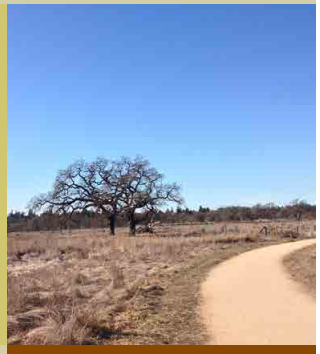
SEBASTOPOL General Plan Update

Existing Conditions Report

August 2014



De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

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SEBASTOPOL GENERAL PLAN EXISTING CONDITIONS REPORT

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INTRODUCTION

The City of Sebastopol General Plan identifies the community's vision for the future and provides a framework to guide decisions on growth, development, and conservation of open space and resources in a manner consistent with the quality of life desired by residents and businesses.

This City of Sebastopol General Plan Update Existing Conditions Report provides an overview of Sebastopol's physical, environmental, economic, and demographic setting, as of early/mid 2014.

City of Sebastopol staff, the General Plan Update consultant (De Novo Planning Group), and its subconsultants have worked together to ensure that this is an accurate and reliable source of information. This document is intended to serve as a comprehensive reference for community members, policymakers, staff, the city's General Plan Advisory Committee (GPAC), and the consultant team throughout the General Plan Update process.

The City of Sebastopol's General Plan Update is a multi-year process that will include a comprehensive update of the General Plan, which sets a vision for the future of the city, and an Environmental Impact Report (EIR), which investigates the possible impacts of the General Plan Update policy changes to the surrounding physical environment. This Existing Conditions Report document provides information about these components and establishes the existing setting for the EIR.

This chapter provides a brief background summary of the City of Sebastopol, summarizes the contents of this Existing Conditions Report, and provides an overview of the General Plan Update.

BACKGROUND

Sebastopol was incorporated in 1902, primarily to address critical public health concerns. Sebastopol is a 'general law' Council-Manager city with five Council members elected at large. Boards and Commissions include: Planning Commission; Design Review Board/Tree Board; Complete Streets Committee; and Public Arts Committee.

Sebastopol has a unique and highly-valued small-town character. A community of about 7,500, located in the San Francisco/North Bay region, Sebastopol is the hub of West Sonoma County. While the incorporated area is small, Sebastopol serves a much larger unincorporated area stretching to the Pacific Ocean and the Russian River. The City's 'market area' comprises a population of approximately 40,000-50,000 people, who, to varying degrees, use Sebastopol as their 'town' for goods, services, and recreational and cultural activities. Thus, the town has far more economic activity, traffic, and recreational and cultural services than would be apparent based simply on the incorporated area's population.

The City has an extraordinary location, being surrounded by vineyards, orchards, rural residential and wetlands, located minutes from the Sonoma Coast and the Russian River area, and just 60 miles north of San Francisco, one of the world's premier urban visitor destinations. Sebastopol is at the crossroads of two State Highways, Highways 116 and 12, and is just eight miles from Sonoma County's largest city, Santa Rosa. Sebastopol has an active population, highly engaged in community affairs. Although a very small city, Sebastopol has been a leader in community planning, adopting a number of innovative policies and programs. It is anticipated that there will be a high level of community involvement with the Update.

Excepting the Housing Element, the City's current General Plan was adopted in 1994 and includes the following elements:

- Land Use
- Transportation
- Conservation, Parks and Open Space
- Housing
- Community Identity
- Economic Vitality
- Safety

The City has limited developable areas and a history of few annexations since the current General Plan was adopted. The City has a voter-approved Urban Growth Boundary and a Growth Management Program, both of which are intended to preserve the small-town character of the town, discourage sprawl, and preserve open space, agriculture and environmental resources on the town's perimeter.

EXISTING CONDITIONS REPORT CONTENTS

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

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

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

1.0 LAND USE AND SOCIOECONOMICS

The Land Use and Socioeconomics chapter addresses land use and demographics, including issues related to land use patterns, community character, and economic development. The information in this chapter provides both an historical and current perspective on land use and is intended to assist the General Plan Update process by providing both historical context and a baseline of existing land use information to be used when formulating and considering amendments to the city's current land use pattern or when considering alternate growth and land use scenarios for the city.

The economic development discussion provides information about the city's economic trends and conditions. The purpose of this information is to describe the city, its residents, and business activity from an economic market perspective. This section discusses the current economic base of the city,

business in industrial and commercial core areas, and local employment conditions. This section identifies the employment and industry sectors present in the city, jobs by employment and industry sector, and employment trends.

2.0 TRANSPORTATION AND CIRCULATION

The Transportation and Circulation chapter describes the circulation network serving the city. Existing conditions are described for roadway operations, pedestrian-bicycle facilities, transit service, and multimodal operations. This chapter includes a review of relevant transportation planning documents describing the Sebastopol area including the current Circulation Element, Sebastopol's current Capital Improvement Program, MTC *Transportation 2035*, the MTC Regional Transportation Improvement Program, the Sonoma Comprehensive Transportation Plan, Plan Bay Area, and the *Sebastopol Bicycle and Pedestrian Master Plan.* Federal, State, regional, and local regulations pertaining to traffic and circulation in Sebastopol are also described.

3.0 COMMUNITY SERVICES AND UTILITIES

The Community Services and Utilities chapter describes the existing conditions and regulatory context regarding community services and utilities, including water, wastewater, drainage and flood control, education, public safety services, schools, and parks and recreational resources within the city. These facilities and services provide a framework that supports growth and development in the city. This chapter describes existing service levels, available resources, and planned expansion of services and infrastructure.

4.0 HAZARDS

The Hazards chapter includes a listing of key significant issues that will ultimately guide the preparation of the Safety Element of the General Plan. This chapter provides a summary of the existing setting and conditions associated with natural and man-made hazards that may pose a danger to city residents, employees, and visitors including: flooding; soils hazards; dangers from hazardous materials including hazardous materials sites (i.e., landfills, superfund sites, pipelines and sites with the potential for chemical explosion); fire hazards; emergency response; aircraft hazards; and major inclement weather conditions. Known hazardous conditions listed in available State and County databases are also described.

5.0 CONSERVATION AND NATURAL RESOURCES

The Conservation and Natural Resources chapter discusses conservation issues related to cultural and historic preservation, air quality, greenhouse gases, biological resources, and visual resources in and around the city. This chapter also discusses open space as it relates to the preservation of natural resources as part of the biological resources discussionFederal, State, and local regulations that pertain to each of these topics are also described.

6.0 COMMUNITY HEALTH AND WELLNESS

The Community Health and Wellness chapter addresses a wide range of topics related to the health and well-being of city residents and workers. A community's overall health depends on many factors, including the environment in which people live and work. A healthy living environment reduces risks and facilitates healthy lifestyles. Critical determinants of healthy living environments, which will be used to develop a community health baseline, include:

- Public health indicators such as vulnerable populations, asthma, obesity, diabetes, and chronic disease;
- Active lifestyle opportunities – walking and bicycling to services, and availability of recreational facilities;
- Community design - safe neighborhoods and public spaces, affordable housing, and sustainable development;
- Healthy lifestyle determinants – local foods, healthy shopping options, number of fast food restaurants, medical and mental health services; and
- Environmental quality.

The context of each determinant in promoting healthy communities is described and supporting information that describes existing conditions in Sebastopol is provided, based on available information and reports. This section also includes a summary description of current efforts that the City is undertaking to promote sustainability and healthy communities strategies.

7.0 NOISE

The Noise chapter includes descriptions of the characteristics of sound and noise and a description of transportation, stationary, and construction noise sources within the City's Planning Area. A description of the noise monitoring survey results, tabularized noise exposure contours, and an existing conditions analysis that reflects traffic and stationary noise sources are included. This section also summarizes current information on ground vibration thresholds and summarizes the existing vibration environment.

Noise measurement locations were selected to quantify noise levels along major thoroughfares, near significant stationary noise sources, in developing areas, and in other areas that have been problematic in the past. Noise levels associated with stationary and railroad sources were identified in tabular format, and background noise levels within the community are quantified. A summary of the regulatory framework related to noise, including Federal, State, and City laws, ordinances, plans, policies, and standards is also provided.

GENERAL PLAN OVERVIEW

State law requires every city and county in California to prepare and maintain a planning document called a general plan. A general plan is a "constitution" or "blueprint" for the future physical development of a county or city. All future planning decisions and project approvals must be consistent with the general plan, including, but not limited to: specific plans, subdivisions, public works projects, and zoning decisions.

A general plan has four defining features:

- **General.** As the name implies, a general plan provides general guidance for future land use, transportation, infrastructure, environmental, and resource decisions.
- **Comprehensive.** A general plan covers a wide range of social, economic, infrastructure, and natural resource issues. The Sebastopol General Plan Update will include goals, policies and implementation programs to address: land use, housing, conservation, open space, safety, noise, community health and wellness, urban design and community character, and economic sustainability.

- **Long-Range.** A general plan provides guidance on achieving a long-range vision of the future for a city or county. To reach this envisioned future, the general plan includes goals, policies, and implementation programs that address both near-term and long-term needs. The City of Sebastopol General Plan Update will look ahead approximately 20 years, to the year 2035.

- **Integrated and Coherent.** The goals, policies, and implementation programs in a general plan must present a comprehensive, unified program for development and resource conservation. A general plan uses a consistent set of assumptions and projections to assess future demands for housing, employment, public services, and infrastructure. A general plan has a coherent set of policies and implementation programs that enables citizens to understand the vision of the general plan, and enables landowners, businesses, and industry to be more certain about how future planning decisions will be made and implemented.

USING THE GENERAL PLAN

The General Plan is used by the City Council, Planning Commission, and City staff on a regular basis to make decisions with direct and indirect land use implications. It also provides a framework for inter-jurisdictional coordination of planning efforts among officials and staff of the City and other government agencies such as the County and State and Federal agencies.

The General Plan is the basis for a variety of regulatory mechanisms and administrative procedures. California planning law requires consistency between the General Plan and its implementation programs. Implementation programs and regulatory systems of the General Plan include zoning and subdivision ordinances, capital improvement programs, specific plans, environmental impact procedures, and building and housing codes.

Over time, the city's population will change, its goals will be redefined, and the physical environment in which its residents live and work will be altered. In order for the General Plan to be a useful document, it must be monitored and periodically revised to respond to and reflect changing conditions and needs. As such, a general plan should be comprehensively updated approximately every 10 years.

The City's General Plan should also be user-friendly. To this end, the Sebastopol General Plan Update will be divided into two primary documents: the Existing Conditions Report and the Goals and Policies Report.

As described above, this Existing Conditions Report provides a summary of a range of conditions in Sebastopol as they exist in early/mid 2014, and provides the baseline framework for the development of the General Plan's goals, policies, and implementation programs.

The Goals and Policies Report is the essence of the General Plan. It contains the goals and policies that will guide future decisions within the city. It also identifies a full set of implementation programs that will ensure the goals and policies in the General Plan are carried out.

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1.0 LAND USE AND SOCIOECONOMICS

This chapter examines the land use and development patterns in the city of Sebastopol, as well as a profile of the City's demographics, housing, and economic characteristics. 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 includes the following sections:

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

1.1 LAND USE

This section examines the land use and development patterns in the city of Sebastopol. The regulatory framework associated with land use is identified. Existing land use conditions, including land uses by General Plan designation and assessed land uses, are described. This chapter provides an overview of existing land use patterns, types and location of development in the city, and approved and pending projects.

KEY TERMS

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

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

Urban Growth Boundary: The Urban Growth Boundary (UGB) is the area in which urban development and urban services may be provided by the City. The Urban Growth Boundary is in effect through December 31, 2016, as described in the Regulatory Framework discussion.

Planning Area: For the purposes of the Sebastopol General Plan Update, the Planning Area is defined as the area surrounding the city limits and within the Sebastopol SOI and UGB that is included in the analysis and planning for the 20 year horizon of the City's General Plan Update.

Figure 1-1 shows the Sebastopol City Limits, the adopted SOI, and the Urban Growth Boundary.

REGULATORY FRAMEWORK

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

STATE

California General Plan Law

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

The General Plan 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 provides a statement of the community's development, economic, circulation, and environmental goals and includes diagrams and text setting forth objectives, standards, policies, and programs. 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 describe 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 Sebastopol General Plan

The City's current General Plan was adopted May 31, 1994 and reflects amendments through 2011. Land uses in Sebastopol have been developed based on the Land Use Map, goals, and policies established by the City of Sebastopol General Plan. The City's General Plan includes the following chapters: I - Land Use, II - Transportation, III - Conservation, Parks, and Open Space, IV – Housing, V – Community Identity, VI – Economic Vitality, and VII – Safety, that guide land use and planning decisions within the city. Goals in the General Plan most related to the topic of land use include:

I – Land Use

Goal 1 **Phase future growth so that City resources are not exceeded.**

Goal 2 **Maintain Sebastopol as a small town.**

Goal 3 **Ensure that development adjacent to the Sphere of Influence is compatible with the goals and policies of the Sebastopol General Plan.**

Goal 4 **Preserve the unique character and ambiance of residential areas.**

Goal 4 **Emphasize, develop, and establish Sebastopol's role as a market and service center for the West County.**

Goal 5 **Increase the city's retail sales tax base.**

Goal 6 **Increase job opportunities in the office sector of the economy.**

Goal 7 **Increase industrial employment in Sebastopol while maintaining the quality of the environment.**

Goal 8 **Create opportunities for economic development and redevelopment.**

Goal 9 **Ensure that development adjacent to the Sphere of Influence is compatible with the goals and policies of the Sebastopol General Plan.**

III – Conservation, Parks, and Open Space

Goal 1 **Preserve areas with important biotic resources such as wetlands, riparian corridors, and areas with scenic features.**

Goal 2 **Ensure the maintenance of wetlands areas adjacent to City boundaries as permanent open space.**

Goal 3 **Protect, maintain and restore wetlands areas.**

Goal 11 **Develop open space, parks, and recreation facilities in harmony with the surroundings.**

Goal 12 **Incorporate open space in all major developments.**

Goal 15 **Protect and enhance existing sensitive habitats in the Laguna.**

V - Community Identity

Goal 2 **Preserve the character of existing residential neighborhoods.**

Goal 3 **Ensure that new residential development demonstrates quality, excellence of design, and sensitivity to the character of the surrounding neighborhood.**

Goal 4 **Maintain Sebastopol's identity as a small, compact town.**

Goal 7 **Continue to maintain a *Downtown Plan*.**

Goal 9 **Establish the Downtown as the retail center of the community.**

Goal 10 **Establish the Downtown as a place for community and cultural activities.**

Goal 11 Provide housing in Downtown areas for diversity, security and in order to extend "life on the streets" into the evening hours.

VII – Safety

Goal 10 Ensure the compatibility of new development with existing and future noise environment.

Goal 11 Prevent land uses which increase the existing noise level above established acceptable standards.

These guiding goals are reinforced by the City's General Plan Land Use Map through focusing future growth within the community and/or adjacent to developed areas; the establishment of permanent open space and conservation areas that protect natural resources, buffer the community, and limit the extent of growth; the designation of commercial, mixed use, and office uses in the downtown and along primary transportation corridors; the designation of residential uses proximate to existing and/or planned services, parkland, and other amenities; and the designation of lands for parks and community facilities.

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 Planning Area by acreage and parcels. Land use designations on the adopted General Plan Land Use Map, as amended through 2011, are shown on Figure 1-1.

A brief description of each of the adopted General Plan land use designations is provided below. These descriptions are based on the text of the General Plan Land Use Element, as updated in 2001.

Residential Land Use Designations

Residential land use designations define densities and types of residential uses, and allow group care and day care facilities in multifamily residential areas. Churches, schools, and utilities facilities are permitted in all residential land use designations. The residential densities described below are given in dwelling units per net acre. A net acre is the actual area of a given property, including any right-of-way reserved, dedicated or used for utilities and streets, minus undevelopable land because of environmental constraints such as wetlands, riparian vegetation and required buffer setbacks.

Very Low Density Single Family Residential: Designates areas suitable for single family dwellings at a density up to one unit per acre. Smaller existing parcels within this designation would not be precluded from developing one house unit. Population density for this designation could range from zero to 2.4 persons per acre.

Low Density Single Family Residential: Designates areas suitable for single family dwellings at a density of 1.1 to 2.0 units per acre. Smaller existing parcels within this designation would not be precluded from developing one housing unit. Population density for this designation could range from 2.6 to 4.8 persons per acre.

Medium Density Single Family Residential: Designates areas suitable for single family dwellings at a density of 2.1 to 6.0 units per acre. Smaller existing parcels within this designation would not be precluded from developing one housing unit. Population density for this designation would range from 5.0 to 14.4 persons per acre.

High Density Single Family Residential: Designates areas suitable for multifamily dwellings at a density of 6.1 to 22 units per acre. Population density would range from 14.6 to 36.0 persons per acre. This designation is suitable for duplexes, apartments, townhouses, and other attached dwelling units.

Commercial, Office, Downtown Core, and Industrial Designations

Office: This designation provides areas for office activities which serve local and regional needs. It allows professional, administrative, medical, dental, and business offices, bed and breakfast users, along with ancillary commercial and service uses. Residential uses are permitted as a secondary use to the primary office use at the Medium Density Residential density of 2.1 to 15 units per acre. The maximum FAR shall not exceed 1.0 (not including the residential use).

General Commercial: This designation provides areas for commercial uses with off-street parking and/or clusters of street-front stores. This designation permits primarily local-serving retail establishments, specialty shops, banks, professional offices, motels and business and personal services. This designation is typically assigned to parcels, located on a major arterial street, that can provide sufficient land for commercial establishments that do not benefit from high-volume pedestrian concentrations found Downtown. The following types of retail uses are discouraged in this land use designation: factory outlets; large regional-serving shopping centers; and other similar retail uses generating high traffic volumes. Maximum FAR shall not exceed 1.0. Residential uses are permitted as a secondary use to the primary commercial uses permitted in this land use designation if generally located above the ground floor at the High Density Residential density of 6.1 to 22 units per acre. The residential space will not be counted in calculating the FAR for a development. (Residential uses in the General Commercial designation would require a conditional use permit.)

Downtown Core: This designation applies to Sebastopol's Downtown and permits office, commercial and retail uses, as well as mixed-use residential developments. Residential uses are permitted at a density of 15 to 44 units per acre if combined with commercial land uses, such as office and retail. Maximum FAR shall not exceed 2.0 (not including the residential use). This designation is intended to implement the Downtown Plan and enhance the vitality and character of Sebastopol's historic commercial area. Second story housing is encouraged.

Light Industrial: This designation provides for a wide variety of commercial, wholesale, service, and processing uses which do not generate excessive adverse environmental impacts. Other uses permitted in this designation include office ancillary to industrial uses; warehousing and agricultural products sales and services; auto sales and repair; food and drink processing; construction yards; light manufacturing; and similar uses. Residential uses are permitted as a secondary use to the primary light industrial uses permitted in this land use designation at the High Density Residential density of 6.1 to 22 units per acre. Maximum FAR shall not exceed 0.55 (not including the residential use).

Office/Light Industrial: This designation represents a synthesis of the Office and Light Industrial classifications and is intended to promote well planned, integrated business parks, which will serve as major employment center within the community. The Office/Light Industrial designations only applies to sites of three (3) acres or larger and must be implemented through the PC-Planned Community zoning process. Land uses within business parks shall be limited to non-polluting, "clean" industries and businesses with primary permitted uses including corporate and administrative offices and research development uses. Ancillary uses shall be permitted under this designation, which may include warehousing and distribution, exercise facilities, child care uses, and food service uses which provides support services to primary uses. FAR shall not exceed 0.40.

Open Space, Recreation, and Other Designations

Open Space: This designation applies to areas of land which are essentially unimproved and devoted to the preservation of natural resources, agriculture, outdoor recreation, and for the maintenance of public health and safety. The only structures permitted are shelters, restrooms, storage sheds, and other structures needed to accommodate public use or provide for maintenance of the land. Maximum FAR shall not exceed 0.10.

Parkland: This designation applies to existing and proposed active and passive parks, and linear parks (landscaped paths) in urban areas. Structures allowed are shelters, restrooms, storage sheds, other structures needed to accommodate public use or provide for maintenance of the land, and recreational facilities. Maximum FAR shall not exceed 0.10.

Community Facilities: This designation includes public buildings and facilities, utility facilities and related easements, public libraries, city offices, fire and police stations, and school sites. Maximum FAR shall not exceed 1.0.

TABLE 1-1: CITY OF SEBASTOPOL GENERAL PLAN LAND USE DESIGNATIONS

	City	SOI/UGB	TOTAL
Open Space and Recreation			
Open Space	90.7	0	90.7
Parkland	34.4	0	34.4
Subtotal	*125.1*	*0*	*125.1*
Commercial, Office, and Industrial			
Downtown Core	44.8	0	44.8
General Commercial	66.4	0	66.4
Light Industrial	32.7	44.8	77.4
Office	35.8	0	35.8
Office/Light Industrial	13.3	0	13.3
Subtotal	*193.0*	*44.8*	*237.7*
Residential			
Very Low Density Residential	7.4	69.0	76.3
Low Density Residential	89.9	18.3	108.2
Medium Density Residential	369.7	67.0	436.7
High Density Residential	134.5	0	134.5
Subtotal	*601.5*	*154.3*	*755.7*
Other			
Community Facilities	96.3	0	96.3
Right-of-Way	172.5	15.5	188.0
No Label	0	12.6	12.6
Subtotal	*268.8*	*28.1*	*296.9*
TOTALS	***1,188.4***	***227.2***	***1,415.4***

City of Sebastopol Zoning Ordinance

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

A. To implement the General Plan of the City of Sebastopol including the Growth Management policies.

B. To provide a definite and comprehensive zoning plan for development of the City and to guide, control, and regulate the future growth of the City in accordance with such plan and the City's General Plan.

C. To protect the character and the social and economic stability of the land uses within the City, and to assure the orderly and beneficial development thereof.

D. To minimize disagreements between private individuals or groups or other disagreements which might result from incompatible or inappropriate adjacent land uses.

E. To maintain and enhance desirable characteristics of neighborhoods; to provide for open space for light and air; to prevent undue concentration of population; to promote orderly community development; and to otherwise promote the implementation of the Sebastopol General Plan.

F. To promote efficient use of land, thereby minimizing unnecessary cost of development.

Chapter 17.12 of the Zoning Ordinance establishes the City's zoning districts and includes the City's Zoning Map and provides direction for the interpretation of the Zoning Map. Chapters 17.16 through 17.94 define allowable land uses within each zoning and combining district, provide development standards for each zoning district and, where applicable, provide performance standards and identify design criteria. Chapter 17.96 establishes supplementary development standards and provisions. Chapter 17.110 establishes special use permit criteria. Chapter 17.250 through 17.340 establishes administrative procedures, permit requirements, and procedures for amending the General Plan and Zoning Ordinance.

Design Review Guidelines

The Design Review Guidelines apply to new buildings, additions, and other site improvements in the City. The Design Review Guidelines are intended to be interpreted with flexibility and are not strict standards. The Guidelines are intended to provide guidance to owners, builders, architects, landscape architects, engineers, designers and others involved in land use development and to assist the Design Review Board in reviewing applications to promote a high quality of design, and consistency in the design review process. The Guidelines address the following topics:

- Site planning
  - Neighbordhood context
  - Building orientation
  - Circulation and parking

  - Open space
  - Grading and storm water management
  - Auxiliary structures
  - Noise and privacy
- Architecture
  - Relationship to surrounding architecture
  - Massing
  - Elements
- Landscaping
  - Plant types
  - Trees
  - Parking lots
  - Hardscape
- Downtown and pedestrian-oriented commercial frontages and facades
- Laguna de Santa Rosa
- Fast food restaurants
- Shopping centers
- Auto dealerships
- Auto service stations
- Signage
  - Design
  - Placement
  - Illuminations

Sebastopol Downtown Plan

The Sebastopol Downtown Plan was adopted in 1990 and provides direction for the continued development of Downtown in order to maintain and strengthen the city's role as a western county retail/cultural center and as a viable alternative to retail/service shopping in nearby cities. See Figure 1-2 for the Downtown Plan area. The Downtown Plan provides for the coordination of public and private investment in order to fulfill identified objectives for the Downtown area. The Downtown Plan was developed to encourage pedestrian-friendly streets, provide for a focal point (Town Square), and provide open spaces for community events.

The Downtown Plan establishes the following eight broad goals:

- Economic: Enrich existing businesses and increase the self-sufficiency of the community.
- Economic: Establish the Downtown area as the retail center of the community.
- Community/Culture: Establish the Downtown as a place for community activities.
- Community/Culture: Establish the historic Downtown area as the cultural core of the community.

- Community/Culture: Provide housing in the Downtown area for diversity, security, and in order to extend "life on the streets" into the evening hours.
- Environment: Retain and enhance the quality of life and environment in the Sebastopol Downtown area.
- Environment: Reduce automobile congestion by promoting other modes of transportation and providing alternatives to existing vehicle travel patterns.
- Environment: Promote ridership for transit by developing higher density residential and commercial areas on transit corridors.

The Downtown Plan provides identifies 16 specific implementation measures including establishing the Town Square, opportunity sites for mixed-use development (Diamond Lumber/Brown Street, Main Street/High Street/Burnett Street, and Morris-Old Duraglass Area locations), retail space improvements, pocket parks, downtown entries, improvements to specific buildings/sites (Glendale/Tuttle Drug and Sprouse), identification of a potential hotel site, and improvements to the circulation system, including street, bicycle lane, pedestrian path, and parking improvements.

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.

Measure O

Measure O, approved by Sebastopol voters in November 1996, amended the General Plan to reaffirm the City's UGB and amend Land Use Policy P.9 to keep the UGB in effect until December 31, 2016 to be approved by the City's voters. The UGB is shown on Figure 1-1. Measure O also amended Land Use Policy P.8 to prohibit extension of City services outside the UGB, except under specific extraordinary circumstances. The measure also added Land Use Policy P.9A to establish provisions for the administration of the UGB, including provisions for the City Council to amend the UGB either within or coextensive of the April 9, 1996 UGB limits, allow for up to 3 acres of land to be brought within the UGB in any calendar year to accommodate residential uses pursuant to specified findings, allow for up to 25 acres of land to be brought within the UGB in any calendar year to accommodate office or light industrial uses pursuant to specified findings, allow amendment of the UGB to avoid unconstitutional taking of property, to define uses not considered development that are permitted beyond the UGB, and to ensure that subsequent regulatory documents, entitlements, and General Plan Updates are consistent with Land Use Policies P.8, P.9, and Policy P.9A.

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 Sebastopol's Sphere of Influence and Urban Growth Boundary. While the City of Sebastopol General Plan Land Use Map identifies planned land uses within the SOI and UGB, the County of Sonoma has ultimate land use planning and project approval authority within the SOI and UGB unless the lands are annexed to the City. The County's land use designations for areas within the Sphere of Influence are summarized in Table 1-2 and the County's land use designations for the unincorporated area around the City are shown on Figure 1-3.

TABLE 1-2: SONOMA COUNTY LAND USE DESIGNATIONS IN SOI /UGB	
Land Use	**Acreage**
Sphere of Influence	
Diverse Agriculture	12.6
General Commercial	3.1
Limited Commercial	5.4
Limited Industrial	7.3
Rural Residential	183.2
TOTAL	**211.6**

Source: Sonoma County, 2014; De Novo Planning Group, 2014

EXISTING SETTING

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 building square footage. This information is used as the basis for property tax assessments and is summarized in Table 1-3 and depicted on Figure 1-4.

TABLE 1-3: EXISTING LAND USES –CITY OF SEBASTOPOL			
Use Description[1]	**Acres**	**Residential Units**	**Square Feet[2]**
Residential			
Single Family Dwelling	414.6	1,721	3,068,587
Condominium, Townhome, Attached Single Family Units	9.1	312	381,964
Single Family Dwelling, 2 or more Units on Parcel	38.1	222	267,734
Multifamily, 2 to 4 Units	28.5	357	328,830
Multifamily, 5 to 40 Units	25.9	426	233,990
Multifamily, 41 or more Units	14.0	248	127,192
Manufactured Home Parks	17.2	103	1,344
Enforceably Restricted Dwelling	2.4	57	75,156
Common Areas	11.5	0	3,584
Subtotal	*561.3*	*3,446*	*4,488,381*
Commercial			
Auto Sales and/or Repair	5.7	0	90,125
Banks	2.4	0	38,216
Commercial Stores	10.0	0	151,713
Grocery Stores; Supermarkets	6.0	0	96,911

TABLE 1-3: EXISTING LAND USES –CITY OF SEBASTOPOL

Use Description[1]	Acres	Residential Units	Square Feet[2]
Health Spa or Club	0.84	0	31,120
Hotels	3.4	0	43,858
Medical; Dental	26.8	0	105,039
Miscellaneous, Undefined	13.9	0	223,258
Office Buildings	20.9	0	299,480
Restaurants, Bars	5.2	0	39,917
Service Stations; Car Washes; etc.	4.5	0	9516
Shopping Centers	9.9	0	150,181
Stores or Offices with Residences; Live/Work Units	7.0	49	100,134
Theaters	1.6	0	4,908
Veterinary	1.1	0	9,181
Subtotal	*119.24*	*49*	*1,393,557*
Industrial			
Food Processing	0.4	0	8,464
Light Manufacturing, Warehousing	12.0	0	163,613
Mineral Processing	0.7	0	3,000
Mini-warehouse (Public Storage)	3.1	0	34,190
Miscellaneous	9.1	0	115,067
Retail Sales (Feed, Lumber)	1.7	0	18,000
Subtotal	*27*	*0*	*342,334*
Agriculture			
Non-irrigated Orchards	5.9	0	0
Wasteland	1.2	0	0
Subtotal	*7.1*	*0*	*0*
Governmental			
City	35.4	0	59,987
County	4.0	0	0
Federal, State	7.0	0	0
School District	51.5	0	0
Municipal Utility	74.1	0	3,258
Miscellaneous District/Company	2.8	0	0
Subtotal	*174.8*	0	*63,245*
Institutional			
Churches and Religious Facilities	25.5	0	91,746
Hospital	3.6	0	0
Residential Care Facilities and Convalescent Care	3.6	1	47,064
Service Organizations; Lodges	0.6	0	6,960
Cemeteries & Mortuaries	21.1	0	0
Subtotal	*54.4*	1	*145,770*
Miscellaneous			
Right-of-Ways	165.8	87	0

TABLE 1-3: EXISTING LAND USES –CITY OF SEBASTOPOL			
Use Description[1]	**Acres**	**Residential Units**	**Square Feet[2]**
Private Roads	1.8	0	0
Parking Lots (non-governmental)	10.3	0	0
Common Areas	7.4		
Subtotal	*185.3*	*87*	*0*
	Vacant		
Vacant, Residential	16.0	0	1,978
Vacant, Commercial	18.7	0	8,559
Vacant, Industrial	2.0	0	0
Vacant, City	22.5	0	736
Subtotal	*59.2*	0	*11,273*
TOTALS	***1,188.3***	***3,583***	***6,444,560***

[1]USE DESCRIPTION BASED PRIMARILY ON ASSESSOR USE CODES
[2]SQUARE FOOTAGE REPRESENTS THE PRIMARY AND SECONDARY SQUARE FOOTAGES. SQUARE FOOTAGE OF MIXED USE BUILDINGS INCLUDES BOTH RESIDENTIAL AND NON-RESIDENTIAL USES.
SOURCE: SONOMA COUNTY ASSESSOR'S OFFICE, 2014; DE NOVO PLANNING GROUP, 2014

Existing land uses refers to the existing built environment, which may be different from the land use or zoning designations applied to land in the city for planning purposes. Existing land uses are based on data provided by the County Assessor and are described below. Figure 1-4 identifies the location of existing land uses.

