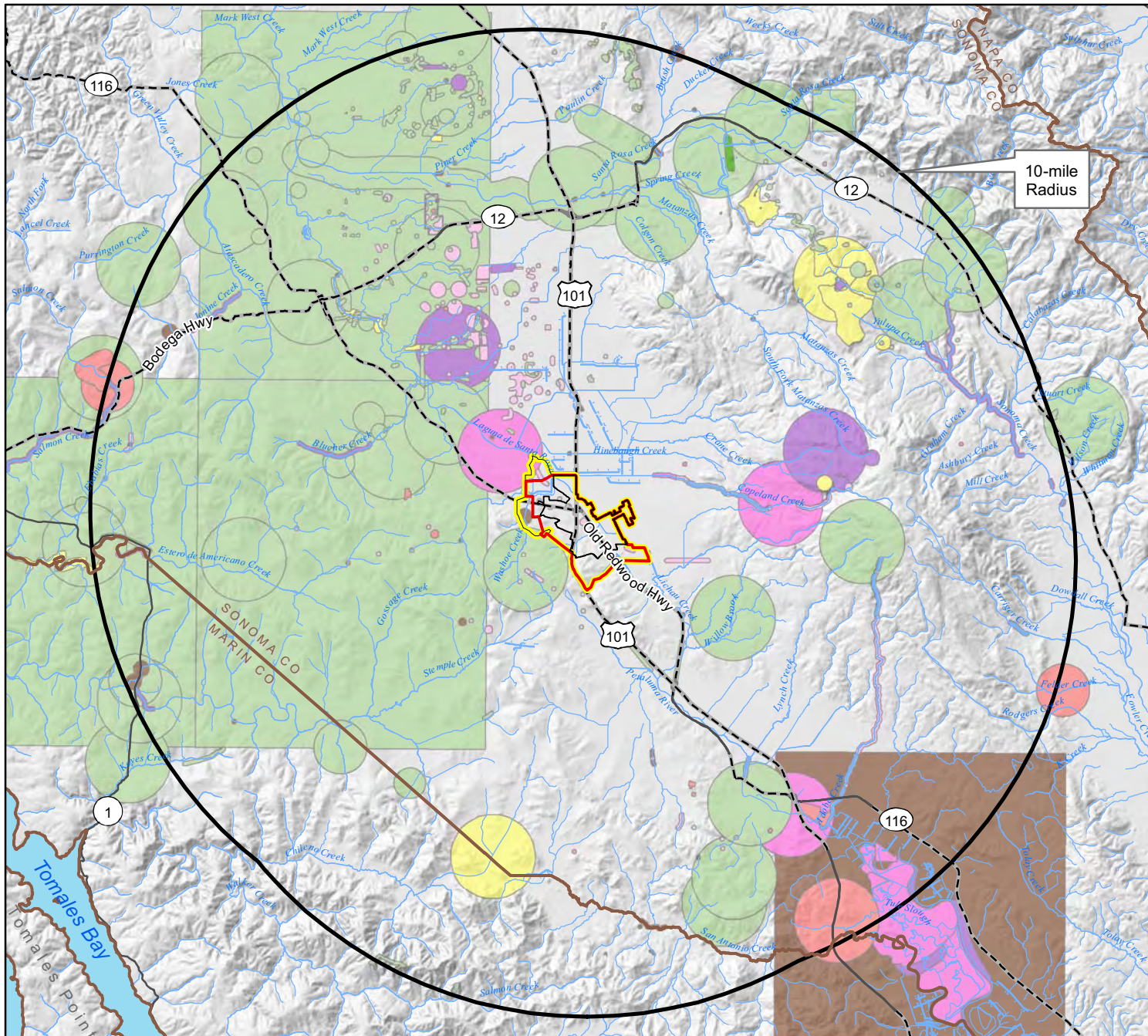
Data sources: California Natural Diversity Database, Biogeographic Data Branch, Department of Fish and Game, May 3, 2011; Cotati GIS. Map date: July 15, 2011.





Cotati General Plan Update

Figure 9.2-3:  
Special Status Species  
10-mile Radius

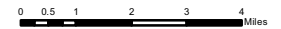


CNDDDB Species Type

- Amphibian
- Mammal
- Bird
- Invertebrate
- Fish
- Reptile
- Community
- Vascular Plant
- Non-Vascular Plant

Planning Areas

- Cotati City Limits
- Sphere of Influence
- Urban Growth Boundary



1:220,000

Data sources: California Natural Diversity Database, Biogeographic Data Branch, Department of Fish and Game, May 3, 2011; Cotati GIS. Map date: May 5, 2011.