RESIDENTIAL

Residential uses in Sebastopol include single-family homes and multi-family developments.

Single family residential is the dominant land use type in the city, accounting for 38.9% of the city's land area. Single family residential land uses, including single family homes, condominiums, townhomes, and second (granny) units developed in conjunction with a single family residence, are generally located throughout the city. There are approximately 2,255 single family residential units in the city, located on 461.8 acres. The majority of single family residential units (1,721 units) are typical single family residences, with one residence located on one parcel. Single family uses in a condominium, townhome or other attached single family-type of residential development are the second most common type of single family residential use, accounting for 312 units on 9.1 acres. There are 222 single family units built with two or more single family uses on a parcel or a single family residence and second (granny) unit on a single parcel.

Multifamily residential refers to parcels that contain more than one housing unit, including duplexes, triplexes, fourplexes, and apartment buildings. The predominate type of multifamily development, based on land area, is small structures with two to four residential units, which account for 357 multifamily units located on 28.5 acres. Multifamily complexes with five to 40 units account for 357 units on 25.9 acres. Large multifamily apartment complexes with 41 or more units represent 248 units and a total of 14 acres. Multifamily uses are generally located near services, including retail uses, and are located along Bodega Avenue and Healdsburg Avenue and are also located northeast of the downtown core area.

COMMERCIAL

The majority of non-residential development in the city is commercial, which includes approximately 1.4 million square feet (s.f.) on 119.2 acres. Commercial uses, as identified by the County Assessor, are varied. The predominate type of commercial land use, based on s.f. of development, is office buildings, which account for 299,480 s.f. of development on 20.9 acres. This is followed by miscellaneous commercial uses (not supermarkets) which account for 223,258 s.f. of development. Commercial stores (151,713 s.f.), shopping centers (150,181 s.f.), and also represent a large portion of the city's commercial uses. Commercial/residential development, including residences above or within the same building as offices and stores, and live/work units, represent 100,134 s.f. and include 49 dwelling units on a total of 7 acres. Other commercial uses in Sebastopol include auto sales and/or repair, banks, grocery stores/supermarkets, health clubs (classified under recreational by the Assessor), hotels, restaurants and bars, service stations and car washes, theaters, and veterinary offices. As shown on Figure 1-4, many of the city's commercial uses are located in and around the Downtown core and the main arterials running through town, Healdsburg Avenue, Main Street, Petaluma Avenue, and Sebastopol Avenue.

INDUSTRIAL

Industrial uses represent 2.3% of the land area in Sebastopol. Industrial uses total approximately 342,334 s.f. of development on 27 acres. Industrial uses include light manufacturing and/or warehousing (163,613 s.f. of development on 12 acres), miscellaneous industrial (115,067 s.f. of development on 9.1 acres), public storage units (34,190 s.f.), retail feed and lumber sales (18,000 s.f.), food processing (8,464 s.f.), and mineral processing (3,000 s.f.). Industrial uses are generally located west of Petaluma Avenue and are mainly focused in the area north and south of Sebastopol Avenue.

GOVERNMENTAL

Governmental uses include City, County, State, Federal, special district, and utility buildings and facilities and total 174.8 acres (14.7% of land area). Municipal utilities represent the largest governmental use in the city, with 74.1 acres, followed by school districts (51.5 acres), and the City (35.4 acres). It is noted that the assessor data does not including building square footages for all governmental uses. Government facilities include City Hall, the Community Center, the Senior Activity Center, City parks and recreation facilities, and facilities operated by other governmental entities.

INSTITUTIONAL

Institutional uses include churches and religious facilities, hospitals, residential and convalescent care facilities, cemeteries and mortuaries, and service organizations (lodge and club facilities are identified as a Recreational use by the Assessor). There are 54.4 acres with institutional uses that include 145,770 s.f. of development. Churches and religious facilities represent the most development in the institutional category with 91,746 s.f. on 25.5 acres. The category with the second highest amount of development is residential care facilities, which include 47,064 s.f. of development on 3.6 acres. Cemeteries and mortuaries account for the second highest amount of land (21.1 acres) in this category.

AGRICULTURE

The agriculture category represents a total of 7.1 acres. This land is not developed with built structures. The non-irrigated orchard category has 5.9 acres. The wasteland category represents 1.2 acres.

MISCELLANEOUS

Miscellaneous uses include right-of-ways, private roads, parking lots (non-governmental), and various common areas and account of 185.3 acres (15.6% of total land area).

VACANT

Vacant land is currently unused and has minimal development. Approximately 5% of the land in Sebastopol is City land (22.5 acres), according to the County Assessor. Vacant residential lands total 16 acres, while commercial and industrial lands represent 18.7 and 2 acres, respectively.

Development Trends

Figure 1-5 identifies residential and non-residential (commercial and governmental) parcels by the time frame that the uses on the parcel were developed, based on available County Assessor's data. As is shown on Figure 1-5, most of the development in the City was built prior to 1976. Residential development during this period was spread throughout the City. Non-residential growth during this period was focused along SR 116 going through the City, in the Downtown core, and the areas bordering Sebastopol Avenue through the City.

From 1976 to 1989, growth was primarily residential from the Downtown core toward the west. The majority of residential growth occurred in subdivisions, generally located near the western edge of the City both north and south of Covert Lane, along Jewell Avenue, and on Frankel Lane. Residential development also occurred on various in-fill lots throughout the City. Non-residential development occurred as in-fill development along SR 116 and development north of Sebastopol Avenue along Morriss Street .

From 1990 to 1999, residential growth occurred in small subdivisions and various scattered sites. Non-residential growth continued to occur along the City's major arterials and also included small commercial centers in the City's neighborhoods.

From 2000 to the present, the pace of development slowed. Residential development continued to occur on scattered sites throughout the City. Commercial development included several scattered sites, but was primarily focused in The Barlow area, west of Morris Street and north of Sebastopol Avenue.

Pending and Approved Projects

Table 1-4 lists recently approved and pending development projects in the City involving development of two or more dwelling units, new non-residential square footage, or a major change of use.

TABLE 1-4: APPROVED AND PENDING DEVELOPMENT PROJECTS

Applicant / Owner Address	Project Description	Status
Peter Standley The Barlow 100 Morris Street	Use Permit, Major: Conversion of vacant existing buildings to a 60-room hotel and spa; addition of 23,100 sq. ft.	Pending Pending CEQA studies
Spiral Foods Coop. / Lars Langberg Max Caruso 885 Gravenstein Highway North	Use Permit, Minor: Small market in existing storage building	Approved Pending
Claudia Cleaver / French Garden Inn Dan Smith 8060 Bodega Avenue	Design Review, Major: 18-room inn	Approved Pending
W. Scott Miller Tennyson Tucker 265 Petaluma Avenue	Design Review, Major: Reconstruction of fire-destroyed 13,021 sq. ft. retail/warehouse building	Approved Under construction
Armstrong Development CVS/Chase 6877 Sebastopol Ave	Design Review: Construction of a 14,576 square foot CVS pharmacy and construction of a 4,120 s.f. bank	Approved Pending litigation; pending final design review
Chris Pellacinni Gravenstein Mixed Use LLC/Chris Pellacinni 961 Gravenstein Highway So (front parcel)	Design review: 8 residential condominiums and 8 1,000-square foot commercial condominiums	Approved Pending final design review
Schellinger Brothers Laguna Vista - 955, 995 & 997 Gravenstein Hwy So	EIR Supplement: 145 residential units, and wetlands preserve	Pending litigation; pending CEQA study
Greg Drew 160 Pleasant Hill Avenue North	Annexation: 14-parcel small lot subdivision	Approved Pending final map
William Abrams 7355-65 Healdsburg Ave.	Design Review: Major remodel and 330 s.f. addition for café.	Approved Under construction

SOURCE: DE NOVO PLANNING, 2014; CITY OF SEBASTOPOL, 2014

REFERENCES

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

City of Sebastopol, 1990. Sebastopol Downtown Plan. Volume I. City of Sebastopol. October 5, 1990.

City of Sebastopol, 1994. City of Sebastopol General Plan. Updated to reflect amendments through 2011.

City of Sebastopol, 1996. Sebastopol Urban Growth Boundary Initiative (Measure O language). Passed November 1996.

City of Sebastopol, 2010. City of Sebastopol Design Review Guidelines. Approved by Design Review Board. May 5, 2010.

City of Sebastopol, 2013. Zoning Ordinance. Current to Ordinances Adopted or Introduced as of March 2013. City of Sebastopol. March 2013.

City of Sebastopol, 2014. GIS data.

City of Sebastopol, 2014. Planning Department Project List Fiscal Year 2013/2014. 2014.

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

Sonoma County, 2008. Sonoma County General Plan 2020. Adopted September 23, 2008; updates through February 4, 2014. Accessed via: http://www.sonoma-county.org/PRMD/ gp2020/ index.htm

Sonoma County, 2014. Parcel Data provided by the County Assessor's Office. July 2014.

1.2 POPULATION AND HOUSING

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

REGULATORY FRAMEWORK

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

STATE

California General Plan Law

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

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

LOCAL AND REGIONAL

Regional Housing Needs Plan

California General Plan law requires each city and county to have land zoned to accommodate a fair share of the regional housing need. The share is known as the Regional Housing Needs Allocation (RHNA) and is based on a Regional Housing Needs Plan (RHNP) developed by councils of government. The Association of Bay Area Governments (ABAG) is the lead agency for developing the RHNP for the nine-county area that includes Sonoma County and the City of Sebastopol. Sebastopol's fair share of the adopted RHNA for 2007-2014 and the RHNA for 2014-2022 is summarized in Table 1-5.

The City is not required to ensure that adequate development to accommodate the RHNA occurs; however, the City must facilitate housing production by ensuring that land is available and that unnecessary development constraints have been removed. The City's Housing Element, adopted in 2010, provides for the accommodation of the 2007-2014 RHNA that has been assigned to the City of Sebastopol. As part of the region's planning efforts, ABAG and the Metropolitan Transportation Commission (MTC) worked with local governments and stakeholders to develop the 2014-2022 RHNA. The 2014-2022 RHNA allocates housing units within the region consistent with the development pattern included in the Sustainable Communities Strategy and Plan Bay Area.

TABLE 1-5: REGIONAL HOUSING NEEDS ALLOCATION				
Very Low Income	Low Income	Moderate Income	Above Moderate Income	Total
2014 – 2022				
22	17	19	62	120
2007 - 2014				
32	28	29	87	176

SOURCE: ABAG, 2008; ABAG, 2014

City of Sebastopol General Plan

The City's Housing Element, one of the seven mandated General Plan elements, was adopted in October 2010. The Housing Element establishes goals related to the following:

- Identification of adequate sites,
- Housing conservation,
- New housing production,
- Housing diversity and affordability,
- Fair housing,
- Energy and natural resource conservation,
- Remove government constraints, and
- Housing policy update and program administration.

The Land Use Element identifies six land use designations for residential use: Very Low Density, Low Density, Medium Density, and High Density. The Office, General Commercial, Downtown Core, and Light Industrial designations also allow residential uses. The Land Use Element and land use designations are described in detail in Section 1.1, Land Use.

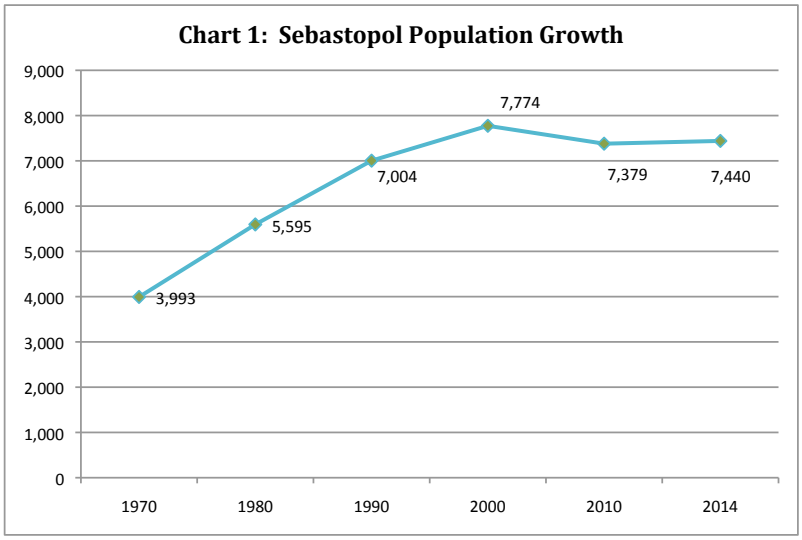
Growth Management Program

The City's Growth Management Program was established by the General Plan and is implemented through Zoning Code Section 17.350, Growth Management. The Growth Management Program allows for 575 dwelling units or the remaining wastewater treatment capacity, whichever is less. Dwelling unit allocations may not exceed 25 dwelling units per year, averaged over a two-year period (e.g., up to 50 dwelling units may be allocated in any given two-year period). The Growth Management Program exempts affordable housing units, second dwelling units, replacement residential structures, single family homes on an existing lot of record as of November 1994, homeless shelters, single room occupancies, and community or health care facilities from the annual allocation; most of these uses count toward the total maximum 575 dwelling units. Allocations are issued on a first come, first served basis once a project has obtained necessary discretionary approvals.

EXISTING SETTING

Population and Households

Historical population growth trends in Sebastopol are depicted in Chart 1-1. Table 1-6 summarizes population and household data for Sebastopol and Sonoma County from 1970 through 2010.



Sebastopol had a population of 1,233 in 1910, following incorporation in 1902. Sebastopol's growth rate was generally steady through 1990. Throughout the 1970s and 1980s growth fluctuated, reflecting the prevailing economic conditions. Over the past several decades, Sebastopol's population has fluctuated, increasing by about 770 persons from 1990 through 2000 then decreasing by about 400 persons from 2000 to 2010. The city's population is currently 7,440 persons, a decrease of 4% since 2000. In contrast, Sonoma County's total population increased by approximately 7% from 2000 through 2014.

While Sebastopol's population growth has decreased, household growth has continued albeit at a slow pace. In 2014, there were 3,296 households in the city, an increase of 1% since 2000. The average number of persons per household has generally been decreasing over the years, with an average of 2.50 persons per household in 1970 to 2.40 in 1990 to 2.22 in 2014. Countywide, the average number persons per household is 2.56. This figure has been relatively steady for the County since 1980.

TABLE 1-6: POPULATION AND HOUSEHOLD GROWTH

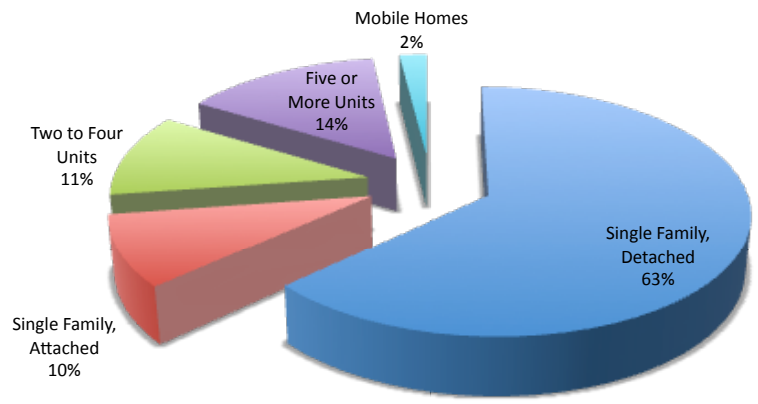
	1970	1980	1990	2000	2010	2014	1970-2014 Change	2000 - 2014 Change
Sebastopol								
Population	3,993	5,595	7,004	7,774	7,379	7,440	86%	-4%
Households	1,531	2,358	2,842	3,250	3,276	3,296	115%	1%
Persons per household	2.50	2.29	2.40	2.33	2.21	2.22	-11%	-5%
Sonoma County								
Population	204,885	299,681	388,222	458,614	483,878	490,486	139%	7%
Households	67,867	115,008	149,382	172,403	185,825	187,626	176%	9%
Persons per household	2.92	2.55	2.55	2.60	2.55	2.56	-12%	-2%

SOURCE: U.S. CENSUS, 2000; US CENSUS, 2010; ABAG HISTORICAL DATA, 2014; DEPARTMENT OF FINANCE, 2014

Housing Units

As shown in Table 1-7, the number of housing units in Sebastopol has increased at a steady pace since 1990. In 2014, there were 3,485 housing units in the city, an increase of 20 units since 2010. From 1990 to 2010, housing units increased from 2,943 to 3,465, a 9% increase. As reported by the Department of Finance, the majority of the housing units in the city are single family detached, which account for 63% of housing units. The remaining housing types include single family attached (10%), duplexes through fourplexes (11%), multifamily apartments with five or more units (14%), and mobile homes (2%).

Chart 1-2: Housing Units by Type (2014)



In Sonoma County, housing units have increased at a greater pace, with a 28% increase from 1990 to 2014, compared to an 18% increase in Sebastopol and a 13% increase from 2000 to 2014, compared to 5% in Sebastopol.

TABLE 1-7: HOUSING UNITS

	1990	2000	2010	2014	1990-2014 Change	2000-2014 Change
Sebastopol	2,943	3,321	3,465	3,485	18%	5%
Sonoma County	161,062	183,153	204,572	206,537	28%	13%

SOURCE: U.S. CENSUS, 2000; US CENSUS, 2010; CALIFORNIA DEPARTMENT OF FINANCE, 2012; ABAG, 1990

REFERENCES

ABAG, 2014. Data for Bay Area Housing Elements Revised. Excel spreadsheet. Association of Bay Area Governments. July 25, 2012.

California Department of Finance. 2014. Table E-5, Population and Housing Estimates for Cities, Counties and the State, 2010-2014, with 2010 Benchmark. Sacramento, California, May 2014.

California Department of Finance. 2007. State of California, Department of Finance, E-8 *Historical Population and Housing Estimates for Cities, Counties, and the State, 1990-2000*. Sacramento, California, August 2007.

U.S. Census Bureau, 2010. 2010 U.S. Census Population, Housing, and Housing Unit Counts. Accessed via: http://factfinder2.census.gov.

U.S. Census Bureau, 2000. 2000 U.S. Census Population, Household, and Housing Unit Counts. Accessed via: http://factfinder2.census.gov.

1.3 ECONOMIC DEVELOPMENT

This section provides an overview of Sebastopol'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 the U.S. Census to identify economic statistics and trends in Sebastopol.

REGULATORY FRAMEWORK

Economic Vitality Element

The General Plan includes an Economic Vitality Element. The element establishes policies and actions intended to address the City's economic goals. The Economic Vitality Element identifies the following goals:

- Goal 1: Broaden the city's employment base,
- Goal 2: Increase the city's retail tax base,
- Goal 3: Produce an economic development strategy that sustains the goals and policies of the General Plan and supports Sebastopol's unique identity and sense of place,
- Goal 4: Protect and increase the economic vitality of the city,
- Goal 5: Protect and increase the economic vitality of the Downtown,
- Goal 6: Emphasize Sebastopol's role as a market and service center for the West County, and
- Goal 7: Improve the appearance and functioning of the South Main Area.

EMPLOYMENT CHARACTERISTICS

Labor Force

From 2000 to 2010, Sebastopol's population decreased from 7,774 to 7,379 persons, a 5% decrease and the number of jobs in the city decreased by 4.4% to 5,650. However, the City's labor force increased by 7% from 4,056 to 4,324 and the number of employed persons increased by 2% to 4,036. However, the labor force increased more than employment. Similarly, unemployment increased from 2.5% in 2000 to 6.7% in 2010. In 2014, the City's labor force was estimated to be 4,500 persons with 4,300 persons employed, representing an unemployment rate of 3.3%.

The ratio of employment opportunities in Sebastopol to the local labor force was 1.31:1 in 2010, a decrease from 1.46:1 in 2000. A jobs-to-persons in labor-force ratio that is more than 1:1 means that a percentage of persons living outside of Sebastopol must travel to Sebastopol for employment, as there are more jobs available locally than there is available labor force. Table 1-8 summarizes population, job, and employment data from 2000 to 2010.

TABLE 1-8: JOBS, POPULATION, AND EMPLOYMENT [1]

	Population	Employment Statistics				
		Jobs	Labor Force	Employed	Jobs / Labor Force	Unemployment Rate
2000	7,774	5,910	4,056	3,956	1.46	2.5%
2010	7,379	5,650	4,324	4,036	1.31	6.7%
Change	*-5%*	*-4%*	*7%*	*2%*	*-10%*	*168%*

SOURCE: US CENSUS, 2000; CENSUS, 2008-2012; ABAG/MTC, 2013; ABAG PROJECTIONS, 2007 AND 2013

Industry and Occupation

Sebastopol's labor force is employed in a broad range of industries, with the services category, which includes a variety of service-related industries, comprising the majority of jobs. In 2010 (based on 2008-2012 Census data), the largest employment categories in the services industry were educational, health care, and social assistance (28%), arts, entertainment, recreation, accommodation, and food services (8%), professional, scientific, administrative, and waste management (6%), and public administration (5%). Apart from the services sectors, the retail trades and manufacturing groups are the next largest sectors, at approximately 15 and 11% respectively. From 2000 to 2010, the most significant gains by industry occurred in the professional, scientific, administrative, and waste management services and construction sectors, as shown in Chart 1-3. The largest decreases occurred in the retail trade and educational, health care, and social assistance services categories. Chart 1-3 summarizes the employment of Sebastopol's residents by overall industry based on 2000 and 2008-12 Census data. It is noted that the data in Chart 1-3 reflects the industries that the city's labor force (residents) are employed in regardless of the location of employment.

Chart 1-3: Employment (Residents) by Industry Trends

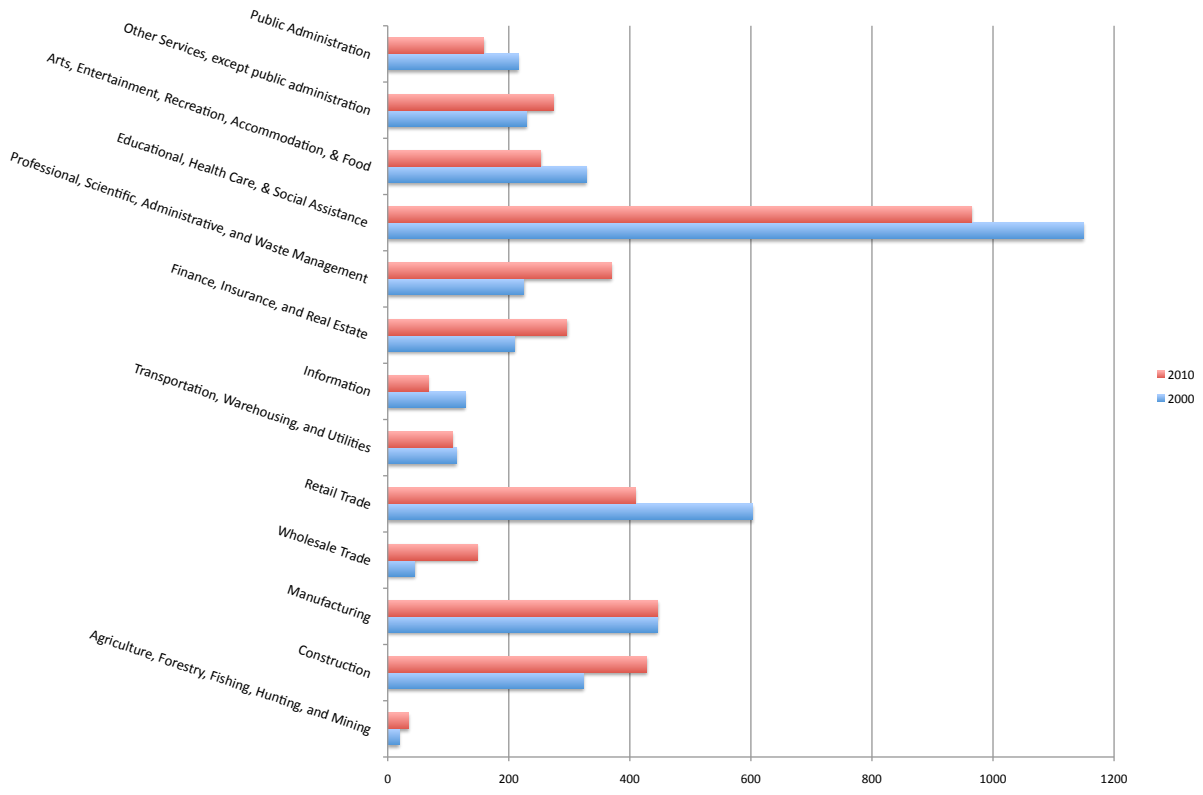


Table 1-9 summarizes the businesses and jobs by industry in Sebastopol. The predominant type of job in the City is in the health care and social assistance industry. It is noted that this data likely does not reflect the closure of Palm Drive Hospital. The next largest job categories are retail trade (826 jobs), professional, scientific, and technical services (508 jobs), other/miscellaneous services (400 jobs), and accommodation and food services (389 jobs). It is noted that although professional, scientific, and

technical service businesses generate the third-highest number of jobs, this is the industry with the most businesses.

TABLE 1-9: LABOR FORCE VS JOBS BY INDUSTRY (2014)

Industry	Businesses		Jobs	
	#	%	#	%
Agriculture, Forestry, Fishing, Hunting, and Hunting	14	1.1%	30	0.5%
Construction	85	6.7%	246	4.5%
Manufacturing	42	3.3%	300	5.5%
Wholesale Trade	34	2.7%	201	3.7%
Retail Trade	108	8.5%	826	15.1%
Transportation and Warehousing	9	0.7%	90	1.6%
Information	29	2.3%	299	5.5%
Finance and Insurance	43	3.4%	198	3.6%
Real Estate	44	3.5%	131	2.4%
Professional, Scientific, and Technical Services	190	15.0%	508	9.3%
Management of Companies and Enterprises	2	0.2%	4	0.1%
Administrative, Support, Waste Management, and Remediation	89	7.0%	190	3.5%
Educational Services	40	3.2%	360	6.6%
Health Care and Social Assistance	154	12.1%	1,054	19.3%
Arts, Entertainment, and Recreation Services	24	1.9%	176	3.2%
Accommodation and Food Services	59	4.6%	389	7.1%
Public Administration	3	0.2%	52	1.0%
Other Services	114	9.0%	413	7.6%
Unclassified	186	14.7%	0	0.0%
TOTAL	**1,269**	**100%**	**5,467**	**100%**

SOURCE: ESRI, 2014

While industry represents the overall sector in which an individual is employed, occupation represents a person's position at their place of employment. In Sebastopol, the predominant type of occupation is management, professional and related positions (43%). The next largest is sales and office positions (23%). Over the past decade, there has been a significant increase in the services category (46%) and a strong decline in occupations associated with natural resources, construction, and maintenance (-45%). Table 1-10 summarizes employment by occupation in 2000 and 2010.

TABLE 1-10: EMPLOYMENT BY OCCUPATION -

	2000		2010		Proportion Change
Occupation	Number	Percent	Number	Percent	
Management, Professional, and Related	1,666	42%	1,754	43%	5%
Sales and Office	885	22%	912	23%	3%
Services	528	13%	772	19%	46%
Natural Resources, Construction, and Maintenance	515	13%	284	7%	-45%
Production, Transportation, and Material Moving	362	9%	314	8%	-13%

SOURCE: US CENSUS, 2000; CENSUS, 2008-2012.

Major Employers

Table 1-11 shows that the largest employers in Sebastopol provide employment in a variety of industries, with multiple large employers in the education and grocery store categories.

TABLE 1-11: MAJOR EMPLOYERS

Employer	Industry
O'Reilly Media	Publishing/Media
Safeway	Grocery Stores
Analy Union High School	Education
Sebastopol Union School	Education
Whole Foods	Grocery Stores

SALES AND SPENDING

Taxable Sales

Taxable sales indicate the value of all transactions subject to sales tax. The California Board of Equalization (BOE) 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 1-12 identifies taxable sales by category for the city bi-annually from 2002 through 2012. During this time, total amount of annual taxable transactions increased by almost $11 million (8%), from $133.8 million in 2002 to $144.6 million in 2010. During this same time period, the total number of businesses decreased by 13% from 689 in 2002 to 600 in 2012. While there was a 3% decrease in taxable sales in the retail and food services category, this category increased in the number of businesses (permits) from 273 to 426, a 56% increase. Countywide, there also was a large increase in retail and food service permits (98%), while overall permits increased by a more modest 3%.

TABLE 1-12: TAXABLE SALES

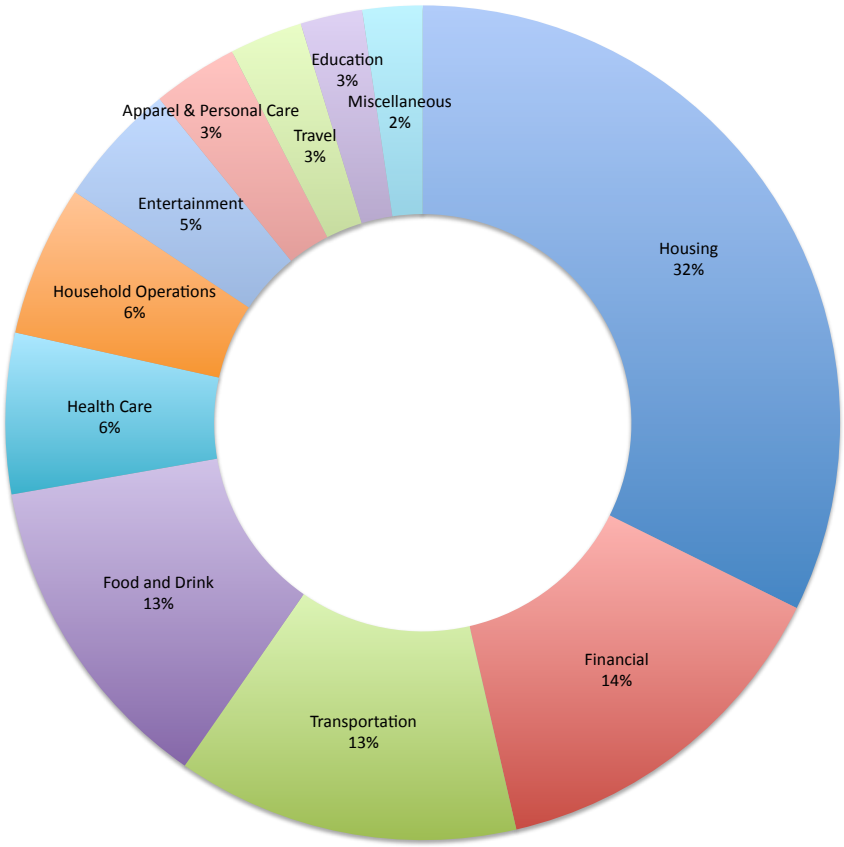
	Retail and Food Services		Total Outlets	
	Sales Tax Permits	Taxable Transactions	Sales Tax Permits	Taxable Transactions
2012	426	$117,438,000	600	$133,792,000
2010	410	$105,591,000	583	$123,806,000
2008	272	$113,547,000	583	$137,977,000
2006	259	$119,391,000	615	$140,141,000
2004	267	$122,933,000	648	$147,054,000
2002	273	$121,379,000	689	$144,670,000
Change 2002 – 12	153	-$3,941,000	-89	$10,878,000
Percent Change 2002-12	56%	-3%	-13%	8%
Countywide Change 2000-12	5,494	$478,116,000	532	$680,132,000
Countywide % Change 2002-12	98%	10%	3%	10%

SOURCE: BOE, 2000; BOE, 2002; BOE, 2004; BOE, 2006; BOE, 2008; BOE, 2010; BOE, 2012

Consumer Spending

Chart 1-4 depicts annual household spending by category for Sebastopol in 2014. 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. Categories with the highest annual spending are home and shelter (32%), followed by financial, including insurance, retirement, and savings, (14%), transportation (13%), food and drink (13%), and health care (6%).

Chart 1-4: Average Annual Household Spending



Leakage/Surplus

A leakage/surplus analysis presents a snapshot of retail opportunity. This is a measure of the relationship between supply and demand, based on the per capita sales and sales tax deviation associated with retail categories. A positive value represents 'leakage' of retail opportunity outside the trade area, meaning that the demand for these items is filled outside of the City. A negative value represents a surplus of retail sales, a market where customers are drawn in from outside the trade area. The retail gap represents the difference between retail potential and retail sales. Table 1-13 summarizes surplus and leakage by retail category based on 2013 ESRI data for the city.

The retail categories with the highest surplus sales include food and beverage stores, food and drinking places, and health and personal care stores. The retail subcategories with the most surplus sales include grocery stores, restaurants and drinking places, used merchandise stores, specialty food stores, lawn and garden stores, and book, periodical, and music stores. The retail categories with the most leakage include general merchandise stores (leakage of $13.3 million), motor vehicle and parts dealers (leakage of $12.8 million), clothing and accessories stores (leakage of $5 million), and non-store retailers (leakage of $3.2 million).

TABLE 1-13: RETAIL LEAKAGE AND SURPLUS

Industry Group	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/ *Surplus*	Number of Businesses
Motor Vehicle & Parts Dealers	$16,053,179	$3,300,465	**$12,752,714**	**65.9**	6
Automobile Dealers	$13,663,882	$1,089,962	**$12,573,920**	**85.2**	1
Other Motor Vehicle Dealers	$1,055,431	$845,056	**$210,375**	**11**	2
Auto Parts, Accessories & Tire Stores	$1,333,866	$1,365,447	*-$31,581*	*-1.2*	3
Furniture & Home Furnishings Stores	$2,138,106	$1,463,864	**$674,242**	**18.7**	8
Furniture Stores	$1,120,128	$416,816	**$703,312**	**45.8**	3
Home Furnishings Stores	$1,017,978	$1,047,048	*-$29,070*	*-1.4*	5
Electronics & Appliance Stores	$2,302,399	$387,836	**$1,914,563**	**71.2**	2
Building Materials, Garden, & Supply	$2,962,079	$2,601,557	**$360,522**	**6.5**	5
Bldg Material & Supplies Dealers	$2,665,292	$1,607,984	**$1,057,308**	**24.7**	4
Lawn and Garden Stores	$296,787	$993,573	*-$696,786*	*-54.0*	1
Food & Beverage Stores	$16,147,130	$86,810,676	*-$70,663,546*	*-68.6*	20
Grocery Stores	$14,608,335	$84,551,996	*-$69,943,661*	*-70.5*	6
Specialty Food Stores	$603,018	$1,024,936	*-$421,918*	*-25.9*	11
Beer, Wine & Liquor Stores	$935,777	$1,233,744	*-$297,967*	*-13.7*	3
Health & Personal Care Stores	$7,514,667	$11,686,407	*-$4,171,740*	*-21.7*	6
Gasoline Stations	$7,842,930	$10,335,808	*-$2,492,878*	*-13.7*	3
Clothing & Accessories Stores	$6,185,926	$1,231,269	**$4,954,657**	**66.8**	10
Clothing Stores	$4,664,012	$1,142,707	**$3,521,305**	**60.6**	9
Shoe Stores	$742,676	$0	**$742,676**	**100.0**	0
Jewelry, Luggage & Leather Stores	$779,238	$88,562	**$690,676**	**79.6**	1
Sporting Goods, Hobby, Book & Music Stores	$2,292,664	$2,232,461	**$60,203**	**1.3**	10
Sporting, Hobby, Musical Instr. Stores	$1,817,262	$920,357	**$896,905**	**32.8**	8
Book, Periodical & Music Stores	$475,402	$1,312,104	*-$836,702*	*-46.8*	2
General Merchandise Stores	$13,348,868	$0	**$13,348,868**	**100.0**	0
Department Stores	$6,131,543	$0	**$6,131,543**	**100.0**	0
Other General Merchandise Stores	$7,217,325	$0	**$7,217,325**	**100.0**	0
Miscellaneous Store Retailers	$2,801,644	$2,139,934	**$661,710**	**13.4**	24
Florists	$169,314	$53,944	**$115,370**	**51.7**	1
Office Supply, Stationery & Gift Stores	$589,880	$300,244	**$289,636**	**32.5**	11
Used Merchandise Stores	$229,469	$1,148,522	*-$919,053*	*-66.7*	4
Other Miscellaneous Store Retailers	$1,812,981	$637,224	**$1,175,757**	**48.0**	8
Nonstore Retailers	$7,532,006	$4,343,033	**$3,188,973**	**26.9**	5
Electronic Shopping & Mail-Order	$6,115,024	$2,258,817	**$3,856,207**	**46.1**	4

TABLE 1-13: RETAIL LEAKAGE AND SURPLUS

Industry Group	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/ *Surplus*	Number of Businesses
Vending Machine Operators	$175,525	$0	**$175,525**	**100.0**	0
Direct Selling Establishments	$1,241,457	$2,084,216	*-$842,759*	*-25.3*	1
Food Services & Drinking Places	$9,973,252	$18,748,473	*-$8,775,221*	*-30.6*	32
Full-Service Restaurants	$4,841,649	$7,276,354	*-$2,434,705*	*-20.1*	13
Limited-Service Eating Places	$4,371,167	$8,007,645	*-$3,636,478*	*-29.4*	11
Special Food Services	$484,596	$1,510,811	*-$1,026,215*	*-51.4*	4
Drinking Places - Alcoholic Beverages	$275,840	$1,953,663	*-$1,677,823*	*-75.3*	4
TOTAL	$97,094,850	$145,281,783	*-$48,186,933*	*-19.9*	131

SOURCE: ESRI, 2014

REFERENCES

ABAG/MTC, 2013. Final Forecast of Jobs, Population, and Housing. Association of Bay Area Governments/Metropolitan Transportation Commission. July 2013.

BOE, 2000. Taxable Sales in California (Sales and Use Tax) During 2000. State Board of Equalization. Sacramento, CA. No date of publication listed.

BOE, 2002. Taxable Sales in California (Sales and Use Tax) During 2002. State Board of Equalization. Sacramento, CA. No date of publication listed.

BOE, 2004. Taxable Sales in California (Sales and Use Tax) During 2004. State Board of Equalization. Sacramento, CA. No date of publication listed.

BOE, 2006. Taxable Sales in California (Sales and Use Tax) During 2006. State Board of Equalization. Sacramento, CA. No date of publication listed.

BOE, 2008. Taxable Sales in California (Sales and Use Tax) During 2008. State Board of Equalization. Sacramento, CA. No date of publication listed.

BOE, 2010. Taxable Sales in California (Sales and Use Tax) During 2010. State Board of Equalization. Sacramento, CA. No date of publication listed.

BOE, 2012. Taxable Sales in California (Sales and Use Tax) During 2012. State Board of Equalization. Sacramento, CA. No date of publication listed.

California Employment Development Department, 2013. Labor Market Info, Data Library. Database accessed via: http://www.labormarketinfo.edd.ca.gov/ in August 2014.

ESRI, 2014. Business Summary. August 2014.

ESRI, 2014. Household Budget Expenditures. August 2014.

ESRI, 2014. Retail MarketPlace Profile. August 2014.

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.

U.S. Census, 2013. American Community Survey, 2008-2012. Accessed via: http://factfinder2.census.gov.

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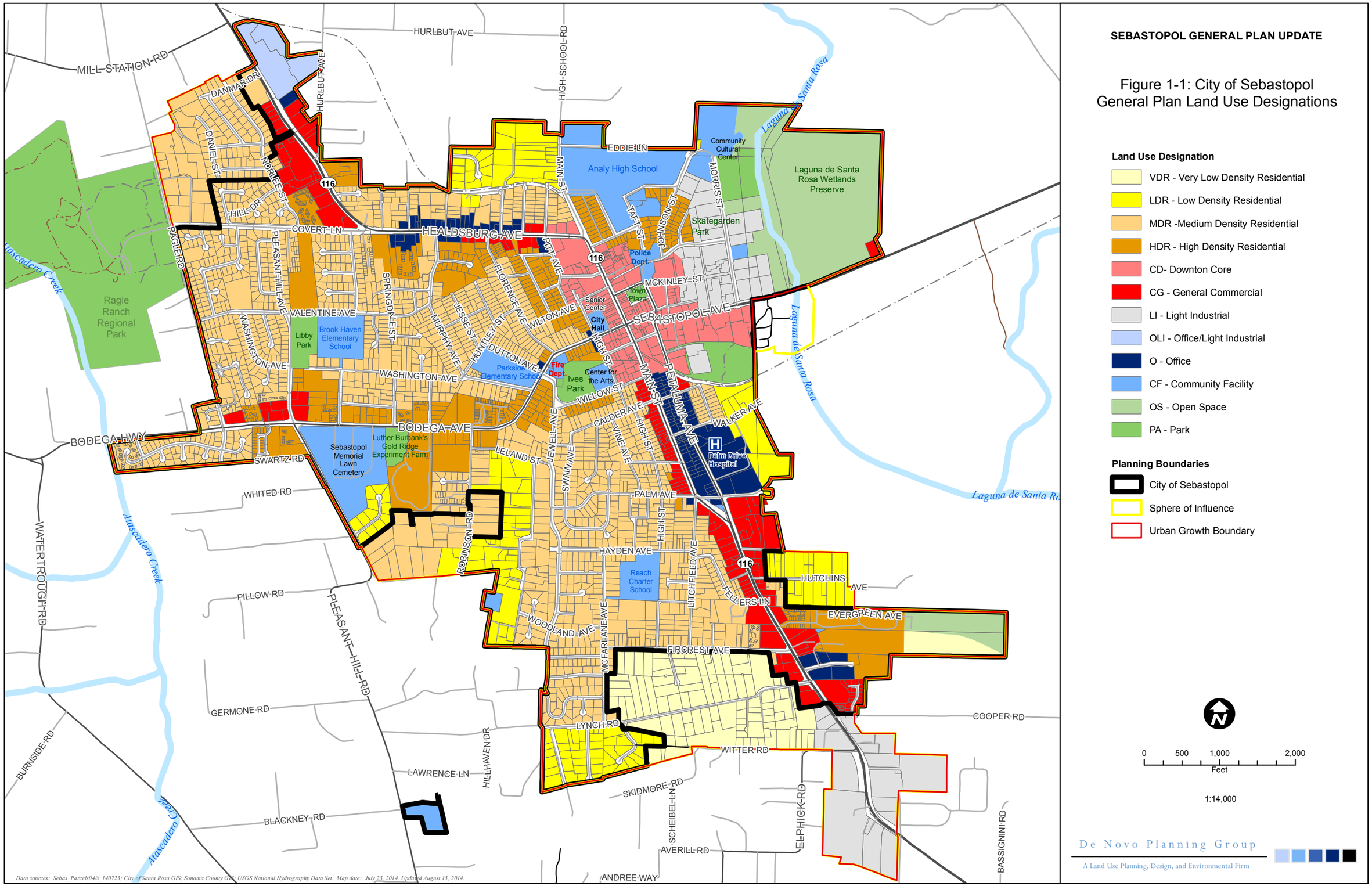
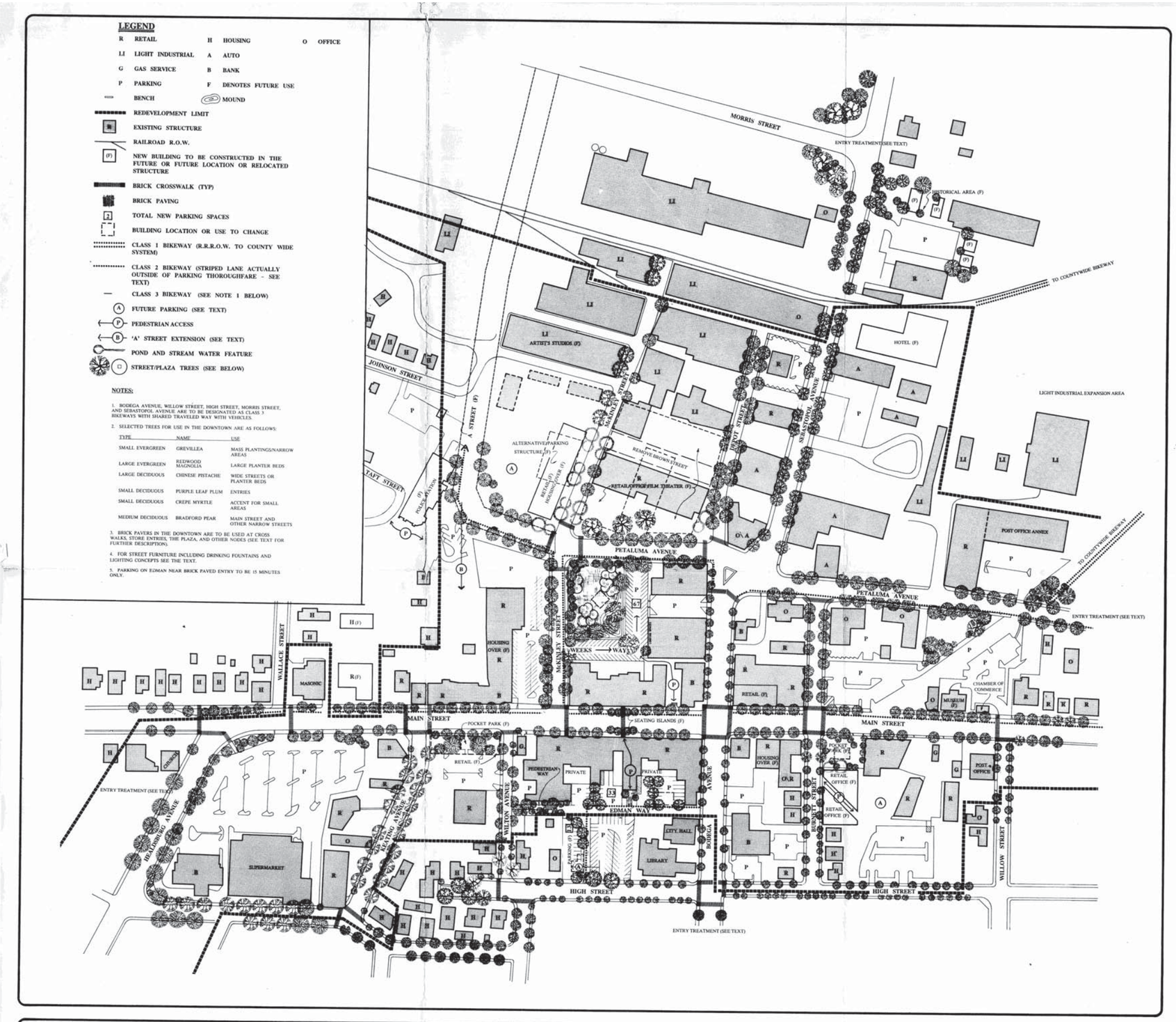
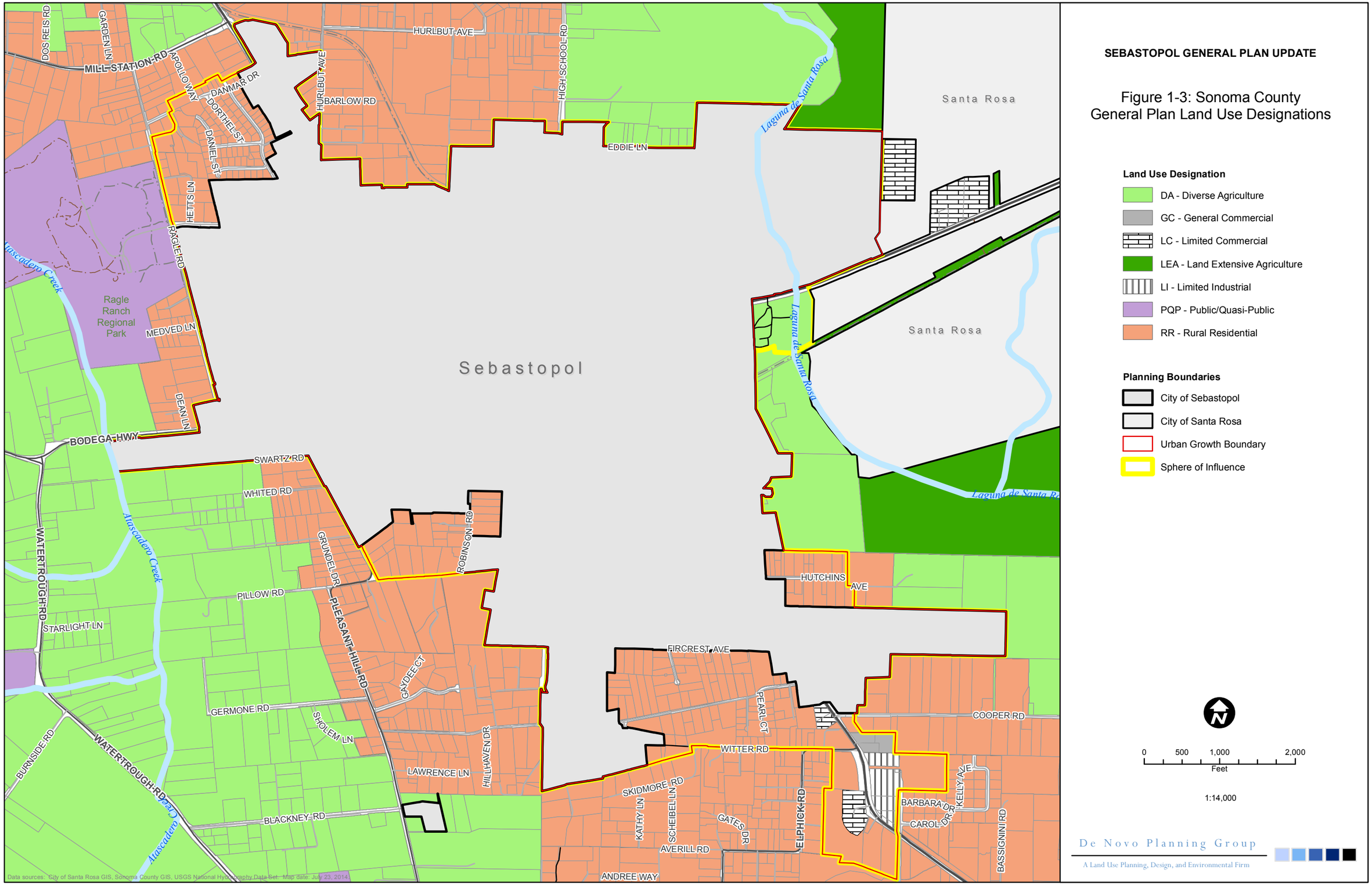
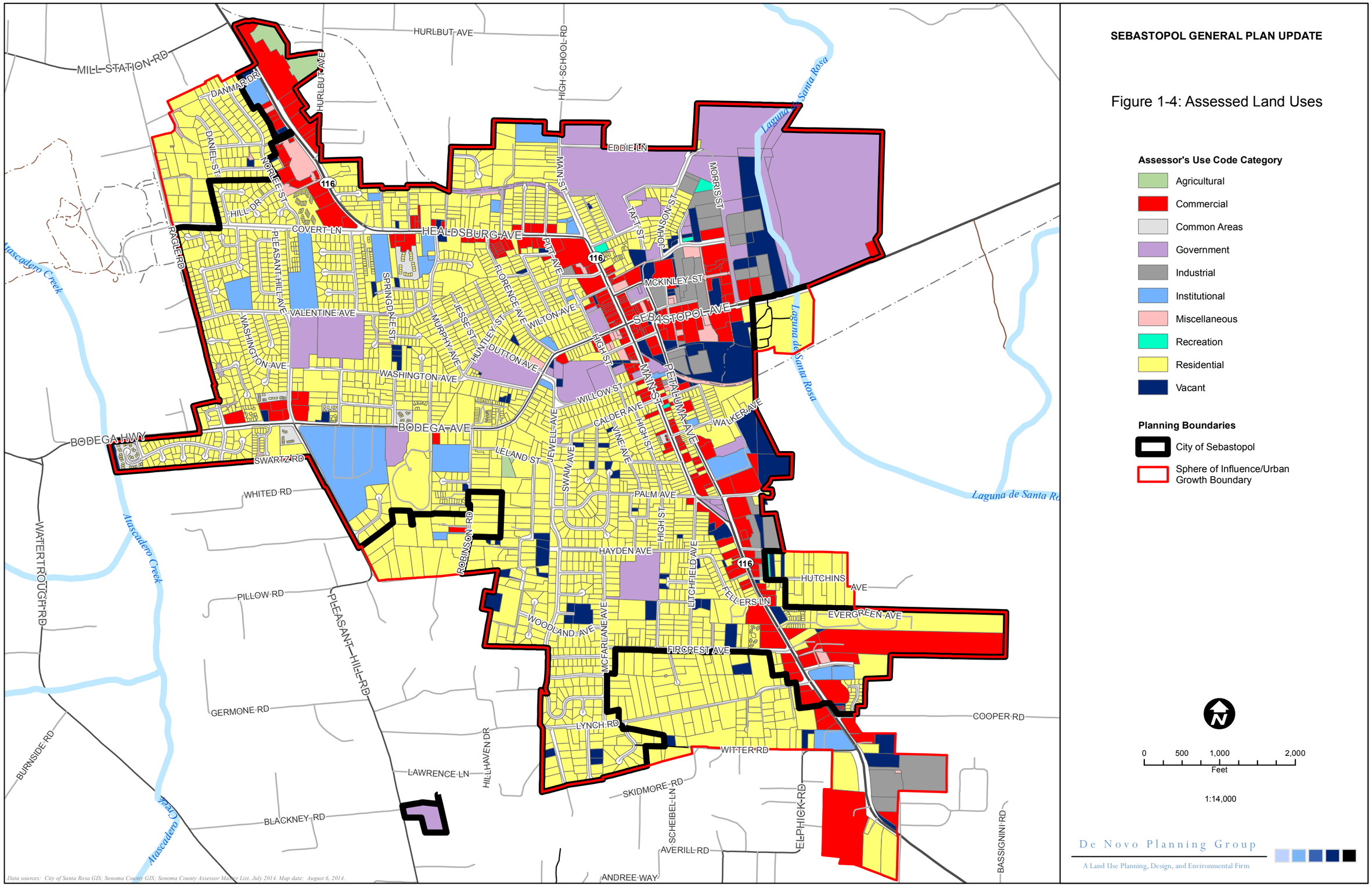

SEBASTOPOL GENERAL PLAN UPDATE
Figure 1-1: City of Sebastopol General Plan Land Use Designations
Land Use Designation
VDR - Very Low Density Residential
LDR - Low Density Residential
MDR -Medium Density Residential
HDR - High Density Residential
CD- Downton Core
CG - General Commercial
LI - Light Industrial
OLI - Office/Light Industrial
O - Office
CF - Community Facility
OS - Open Space
PA - Park
Planning Boundaries
City of Sebastopol
Sphere of Influence
Urban Growth Boundary
0 500 1,000 2,000
Feet
1:14,000
De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm
Data sources: Sebas_Parcels04/s_140723; City of Santa Rosa GIS; Sonoma County GIS; USGS National Hydrography Data Set. Map date: July 23, 2014. Updated August 15, 2014.
Analy High School
Community Cultural Center
Laguna de Santa Rosa Wetlands Preserve
Skategarden Park
Police Dept.
Town Plaza
Senior Center
City Hall
Fire Dept.
Ives Park
Center for the Arts
Parkside Elementary School
Palm Drive Hospital
Ragle Ranch Regional Park
Libby Park
Brook Haven Elementary School
Sebastopol Memorial Lawn Cemetery
Luther Burbank's Gold Ridge Experiment Farm
Reach Charter School
Laguna de Santa Rosa
Atascadero Creek
HURLBUT AVE
HIGH SCHOOL RD
MILL STATION RD
DANMAR DR
DANIEL ST
NORLEE ST
HILL DR
COVERT LN
RAGLE RD
PLEASANT HILL AVE
VALENTINE AVE
WASHINGTON AVE
SPRINGDALE ST
MURPHY AVE
JESSE ST
HUNTLEY ST
FLORENCE AVE
WILTON AVE
DUTTON AVE
HEALDSBURG AVE
EDDIE LN
MAIN ST
TAFT ST
JOSHUA ST
MORRIS ST
MCKINLEY ST
SEBASTOPOL AVE
HIGH ST
WILLOW ST
CALDER AVE
VINE AVE
PETALUMA AVE
WALKER AVE
BODEGA AVE
BODEGA HWY
SWARTZ RD
LELAND ST
JEWELL AVE
SWAN AVE
PALM AVE
WHITED RD
ROBINSON RD
HAYDEN AVE
LITCHFIELD AVE
HUTCHINS AVE
FELLERS LN
EVERGREEN AVE
WOODLAND AVE
MCFARLANE AVE
FIRCREST AVE
WATERTROUGH RD
PILLOW RD
PLEASANT HILL RD
GERMONE RD
COOPER RD
LYNCH RD
WITTER RD
BURNSIDE RD
LAWRENCE LN
HILLHAVEN DR
SKIDMORE RD
SCHEIBEL LN
ELPHICK RD
BLACKNEY RD
AVERILL RD
ANDREE WAY
BASSIGNINI RD
116

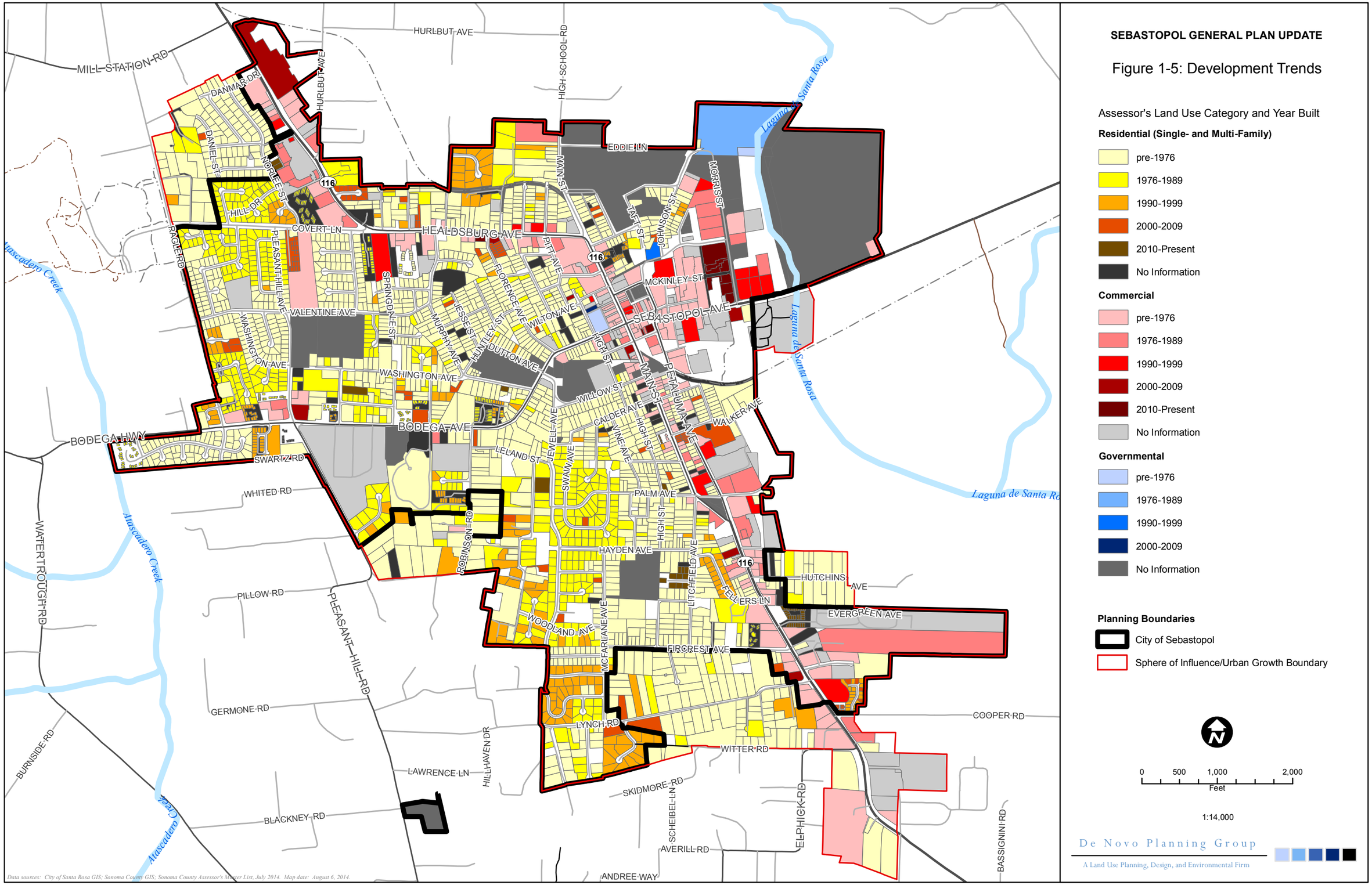
Figure 1-2: Sebastopol Downtown Plan



Source: MFR Associates


SEBASTOPOL GENERAL PLAN UPDATE
Figure 1-3: Sonoma County General Plan Land Use Designations
Land Use Designation
DA - Diverse Agriculture
GC - General Commercial
LC - Limited Commercial
LEA - Land Extensive Agriculture
LI - Limited Industrial
PQP - Public/Quasi-Public
RR - Rural Residential
Planning Boundaries
City of Sebastopol
City of Santa Rosa
Urban Growth Boundary
Sphere of Influence
0 500 1,000 2,000
Feet
1:14,000
Sebastopol
Santa Rosa
Santa Rosa
Ragle Ranch Regional Park
Atascadero Creek
Laguna de Santa Rosa
HURLBUT AVE
HIGH SCHOOL RD
BARLOW RD
EDDIE LN
MILL STATION RD
DOS REIS RD
GARDEN LN
APOLLO WAY
DANMAR DR
DORTHEL ST
DANIEL ST
HETTS LN
RAGLE RD
MEDVED LN
DEAN LN
BODEGA HWY
SWARTZ RD
WHITED RD
ROBINSON RD
GRUNDEL DR
PILLOW RD
PLEASANT HILL RD
STARLIGHT LN
WATERTROUGH RD
GAYDEE CT
GERMONE RD
SHOLEM LN
LAWRENCE LN
HILLHAVEN DR
BURNSIDE RD
BLACKNEY RD
HUTCHINS AVE
FIRCREST AVE
PEARL CT
WITTER RD
COOPER RD
SKIDMORE RD
KATHY LN
SCHEIBEL LN
GATES DR
ELPHICK RD
AVERILL RD
ANDREE WAY
BARBARA DR
CAROL DR
KELLY AVE
BASSIGNINI RD
De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm
Data sources: City of Santa Rosa GIS, Sonoma County GIS, USGS National Hydrography Data Set. Map date: July 23, 2014


SEBASTOPOL GENERAL PLAN UPDATE
Figure 1-4: Assessed Land Uses
Assessor's Use Code Category
Agricultural
Commercial
Common Areas
Government
Industrial
Institutional
Miscellaneous
Recreation
Residential
Vacant
Planning Boundaries
City of Sebastopol
Sphere of Influence/Urban Growth Boundary
0
500
1,000
2,000
Feet
1:14,000
De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm
Data sources: City of Santa Rosa GIS; Sonoma County GIS; Sonoma County Assessor Master List, July 2014. Map date: August 6, 2014.
MILL STATION RD
HURLBUT AVE
HIGH SCHOOL RD
DANMAR DR
DANIEL ST
NORLEE ST
HILL DR
COVERT LN
HEALDSBURG AVE
EDDIE LN
MAIN ST
MORRIS ST
TAFT ST
JOHNSON ST
PUTT AVE
MCKINLEY ST
SEBASTOPOL AVE
PLEASANT HILL AVE
VALENTINE AVE
SPRINGDALE ST
FLORENCE AVE
WILTON AVE
JESSE ST
MURPHY AVE
HUNTLEY ST
DUTTON AVE
HIGH ST
WASHINGTON AVE
WILLOW ST
CALDER AVE
PETALUMA AVE
WALKER AVE
BODEGA AVE
BODEGA HWY
SWARTZ RD
LELAND ST
JEWELL AVE
SWAN AVE
VINE AVE
PALM AVE
WHITED RD
ROBINSON RD
HAYDEN AVE
LITCHFIELD AVE
HUTCHINS AVE
FELLERS LN
EVERGREEN AVE
WOODLAND AVE
MCFARLANE AVE
FIRCREST AVE
PILLOW RD
PLEASANT HILL RD
WATERTROUGH RD
GERMONE RD
LYNCH RD
COOPER RD
WITTER RD
BURNSIDE RD
LAWRENCE LN
HILLHAVEN DR
SKIDMORE RD
SCHEIBEL LN
EPHICK RD
BLACKNEY RD
AVERILL RD
BASSIGNINI RD
ANDREE WAY
Atascadero Creek
Laguna de Santa Rosa
116


SEBASTOPOL GENERAL PLAN UPDATE
Figure 1-5: Development Trends
Assessor's Land Use Category and Year Built
Residential (Single- and Multi-Family)
pre-1976
1976-1989
1990-1999
2000-2009
2010-Present
No Information
Commercial
pre-1976
1976-1989
1990-1999
2000-2009
2010-Present
No Information
Governmental
pre-1976
1976-1989
1990-1999
2000-2009
No Information
Planning Boundaries
City of Sebastopol
Sphere of Influence/Urban Growth Boundary
0
500
1,000
2,000
Feet
1:14,000
De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm
Data sources: City of Santa Rosa GIS; Sonoma County GIS; Sonoma County Assessor's Master List, July 2014. Map date: August 6, 2014.
MILL STATION RD
HURLBUT AVE
HIGH SCHOOL RD
DANMAR DR
DANIEL ST
NORLEE ST
HILL DR
COVERT LN
HEALDSBURG AVE
EDDIE LN
MAIN ST
MORRIS ST
TAFT ST
JOHNSON ST
PITT AVE
MCKINLEY ST
SEBASTOPOL AVE
RAGLE RD
PLEASANT HILL AVE
VALENTINE AVE
SPRINGDALE ST
FLORENCE AVE
WILTON AVE
JESSE ST
MURPHY AVE
HUNTLEY ST
DUTTON AVE
HIGH ST
PETALUMA AVE
WASHINGTON AVE
WILLOW ST
CALDER AVE
WALKER AVE
BODEGA AVE
BODEGA HWY
SWARTZ RD
LELAND ST
JEWELL AVE
SWAW AVE
VINE AVE
PALM AVE
WHITED RD
ROBINSON RD
HAYDEN AVE
LITCHFIELD AVE
HUTCHINS AVE
FELLERS LN
EVERGREEN AVE
WATERTROUGH RD
PILLOW RD
PLEASANT HILL RD
WOODLAND AVE
MCFARLANE AVE
FIRCREST AVE
GERMONE RD
LYNCH RD
COOPER RD
WITTER RD
BURNSIDE RD
LAWRENCE LN
HILLHAVEN DR
SKIDMORE RD
SCHEIBEL LN
EPHICK RD
BLACKNEY RD
AVERILL RD
BASSIGNINI RD
ANDREE WAY
Atascadero Creek
Laguna de Santa Rosa
116

2. TRANSPORTATION AND CIRCULATION

The following section describes the existing regulatory, physical and operational characteristics affecting Sebastopol's transportation system. An overview of the circulation network's setting and regulatory framework is presented first, followed by descriptions of each transportation mode.