Cotati General Plan Update

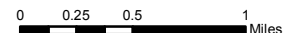
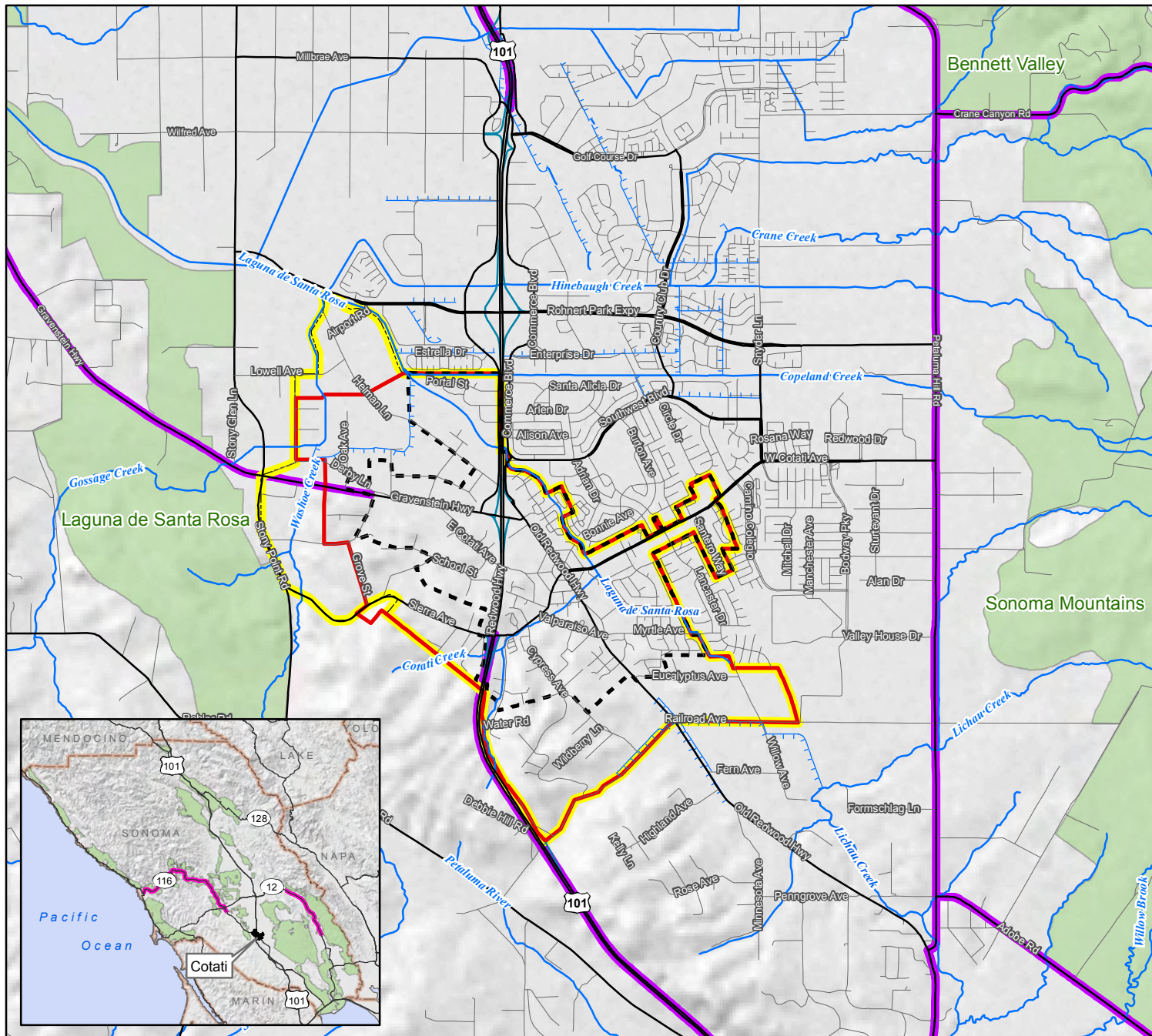
Figure 9.4-1:  
Scenic Resources

Scenic Resources

-  California State Scenic Highways (inset only)
-  Sonoma County Designated Scenic Corridor
-  Sonoma County Designated Scenic Landscape

Planning Areas

-  Cotati City Limits
-  Sphere of Influence
-  Urban Growth Boundary



1:54,000

Data sources: Sonoma County Permit and Resource Management Dept; CalTrans; Cotati GIS; USGS National Hydrography Dataset; Map date: July 15, 2011.