SETTING

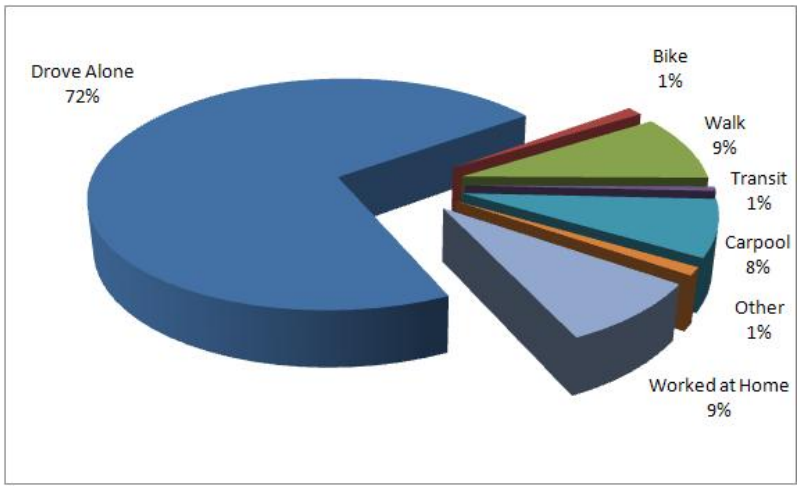
Urban Context

Sebastopol is a compact city set in a semi-rural atmosphere with a "small town" feel. Sebastopol's agricultural roots are present and visible throughout downtown and some of the community's neighborhoods. The City of Sebastopol is located between Santa Rosa and Bodega Bay and is at the crossroads with State Route (SR) 116 which serves the Russian River communities. Recently, the northeast area cannery/warehouse section has been redeveloped with restaurant, food production and art space.

Sebastopol's circulation system is largely dominated by the intersection of State Routes 12 and 116 that run through the center of town. The highways serve as the main transportation corridors connecting the town and Western Sonoma County to Santa Rosa, Highway 101, and the Sonoma coast. This intersection creates high levels of traffic congestion in the downtown core of Sebastopol during peak commute hours and summer weekends. A majority of commute trips by residents are in single occupancy vehicles, with a very low percentage of residents using public transit.

Travel Characteristics

CENSUS JOURNEY TO WORK



Data from the 2010 US Census and 2006-2010 American Community Survey were utilized to illustrate Journey to Work (JTW) statistics for Sebastopol. According to the 2010 US Census, Sebastopol's population was about 7,400 people, including nearly 4,000 workers 16 years of age or older. The ACS reports that the majority of people living in Sebastopol, 72 percent of workers, drive to work alone, whereas alternative modes of transportation accounted for approximately 12 percent of commute trips with approximately 8 percent of workers in carpools; less than 1 percent using public transit systems; 9 percent of commuters walking to work; 1 percent bicycling to work; and the remaining 8.5 percent of workers working at home. Table 2-1 provides an overview of Sebastopol's JTW mode split data compared to countywide statistics for Sonoma County and the State of California.

TABLE 2-1: DEMOGRAPHIC AND JOURNEY TO WORK DATA 2010 US CENSUS						
	Sebastopol		Countywide		California	
Population	7,379[1]		483,878[1]		37,253,956[1]	
Employed persons	3,955[2]		219,015[3]		16,282,943[2]	
Mode Split	Number	Percentage	Number	Percentage	Number	Percentage
Drove Alone	2,842	71.9%	167,438	76.5%	11,894,644	73%
Bike	48	1.2%	1,818	0.8%	169,960	1.1%
Walk	356	9%	4,406	2%	449,779	2.8%
Public Transit	24	0.6%	4,077	1.9%	837,820	5.1%
Carpool	304	7.7%	22,622	10.3%	1,877,683	11.5%
Motorcycle	19	0.5%	435	0.2%	56,270	0.3%
Other	24	0.6%	927	0.4%	150,828	0.9%
Worked at Home	338	8.5%	17,264	7.9%	839,860	5.2%

[1]*POPULATION DATA OBTAINED FROM 2010 CENSUS*
[2]*SEBASTOPOL AND STATE MODAL CHOICE DATA OBTAINED FROM 2008-2012 ACS 5-YEAR ESTIMATES*
[3]*COUNTY MODAL CHOICE DATA OBTAINED FROM 2010 ACS 1-YEAR ESTIMATES*

Of the 3,446 workers in Sebastopol 16 years old or older who work outside the home, 32 percent, or 1,107 workers, have a travel time to work of 15 minutes or less. Travel time to work for Sebastopol residents and the rest of the California workforce is shown in Table 2-2 below.

TABLE 2-2: 2010 TRAVEL TIME TO WORK			
	Sebastopol[1]		California[1]
	Number	Percentage	Workforce
Workforce	3,446	100%	15,466,086
Travel Time	Number	Percentage	Percentage
Less than 15 minutes	1,107	32.1%	25.2%
15 to 29 minutes	1,471	42.7%	35.8%
30 to 44 minutes	487	14.1%	21.1%
45 minutes or more	381	11.1%	17.9%

[1]*SEBASTOPOL AND STATE TRAVEL TIME DATA OBTAINED FROM 2006-2010 ACS 5-YEAR ESTIMATES*

Vehicle Miles Traveled

A common indicator used to quantify the amount of motor vehicle use in a specified area is Vehicle Miles Traveled (VMT). VMT represents the total number of miles driven by persons traveling to and from a defined regional area, which for the purposes of this study is the City of Sebastopol. 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\10 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 237,000 vehicle miles of travel are generated daily within the City of Sebastopol. This estimate reflects trips beginning or ending within the City of Sebastopol and does not include regional traffic passing through the area (such as traffic on SR 12 or 116).

ROADWAY SYSTEM

This section describes the physical characteristics of Sebastopol's roadway network. Figure 2-1 shows the major routes in Sebastopol and the roadway classification system.

State Highways

Two highways operated and maintained by Caltrans pass through Sebastopol.

- SR 12
- SR 116

SR 12 is the primary route connecting the City of Sebastopol with Santa Rosa and the east side of Sonoma County. As SR 12 enters Sebastopol from the east, it transitions from a three-lane highway to a three-lane arterial street (Sebastopol Avenue) which then ceases as a State Highway at its intersection with SR 116 (Main Street). West of Main Street, the street is referred to as Bodega Avenue. Sections of SR 12 within the City of Sebastopol include:

> **Sebastopol Avenue** is designated as an arterial by the City of Sebastopol. It connects Bodega Avenue in Sebastopol with SR 12 to the east. Existing daily traffic on the highway, at the eastern City limit averages 25,400 vehicles per day.

SR 116 is a State Highway running through Sebastopol that connects with SR 1 on the Pacific coast at its north terminus near Jenner, and connects to SR 121 near the City of Sonoma at its southern terminus. The corridor also provides primary access to the Sonoma County communities of Forestville, Guerneville, and other unincorporated towns along the Russian River. Sections of SR 116 adjacent to and within the City of Sebastopol from north to south include:

> **Gravenstein Highway North** is designated as a Rural Principal Arterial by the County of Sonoma. North of the City, the corridor operates as a two to three-lane highway. Within the City, Gravenstein Highway North is a three-lane facility.
>
> **Healdsburg Avenue** is designated as an arterial by the City of Sebastopol. It serves as the one-half mile portion of SR 116 south of Gravenstein Highway North and west of North Main Street. There are three lanes on this section of Healdsburg Avenue.
>
> **North Main Street** is designated as an arterial by the City of Sebastopol. It serves as the 0.2-mile portion of SR 116 east of Healdsburg Avenue and north of South Main Street/SR 12. North Main Street has one northbound lane, one center two-way left-turn lane and two southbound lanes.
>
> **South Main Street** is designated as an arterial by the City of Sebastopol. It serves as the 0.6-mile portion of SR 116 south of North Main Street and north of Gravenstein Highway South. Currently South Main Street only carries southbound traffic including three lanes between

McKinley Street and Burnett Street and two lanes between Burnett Street and Gravenstein Highway South.

McKinley Street is designated as an arterial by the City of Sebastopol. It serves as the 260-foot portion of northbound SR 116 connecting Petaluma Avenue with South Main Street. The street includes two westbound lanes.

Petaluma Avenue is designated as an arterial by the City of Sebastopol. It serves as the 0.6-mile portion of SR 116 south of Sebastopol Avenue and north of Gravenstein Highway South. Currently Petaluma Avenue only carries northbound traffic with two lanes of traffic.

Gravenstein Highway South is designated as a Rural Principal Arterial by the County of Sonoma. Within Sebastopol, Gravenstein Highway South includes two through lanes, often with a two-way left-turn lane, and transitions to a two-lane highway outside the limits of Sebastopol. At its southern interface with the Sebastopol City limits, the road carries approximately 22,900 vehicles per day.

Other Local Arterials

Bodega Avenue is designated as an arterial (local) by the City of Sebastopol. It begins where SR 12 ends at South Main Street and continues west to SR 1 near Bodega. Outside of Sebastopol, the facility operates as a two-lane rural highway, passing primarily through rural residential and agricultural uses. Within the City, Bodega Avenue is primarily a three-lane street or two lanes with parking. At its eastern end near South Main Street, the road carries approximately 12,600 vehicles per day.

Traffic Volume Patterns

As in many communities, vehicular traffic volumes in Sebastopol tend to peak during weekday commute periods. 24-hour traffic volume counts on SR 12, SR 116, and Bodega Avenue reveal these trends. SR 12 has a particularly notable plateau in traffic nearing 2,000 vehicles per hour for several hours during the afternoon and evening commute. Volumes on Gravenstein Highway South show a similar trend, averaging approximately 1,800 vehicles per hour during the same time period as SR 12. The existing segment volumes are shown in Figure 2-2. The volume trends are included in Appendix A.

REGULATORY FRAMEWORK

The City of Sebastopol 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 Sebastopol. While the City of Sebastopol has primary responsibility for the maintenance and operation of transportation facilities within the City, Sebastopol 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.

SEBASTOPOL GENERAL PLAN

The Sebastopol General Plan is a long-range comprehensive planning document required by state law and adopted by the City in 1994, and amended most recently in 2008, to set policy and guide future growth, development and conservation of resources. The following 1994 General Plan goals, objectives, and policies are relevant to circulation in Sebastopol.

GOAL 1: REDUCE REGIONAL TRAFFIC GROWTH.

Policies 1 and 2 support communication between the communities of Sonoma County to plan transportation on a more regional level.

Policy 3 encourages alternative modes of transportation to the single-occupant vehicle.

GOAL 2: DEVELOP A CITYWIDE AND AREA WIDE CIRCULATION SYSTEM THAT IS SAFE AND EFFICIENT.

Policies 4 through 7 support roadway improvements and the continuation of streets and bicycle and pedestrian paths, discourage strip commercial uses, and require traffic studies for proposed high trip-generating projects.

GOAL 3: REGARD THE QUALITY OF LIFE IN SEBASTOPOL AND MAINTAINING COMMUNITY IDENTITY AS MORE IMPORTANT THAN ACCOMODATING TRAFFIC.

Policies 8 to 9 and 11 to 12 emphasize the importance of making the community a higher priority than transportation issues. Policies 10 and 11 address protecting irreplaceable resources and reducing pollution.

GOAL 4: BUILD A BY-PASS AROUND SEBASTOPOL.

Policy 13 describes different alternatives for possibly routing traffic around Sebastopol and Policies 14 and 15 emphasize the importance of traffic mitigation.

Policy 16 establishes Level of Service (LOS) standards:

- At Intersections: Allow a minimum operation of LOS D for signalized intersections within the Downtown; LOS C for all signalized intersections outside of the Downtown; and LOS D for all side street movement at unsignalized intersections.
- On Road Segments: Allow a minimum LOS E for Highway 12, east of Main Street; LOS D for Highway 116 and Bodega Avenue; and LOS C for all other road segments.
- On Local Residential Streets: Allow a maximum of 1,500 to 2,000 vehicles per day on all existing residential streets and a maximum of 1,000 to 1,500 vehicles per day on all new residential streets.

GOAL 6: PRESERVE THE PEACE AND QUIET OF RESIDENTIAL AREAS.

Policy 17 addresses reducing through-traffic on local streets.

GOAL 6: REDUCE DEPENDENCE ON THE AUTOMOBILE.

Policies 18 and 19 encourage the use of bicycle and public transit. Policy 20 suggests more bus shelters around the City.

GOAL 7: MAKE IT EASIER AND SAFER FOR PEOPLE TO TRAVEL BY BICYLE.

GOAL 8: MAKE IT EASIER FOR PEOPLE TO WALK.

Policies 21 and 22 promote bicycle facilities and policies 23 through 25 are geared towards pedestrian safety.

GOAL 9: PROVIDE PERSONS WHO ARE MOBILITY-IMPAIRED WITH ACCESS TO TRANSPORTATION.

Policy 26 recommends the City enforce Federal and State regulations regarding access for persons with disabilities.

GOAL 10: REDUCE TRAVEL DEMAND.

Policy 27 recommends promoting measures to reduce travel demand.

TRAFFIC CALMING GUIDELINES

The *City of Sebastopol Traffic Calming Guidelines*, 2003, provides residents with a better understanding of the tools available and steps necessary to seek traffic calming services and measures. The Guidelines discuss traffic calming measures feasible in Sebastopol as well as the benefits.

Traffic Calming Measures

- Programmatic: First course of action taken if it is determined that speeds or safety conditions exceed the City's standards. They primarily include educational and enforcement programs rather than physical modifications to the street.
- Non-physical measures: Any mitigation that does not require the construction of physical modifications to the roadway while utilizing lower cost treatments.
- Vertical deflection measures: Variations in pavement height and alternative paving materials to cause drivers discomfort at high travel speeds. The intention of the deflection is to reduce speeds along a street within a neighborhood or at a specific location so that others users, such as pedestrians, are presented with a roadway feature which better meets their needs.
- Horizontal deflection measures: Raised islands and curb extensions to deflect the driver's path away from a straight line along roadways and through intersections. The intention of the deflection is to reduce the driver's speed through a corridor so that other users of the area are not impacted by speeding traffic.

BICYCLE AND PEDESTRIAN MASTER PLAN

The 2011 Amended *Sebastopol 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 establishes bicycle and pedestrian policies for Sebastopol and the larger Countywide Bicycle System, along with bicycle and pedestrian infrastructure projects, and programmatic improvements.

Through a collaborative planning process, a vision, goals and objectives were approved by all ten jurisdictions in Sonoma County, including Sebastopol. Each City's plan is distinct and tailored to the needs of each 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 from the *Countywide Bicycle and Pedestrian Plan, 2014 Update* are summarized below, and the map of proposed and existing bicycle and pedestrian facilities in Sebastopol is shown in Figure 2-3.

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 transportation opportunities for bicyclists and pedestrians.

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 complete streets for the development of bicycle and pedestrian facilities.

Objective 3.0: Multimodal Integration

Develop and enhance opportunities for bicyclists and pedestrians to easily access other modes of public transportation.

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 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

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

Objective 8.0: Planning

Plan for the ongoing expansion and improvement of the countywide bicycle and pedestrian system.

Objective 9.0: Maintenance

Maintain and/or improve the quality, operation, and condition 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.

BIKE LANE FEASIBILITY STUDY

The Bike Lane Feasibility Study was completed to compliment the City of Sebastopol Bicycle and Pedestrian Master Plan. It presents an analysis of the opportunities and constraints and feasibility of installing Class II bicycle lanes on streets/segments in Sebastopol. Where Class II bike lanes were found to be infeasible the report included recommendations for alternatives to Class II bike lanes. These recommendations were offered for the consideration and approval of the City Council. Subsequent to acceptance of this report these recommendations will be included by amendment into the Sebastopol Bicycle and Pedestrian Master Plan. Table 2-3 lists the segments in Sebastopol that were included in the Bike Lane Feasibility Study.

TABLE 2-3: SEGMENTS INCLUDED IN BIKE LANE FEASIBILITY STUDY

Local Streets (11)	State Highways (6)
Covert Ln	Healdsburg Ave – Covert Ln to North Main St
Bodega Ave – Main St to West City Limit	North Main St
Ragle Rd – Covert Ln to Bodega Ave	South Main St – Sebastopol Ave to Petaluma Ave
Pleasant Hill Rd – all within City limits	Petaluma Ave
Pleasant Hill Ave North	McKinley St – Petaluma Ave to North Main St
Valentine Ave	Sebastopol Ave – Morris St to Main St
Murphy Ave	
Washington Ave – Huntley St to Bodega Ave	
Jewell Ave	
Laguna Park Way	
Morris St	

Bicycle Facility Alternatives

- *Standard Class II Bikeways (bike lane markings)*
- *Standard Shared Roadway bicycle markings (shared lane markings aka "sharrows")*
- *Non-standard application of bike lane markings*
- *Non-standard application of shared lane markings*
- *Standard Class III Bikeways (bike routes)*

Regional

STATE OF CALIFORNIA COMPLETE STREETS ACT

On September 30, 2008, Governor Schwarzenegger signed Assembly Bill (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 (DD) 64; a policy directive related to non-motorized travel throughout the state. In October 2008, DD 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.*
>
> *The Department develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of "complete streets" requires collaboration among all Department functional units and stakeholders to establish effective partnerships.*

Providing safe mobility for all users, including motorists, bicyclists, pedestrians and transit riders, contributes to the Department's 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 maintenance activities and products on the State Highway System.

Complete Street

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

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 Sebastopol, Caltrans oversees operation on SR 12 and SR 116 and would like to maintain a target LOS at the transition between LOS C and LOS D.

METROPOLITAN TRANSPORTATION COMMISSION

The current Regional Transportation Plan (RTP) produced by MTC and the Association of Bay Area Governments, *Plan Bay Area*, was adopted in 2013. Plan Bay Area sets forth regional transportation policy and provides capital program planning for all regional, State, and Federally funded projects. In addition, Plan Bay Area 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. Plan Bay Area includes no roadway improvement projects within or immediately adjacent to the City of Sebastopol, though does include regional funding to implement Sonoma County's Safe Routes to School program, implement bicycle and pedestrian improvements countywide, and enhance bus service frequencies in the County.

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 Sebastopol include:

- Intersection control on Highway 116 at four locations
- Bodega Avenue curb, gutter, and sidewalk improvements from Golden Ridge Avenue to Pleasant Hill Road
- SR 116 curb, gutter, and sidewalk improvements from Live Oak Avenue to Hurlbut Avenue

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 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.

Funding for Local Street Projects (LSP) from Measure M can be 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. Sebastopol received funding to improve crossings on local streets as part of the Street Smart Sebastopol project.

PUBLIC TRANSPORTATION SYSTEM

Bus Transit Operations

Bus service in Sebastopol is provided by Sonoma County Transit (SCT). An exhibit showing bus routes in and surrounding the City is provided in Figure 2-4.

SONOMA COUNTY TRANSIT

Sonoma County Transit is the primary transit provider in Sebastopol; 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 Sebastopol.

Route 20 travels between the Russian River Area, Forestville, Sebastopol, and Santa Rosa. The route operates Monday through Friday between 6:00 a.m. and 9:30 p.m. with approximately ninety minute headways. Weekend service operates between 8:00 a.m. and 8:00 p.m. with approximately three hour headways. In Sebastopol, Route 20 stops at the Post Office, the Sebastopol Hub, and Highway 12/Llano Road.

Route 22 provides services between Santa Rosa and Sebastopol Monday through Friday during peak commute hours. The route operates along Highway 12 and connects the Sebastopol Transit Hub and the Santa Rosa Transit Mall.

Route 24 is a fixed local route that serves the City of Sebastopol. Route 24 operates Monday through Friday between 9:00 a.m. and 3:30 p.m. with approximately forty-minute headways. Saturday service operates between 9:00 a.m. and 3:00 p.m. with approximately forty-minute headways.

Route 26 provides services between Sebastopol and Rohnert Park and Graton Resort. Route 26 operates Monday through Friday during peak commute hours. The route operates along SR 116 and connects the Sebastopol Transit Hub to various locations within Rohnert Park.

Sonoma County Transit staff indicated that all service routes in Sebastopol operate well within maximum capacity levels. System wide, SCT carried over 1.4 million passengers in 2012, representing an approximate 8.4 percent increase from 2010.

Sonoma County Transit maintains five shelters at Sebastopol 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.

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 Sebastopol. Service hours are Monday through Friday from 5:00 AM to 11:00 PM and Saturday and Sunday from 7:00 AM to 9:00 PM. Ride reservations can be scheduled daily.

Park and Ride Lots

Sebastopol has a park and ride lot, at Petaluma Avenue and Burnett Street.

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 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.

The Santa Rosa Railroad Square Station is located 6.5 miles east of Sebastopol and is currently served by SCT Route 22. The operation of the SMART system will give residents in Sebastopol a new alternative to using Highway 101 for commuting. As of 2014, SMART is planning to initiate rail service in 2016 on what is being referred to as the initial operating segment (IOS). The IOS runs from Santa Rosa on the north to the Downtown San Rafael Transit Center on the south.

Taxi Service

Taxi service in Sebastopol 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 and activities in Sebastopol. Bicycle and pedestrian volumes were collected during the weekday PM peak hour in April 2014 at four of the downtown intersections as well as at the Bodega Avenue/Dutton Avenue-Jewell Avenue and SR 12/Morris Avenue intersections. These bicycle and pedestrian volumes are shown in Table 2-4.

TABLE 2-4: SEBASTOPOL BICYCLE AND PEDESTRIAN VOLUMES (PM PEAK HOUR VOLUMES)

Intersection	Total Number of Bicycles	Total Number of Pedestrians
N. Main St/McKinley St	12	100
Petaluma Ave/McKinley St	24	78
S. Main St/Bodega Ave	12	164
Petaluma Ave/Sebastopol Ave	14	32
Jewell Ave/Bodega Ave	6	16
Morris St/Sebastopol Ave	14	38

Bicycle and Pedestrian Facilities

BICYCLE FACILITIES

Bicycle circulation in Sebastopol is supported by an existing network of multi-use paths, on-street bike lanes, and bicycle routes. Notable facilities include the West County Trail, which comes into Sebastopol from the north at Mill Station Road and follows the old railroad right-of-way, and the Joe Rodota Trail, which provides access to Santa Rosa and parallels SR 12 and connects to Petaluma Avenue south of SR 12. Other Class I trails include the Eddie Lane connection between North Main Street and Morris Street, the Railroad Forest Path which connects the Joe Rodota Trail to Morris Street, and Jewell Avenue Path which connects the south terminus of Jewell Avenue to Lynch Road. The City's Bicycle and Pedestrian Master Plan, shown in Figure 2-3, expands upon the existing network to create a robust bicycle circulation system in Sebastopol. The Plan includes important bicycle facility improvements such as connection of the northern and eastern segments of the Joe Rodota Trail with proposed Class II bike lanes on SR 116 as well as proposed Class II bike lanes or suggested shared lane markings (sharrows) on other major connector roads in the city.

Bicycle racks for short-term bicycle parking are provided at various locations in Sebastopol including the Lucky/CVS Pharmacy shopping center at SR 116/Hurlbut Avenue, the Sebastopol Community Center in the northeast corner of town, and four locations in the downtown area. There are no known existing shower or locker facilities designated for bicyclists, and none are proposed at this time. Section

17.220.050 of Sebastopol'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 Sebastopol Bicycle and Pedestrian Master Plan identifies two Pedestrian Districts in Sebastopol (areas of high activity where pedestrian improvements should be prioritized). One is the downtown pedestrian district encompassing a large portion of the city's center, including the Barlow district. The boundaries of this district are Laguna Park Way, High Street, Willow Street, and Morris Street. The other pedestrian district is the Main Street Corridor, which provides access to Analy High School, Safeway, Rite Aid, and civic destinations near the center of town. Nearly complete sidewalk coverage, accessible curb ramps, and marked crosswalks are provided along arterial streets in Sebastopol. High-visibility crosswalk markings, pedestrian refuge islands, and in-roadway pedestrian warning signs, among other treatments, are provided at several uncontrolled crosswalk locations along SR 116.

Sidewalks in Sebastopol 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 Sebastopol's single-family residential neighborhoods, in multi-family residential developments, and in commercial developments.

While the pedestrian network is generally well developed in Sebastopol, there are some locations where gaps in the sidewalk network can be found. The most notable gap in the identified pedestrian district includes the southern frontage of McKinley Street between Petaluma Avenue and the Barlow development. Another prominent gap is on Bodega Avenue between Golden Ridge and Pleasant Hill Avenue. Further, traditional curb, gutter, and sidewalks are generally not provided along some residential streets in Sebastopol.

Street Smart Sebastopol

In an effort to capitalize on what Sebastopol has to offer pedestrians, and to improve pedestrian safety and walkability in the downtown area, the City developed the "Street Smart Sebastopol" program in 2001. From the citywide Street Smart visioning process, a "wish-list" of over 40 projects was developed. Many of these projects have been completed as funding opportunities have arisen. Most visible are a series of pedestrian safety crossing improvements at 15 intersections, mostly located along State Highway 116. These intersections have been reconstructed with bulb-outs, pedestrian-level lighting, sidewalk widening, continuous sidewalks where formerly there were gaps, refuge islands, pedestrian-actuated crossing beacons and in-pavement crosswalk lights, and landscaping. Three intersections were improved in 2006. Another three were improved in 2010, and the remaining nine intersections were upgraded by 2012. This work was accomplished using $2 million in Countywide Transportation Sales Tax (Measure M) funds, combined with approximately $1 million in Federal transportation grants. This project is a credit to the local jurisdictions' ability to work with Caltrans, which owns and operates these highways, to make pedestrian-related improvements.

INTERSECTION LEVEL OF SERVICE

Level of Service (LOS) is used to rank traffic operations 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.

Study Intersections

The following 18 study intersections were identified as those most critical to Sebastopol's local circulation system and its connectivity to the regional transportation network. The locations of the study intersections are shown in Figure 2-5.

1. Gravenstein Highway (SR 116)/Mill Station Road
2. Gravenstein Highway (SR 116)/Hurlbut Avenue
3. Healdsburg Avenue/Covert Lane
4. Healdsburg Avenue/Murphy Avenue
5. Healdsburg Avenue/Florence Avenue
6. Healdsburg Avenue/North Main Street
7. North Main Street/McKinley Street
8. McKinley Street/Laguna Park Way/Petaluma Avenue
9. Morris Street/Laguna Park Way
10. Bodega Avenue/Ragle Road-Ragle Avenue South
11. Bodega Avenue/Pleasant Hill Avenue North-Pleasant Hill Road
12. Bodega Avenue/Dutton Avenue-Jewell Avenue
13. Bodega Avenue-SR 12/North Main Street-South Main Street
14. SR 12/Petaluma Avenue
15. SR 12/Morris Street
16. SR 12/Llano Road
17. Gravenstein Highway (SR 116)/Fircrest Avenue
18. Gravenstein Highway (SR 116)/Lynch Road

Traffic volumes were obtained in January and March 2014, while schools were in session. Operating conditions during the AM and PM peak periods were evaluated to capture the highest volumes on the local transportation network. The 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 existing lane configurations for the study intersections are shown in Figure 2-6 and the existing peak hour traffic volumes are shown in Figure 2-7.

Level of Service Methodology

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.

TWO-WAY STOP-CONTROLLED INTERSECTIONS

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" 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.

SIGNALIZED INTERSECTIONS

The study intersections that are currently controlled by a traffic signal, or may be in the future, 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. For purposes of this study, delays were calculated using optimized signal timing.

The ranges of delay associated with the various levels of service are indicated in Table 2-5.

TABLE 2-5: INTERSECTION LEVEL OF SERVICE CRITERIA

LOS	Two-Way Stop-Controlled	Signalized
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. 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 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 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 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 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 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

REFERENCE: HIGHWAY CAPACITY MANUAL, TRANSPORTATION RESEARCH BOARD, 2000

Level of Service Standards

Program 16.1 of the Sebastopol General Plan calls for a minimum operation of LOS D for signalized intersections within the Downtown; a LOS C for all signalized intersections outside of the Downtown; and LOS D for all side street movements at unsignalized intersections. On road segments, a minimum of LOS E should be provided for SR 12 east of Main Street and LOS D for SR 116 and Bodega Avenue and LOS C for all other road segments.

LEVEL OF SERVICE ANALYSIS

Intersections

Currently, 17 of the 18 study intersections are operating acceptably. The intersection at SR 12/Morris Street is operating unacceptably at LOS E during the AM peak hour. A summary of the intersection level of service calculations is contained in Table 2-6. LOS Calculations are included in Appendix B.

TABLE 2-6: SUMMARY OF EXISTING PEAK HOUR INTERSECTION LEVELS OF SERVICE

Intersection	AM Peak Hour		PM Peak Hour	
Approach	Delay	LOS	Delay	LOS
1. Gravenstein Highway (SR 116)/Mill Station Road	14.1	B	15.4	B
2. Gravenstein Highway (SR 116)/Hurlbut Avenue	12.1	B	17.3	B
3. Healdsburg Avenue/Covert Lane	5.4	A	4.1	A
Northeastbound Approach	*21.5*	*C*	*24.9*	*C*
4. Healdsburg Avenue/Murphy Avenue	2.4	A	1.26	A
Northbound Approach	23.7	C	20.6	C
5. Healdsburg Avenue/Florence Avenue	1.0	A	1.14	A
Northbound Approach	*19.7*	*C*	*20.5*	*C*
6. Healdsburg Avenue/North Main Street	11.4	B	10.0	A
7. North Main Street/McKinley Street	7.9	A	11.2	B
8. McKinley Street/Laguna Park Way/Petaluma Avenue	3.0	A	3.2	A
Southbound Approach	*15.3*	*C*	*17.9*	*C*
Westbound Approach	*16.0*	*C*	*19.2*	*C*
9. Morris Street/Laguna Park Way	2.0	A	2.6	B
Eastbound Approach	*11.6*	*B*	*10.2*	*B*
10. Bodega Avenue/Ragle Road-Ragle Avenue South	5.0	A	3.5	A
Northbound Approach	*19.5*	*C*	*10.2*	*B*
Southbound Approach	*21.4*	*C*	*15.6*	*C*
11. Bodega Avenue/Pleasant Hill Road	18.3	B	15.6	B
12. Bodega Avenue/Dutton Avenue-Jewell Avenue	17.6	B	13.5	B
13. Bodega Avenue-SR 12/Main Street	29.7	C	24.9	C
14. SR 12/Petaluma Avenue	31.7	C	38.7	C
15. SR 12/Morris Street	**75.1**	**E**	37.9	D
16. SR 12/Llano Road	26.8	C	16.9	B
17. Gravenstein Highway (SR 116)/Fircrest Avenue	0.5	A	2.2	A
Eastbound Approach	*15.7*	*C*	*32.0*	*D*
18. Gravenstein Highway (SR 116)/Lynch Road	13.6	B	13.0	B

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*

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 July 1, 2007 through June 30, 2012.

The collisions were analyzed using the Transportation Injury Mapping System (TIMS) developed by UC Berkeley. TIMS does not report "Property damage only" vehicle collisions, however the more severe collisions are reported and these are the ones that would be more likely to indicate the geometric/driver behavior issues at certain intersections. The area of town with the most amount of collisions is on SR 12 between downtown and the eastern town limits. Figures 2-8A, 2-8B, and 2-8C highlight the areas in town with the most collisions.

There were 10 or more reported collisions in the vicinity of the SR 12/Petaluma Avenue intersection and at least two collisions at many intersections along SR 116 through Sebastopol. There were five reported pedestrian collisions at Bodega Avenue/High Street and four reported pedestrian collisions at two intersections in the vicinity of Sebastopol's downtown area. There were four reported bicycle collisions also within the vicinity of SR 12/Petaluma Avenue intersection and several intersections along SR 116 with one or more reported bicycle collisions.

The city has been implementing pedestrian and bicycle improvements in the downtown area over the past several years and has additional improvements planned for the near future.

ELECTRIC CHARGING STATIONS

Three ChargePoint charging stations are provided in the theater parking lot opposite the City police station. Free charging is available to the public.

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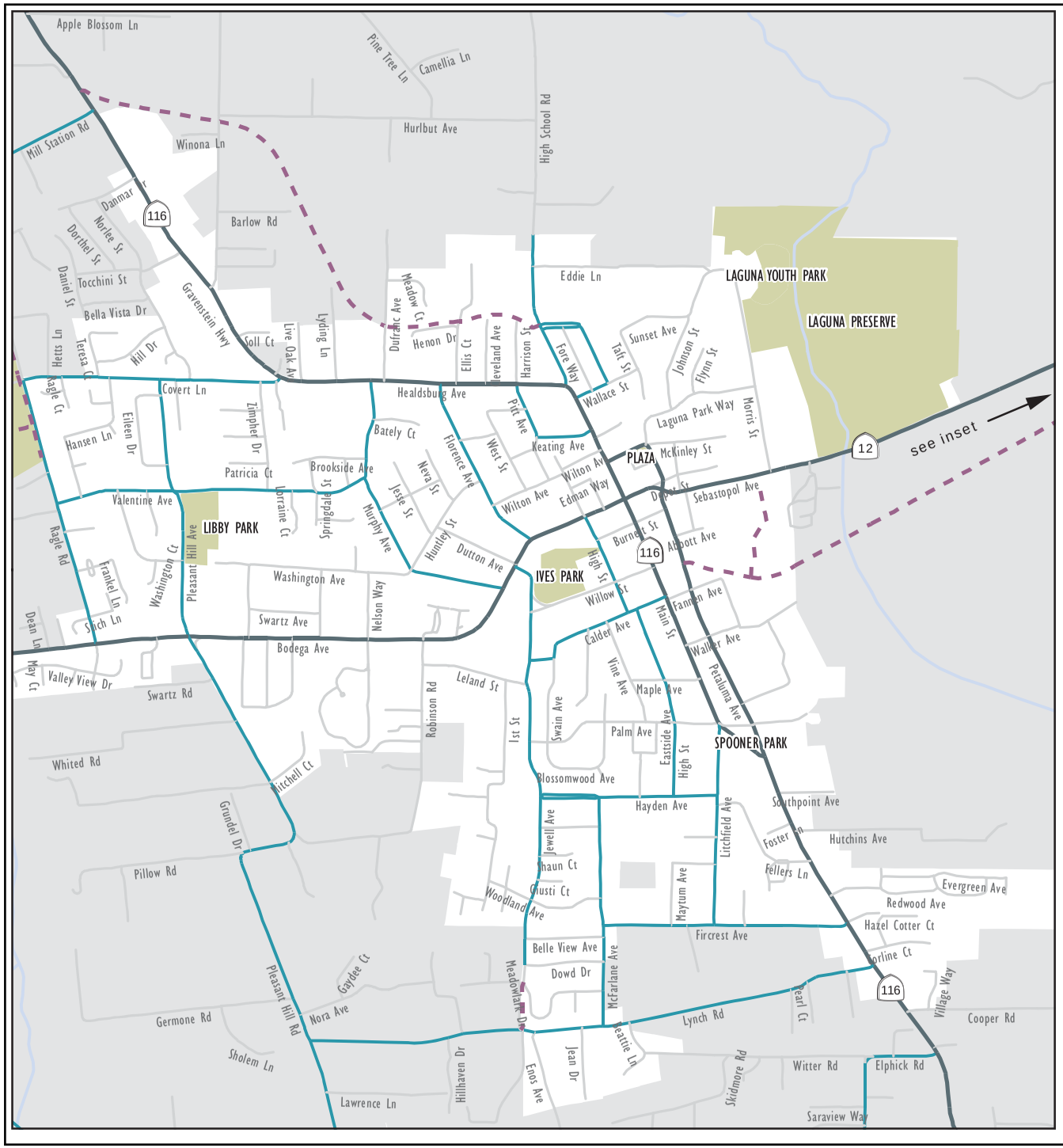
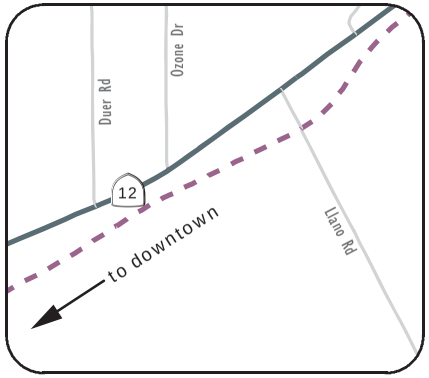
Sebastopol General Plan Update

Figure 2-1
Roadway Classification



Arterial
Collector
Trail
Local



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Sebastopol General Plan Update

Figure 2-2
Existing Segment Volumes

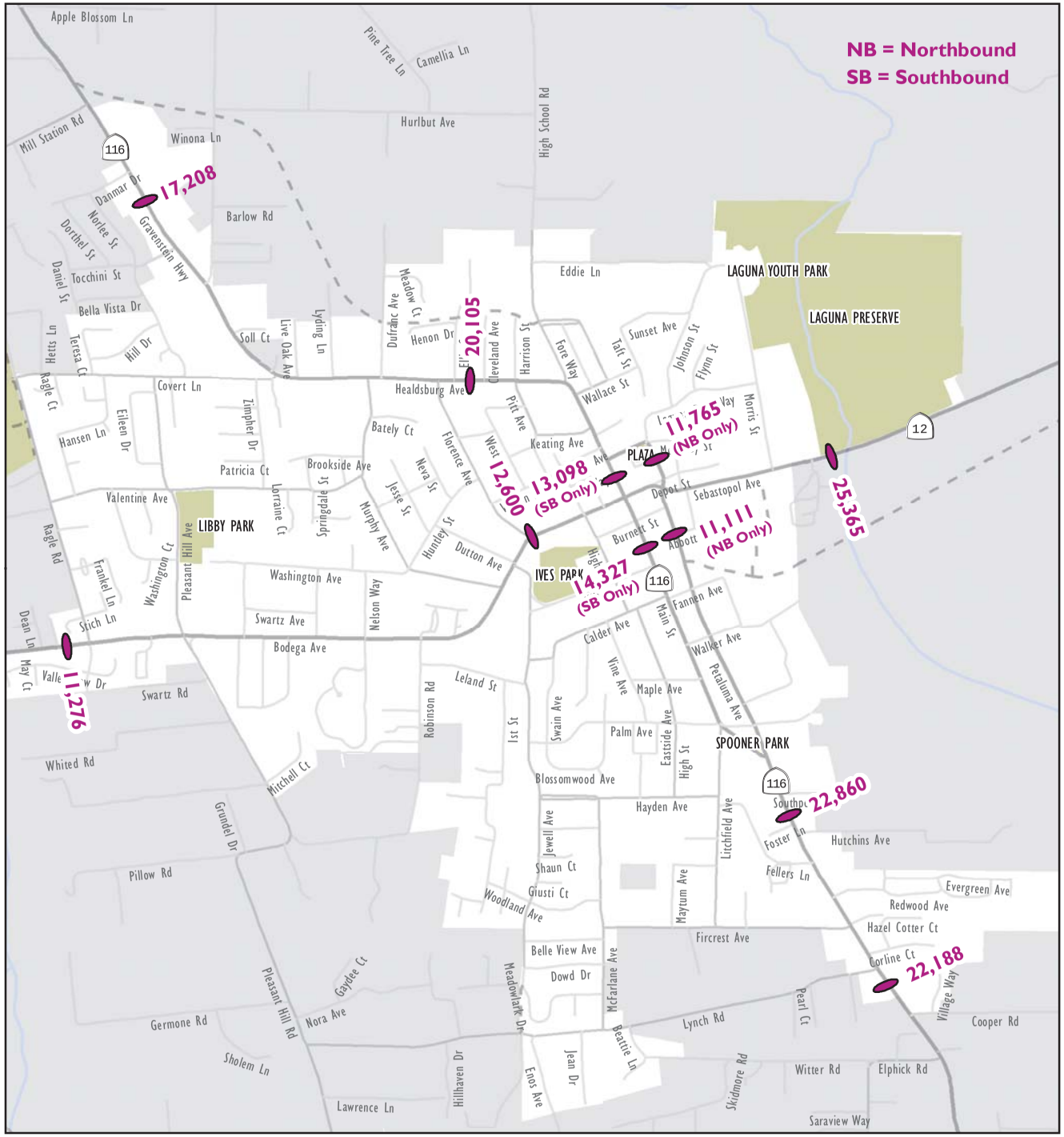

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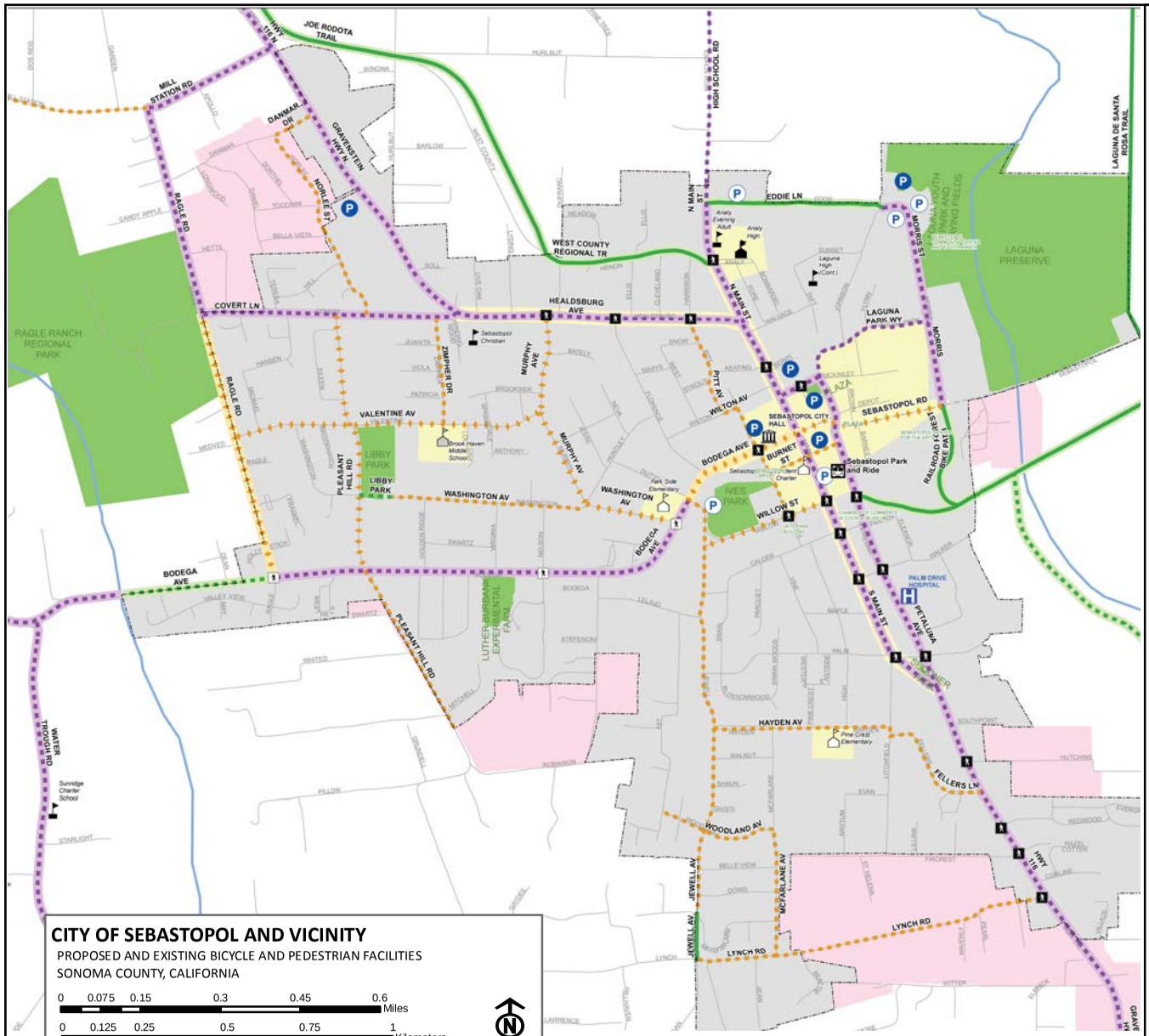
Figure 2-3
Bicycle and Pedestrian Master Plan



CITY OF SEBASTOPOL AND VICINITY

PROPOSED AND EXISTING BICYCLE AND PEDESTRIAN FACILITIES
SONOMA COUNTY, CALIFORNIA

0 0.075 0.15 0.3 0.45 0.6 Miles

0 0.125 0.25 0.5 0.75 1 Kilometers

Author: Sonoma County Transportation Authority
Date: April 20, 2006
Revised: March 3, 2014
Projection & Coordinate System: CA State Plane, Zone 11, NAD 83, US Survey Feet, Lambert Conformal Conic Projection.
Project Source:S:\SCTA\SCTA Modeling Program\PROJECTS\bikeplan\2014_Update\sebastopol_2014.mxd
Sources: SCTA Countywide Bicycle and Pedestrian Advisory Committee, Sonoma County GIS, City of Sebastopol

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.

SCTA
sonoma county transportation authority

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
- SHARROWS, RECOMMENDED

Bicycle Amenities
- Bike Parking - Existing
- Bike Parking - Proposed
- Showers/Lockers - Existing
- Showers/Lockers - Proposed

Pedestrian Crossing Enhancements
- EXISTING
- PROPOSED

Pedestrian Oriented Areas
- Pedestrian Districts
- Pedestrian Corridors

Multimodal Connections
- EXISTING
- PROPOSED

Transportation Features
- Street or Road
- Highway
- Freeway
- Railroad

Geographic Elements
- City Sphere of Influence
- Sebastopol City Limits
- Other City Limits
- Public Places/Parks
- City Halls
- Hospitals
- Waterway

Schools
- OTHER
- ELEMENTARY
- MIDDLE
- HIGH SCHOOL

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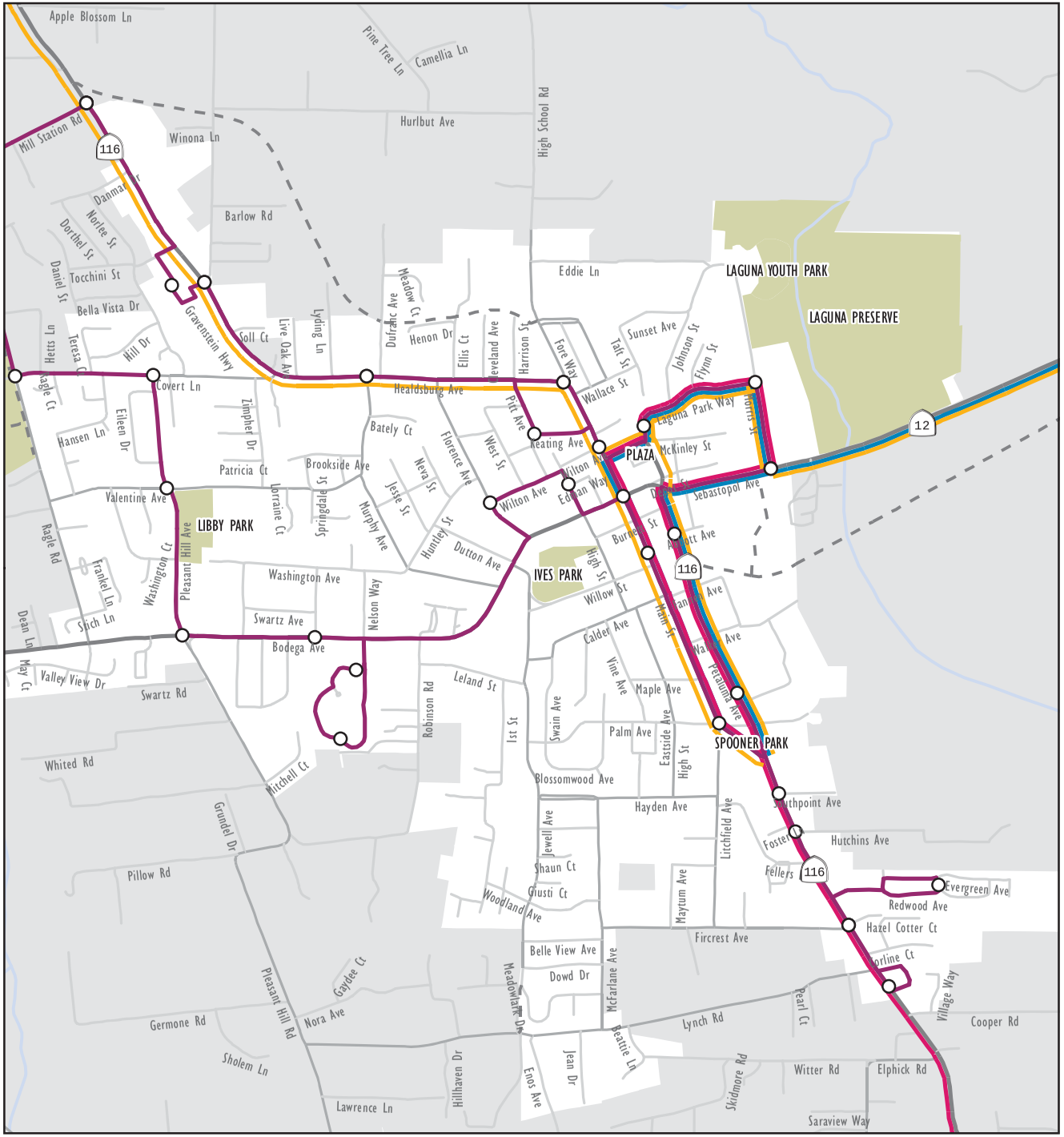
Sebastopol General Plan Update

Figure 2-4
Transit Routes



Bus Stops
Route 20
Route 22
Route 24
Route 26

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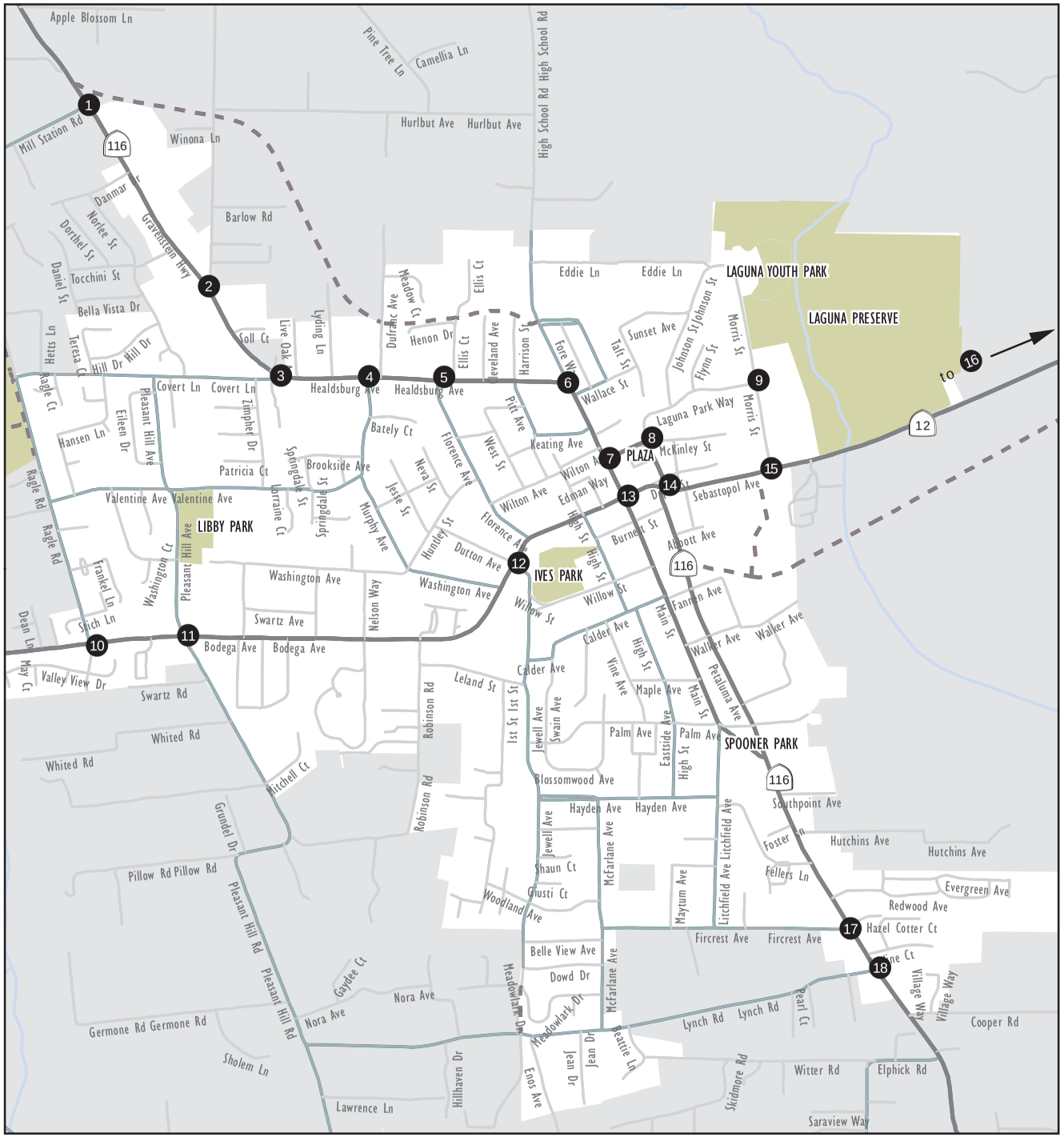
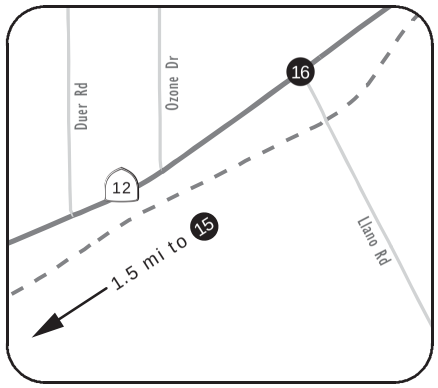
Sebastopol General Plan Update

Figure 2-5
Study Intersections





Study Intersection

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Sebastopol General Plan Update

Figure 2-6
Lane Configurations

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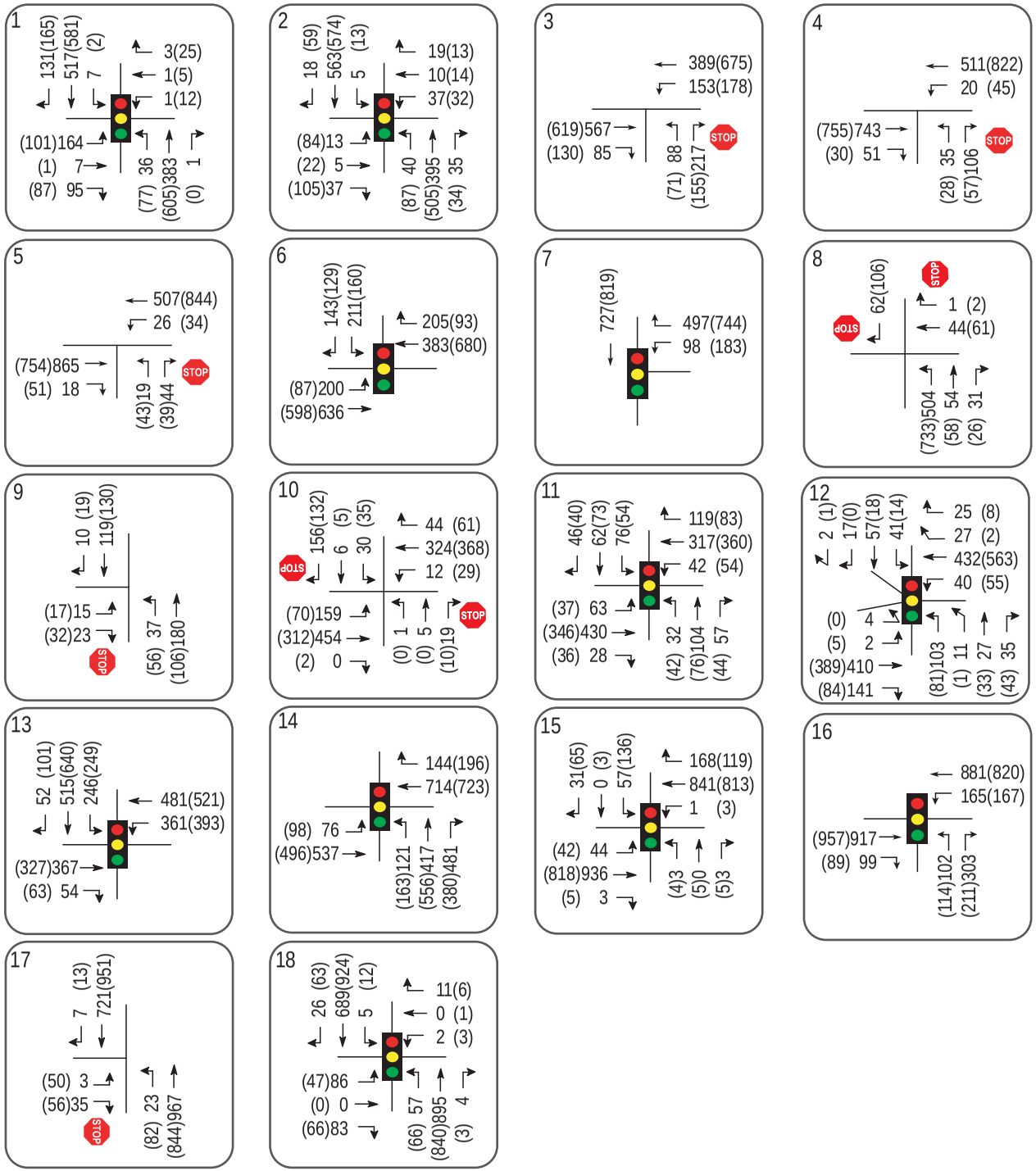

Sebastopol General Plan Update

Figure 2-7
Existing Traffic Volumes

xx A.M. Peak Hour Volume
(xx) P.M. Peak Hour Volume

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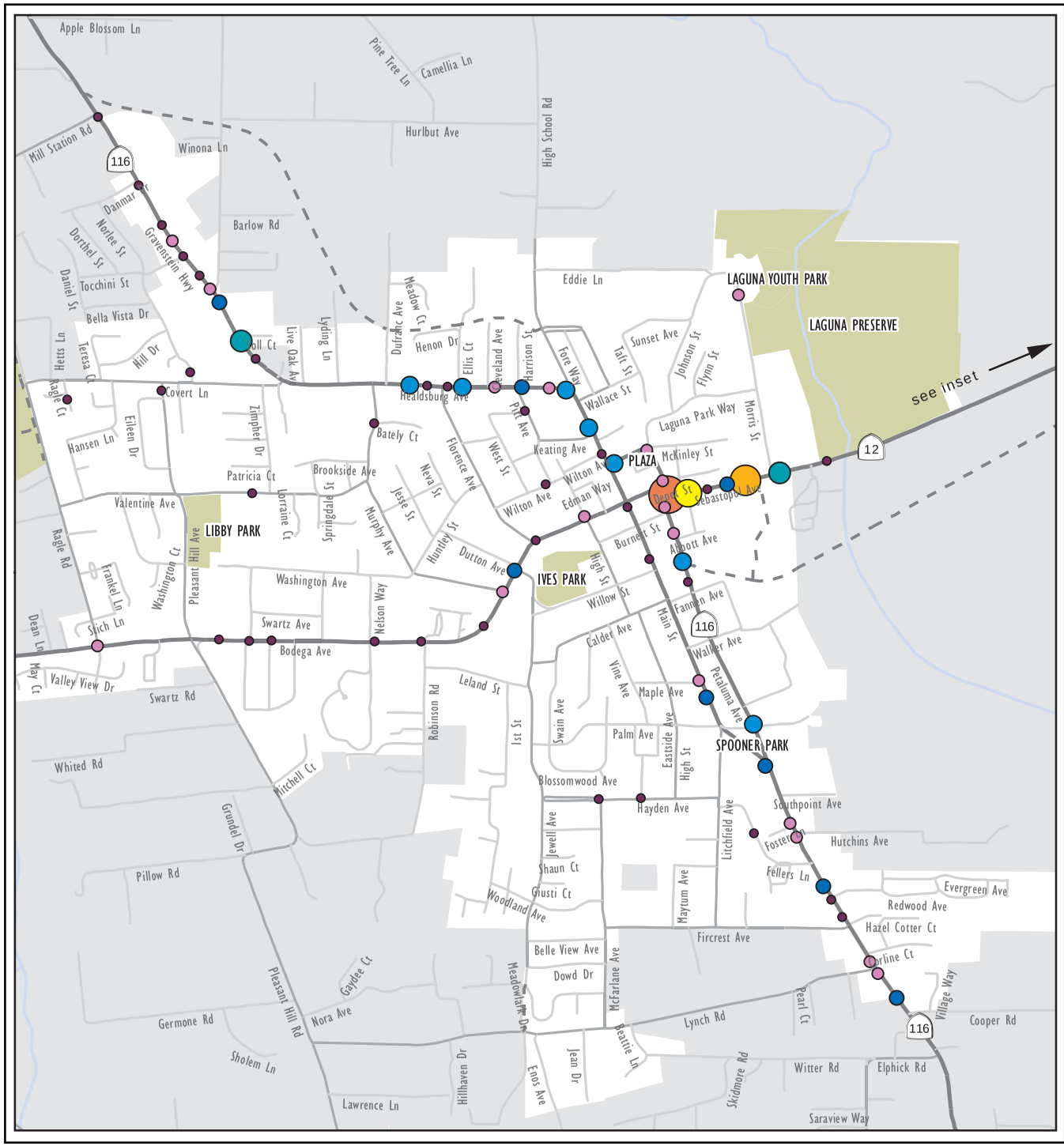
Sebastopol General Plan Update

Figure 2-8A
Vehicle Collisions



Number of Collisions

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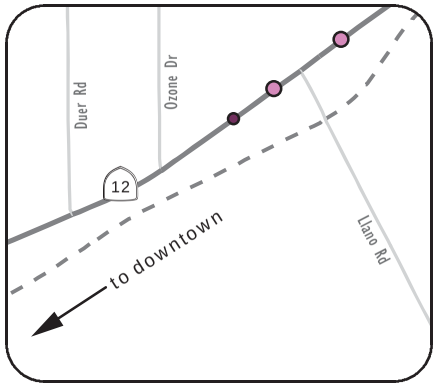
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10



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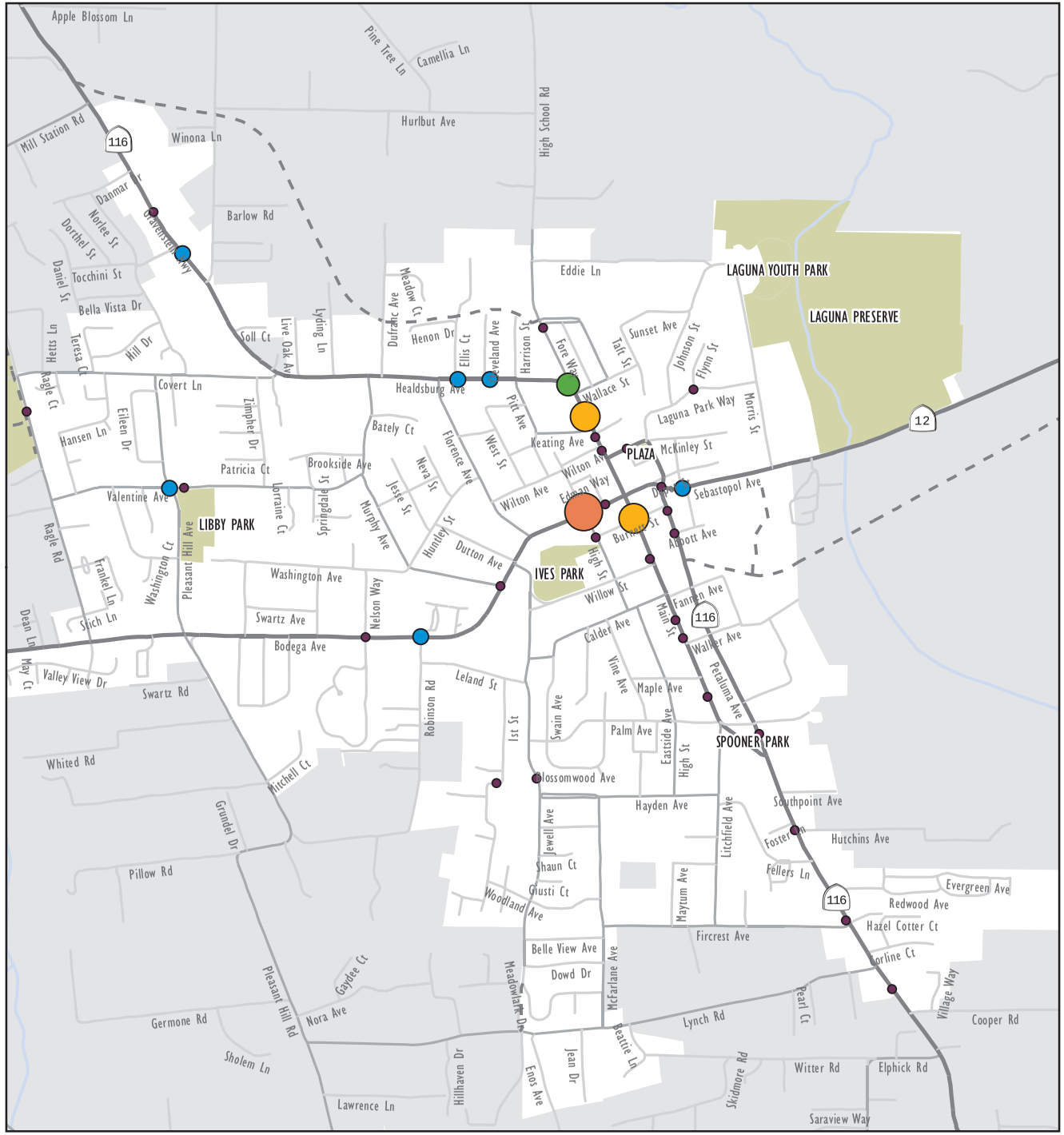
Sebastopol General Plan Update

Figure 2-8B
Pedestrian Collisions



Number of Collisions

- 1
- 2
- 3
- 4
- 5

0 ½ miles

N W E S

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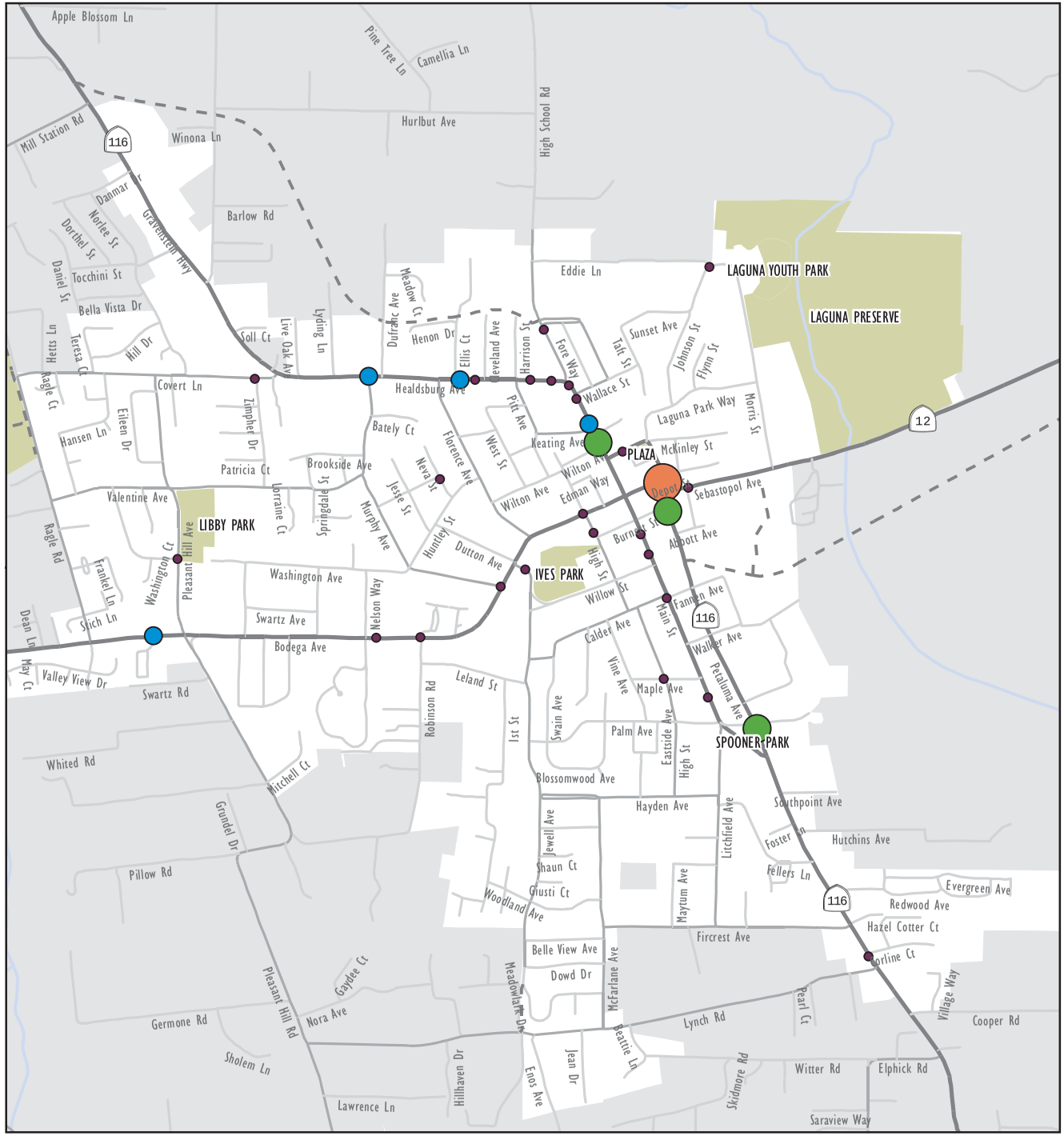
Sebastopol General Plan Update

Figure 2-8C
Bicycle Collisions



Number of Collisions

- 1
- 2
- 3
- 4

0 ½ miles

N W E S

w-trans

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3.0 COMMUNITY SERVICES AND UTILITIES

This chapter addresses community services and facilities and utility services within the City of Sebastopol. Utility services include the provision of water services, wastewater (sewer) services, stormwater and drainage, solid waste disposal, electric, and natural gas. Public safety services include fire protection, law enforcement, and local safety, including emergency medical services. Community services and facilities include parks, recreational facilities, schools, libraries, and a senior activity center. In addition, a non-profit organization operates the Sebastopol Center for the Arts.

This chapter is divided into the following sections:

- 3.1 Utilities
  - 3.1.1 Water
  - 3.1.2 Wastewater
  - 3.1.3 Stormwater and Drainage
  - 3.1.4 Solid Waste
  - 3.1.5 Electricity and Natural Gas
- 3.2 Public Safety
  - 3.2.1 Fire Protection
  - 3.2.2 Law Enforcement
  - 3.2.3 Local Safety
- 3.3 Parks and Recreation
- 3.4 Schools, Libraries, and Other Public Facilities

3.1 UTILITIES

This section address the provision of utilities in the City of Sebastopol, including water, wastewater (sewer), stormwater and drainage, solid waste, electricity, and natural gas.

3.1.1 WATER SERVICES

This section describes the City of Sebastopol's water demands, water supplies, water distribution system, and water quality.

KEY TERMS

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

BGS: Below ground surface.

GPD: Gallons per day.

GPM: Gallons per minute.

Groundwater: Water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. Water beneath the earth's surface fills the spaces in soil, gravel, or rock formations. Pockets of groundwater are often called "aquifers" and are the source of drinking

water for a large percentage of the population in the United States. Groundwater is often extracted using wells which pump the water out of the ground and up to the surface. Groundwater is naturally replenished by surface water from precipitation, streams, and rivers when this recharge reaches the water table.

MG: Million gallons.

MGD: Million gallons per day.

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

REGULATORY FRAMEWORK

STATE

California Department of Health Services

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

Consumer Confidence Report Requirements

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

Urban Water Management Planning Act

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

fewer than 3,000 acre-feet of water annually. As such, the City is not required to prepare an Urban Water Management Plan (UWMP).

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 Sebastopol Water Master Plan (2005)

The City's 2005 Water Master Plan evaluates the water supply sources, storage capabilities and distribution capacity of the water system that the City owns and maintains for domestic use, commercial use, and fire fighting. The study identifies system deficiencies and outlines existing and future system improvements necessary to meet projected demands.

SCWA Santa Rosa Plain Groundwater Management Plan

The Basin Advisory Panel has been developing a Groundwater Management Plan in accordance with state water code to locally and voluntarily manage groundwater resources. The Panel is comprised of almost 30 technical experts, residential well users, businesses, agricultural groups, environmental

organizations, governmental agencies, tribal groups, natural resource managers, and members of the general public. After nearly two years in development, the Plan is nearing completion. Four main elements guide the Plan:

- Groundwater management and land use planning
- Urban Water Management Plans tracking and integration
- Multi-agency and organization integration
- Climate change planning
- Multi-benefit actions and activities

City of Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following goals and policies related to water supplies:

Land Use Element

Goal 1 Phase future growth so that City resources are not exceeded.

P.1 Phasing Growth: Use information on growth and infrastructure capacity to phase growth.

Program 1.1: Prepare and adopt a Growth Management Ordinance

Program 1.2: Monitor growth and infrastructure capacity.

Program 1.3: Revise the City's water demand calculations based on land use changes in this Plan.

Program 1.4: Maintain Level of Service (LOS) standards and guidelines for City services.

- Water: The standard for water volume and flow is established by Title 22 of the State of California. The minimum fire flow standard is 1,000 gallons per minute.
- Wastewater: The standard for sewage treatment is based on capacity. The City shall maintain a reserve capacity of at least the equivalent of five years' wastewater utilization, based on 1992 wastewater usage figures. (This reserve capacity would permit the City either to reduce development or to purchase increased wastewater capacity. At the time that the City reaches the reserve capacity established above, it must either reduce the amount of development commensurately, or increase wastewater capacity, or reduce volume through conservation. It typically takes at least five years to plan, approve and complete the construction of new wastewater treatment facilities.)
- Parks: The standard for parks is give acres of park land for each 1,000 residents. As of 1993, the City has only three acres of parks per 1,000 residents.
- Fire: The standard for fire service is an emergency response time of less than five minutes for 80 percent of calls.
- Police: The standard for police service is a response time of three minutes for 70 percent of emergency calls.
- Drainage: The standard for storm drainage facilities is established by the Sonoma County Water Agency. The Sonoma County Water Agency plans and constructs storm drainage

facilities in the Planning Area, then turns them over to the City after one year for continued maintenance.

- Schools: The standard for school class size and appropriate square footage of play area per student is established by the Sebastopol Union School District and Analy High School District. Both Districts shall be contacted yearly to determine that their standards are maintained.
- Traffic: The standard for traffic is shown in the Transportation Chapter.

P.2 Levels of Service: Manage growth and infrastructure capacity so that the quantity and capacity of City services and infrastructure will not drop below acceptable Levels of Service as a result of new development.

Program 2.1: Review all development proposals for their direct and cumulative effects on City-adopted LOS standards. The City will only permit developments that meet City-adopted Level of Service standards.

P.3 New Development Pays Fair Share: Require new developments to pay their "fair share" of capital improvements for public services and facilities to maintain adequate Levels of Service in the city.

Program 3.1: Establish a five-year Capital Improvements Program.

Program 3.2: Continue the program of public facilities impact fees.

Goal 2 Maintain Sebastopol as a small town.

P.7 Do not allow development in areas not served by municipal utilities.

P.8 Extension of City Services Outside Sphere of Influence: Prohibit extensions of wastewater, water and other City services to new development in unincorporated areas outside the Sphere of Influence.

Program 8.1: Reserve a specific amount of wastewater capacity to be used for existing development outside the city limits.

P. 12 Annexation Guidelines: Do not allow annexation and development to leapfrog over vacant and undeveloped land. Require proposed annexations to meet the following guidelines.

a. Urban Development shall be contained within the UGB.

b. Annexation shall not occur outside of the UGB, except for public parks and public schools.

c. Areas to be annexed must be able to be served by existing City facilities, or by environmentally and economically feasible extensions to City facilities, to be paid for by the proposed development.

d. Utilities will not be extended outside the UGB, except for public parks and public schools.

Goal 7 Increase industrial employment in Sebastopol while maintaining the quality of the environment.

P.25 Ensure that industrial development does not overburden infrastructure.

Program 23.1: Require proposed industrial development to provide the City with an engineering report of the anticipated potable water and wastewater demand.

Additional review will be required for proposed industrial uses with a high potable water and wastewater demand. The City will either deny such projects or require appropriate mitigations.

Safety Element

Goal 4 Protect water quality.

P.11 Water Quality: Protect the water quality obtained from City wells.

Program 11.1: Continue to monitor on a regular basis Sebastopol's potable water supply for trace chemicals and other potential contaminants. Utilize updated industry-wide standards for evaluating potable water quality. Alert the County Public Health Officer, City Council and the public if water quality hazards are identified. Develop and implement mitigating measures to protect the public health.

P.12 Reduce Agricultural Contamination of Potable Water Supplies: Reduce agricultural contamination of potable water supplies in the Sebastopol aquifer.

Program 12.1: Work with the County Planning Department, the Public Health Officer and Agricultural Commissioner to identify the impacts of farming operations and the use of herbicides, pesticides and fertilizers on the City's domestic water supply.

P.13 Fines for Violators of Water Quality Resources: Revise the Sebastopol Municipal Code to fine individuals and corporations which pollute water quality resources.

Program 13.1: Identify and mitigate point sources of pollution.

P.14 Well Number 7: Support funding source and program for Well Number 7.

WATER DEMANDS

The City serves approximately 2,650 water service customers. Total water production in 2004, the City's highest use year, was 500 million gallons per year, which is equal to 1,534 acre-feet. The predominant use over the last 10 years has been potable use. During calendar year 2012 single-family and multi-family residential customers accounted for 70% of water consumption, followed by 21% for commercial/industrial uses, 8% for landscape and irrigation, and 1% for other uses. Total production for 2012 equated to an average production of 1 million gallons per day (mgd) (City of Sebastopol Water Production and Usage, and Wastewater Statistics for Annual Level of Service Report Calendar Year 2012).

The city experienced a 5% population reduction between 2000 and 2010. This reduction assisted in keeping water consumption from increasing in recent years. The 2013 water production of 376 million gallons is 6% lower than the 10-year average of 399 million gallons. In 2013, the City's annual water use was about 1.03 mgd average daily water use. For a number of years the City, in an effort to encourage water conservation, has monetarily incentivized the installation of water-conserving toilets and washing machines by offering credits toward City water and wastewater utility bills.

The statewide drought has not had a measurable effect on the City's water supply, but the situation is being monitored closely, and residents are encouraged to conserve water. The City has no backup system or the ability to connect to other water systems. The City's wells are the only source of water available. The City will adopt a water shortage contingency plan in September 2014, consistent with recent State regulations.

The City must be able to meet demand from all supply sources on the maximum demand day of the year, and also provide adequate water distribution system facilities to supply customers and maintain adequate pressure on the maximum demand day. In 2012 annual water production as a percentage of total maximum production was 27% (City of Sebastopol Water Production and Usage, and Wastewater Statistics for Annual Level of Service Report Calendar Year 2012).

WATER SUPPLIES

The City relies exclusively on groundwater as a water supply source. The City of Sebastopol has five permitted wells, three of which are currently active for potable water uses, non-potable water uses, irrigation, and industrial uses. All of the City's available water is groundwater from these three active wells.

Currently the City's water supply comes from Wells No. 4, 6, and 8. Well No. 8 was designed to produce water from zones with lower concentrations of arsenic and Well No. 4 tends to have lower overall arsenic concentrations. Consequently, their combined effect has been to reduce the concentrations of arsenic in in water supply.

ACTIVE CITY WELL INFORMATION

This section provides information on active City wells (4, 6 & 8) including: site conditions, well construction, impacts, contaminates of concern, and treatment options.

Well No. 4

Well 4 Site Conditions

Well 4 is located on Petaluma Avenue in Sebastopol at the intersection of Gravenstein Highway and Palm Avenue. Located on the site is a well and pump house, two vertical granular activated carbon (GAC) filter vessels including process piping valving, sand removal equipment, and a filter backwash storage buffer tank. The GAC system became operational in late 2006. The site is large enough to support vehicle parking and equipment removal and maintenance.

Well 4 Pump and Well Construction

Well 4 was drilled in 1953 to a depth of 530 feet. The well has a 14-inch steel casing, and is screened between 237 and 468 feet. The well pump is a 100 horsepower (HP) vertical turbine pump enclosed within a pump house, and rated for 900 gpm capacity.

Well 4 Impacts

The California State Water Quality Control Board (CSWRCB) lists sites with contamination through its Geotracker application. The resource contains copies of reports from open and closed sites in the last 10 years. The following open cases were identified near the Well 4 site as of 2012:

1. Valero (former Alliance Station), 720 South Main Street;

2. Sebastopol Shell, 778 South Gravenstein Highway;

3. Exxon, 840 Gravenstein Highway;

4. Old Dry CIeaners/Talmadge Wood, 250 South Main Street; and

5. Frees Development Co. Bldg, 501 South Main Street.

Of these sites, the Valero station has impacted the City's Well 4 at Spooner Park, some 200 feet east, with 1,2-Dichloroethane (1 ,2-DCA). According to the Third Quarterly Monitoring Report for Valera prepared in 2011, the site has an open North Coast Water Quality Control Board (NCRWQCB) case that indicates total petroleum hydrocarbons as gasoline (TPH-G), benzene, toluene, ethyl benzene and xylenes (BTEX), as well as 1,2-DCA are all potential contaminants of concern at 80 to 100 feet deep. In 2006, a soil vapor extraction/air sparge system was installed, but was inadequate for the concentrations of gasoline. An additional vapor extraction well was installed and is currently being permitted to be added to the current extraction system. Shallow monitoring wells are installed at the edge of the park, between the City's well and the Valero station, but none of the monitoring wells have been impacted.

Tetrachloroethylene (also known as perchloroethylene (PCE)) which is used commercially as industrial degreasers, spot removers, and in dry cleaning, has also been steadily climbing at low levels in the groundwater at Well 4. The source of the PCE contamination is the Old Dry Cleaners site at 250 S. Main Street. The NCRWQCB has instructed the owners at the Old Dry Cleaners site to begin response to interim remedial action to abate the contamination moving into the radius of influence of Well 4.

Well 4 Contaminants of Concern

Historically, the contaminant of concern has been 1, 2-DCA, but TPH-G and BTEX are also potential contaminants of concern that are in the nearby Valero station. Recent data is also indicating a rise in concentrations of PCE from the Old Dry Cleaners site.

Well 4 Treatment Discussion

Well 4 is fitted with a granular activated carbon (GAC) treatment system to address groundwater contamination from 1, 2-DCA. Since its installation, levels of contamination have steadily and continually dropped below the Maximum Contaminant Level (MCL). TPH-G and BTEX are still potential contaminants of concern, but have not been detected in the groundwater from City Well 4. While the water is still processed through the GAC, the water quality at this point sufficiently meets drinking water standards, such that filtration of GAG may no longer be necessary for treating the 1,2 DCA. However, with the contaminant levels of nearby plumes and if the concentration of PCE continues to rise, the GAC is necessary as it is an effective method for the removal of PCE and other Volatile organic compounds (VOCs).

Well No. 6

Well 6 Site Conditions

Well 6 is located on Gravenstein Highway near Hazel Cotter Court to the south and Redwood Avenue to the north. This well replaced Well 1 and 3. The large, triangular property contains a pump house, well, booster/blending pumps, a cyclone type sand separator, and electrical gear. A significant portion of the site is unpaved and unimproved.

Well 6 Pump and Well Construction

The well was installed in 1968 to 572 feet deep and screened between 172 to 552 feet. The well has a 125 HP submersible pump and has a capacity to pump 750 gpm. The City has installed a booster pump/blending station that blends groundwater from Well 6 with water in the City's distribution system from Well 4 at an approximate ratio of 1:3 to reduce Arsenic that appears to be naturally occurring.

Well 6 Impacts

Arsenic has been steadily increasing in well 6. In a Spinner Test completed in December 2004, indicated that Arsenic appears to be elevated in the shallower aquifer zones above MCL levels in the upper aquifer, with Arsenic below the MCL in the lower aquifer. In 2008, the City installed an inflatable packer to attempt to isolate the shallow elevated Arsenic zones, but it did not work as intended.

A test from 2008/2009 for Title 22 constituents detected elevated Aluminum and Manganese above the Secondary MCL. However, subsequent tests reported concentrations well below the Secondary MCL and therefore do not appear at this time to be contaminants of concern.

A review of the GeoTracker indicated there are no open cases near Well 6, but it is approximately 2,000 feet south of Well 4, which is impacted with VOCs. Although down-gradient. However, it is not expected that the comingled plumes affecting Well 4 would reach Well 6.

Well 6 Contaminants of Concern

Groundwater collected from Well 6 contains elevated, naturally occurring Arsenic above the MCL. Arsenic has been detected in the groundwater around the Santa Rosa Basin and has been linked to naturally occurring Arsenic of the Glen Ellen Formation.

Well 6 Treatment Discussion

Well 6 has recently been fitted with a booster pump/blending station which blends water supplied from Zone 1 tanks with water supplied from Well 6 before supplying the blended water to Zone 2. This method has been successful in lowering the concentration of Arsenic, but current blended water quality remains close to the MCL concentration for Arsenic. Should levels continue to rise, the blending of Zone 1 water with Well 6 water will become less effective for the same production volume. Well 6 would then require a reduction in production volume prior to blending or will require a treatment step at the well head to maintain concentrations at or below the MCL.

Well No. 8

Well 8 Site Conditions

Well 8 is located at the comer of Jewell and Calder Avenues, on the same site as the former Well 2. The decommissioned Well 2 resided inside the pump house. Well 8 is outside the pump house located in a precast concrete structure located 50 feet from the former Well 2. Also located in the pump house is a booster pump station to facilitate inter-zone water transfers.

Well 8 Pump and Well Construction

Installed in 2007, Well 8 is the most recently constructed municipal well in the City. It has a 125 HP submersible pump, and is screened between 320 and 560 to avoid the naturally occurring Arsenic observed in the shallower zones (<350 feet) seen in other wells.

Well 8 Impacts

A GeoTracker review indicated there are no sites with contamination that affect the Well 8 site, but it is approximately 1,500 to 2,000 feet away from Main Street where the comingled VOC/TPH-G/MTBE plume is being investigated near Well 4. It appears that Well 8 is up-gradient and has not pulled these contaminants into its radius of influence.

Well 8 Contaminants of Concern

Water quality data for well indicates that there are currently no constituents measured at concentrations that would be the cause of concern. It should be noted that the decommissioned Well 2 did indicate elevated Arsenic concentrations in shallower screened zones (<350 feet) while in operation, but not in the deeper zones.

Well 8 Treatment Discussion

With no contaminants of concern indicated in Well 8, water treatment is not required. Should Arsenic become a constituent of concern, there is sufficient land at the site to support a treatment system and the well house does contain booster pumps that could be used as a blending station.

INACTIVE CITY WELLS

This section provides information on inactive city wells (5 & 7) including: site conditions, well construction, impacts, contaminates of concern, and treatment options.

Well No. 5

Well 5 Site Conditions

Well 5 is located on a small triangular parcel one block east of Gravenstein Highway on Fannen Avenue in Sebastopol. At the site there is a small pump house and a large, baffled settling tank for the removal of sand.

Well 5 Pump and well Construction

Well 5 was constructed in 1960. The pump is a vertical turbine fitted with a 60 HP motor, and pump control equipment housed in the pump house. The pump has a capacity to pump 900 gpm and is set at 250 feet below the ground, and is screened between 138 and 528 feet.

Well 5 Impacts

In 1987, PCE was discovered in Well 5. it was determined that the PCE originated from the Em's Chevron/Old Dry Cleaners/Talmadge Wood Site area located to the northwest of Well 5. In 1987, Well #5 was taken out of service. Since cessation of pumping at City Well 5, the natural groundwater flow from the Site has consistently been to the south-southeast instead of towards southeast, towards Well 5. Since then, the PCE in Well 5 has decreased to the point that the City has been considering options to reactivate the well. Nearby sites that could potentially impact this well include:

1. Em's Chevron, 280 Main Street;

2, Old Dry Cleaner/Talmadge Wood; 250 Main Street, South;

3. Angelo Giusti Class III Disposal Site, East of Highway 12, between Burnett and Bodega Ave;

4. Foreign Auto Repair, 401 Main Street, South;

5. Nelson Site, 327 Petaluma Avenue; and

6. Wyatt's Tire Service, 100 Brown Street.

Well 5 Contaminants of Concern

Well 5 has been out of service since 1987 due to PCE contamination in concentrations exceeding MCL standards resulting from the Old Dry Cleaners site up-gradient of the site. However, there are several potential sources of contamination that could affect Well 5. VOCs: TPH-G, BTEX, MTBE and 1, 2 DCA are all potential sources of contamination. Currently, the City Well 5 is inactive but the City has continued monitoring the contamination. At present time PCE concentrations are below the MCL, and the City would like to consider placing the well back into active status. The treatment for this well should consider all the V0Cs and MTBE as potential contaminants of concern.

Well 5 Treatment Discussion

No treatment currently exists at the well site. While the PCE concentrations are currently below the MCL, it is likely that contaminant concentrations will increase when actively pumping on the aquifer and may bring in the other VOCs, and it should be assumed that the concentration has the potential to

increase and should therefore be treated prior to entering the distribution system. Similar to Well 4, the process by which PCE and the other VOCs are typically and effectively removed is adsorption employing GAC.

Well No. 7

Well 7 Site Conditions

Well 7 is located at 1157 Village Way, Sebastopol, on a small parcel located on the corner of Cooper Road and Village Way. The site is completely built upon and contains a pump house.

Well 7 Pump and Well Construction

Well 7 was installed in 1996 with multiple screen intervals between 270 and 670 feet deep. The well pump is a 100 HP submersible pump, set at 420 feet deep with a capacity of 800 gpm. An inflatable packer is installed at 395-400 feet.

Well 7 Contaminants of Concern

The latest Well 7 water quality test data in 2012 indicates Arsenic concentrations are around the MCL. Any subsequent increase in Arsenic concentration will place the water from the well above the MCL. Furthermore, historical water quality data shows several reported concentrations well above the MCL with subsequent tests showing concentrations below the MCL.. With the current concentration at the MCL, it is likely that future of Well 7 water will be at or above the MCL.

Well 7 Treatment Discussion

No treatment currently exists at Well 7. Due to the small size of the well site, coupled with the fact that the well site and the surrounding parcels have effectively been built out, treatment options are limited at this site. The City is working on an on-site treatment system.

GROUNDWATER

United States Geological Survey Santa Rosa Plain Groundwater Study

As part of a technical study program intended to enhance the current knowledge regarding groundwater resources within Sonoma County, the USGS initiated a multi-year cooperative study of groundwater resources within the Santa Rosa Plain Groundwater Basin in 2005. The cooperative study is being conducted by the USGS in partnership with the Sonoma County Water Agency, County of Sonoma, City of Santa Rosa, City of Rohnert Park, City of Sebastopol, City of Cotati, Town of Windsor, and California-American Water Company.

The study has four principal elements: (1) a comprehensive geographic information system (GIS) to compile, analyze and visualize hydrologic and related data; (2) collection of new data, with a focus of water-quality sampling; (3) data interpretation and hydrogeologic characterization – including refining hydrologic budgets, and updating conceptual models of the groundwater flow system based on the new data and the results of ongoing USGS geologic and geophysical studies in the basin; and (4) the development of a fully-coupled numerical surface water/groundwater flow model for Santa Rosa Plain. Results from the study will provide stakeholders with tools to assist in evaluating the hydrologic impacts of future climate-change scenarios and alternative groundwater management strategies for the basin.

Additionally, the study could potentially form the technical foundation for a local non-regulatory groundwater management planning process.

In summer 2013, the U.S. Geological Survey (USGS) completed the first portion of a seven-year study of groundwater resources of the Santa Rosa Plain Watershed.

In most groundwater management scenarios, the connection between surface water and groundwater has been largely overlooked. Unless surface water is available to recharge the aquifers, groundwater levels will decline. Alternatively, groundwater helps recharge surface water so any overdraft of groundwater means less water in creeks and streams.

In spring 2014, the USGS has recently finalized a second component of the study – a computer model – which couples surface water and groundwater flow and includes a comprehensive summary of the water budget for the study area, as well as future climate change projections. The cutting edge, science-based data is an intregral component of groundwater management planning will allow the community to make decisions that will improve groundwater management.

Santa Rosa Plain Setting and Geology

The 167,410-acre Santa Rosa Plain watershed includes the Santa Rosa Plain and Rincon Valley groundwater subbasins, as well as parts of the Wilson Grove Formation Highlands groundwater basin, Kenwood Valley groundwater basin, Healdsburg area groundwater subbasin, and Alexander Valley groundwater subbasin. The Santa Rosa Plain drains northwest toward the Russian River, and is thus part of the North Coast Hydrologic Region. The groundwater system beneath the Santa Rosa Plain provides water to residents and municipal systems, irrigation water for agriculture, and baseflow to streams, surface water bodies and associated ecosystems. An estimated 10,500 permitted water-supply wells are located within the Santa Rosa Plain.

The groundwater system is large and geologically complex, with multiple aquifers that exhibit wide variations in well yields and groundwater quality. In addition, the groundwater system is subdivided into several compartments that are separated by fault zones, including the Rodgers Creek Fault, the Sebastopol Fault, and the Trenton Fault. Groundwater flows through and is stored in sedimentary and volcanic formations, which include recent Alluvium/Glen Ellen, Wilson Grove, Petaluma, and the Sonoma Volcanics.

Important hydrologic characteristics of the Santa Rosa Plain watershed groundwater-flow system include those that determine the ability of the groundwater system to transmit water, to store and release water, and to allow for vertical passage of water between layers, as well as those that control the flow of water across geologic or hydrologic boundaries. The movement of infiltrated recharge through the saturated groundwater system is controlled by topography, aquifer and aquitard properties, the magnitude of natural discharge, and pumping. Aquifer and aquitard properties depend on the type of sediments and rocks composing the hydrogeologic system. Groundwater is contained in the pore spaces of the Quaternary alluvial materials and Tertiary sedimentary rocks, including the Glen Ellen Formation, the Wilson Grove Formation, the Petaluma Formation, and Sonoma Volcanics. These units, although lithologically heterogeneous, generally form a continuous body of saturated material. The most permeable formations are the Glen Ellen and Wilson Grove formations. The Petaluma Formation has low productivity but is widely distributed.

Water-bearing strata is found only within the Cenozoic sedimentary formations, and not within Tertiary volcanic rocks, which are primarily the Sonoma Volcanics. However, the volcanic rocks provide

substantial quantities of water to wells on the valley floor and in the mountains along the eastern side of the valley. The groundwater-storage capacity of the SRP groundwater subbasin within the depth range of 10 to 200 feet is estimated to be about 950,000 acre feet. The storage capacity over an average thickness of 400 feet is estimated to be about 4,300,000 acre feet. Neither of these estimates includes the amount of groundwater contained in the Sonoma Volcanics. The Sonoma Volcanics, however, contain discontinuous aquifers that in some of the more porous and permeable lithologic packages can yield several hundred to several thousand gallons of water per minute to wells. The sustainable yield of the basin is less than then storage capacity because of potential negative effects of withdrawing all groundwater in storage.

Most of the City of Sebastopol is located within the Wilson Grove Formation Highlands (WGFH) groundwater basin. The basin straddles southern Sonoma and northern Marin Counties, and is located within an upland area between Santa Rosa Valley and the Pacific Ocean (Water Supply Assessment Northeast Area Specific Plan Sebastopol, CA). The WGFH groundwater basin is approximately 140 square miles in area and the City of Sebastopol is located at its eastern-most boundary. This boundary generally follows the Laguna de Santa Rosa.

Long-term groundwater-level trends for California Department of Water Resources monitored wells located outside of the City and within or near the WGFH groundwater basin are relatively stable over the period of record. This indicates that long-term groundwater recharge and discharge have predominantly remained in balance (Water Supply Assessment Northeast Area Specific Plan Sebastopol, CA).

Basin-wide Groundwater Levels 2001-2007

Knowledge of groundwater levels and how they vary spatially and temporally is fundamental to understanding and managing water resources. The shape of the water-table and potentiometric surfaces, and combinations thereof, can reveal important hydrogeological characteristics of the watershed, such as the locations of key areas of recharge and discharge, and geologic effects on groundwater flow. Declining long-term hydrographs can indicate that an aquifer is being pumped in excess of recharge.

A comparison of groundwater contours between spring and fall 2007 revealed a similarity in the general shape and distribution of contours. Groundwater-level contours for spring 2007 indicated that water levels were higher than the spring 2001 levels and the southern pumping depression had disappeared, indicating that long-term reductions in pumping in the Rohnert Park-Cotati area allowed recovery of groundwater levels to altitudes typical of the early 1970s. The 2007 water level contours also indicate that Santa Rosa Creek was gaining water east of the Rodgers Creek fault zone (USGS, 2013).

Water-Level Monitoring Wilson Grove Storage Unit

As described in the 2013 USGS study, wells 6N/9W-02C1, 7N/9W-15K1, and 35D2 are in the Wilson Grove storage unit and all are perforated in the Wilson Grove Formation. Well 02C1 is a production well that is perforated between 332 and 600 ft below land surface (bls), well 15K1 is perforated between 59 and 69 ft bls, and well 35D2 is perforated between 55 and 167 ft bls. The water levels in well 2C1 showed 20–40 ft of seasonal variability (80 ft maximum), which could be in response to pumping, and no long-term trend. The water levels in well 15K1 showed a net increase of about 5 ft between 1980 and 2011. The water levels in well 35D2 showed no net change between 1970 and 2005 (USGS, 2013).

Long-Term Basin-Wide Groundwater Trends

Water-level contour maps show that groundwater levels in the Winsor Basin storage unit were fairly steady with some seasonal variability, and some hydrographs showed the effects of the 1976–77 and 1986–92 droughts. In the Cotati Basin storage unit, water levels from wells in the area near Rohnert Park recovered to 1974 conditions by 2007 as a result of a large reduction in municipal pumping that began in 2000. In the Valley storage unit, water levels were fairly steady with some seasonal variability in the Bennett and Rincon valleys; however, water levels increased in the Kenwood Valley. In the Wilson Grove storage unit, water levels showed seasonal variability but, generally, had no long-term trends. In the Upland storage unit, the water levels in the deeper well showed a long-term decline, while the water levels in the shallow well were steady. Sparse vertical profile data indicated that shallower wells have limited hydraulic communication with deeper aquifer material; this could be caused by the extensive clays in the Petaluma Formation and indicate confined aquifer conditions at depth (USGS, 2013).

WATER DISTRIBUTION SYSTEM

The Sebastopol Municipal Water System (SMWS) distribution system network is comprised of over 37 miles of pipe in sizes up to 24 inches in diameter. Pipe types include asbestos cement, ductile iron, cast iron, and polyvinyl chloride (PVC).

In 1968, the SMWS pipeline system was separated into two pressure zones. Pressure Zone 1 customers are located in the eastern portion of the City and consist mostly of commercial users. Zone 2 customers reside at elevations exceeding approximately 130 feet above sea level. Four pressure-regulating valves separate the two distribution systems; these valves serve as inter-ties between the two zones. In addition, there is one direct valve connection at Bodega and Washington. These valves usually remain closed unless it becomes necessary to divert water from one zone to another. Three storage reservoirs serve the City's two pressure zones. The reservoirs provide water storage for emergencies, to meet peak demand during maximum demand periods, and to maintain hydraulic stability. The total capacity of these tanks is 7.5 Mgal. The First Street reservoir was constructed in 1918 and is an epoxy-coated, steel-welded tank, with a concrete slab-on grade foundation and a capacity of 1.5 Mgal. The Pleasant Hill reservoirs are located southwest of the city and were installed in 1979 and 1987; combined they have a maximum capacity of 6 Mgal. They are both steel-welded tanks. The older reservoirs have a tar-coated interior and the newer is epoxy-coated. (City of Sebastopol Water Master Plan 2005). Based on existing land use and population densities, the reservoirs' storage capacities exceed storage requirements for both pressure zones. Moreover, according to the 2005 Water Master Plan, at build-out, the City will still have sufficient storage for the combined pressure zones.

3.1.2 WASTEWATER

This section describes the City of Sebastopol's wastewater infrastructure, wastewater flows, treatment plant permit requirements, and previous infrastructure planning. The City provides wastewater collection, treatment, and disposal services for its residents and businesses. Facilities include a collection system with gravity sewers, lift stations, and a Wastewater Treatment Plant (WWTP).

KEY TERMS

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

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

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

REGULATORY FRAMEWORK

STATE

State Water Resources Control Board/Regional Water Quality Control Board

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

LOCAL

City of Sebastopol Sanitary Sewer System Utility Master Plan (2005)

The City's 2005 Sanitary Sewer System Utility Master Plan includes a description and maps of the City's wastewater collection system, system-wide flow projections, hydraulic models of system flows, an analysis of the system's capacity, a summary of system capacity improvements that are needed, and estimated costs for wastewater system improvements.

City of Sebastopol Sewer System Management Plan

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

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

1. Goals
2. Organization
3. Legal Authority
4. Operation and Maintenance Program
5. Design and Performance Provisions
6. Overflow Emergency Response Plan
7. Fats, Oils and Grease (FOG) Control Program
8. System Evaluation and Capacity Assurance Plan
9. Monitoring, Measurement, and Program Modification
10. SSMP Audits
11. Communication Plan

Sebastopol Municipal Code

Chapter 13.08 of the Sebastopol Municipal Code includes detailed regulations for sewer services. Section 13.08.050 of the Sebastopol Municipal Code regulates private sewage disposal systems in order to protect public health and environmental quality.

City of Sebastopol General Plan

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

Land Use

Goal 1 Phase future growth so that City resources are not exceeded.

P.1 Phasing Growth: Use information on growth and infrastructure capacity to phase growth.

Program 1.1: Prepare and adopt a Growth Management Ordinance

Program 1.2: Monitor growth and infrastructure capacity.

Program 1.3: Revise the City's water demand calculations based on land use changes in this Plan.

Program 1.4: Maintain Level of Service (LOS) standards and guidelines for City services.

- Water: The standard for water volume and flow is established by Title 22 of the State of California. The minimum fire flow standard is 1,000 gallons per minute.
- Wastewater: The standard for sewage treatment is based on capacity. The City shall maintain a reserve capacity of at least the equivalent of five years' wastewater utilization, based on 1992 wastewater usage figures. (This reserve capacity would permit the City either to reduce development or to purchase increased wastewater capacity. At the time that the City reaches the reserve capacity established above, it must either reduce the amount of development commensurately, or increase wastewater capacity, or reduce volume through conservation. It typically takes at least five years to plan, approve and complete the construction of new wastewater treatment facilities.)
- Parks: The standard for parks is give acres of park land for each 1,000 residents. As of 1993, the City has only three acres of parks per 1,000 residents.
- Fire: The standard for fire service is an emergency response time of less than five minutes for 80 percent of calls.
- Police: The standard for police service is a response time of three minutes for 70 percent of emergency calls.
- Drainage: The standard for storm drainage facilities is established by the City of Sebastopol.
- Schools: The standard for school class size and appropriate square footage of play area per student is established by the Sebastopol Union School District and Analy High School District. Both Districts shall be contacted yearly to determine that their standards are maintained.
- Traffic: The standard for traffic is shown in the Transportation Chapter.

P.2 Levels of Service: Manage growth and infrastructure capacity so that the quantity and capacity of City services and infrastructure will not drop below acceptable Levels of Service as a result of new development.

Program 2.1: Review all development proposals for their direct and cumulative effects on City-adopted LOS standards. The City will only permit developments that meet City-adopted Level of Service standards.

Program 2.2: Establish the maximum number of new residential units at 40 dwelling units per year through 1998 and 25 dwelling units per year starting in 1999, but not to exceed a maximum of 575 new dwelling units during the time frame of this General Plan.

P.3 New Development Pays Fair Share: Require new developments to pay their "fair share" of capital improvements for public services and facilities to maintain adequate Levels of Service in the city.

Program 3.1: Establish a five-year Capital Improvements Program.

Program 3.2: Continue the program of public facilities impact fees.

Program 3.3: Establish and maintain a computerized land use database system.

Goal 7 Increase industrial employment in Sebastopol while maintaining the quality of the environment.

P.24 Infrastructure Constraints to Industrial Development: Resolve infrastructure constraints to industrial development.

Program 24.1: Adopt a Specific Plan for the southern portion of the Sphere of Influence, as designated on the Land Use Designations Map, prior to considering annexation requests in this area.

P.25 Ensure that industrial development does not overburden infrastructure.

Program 23.1: Require proposed industrial development to provide the City with an engineering report of the anticipated potable water and wastewater demand.

Economic Vitality

Goal 4 Protect and increase the economic vitality of the city.

P.8 Reserve Sewer Capacity for Commercial and Industrial Development: Reserve a specific amount of sewer capacity for commercial and industrial development citywide.

WASTEWATER TREATMENT

The City maintains a sanitary sewer collection system as well as pumping stations that transfer wastewater from Sebastopol to the Subregional Water Reclamation System Treatment Plant operated by the City of Santa Rosa on Llano Road.

As a partner in the Subregional system, Sebastopol has an entitlement for treatment capacity up to 840,000 gallons, or 0.84 million gpd Average Daily Dry Weather Flow (ADDWF) (Annual Water and Sewer Usage Report 2012).

The wastewater treatment plant began operating in 1968 and has increased its capacity from 2 Mgpd to 21 Mgpd. According to the City of Santa Rosa Department of Utilities, the plant incorporates the following processes:

Primary Treatment

Sewage arrives at the treatment plant by passing through large bar screens that remove wood, plastics, and paper from the water. Sand and gravel settle in the grit tank and are removed. Clarification tanks allow lighter material to float to the surface and be skimmed off; heavier materials, biosolids, fall to the bottom and are pumped to anaerobic digesters. Bacteria in the digesters break down solids and create methane.

Methane-powered generators serve as the energy source for 16% of the treatment process. Solids are digested for up to 30 days, and their volume is reduced by 50%. Following a dewatering process, biosolids are blended with green-waste material to create compost, or they are applied directly to farming fields as fertilizer. A small amount is sent to the landfill.

Secondary Treatment

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.

The microorganisms making up the biological treatment require protection from toxins. Environmental Compliance staff protects the system by monitoring, inspecting, and issuing permits to ensure all dischargers meet federal, state and local regulations. The state-accredited environmental laboratory located at the treatment facility analyzes drinking water, sewage, and industrial waste, monitoring regulatory and environmental compliance.

Redundancy of equipment allows staff to conduct preventative maintenance. Diesel generators provide power if electricity is interrupted. Flow equalization basins accommodate fluctuation in flow. After primary treatment, water can be temporarily diverted to these basins when volumes are higher than average, and is later returned to the system to complete treatment when the flow has reduced.

After completing less than 24 hours of treatment, the recycled water is ready for reuse. Water is sent to many holding ponds, storing 1.5 billion gallons, or a three-month supply. These ponds are rich with Sonoma County wildlife, including a wide variety of waterfowl.

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 8/11/14), 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 3.1-1 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.

Table 3.1-1: Laguna Wastewater Treatment Plant ADWF (2000)

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

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 Sebastopol represented approximately 3.5% of the total wastewater treated at the Laguna Wastewater Treatment Plant in the year 2000. In 2012-2013 this percentage had fallen to 2.8%.

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. The City of Santa Rosa is currently in the process of updating these future treatment volume projections.

WASTEWATER FLOWS

Wastewater flows are typically evaluated for several conditions, including:

- Average Dry Weather Flow (ADWF)– This is the flow rate that is considered to be the actual wastewater flow from homes and businesses in the community (although it may include some flow resulting from groundwater entering the sewer system). It is measured during the summer, when the weather is dry and there is minimal infiltration and no inflow. This flow is dependent on the number of residents and number and type of businesses within the community. It varies throughout the day, with the peak diurnal flow typically occurring in the morning as the community residents wake up and prepare for the day.

- Infiltration and Inflow (I&I) – This is flow that enters the sewer system from rainfall and from increased levels of groundwater caused by the rainfall or by seasonal variation of groundwater levels.

- Peak Hour Wet Weather Flow (PHWWF) – This is the sum of the peak WWF and the peak I&I. The PHWWF is the peak flow rate that is expected to occur during large storm events.

The City's average dry weather flow to the Laguna WWTP in 2012 was .474 mgd, about 56% of the City's treatment entitlement. The 2005 Sewer Master Plan indicates that the City's existing wastewater collection and conveyance system is adequately designed to accommodate current collection and conveyance demands. The Plan also identifies areas where sewer lines require replacement. Additionally, assuming recommended repairs are made, the collection and conveyance system should be adequate to accommodate projected future growth within the City limits. However, the system may not be adequate to accommodate future projected growth within the City's sphere of influence (SOI).

The City's ability to accommodate future development is limited by the entitlement in the Subregional Water Reclamation System. To estimate the treatment capacity available for future development, the estimated flows were calculated based on 2012 flow rates. Projected sewer demand for approved projects is 0.020 mgd, and projected demand for pending applications is 0.021 mgd. Combining these figures with the 2012 ADDWF of 0.474 and the existing General Plan requirement to reserve treatment capacity of 5% (0.042 mgd), the ADDWF for all current and planned future commitments is 0.557 mgd. This rate leaves 0.283 mgd available for future projects under the current entitlement of 0.840 mgd. (Water Production and Usage, and Wastewater statistics for Annual Level of Service Report 2012).

WASTEWATER COLLECTION SYSTEM

The City's wastewater collection system consists of approximately 152,000 linear feet of pipe, ranging from 6 inches to 22 inches in diameter, and two lift stations, the Morris Street Lift Station and the Green Valley Vista Lift Station. From the stations the wastewater is pumped to the Laguna Treatment Plant though a 14-inch diameter force main.

Sanitary sewer systems must be sized and designed to convey the peak hour wet weather flow (PHWWF) to prevent sanitary sewer overflows. A computer model is used to simulate peak flows, based on an estimate of average dry weather flows, peaking factors, and estimates of infiltration and inflow. Average dry weather flows in the collection system are computed using metered wastewater flows through the Morris Street Lift Station during the dry-weather months with the lowest rainfall of each year (Annual Water and Sewer Usage Report 2012).

PLANNED FUTURE INFRASTRUCTURE

As the City of Sebastopol continues to develop, there will be an increased need for wastewater services. These needs have been addressed in the City's Sewer Master Plan and will require that the City develop plans to accommodate future development (Sebastopol Sewer Master Plan, 2005).

Wastewater infrastructure improvements recommended to meet build-out capacity include the upsizing of several wastewater system collection pipelines within Gravenstein Highway between Cooper Road and Redwood Avenue to accommodate the projected development of the Gravenstein South Study Area. The increases are only required, however, as a result of increased flow in the SOI, and increases predicted within the current City boundaries do not require increasing pipe capacities (Sebastopol Sewer Master Plan 2005).

3.1.3 STORMWATER AND DRAINAGE

Provided below is a discussion of the creeks and stormwater/flood control systems that serve the City of Sebastopol.

REGULATORY SETTING

FEDERAL

Clean Water Act (CWA)

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The State Water Resources Control Board (SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). The SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0005-DWQ) for small Municipal Separate Storm Sewer Systems (MS4s) covered under the CWA to efficiently regulate numerous storm water discharges under a single permit. 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

Sebastopol is covered under the statewide general permit (Water Quality Order No. 2003-0005-DWQ), but is in the process of joining with other permittees in the Santa Rosa Plain under a Phase I NPDES permit (Water Quality Order No. R1-2003-0062) (NPDES No. CA0025054).

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 California Water Code (CWC).

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and surface water discharges of groundwater pumped as part of groundwater cleanup activities. NPDES permits are issued for five years or less, and are therefore to be updated regularly. 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

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 Russian River

The North Coast Regional Water Quality Control Plan is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan has been adopted and approved by the State Water Resources Control Board (State Board) as well as by the United States Environmental Protection Agency (USEPA).

Each plan must contain water quality objectives that will ensure the reasonable protection of beneficial uses and the prevention of nuisance. The Basin Plan is used as a regulatory tool by the Regional Water Board's technical staff. The Basin Plan is also used by other agencies in their permitting and resource management activities. It also serves as an educational and reference document for dischargers and the public.

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

City of Sebastopol Storm Drain System Utility Master Plan

The Storm Drainage System Master Plan is a comprehensive study of the City's storm drain system. The report includes an analysis of publicly-maintained storm drain pipes 12 inches in diameter and larger, and pipes in areas known to have drainage problems. The Master Plan was prepared to analyze the existing storm drain system in Sebastopol, and develop long-term plans for improving drainage facilities within the City. The primary purpose of the Master Plan is to ensure that the City's storm drain system can adequately drain runoff from existing development, and to identify storm drainage improvements that will be needed to accommodate future development.

City of Sebastopol NPDES Permit

In response to the Federal Clean Water Act, the City of Sebastopol is regulated for waste dischargers under a National Pollutant Discharge Elimination System (NPDES) Permit administered by the appropriate Regional Water Quality Control Board. Specifically, the municipalities are regulated with regard to their jurisdiction over and/or maintenance responsibility for municipal storm drain systems and watercourses that they own or operate. The NPDES Permit is concerned primarily with regulating trash, pollutants of concern, and excessive hydrologic runoff, which can carry sediment and cause flooding.

City of Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following policies related to hydrology and water quality:

Land Use

Conservation, Parks, and Open Space

Goal 3 Protect, maintain and restore wetlands areas.

P.8: Floodwater Capacity and Creek Restoration: Preserve the existing and future floodwater carrying capacity of creeks and channels during creek restoration.

Program 8.1: Develop maintenance guidelines for creeks and wetlands areas to reduce flooding, sedimentation and erosion while maintaining and/or enhancing the riparian vegetation and wildlife.

Program 8.2: Install signs indicating the location and names of local creeks and wetlands areas.

Program 8.3: Label each storm-water inlet in the City to identify receiving waters. Signs should indicate the receiving watercourse and state that no dumping is permitted.

Program 8.4: Require development applications which would generate runoff into wetlands to include design features ensuring detention of sediment and contaminants.

Safety

Goal 3 Reduce flood hazards.

P.4 Encourage Enhanced Floodwater Storage in the Laguna: Support strong local and countywide measures to protect and increase the floodwater storage capacity in the *Laguna de Santa Rosa*.

P.5 Utilize Updated FIRM Maps: Utilize the Federal Emergency Management Agency's Flood Insurance Rate Maps (FIRM) to reduce risk of flooding; identify 100 Year Flood Events; and calculate flow rates within identified stream channels.

Program 5.1: Utilize updated Flood Insurance Rate Maps in the review of development proposals.

Program 5.2: Enforce the City's Flood Damage Prevention Ordinance.

P.6 Cooperate with Sonoma County: Continue to work with the Sonoma County Water Agency to ensure that additional storm drain runoff resulting from development occurring in unincorporated areas upstream from drainage channels in the Sebastopol Planning Area is adequately mitigated through improvements on site and/or downstream.

Program 6.1: Request that the County refer all development proposals located in the Sebastopol Planning Area to the City of Sebastopol.

P.7 Discourage Wastewater Discharge into the *Laguna de Santa Rosa*: Monitor and discourage wastewater discharge into the *Laguna de Santa Rosa*.

Program 7.1: Work with other jurisdictions to reduce the volume of wastewater discharge into the *Laguna de Santa Rosa*.

Program 7.2: Monitor the volume of wastewater discharge and water quality in the *Laguna de Santa Rosa*. Use existing documents and reports.

P.8 Pursue Available Funding Sources: Continue to cooperate with the Sonoma County Water Agency in pursuing all available sources of funding to finance improvements to storm drain facilities.

P.9 Reduce Flood Hazards: Reduce flood risk by maintaining effective flood drainage systems and regulating construction.

Program 9.1: Prohibit all development in the 100 year flood zone unless mitigation measures meeting the City's Flood Damage Protection Ordinance criteria are met.

Program 9.2: Continue to work with the Sonoma County Water Agency in the project review process to ensure that adequate measures are implemented to prevent flooding, to establish and maintain effective storm drainage systems and collect the required mitigation fees.

Program 9.3: Continue to participate in the National Flood Insurance program.

Program 9.4: Continue to require new development to prepare hydraulic storm drainage studies defining the net increase in storm water run-off resulting from construction and require mitigation of those impacts.

Program 9.5: Require developers to cover the costs of drainage facilities needed for surface runoff generated as a result of new development.

Program 9.6: Prepare inundation maps and drainage plans for existing and new water shortage tanks constructed within the city.

P.10 Storm Drainage System: Maintain unobstructed water flow in the storm drainage system.

Program 10.1: Enforce measures to minimize soil erosion and volume and velocity of surface runoff both during and after construction through implementation of the Grading Ordinance.

Program 10.2: Continue the annual inspection of the drainage systems and informing residents and property owners of illegal structures and debris must be removed.

Program 10.3: Require, where necessary, construction of siltation/retention ponds to be incorporated into the design of development projects.

CREEKS AND FLOOD CONTROL FACILITIES

The majority of Sebastopol's storm-drain system flows in an easterly direction and discharges into the Laguna de Santa Rosa along the City's eastern border. A small area in the western portion of the City drains to Atascadero Creek at the western City boundary. In addition to the storm drains operated by the City, surface water flowing in creeks and ditches contributes to the storm drain system. Zimpher Creek and Calder Creek are two major creek systems carrying surface water through the City, but other smaller seasonal creeks and tributaries are also located within the City boundaries (City of Sebastopol, 2013).

The City of Sebastopol is a member of the Russian River Watershed Association. The Russian River watershed is a rich and diverse region of nearly 1,500 square miles of forests, agricultural lands, and urban lands in Mendocino and Sonoma Counties. The main stem of the Russian River flows 110 miles from its headwaters near Redwood Valley and Potter Valley to the Pacific Ocean near Jenner. The watershed is home to approximately 360,000 people, 150 streams and creeks, and about 30 species of fish - three of which are listed as threatened or endangered: Chinook salmon, Coho salmon, and Steelhead trout (RRwatershed.org).

The Laguna de Santa Rosa is the second-largest freshwater marsh in Northern California. During heavy rains, the Laguna flows south carrying floodwaters away from the Russian River, reducing its flood levels. After rains subside and the tides fall, the Laguna reverses its flow, returning the floodwater north, back into the Russian River and eventually to the Pacific Ocean. More water enters the Laguna from a collection of creeks, tributaries, springs, seeps, and sub-surface flows. Because of this diverse water supply, the Laguna, though primarily a marsh, has characteristics of a stream, creek, seasonal wetland, open water, and other aquatic habitats depending on location.

As a major retention basin, the Laguna is critical to reducing flood levels in the Russian River. The watershed encompasses 250 square miles and drains the southwestern part of Santa Rosa, the Cotati-Rohnert Park area, as well as the eastern side of Sebastopol. Floodwaters flow from the Russian River into the Laguna whenever the flood stage in the river is higher than that in the Laguna, creating a

temporary lake. The total flood storage capacity of the Laguna is 80,000 acre-feet at the 76-foot elevation (Sebastopol, 2013).

Atascadero Creek springs from the north flank of English Hill, just north of Burnside Road, about 3 miles (5 km) southwest of Sebastopol. It descends to the north, flowing under Barnett Valley Road, Watertrough Road, and Bodega Highway. It continues north through Ragle Ranch Regional Park in the City of Sebastopol, then crosses Mill Station Road, Occidental Road, Graton Road, and Green Valley Road to enter Green Valley Creek about 2 miles (3 km) northwest of Graton.

Zimpher Creek flows generally eastward through central Sebastopol, crossing under North Main Street near Keating Avenue and flowing under McKinley Street and joins the Laguna de Santa Rosa, about 0.25 miles (.5 km) east of Sebastopol's downtown. The stream has been incorporated into the City of Sebastopol's storm sewer system and flows underground for most of its length. The two open sections include a stretch from just east of Zimpher Drive to the end of Bately Court, and the final 150 feet west of Morris Street to its confluence with the Laguna de Santa Rosa.

The headwaters of Calder Creek are found just outside the southwest corner of the City. Calder Creek flows free until it reaches Jewel Avenue, above Ives Park; from there it enters a culvert and re-emerges to flow through Ives Park in a mostly steep-sided, concrete ditch. Then it enters another culvert that takes it nearly to the Laguna a quarter of a mile away.

The City of Sebastopol storm drain system includes over 24 miles of pipelines, hundreds of inlets and other structures, open channels, and ditches. The system represents an investment in excess of $15 million in infrastructure. There are no stormwater pump stations within the city. The storm drains generally range in size from 24-inches to 72-inches in diameter.

FLOODPLAIN MAPPING

The Federal Emergency Management Agency (FEMA) identifies Special Flood Hazard Areas (SFHA). FEMA publishes Flood Insurance Rate Maps that depict the floodplains. Within the City of Sebastopol, there are flood plains that extend beyond the top of the bank of Laguna de Santa Rosa as well as along Atascadero Creek. In these SFHAs there is a 1% chance or more of a flood occurring in any year. Flooding and flood hazards are addressed in greater detail in Section 4.0. The FEMA 100-year flood plain is shown on Figure 4.3-2.

STORMWATER QUALITY

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminants in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

303(d) Impaired Water Bodies: Section 303(d) of the Federal Clean Water Act requires states to identify waters that do not meet water quality standards or objectives and, thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the states to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

The City has one body of water listed on the 2010 Section 303(d) list of impaired water bodies. Laguna de Santa Rosa is listed as polluted by mercury, indicator bacteria, dissolved oxygen, nitrogen, phosphorus, sediment/siltation, and temperature.

3.1.4 SOLID WASTE

The City of Sebastopol contracts with Redwood Empire Disposal, Inc. for solid waste, recyclable, and compostable materials collections as well as street sweeping services. The current contract was approved December 5, 2008. The contract took effect January 1, 2009 and will end December 31, 2023. The City is also a member of the Sonoma County Waste Management Agency, comprised of the County and the nine cities within the County, which is responsible for the development, operation, and management of the County's diversion and recycling programs.

KEY TERMS

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

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

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

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

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

REGULATORY FRAMEWORK

FEDERAL

Resource Conservation and Recovery Act

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

STATE

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

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

California Integrated Waste Management Board Model Ordinance

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

California AB 341 Solid Waste: Diversion

AB 341 took effect July 1, 2012, and requires that not less than 75% of solid waste generated be source reduced, recycled, or composted by the year 2020. To this end AB 341 requires local agencies to update all information required to be included in the nondisposal facility element. The updates are not subject to approval by the department or comment and review by a local task force. AB 341 requires jurisdictions to implement a commercial solid waste recycling program meeting specified elements but does not require the jurisdiction to revise its source reduction and recycling element if the jurisdiction adds or expands a commercial solid waste recycling program to meet this requirement. AB 341 authorizes agencies to charge and collect a fee from a commercial waste generator to recover the local agency's costs incurred in complying with the commercial solid waste recycling program requirements.

LOCAL

Sebastopol General Plan

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

Conservation, Parks, and Open Space

Goal 8 Reduce the volume of solid waste generated by the City

P.23 Solid Waste Reduction: Encourage solid waste reduction methods.

Program 23.1: Develop and implement a Source Reduction and Recycling Program.

Program 23.2: Purchase goods containing recycled materials and which are themselves recyclable for City use wherever possible.

Program 23.3: Promote development of backyard composting.

P.24 Recycling Drop-off Areas: Require on-site drop-off areas for recycling in commercial/retail, office and multifamily residential developments.

Program 24.1: Revise the Zoning Ordinance to require all commercial/retial, office and multifamily developments to provide on-site drop-off areas for recycling. Coordinate with the City's refuse disposal contractor or other recycling services to ensure regular pick-up.

Program 24.2: Evaluate revision to the Zoning Ordinance allowing a solid waste recycling transfer station to locate in the Light Industrial and the Community Facilities Zoning Districts with Conditional Use Permit approval.

P.25 Impacts of Waste-to-Energy Projects: The City will not endorse or support solid waste-to-energy projects until it has been fully demonstrated that such projects will not have detrimental environmental impacts, particularly to air quality.

Program 25.1: Review and provide written comments on Draft EIR's for solid waste-to-energy project proposals carried out by neighboring jurisdictions or special districts, and oppose such projects unless it is substantially determined that such projects would have negligible environmental effects.

Goal 9 Responsibly manage hazardous wastes to protect the health and safety of residents and the environment.

P.26 The Sonoma County Hazardous Waste Management Plan is incorporated by reference into the Sebastopol General Plan and shall be used to guide decision making regarding the use, handling, storage, transfer, and proper disposal of hazardous waste.

Program 26.1: Development projects shall be required to submit information regarding the use, handling and disposal of hazardous wastes so that decision-makers can incorporate conditions and alter project design in accord with the Hazardous Waste Management Plan.

Program 26.2: Projects that generate or use hazardous waste must be consistent with the Sebastopol General Plan and the Hazardous Waste Management Plan goals and policies.

WASTE COLLECTION SERVICES

The City of Sebastopol contracts with Redwood Empire Disposal, Inc. for solid waste, recyclable, and compostable materials collections as well as street sweeping services in the City.

Residential garbage, recycling, and compostable materials are collected on the same day once per week. Residential solid waste collection fees are based on the garbage cart size selected by the customer (20-gallon, 30-gallon, 60-gallon, or 90-gallon). Additional carts may be provided for an additional fee. Each residential customer is provided with a single stream recyclable materials cart, as well as a 90-gallon cart for the collection of compostable material.

Commercial customers can establish a customized garbage collection schedule that includes a range of container sizes and collection frequencies, to be collected not less than once per week. Small commercial generators can select from multiple cart sizes (30-gallon, 60-gallon, or 90-gallon) and additional carts may be provided for an additional fee. Commercial bin service generators have a choice of front-load bins ranging in size from 1 cubic yard to 6 cubic yards. They also have the choice between a roll-off container or compactor for collection of refuse. Each commercial business is supplied with a container for recyclable materials ranging in size from 1 cubic yard to 6 cubic yards.

WASTE DISPOSAL FACILITIES

Sonoma County Refuse Disposal Sites

The Sonoma County Department of Transportation and Public Works owns five County refuse disposal sites for the disposal of garbage from Sonoma County residents and businesses.

The County allows the disposal of large household appliances when dropped off at transfer stations, and appropriately handles any hazardous and potentially hazardous materials, such as Freon. The transfer stations are not used to collect, store, or process household hazardous waste. Contractor collection crews have primary responsibility for inspecting loads prior to transferring into collection trucks.

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 cubic yards, with a remaining capacity of 9,470,629 cubic yards (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.

Sonoma County and the cities within the SCWMA recently entered into a Master Operations Agreement (MOA) with Republic Services, a private waste services company, to develop and implement a long-term strategy for solid waste disposal and recycling. Under the MOA, the County would retain ownership of the Central Disposal Site and enter into a long-term operations contract with Republic Services. The County and the cities within Sonoma County would commit their waste flow to Republic Services for a 20-year term. In exchange for the 20-year waste flow commitment, each city receives indemnification in perpetuity against liabilities and costs associated with facility closures and remediation. The MOA provides a funding mechanism to implement future facility expansions at the Central Disposal Site in order to meet future waste generation demand.

Diversion Facilities

The SCWMA's primary diversion facility is located at the Central Disposal Site, and SCWMA also maintains 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.

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.

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.

HAZARDOUS WASTE DISPOSAL

Hazardous waste disposal is offered by the Sonoma County Waste Management Agency. The household hazardous waste facility is located at the Sonoma County Central Disposal Site, and is available to residents of Sonoma County. Household hazardous waste generated in Sebastopol can be taken to the site. State regulations limit the transportation of HHW to 15 gallons or 125 pounds per vehicle per visit. Individual containers are limited to a 5-gallon capacity. There are no limitations on the number of trips per day.

The following types of hazardous waste are not accepted at the facility: infectious or biologically active materials (other than syringes), radioactive materials, tires greater than 24 inch wheel size, explosives, or ammunition.

The SCWMA conducts HHW collection in events in Sebastopol two to three times each year. Community Toxics Collections and Toxics Rover Pick-up Services are also available in Sonoma County and to the residents of Sebastopol.

SOLID WASTE GENERATION RATES AND VOLUMES

In 2012, the Sonoma County Central Disposal Site averaged approximately 1,250 tons per day of materials received, which is significantly below the facility's permitted capacity of 2,500 tons per day. The facility has enough capacity to serve the City of Sebastopol through the general plan horizon. The two most prevalent material classes for the County's disposed waste stream as a whole are organics 36.3 percent and construction and demolition materials 27.4 percent. The single most prevalent material is food, which comprises approximately 21 percent of the County's disposed waste stream.

The California Department of Resources Recycling and Recovery (CalRecycle) tracks and monitors solid waste generation rates on a per capita basis.

Table 3.1-2: Solid Waste Generation Rates

Year	Waste Generation Rate (lbs/person/day)	Total Disposal Tonnage (tons/year)
2007	5.00	439,293
2008	4.50	393,830
2009	3.90	345,209
2010	4.10	357,944
2011	3.60	322,057
2012	3.40	306,078

SOURCE: HTTP://WWW.CALRECYCLE.CA.GOV/LGCENTRAL/REPORTS/JURISDICTION/REVIEWREPORTS.ASPX ACCESSED AUGUST 6, 2014.

As shown in the table above, both the per capita waste generation rate and the total annual disposal tonnage for the Sonoma County Waste Management Agency has been trending downward consistently from 2007 through 2012.

In accordance with AB 939, which required municipalities to aggressively pursue MSW source reduction and recycling, the County met all AB 939 goals. As of 2006, the County achieved a waste diversion rate of approximately 61 percent.

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).

FUNDING

Residential and commercial customers pay service fees directly to Redwood Empire Disposal.

3.1.5 ELECTRICITY AND NATURAL GAS

REGULATORY FRAMEWORK

STATE

Public Utilities Commission

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

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

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower, and directs State agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20% of its biofuels within California by 2010, 40% by 2020, and 75% by 2050. The executive order also calls for the State to meet a target for use of biomass electricity, including biomass cogeneration facilities.

Senate Bill 14 and Assembly Bill 64

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

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

Title 24

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

EXISTING SETTING

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

Infrastructure to deliver electricity and natural gas throughout Sebastopol is currently in place. PG&E generally can provide these services to newer development on request.

Sebastopol residents also have the option of purchasing electricity through Sonoma Clean Power. Sonoma Clean Power (SCP) is a new, locally controlled electricity provider in Sonoma County. They provide residents and businesses in participating cities with the option of using environmentally friendly power, generated by renewable sources, like solar, wind and geothermal, at competitive rates.

SCP is a not-for-profit agency, independently run by the Sonoma County cities that have joined the program, including Windsor, Sonoma, Cotati, Sebastopol, Santa Rosa and Cloverdale, as well as all of the unincorporated areas in the county.

SCP invests locally to support Sonoma County renewable power and local jobs, and also around California to get the most affordable sources of clean power. The formation of SCP was made possible by the passage, in 2002, of California Assembly Bill 117, enabling communities to purchase power on behalf of their residents and businesses; creating competition in power generation, supporting lower prices and accelerating the development of local renewable power generation.

In 2008, the Climate Protection Campaign issued the Sonoma County Community Action Plan, which introduced Community Choice Aggregation as a way to reduce greenhouse gas emissions in Sonoma County.

The Sonoma County Water Agency began seriously exploring the formation of a community power program in 2011 at the urging of local residents and businesses. A steering committee formed in early 2011, composed of city council members, city managers and staff, business people, activists and other interested parties.

After more than two years of research, public opinion polling, and a detailed feasibility study, the County deepened its efforts, encouraged by the public's response and the impressive potential to generate positive local results. A detailed implementation plan was drafted in 2012 by the Sonoma County Water Agency and updated in 2013, outlining the core program of buying power from cleaner sources. To complement the implementation plan, a series of educational meetings was held in the cities that were invited to participate in Sonoma Clean Power. That tour was followed by city council voting to determine which cities would allow their residents and businesses to participate. So far, the cities of Windsor, Cotati, Sebastopol, Santa Rosa, Sonoma, Cloverdale and all of the County unincorporated areas have decided to participate. The cities of Petaluma and Rohnert Park may vote on allowing their residents and businesses to participate later in 2014.

3.2 PUBLIC SAFETY

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

3.2.1 FIRE PROTECTION

The City of Sebastopol provides fire protection through the City's volunteer fire department. Additional information related to wildland fires is located in Section 4.0, Hazards.

REGULATORY FRAMEWORK

STATE

California Occupational Safety and Health Administration

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

LOCAL

City of Sebastopol General Plan

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

Safety

Goal 5 Reduce fire hazards.

P.18 Utilize the Fire Hazard Severity Scale: Adopt and utilize the Fire Hazard Severity Scale for the classification of fire hazard in wildland areas.

P.19 Review Development Projects for Fire Risk: Review all development proposals for fire risk and require mitigation measures to reduce the probability of fire.

Program 19.1: The Sebastopol Fire Department shall review all development proposals and recommend measures to reduce fire risk.

Program 19.2: Prohibit development beyond a five-minute response time of a fire station, unless acceptable mitigation measures are provided.

Program 19.3: Continue to enforce the Fire Safety Ordinance requiring sprinkler systems for certain structures.

Program 19.4: Work with property owners of the eucalyptus grove in the Laguna to reduce fire hazards.

P.20 Weed Abatement: Continue to implement an effective and environmentally sound weed abatement program.

Program 20.1: Continue to use the following methods of weed abatement wherever possible: use of mechanical rather than chemical removal of weeds; reseeding with native bunchgrass varieties in sloping disturbed soils; and limiting weed abatement

P.21 Uniform Building Code: Continue to enforce the Uniform Building Code (UBC) for all new construction and renovation and when occupancy or use changes occur.

Program 21.1: Continue to update and enforce the City's Uniform Building Code and Uniform Fire Code provisions.

Program 21.2: Require a greater degree of fire resistance in roof coverings and exterior building materials for structures within or adjacent to hazardous areas than what is specified in the UBC, as determined by the Fire Chief.

Program 21.3: Require the use of non-combustible roofing materials as specified by the Fire Chief.

P.22 Use Redevelopment Funds: Consider use of Redevelopment tax-increment funds to assist property owners in the Redevelopment Area to complete renovations that increase fire safety.

P.23 Fire Hydrant Water Flows: Ensure that there exists sufficient water flow in fire hydrants throughout Sebastopol.

Program 23.1: Continue to require that all new developments be provided with sufficient fire flow facilities at the time of permit issuance.

P.24 Funding for Fire Protection: Continue to adequately fund and staff the Sebastopol Fire Department.

Program 24.1: Continue to levy a fee for the Fire Protection Fund. Periodically review and revise the fee structure for the Fire Protection Fund.

P.25 Mutual Aid Agreements: Continue to participate in mutual aid agreements with the County and State fire fighting agencies.

P.26 Maintain Adequate Personnel and Equipment Levels: Continue to evaluate and update the personnel and equipment requirements of the Fire Department to maintain a high level of readiness.

Goal 7 Maintain an effective emergency response system.

P.31 Maintain High Level of Emergency Medical Response: Continue to maintain a high level of emergency medical response.

Program 31.1: Provide incentives to increase the number of volunteer firefighters who are certified Emergency Medical Technicians.

Program 31.2: Obtain the equipment and trained personnel to provide emergency medical defibrillation for people suffering from cardiac arrest.

P.32 Maintain Palm Drive Hospital's Emergency Department: Continue to encourage Palm

Drive Hospital to maintain its emergency department since it provides an essential and life-saving service to the community and a large part of western Sonoma County.

Program 32.1: Work closely with Palm Drive Hospital to become better informed about the hospital's future plans. Identify and carry out actions the City can implement to support their emergency department.

FIRE PROTECTION SERVICES

The Sebastopol Fire Department, along with automatic mutual aid staff from Granton and Gold Ridge Fire Districts, provides fire suppression, firefighting personnel, and emergency medical service (basic life support) to the residents and businesses in Sebastopol. The City's Fire Department has 31 volunteer staff members and is in the process of testing five new recruits (Sebastopol Level of Service Report, 2014).

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

The PPC ratings are calculated on the following factors:

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

Sebastopol's Fire Department has an Insurance Service Office (ISO) rating of three (3). Only five percent of fire departments nationally have a Class 3 or better rating.

In 2013 the Sebastopol Fire Department responded to 861 calls for service. The average response time is 6 minutes and 45 seconds for 100 percent of calls, and 4 minutes and 48 seconds for 80 percent of calls.

FIRE STATIONS

The Sebastopol Fire Station serves the City of Sebastopol. The station is located at 7425 Bodega Avenue in Sebastopol.

3.2.2 LAW ENFORCEMENT

The Sebastopol Police Department provides law enforcement and police protection services throughout the city.

REGULATORY FRAMEWORK

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.

The County of Sonoma is responsible for emergency response and evacuation plans within the county. The Sonoma County Sheriff's Department operates the County Office of Emergency Services.

POLICE PROTECTION SERVICES

The Sebastopol Police Department is a full service law enforcement agency that is charged with the enforcement of local, state, and federal laws, as well as providing 24-hour protection of the lives and property of the public.

The Police Department, in 2013, had 14 sworn police officers and another 8 civilian support staff. In addition to the permanent staff, the department had 11 Reserve Officers, 11 Community Service Volunteers, and 8 Police Explorers.

The Police Department administers two budgets: Police Service and Animal Control, providing comprehensive community-based police services. The department also coordinates with a community-based agency to provide counseling for at-risk youth.

CRIMES BY CATEGORY IN SEBASTOPOL

Statistics on the number of crimes by category of crime in Sebastopol during each year from 2009 to 2012, as reported by the Federal Bureau of Investigation (FBI) Criminal Justice Information Services Division, are shown in Table 3.2-1 below.

Table 3.2-1 Crimes by Category

Category	2009	2010	2011	2012
Violent Crimes	15	17	8	8
Homicide	0	0	0	0
Forcible Rape	1	0	0	0
Robbery	4	5	0	2
Aggravated Assault	10	12	8	6
Property Crimes	200	221	162	170
Burglary	68	77	30	40
Larceny-Theft	121	134	125	122
Vehicle Theft	11	10	7	8
Arson	2	0	2	2

SOURCE: FEDERAL BUREAU OF INVESTIGATION, CRIMINAL JUSTICE INFORMATION SERVICES DIVISION, OFFENSES KNOWN TO LAW ENFORCEMENT TABLES (2009, 2010, 2011, AND 2012).

As shown in the table, the majority of crimes committed in Sebastopol consist of non-violent property crimes, primarily larceny-theft. Between 2009 and 2012, there were no homicides reported in Sebastopol.

POLICE RESPONSE TIMES

Response times are an important benchmark of police service. Response times can vary greatly depending on the size of the city and department, geographical location, and levels of crime. Smaller cities usually have faster response times, primarily due to the smaller geographic territory.

In 2013, the Sebastopol Police Department handled 19,825 events/calls for service. The average response time to all emergency calls, in 2013, was 3 minutes and 9 seconds. The average response time for at least 70% of emergency calls was within 3 minutes. The average response time to all calls was 10 minutes and 16 seconds. Response times in 2013 were the shortest since 2010.

3.2.3 LOCAL PUBLIC SAFETY

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

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

COMMUNITY EMERGENCY RESPONSE TEAM (CERT)

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

The Sebastopol Police Department offers CERT training for those community members interested in this type of community service. The CERT training for community groups is usually delivered in 4-hour sessions, one evening a week over a 6-week period. The training consists of the following:

- Disaster Preparedness – an introduction
- Fire Safety
- Light Search and Rescue
- CERT Organization/Disaster Psychology
- Disaster Medical Skills 1
- Disaster Medical Skills 2

- Law Enforcement/Communications
- Review and Disaster Simulation

EMERGENCY MEDICAL SERVICES

The Sebastopol Volunteer Fire Department provides emergency medical services to the community. For more information on medical services see the Community Health and Wellness Section 6.4.

3.3 PARKS AND RECREATION

Parks, trails, and recreational facilities in the City of Sebastopol are managed and maintained by the Public Works Department.

REGULATORY FRAMEWORK

STATE

Quimby Act

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

LOCAL

Sebastopol Bike and Pedestrian Plan 2011 Update

The City of Sebastopol Bike and Pedestrian Plan Update of 2011 assess the needs of bicyclists and pedestrians in Sebastopol and throughout Sonoma County in order to identify a set of local and countywide improvements and implementation strategies that will encourage more people to walk and bicycle. It identifies local and countywide systems of physical and programmatic improvements to support bicycling and walking. It provides local agencies that adopt the Plan with eligibility for various funding programs, including the State Bicycle Transportation Account (BTA). It acts as a resource and coordinating document for local actions and regional projects; and it fosters cooperation between entities for planning purposes and to create Geographic Information System (GIS) maps and a database of existing and proposed facilities countywide.

Sebastopol 2004 Strategic Plan

Adopted in 2004, one of the goals of the strategic plan is to protect, enhance, and restore environmental quality by: protecting surface and groundwater resources, increase and enhance open space in and around the city, and eliminate and/or mitigate known threats to the environment.

City of Sebastopol General Plan

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

Land Use

Goal 1 Phase future growth so that City resources are not exceeded.

P.1 Phasing Growth: Use information on growth and infrastructure capacity to phase growth.

Program 1.1: Prepare and adopt a Growth Management Ordinance

Program 1.2: Monitor growth and infrastructure capacity.

Program 1.3: Revise the City's water demand calculations based on land use changes in this Plan.

Program 1.4: Maintain Level of Service (LOS) standards and guidelines for City services.

- Water: The standard for water volume and flow is established by Title 22 of the State of California. The minimum fire flow standard is 1,000 gallons per minute.
- Wastewater: The standard for sewage treatment is based on capacity. The City shall maintain a reserve capacity of at least the equivalent of five years' wastewater utilization, based on 1992 wastewater usage figures. (This reserve capacity would permit the City either to reduce development or to purchase increased wastewater capacity. At the time that the City reaches the reserve capacity established above, it must either reduce the amount of development commensurately, or increase wastewater capacity, or reduce volume through conservation. It typically takes at least five years to plan, approve and complete the construction of new wastewater treatment facilities.)
- Parks: The standard for parks is give acres of park land for each 1,000 residents. As of 1993, the City has only three acres of parks per 1,000 residents.
- Fire: The standard for fire service is an emergency response time of less than five minutes for 80 percent of calls.
- Police: The standard for police service is a response time of three minutes for 70 percent of emergency calls.
- Drainage: The standard for storm drainage facilities is established by the Sonoma County Water Agency. The Sonoma County Water Agency plans and constructs storm drainage facilities in the Planning Area, then turns them over to the City after one year for continued maintenance.
- Schools: The standard for school class size and appropriate square footage of play area per student is established by the Sebastopol Union School District and Analy High School District. Both Districts shall be contacted yearly to determine that their standards are maintained.
- Traffic: The standard for traffic is shown in the Transportation Chapter.

P.3 New Development Pays Fair Share: Require new developments to pay their "fair share" of capital improvements for public services and facilities to maintain adequate Levels of Service in the city.

Program 3.1: Establish a five-year Capital Improvements Program.

Program 3.2: Continue the program of public facilities impact fees.

Program 3.3: Establish and maintain a computerized land use database system.

Program 3.4: Work with the school districts to obtain school impact fees as defined by State Law and plan for future school needs.

Conservation, Parks, and Open Space

Goal 10 Provide an attractive and comprehensive system of parks and trails throughout the City that meets the recreational needs of all age groups and capabilities.

P.27 Parkland Standard: Utilize the standard of five acres of parkland per 1,000 residents for acquisition of additional developed parkland pursuant to the provisions of the Quimby Act [Govt. Code § 66477] for all new residential development.

Program 27.1: Carry out a thorough analysis of geoseismic and other related hazard potential prior to City acceptance of dedications of land for park or open space. Identified hazards should be fully repaired and/or financial protection for liability provided to the City before acceptance of land.

P.28 Biannual Review of Parks, Trails and Open Space Acquisition: Carry out a biannual review of the status of parks, trails and open space acquisition and development by the City Council.

Program 28.1: Prepare a biannual report for the City Council and the Parks and Recreation Commission on the status of the acquisition and the improvement of parks and trails, including a list of existing and proposed projects, estimated cost and sources of funding. Determine what additional actions, if any, may be necessary to implement the policies of this Chapter.

Program 28.2: Include in the Capital Improvement Program (CIP) the schedule and costs of expanding and improving the urban trails system.

Program 28.3: Identify additional areas suitable for developed park from the open space areas identified in Table 2 after the City has acquired eight additional acres of park.

P.29 Parks and Recreation Master Plan: Prepare and adopt a Parks and Recreation Master Plan.

P.30 Priorities for Acquisition of Parkland and Open Space: Use the following criteria to prioritize acquisition of open space and parkland:

- distribution of parks on a neighborhood basis;
- scenic beauty;
- relationship to existing trail system and parks; and
- natural resource protection.

P.31 Acquire Land From Willing Sellers Only: Obtain land for park and open space area from willing sellers only.

P.32 Additional Facilities for South Portion of City: Encourage the acquisition of additional park facilities in south portion of the City.

P.33 Coordination with other Jurisdictions: Coordinate with other governmental agencies to procure and develop additional park and recreation facilities.

P.34 Coordinating the Needs of West County Residents: Coordinate with the County in planning, operating, financing, and maintaining open space, parks, and recreation facilities serving West County residents.

Program 34.1: Encourage the Sebastopol Parks and Recreation Commission to coordinate regularly with the County on active and passive parks and recreation issues.

Program 34.2: Develop joint powers agreements with school districts, the County, and other agencies to develop, administer, use, and maintain parks and other recreation facilities.

P.35 City-School District Cooperation: Encourage city-school district cooperation in developing and maintaining park and recreation facilities.

Program 35.1: Develop joint use neighborhood parks on school sites based on the "school-in-the-park" principle.

Program 35.2: Ensure that neighborhood parks and combined park/school sites serve the entire community and provide a broad range of cultural, recreational, and educational activities.

P.36 Integrated Trails System: Facilitate the development of an integrated trails system that connects regional trails, schools, open space, parks, recreation facilities, and residential areas.

Program 36.1: Continue to develop and enlarge a comprehensive and coordinated trails and paths system that serves both recreational and utilitarian travel.

Program 36.2: When developing trails and paths, consider the access needs of a variety of users, including school-age children, the elderly, and those with handicaps and disabilities.

Program 36.3: Require new development to provide direct pedestrian connections, such as sidewalks, trails and other rights-of-way to the existing and planned network of parks and trails wherever feasible.

Program 36.4: Map the existing informal trails and paths in Sebastopol and evaluate their usefulness in an overall pedestrian path system. When possible and appropriate, upgrade these existing paths for use by the public.

P.37 Public Participation: Actively solicit public participation in the selection, design and facilities planning of future park sites.

P.38 Community Center: Continue supporting the Sebastopol Community Center as a multiple-use facility for cultural, educational, social and recreational programs.

Goal 11 Develop open space, parks, and recreation facilities in harmony with the surroundings.

P.39 Public Access to Open Space: Facilitate public access to open space and environmentally sensitive areas in a manner that ensures protection of biotic resources.

P.40 Parking and Transit Facilities: Provide adequate parking and transit facilities at all recreation facilities, where feasible, and where such facility will not unduly disrupt the existing environment.

P.41 Encourage small neighborhood parks:

Program 41.1: Ensure that playgrounds and pocket parks do not unduly disturb the neighborhood by adopting standards for screening, lighting and noise.

Program 41.2: Consider using Transfer of Development Rights (TDR) to encourage small neighborhood parks.

Program 41.3: Provide information to property owners about available funding sources and tax benefits to maintain open space in perpetuity.

CITY PARKS

Sebastopol contains a wide array of park, open space and recreational resources, including those provided by local non-profits and a private development. In the last 20 years, a number of significant new park and open space areas have been created. These include: the town Plaza; the Laguna Preserve; the Skategarden Park; the Laguna Uplands; the Railroad Forest bike path connector; Tomodachi Park; and the Barlow green. An expansion of Skategarden Park is pending.

The City of Sebastopol has eleven parks, which include:

Ives Park, is a community park, located at 7400 Willow Street. It was built over 65 years ago and is the oldest park in Sebastopol. It contains a municipal swimming pool, baseball field, playground, theatre stage, grassy fields, and picnic areas as well as a portion of Calder Creek. Ives Park is also home to several festivals: Cajun Festival, the Roma Festival, and the annual Sebastopol Apple Blossom Festival that draws approximately 25,000 people.

Laguna de Santa Rosa Wetlands Preserve, is a diverse wetlands area, located adjacent to Laguna Youth Park on the eastern edge of Sebastopol. It is biologically diverse, as it is home to many species of birds, mammals, fish, and amphibians as well as native plant species. 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. It contains several miles of trails on both sides of the Laguna de Santa Rosa, a seasonal floating bridge, as well as an outdoor classroom that can accommodate approximately 50 people.

Since 1998, the City has implemented the Laguna Park Master Plan in numerous phases, removing debris, unnecessary fencing, and non-native plant and tree species, developing trails, and planting thousands of native trees and shrubs.

When the Laguna Preserve areas, Tomodachi Park, and the Laguna Uplands site are considered together, there are over 97 acres of publically accessible Laguna lands in the City of Sebastopol, which would appear to be an extraordinary number of open space acres for a very small city.

Laguna Youth Park, is a community park, located on the eastern border of Sebastopol between the Community Center, Youth Annex, and the Laguna de Santa Rosa. It was built in 1987 and contains picnic areas and two baseball fields that are used by the Little League. The Youth Annex includes a brick labyrinth in its lawn area. The relatively new 'Peace Garden' is also located in this area, with implementation of improvements partly completed. The area, adjacent to the Community Center, is also home to several annual events, which draw thousands of people.

Luther Burbank Gold Ridge Experiment Farm is where Luther Burbank purchased a 15-acre farm on Gold Ridge in Sebastopol in 1885. Burbank introduced over 800 varieties of fruits, flowers, vegetables, and grains during his career. He developed many of California's plums and prunes, the ancestor of the

Idaho Potato, the Shasta Daisy, as well as Plumcots, Thornless Blackberry, and Spineless Cactus. Burbank he developed and grew thousands of new hybrids, cross breeds and selections at his Experiment Farm. After Luther died in 1926, Mrs. Burbank established an apple orchard on a portion of the Farm and leased the rest to Stark Brothers Nursery. When their lease expired in 1957 the property deteriorated and subsequently passed into new ownership.

Local historians, intent on preserving the Burbank legacy in Sebastopol, formed the Western Sonoma County Historical Society in 1974. The cottage was placed on the National Register of Historic Places in 1978. The City worked with the Society in its efforts to obtain three acres of the original farm and to restore the Cottage on the property. Restoration began in 1983. The Society's Farm Committee, with the aid of volunteers continues to maintain the cottage and Burbank plant varieties, provide a self-guiding plant walk, and train Docents for guided tours since 1983.

Skategarden Park includes a skate park and community garden, and is located on Laguna Park Way across from The Barlow. It was built in 2008 and contains a 15,000 square foot state-of-the-art skate structure and 23 community garden plots. There is also an 'art wall' where anyone can paint, and which changes on a weekly basis.

Spooner Park, is a 'pocket park,' located at 910 South Main Street (SR116). It also includes the 'Solar Dragon' solar panel installation, which offsets power use by a nearby City well.

Tomodachi Park, is a Laguna Preserve park, located at 6665 Sebastopol Avenue. It was completed in 2013 and resulted from collaboration with the Sonoma County Agricultural Preservation and Open Space District that allowed the City to purchase the 'Village Park' property. Park improvements occurred in the open space area of the property. The entire 'Village Park' property was purchased by the City for park purposes. However, the Village Park mobile home use has been maintained, and the City has not made a determination as to the status of the mobile home use. The City did prepare a conceptual plan for park-related improvements of the entire property; Tomodachi Park represents implementation of one portion of this plan.

Tomodachi Park is approximately 8.7 acres and includes picnic tables, barbecues, a short trail segment, and native tree planting. The intent of the park design is to be a passive use park in the Laguna Preserve system. The park includes stately Valley Oaks and access to the Laguna channel. Low split-rail-type fencing delineates the park area from the adjacent mobile home area to protect the privacy of the Village Park residents. The improvements were also designed so as not to conflict with Caltrans frontage improvements related to the pending Highway 12 bridge replacement project. The remaining mobile home area is approximately 4 acres in size.

The entire site is in the 100-year floodplain, with lower areas generally subject to annual flooding, and the entire site at risk in a major flood. Park improvements have been designed to be generally compatible with flooding; mobile homes are at substantial flood risk.

Mario Savio Free Speech Town Plaza, is a town square, located at 6901 McKinley Street. It includes a gazebo, a fountain, numerous benches, and a public restroom as well as perimeter parking

Willard Libby Park (Libby Park), is a neighborhood park located at 7985 Valentine Avenue adjacent to Brookhaven School on the western side of Sebastopol. It was built in the mid-1970s and contains the Garzot Community Building, a playground, a pond, two baseball fields, tennis courts, a small rock climbing wall, a bocce ball court, a gazebo, picnic areas, and lawns. Several local schools frequent Libby Park for field trips.

Laguna Uplands, is a natural open space area, located to the east of Sebastopol on the western edge of the Laguna de Santa Rosa. The Laguna de Santa Rosa Foundation owns the site and its conservation values are protected permanently by an Open Space District conservation easement. Native plant restoration is ongoing. The site is open to the public and there is a short pathway that can be accessed at the end of Palm Drive; or the site may be accessed via a walkway at the back of Palm Drive Hospital. The site is characterized by moderately sloping hillsides, with sweeping scenic views across the Laguna looking toward Taylor Mountain and Santa Rosa.

The site has an 'outdoor classroom' feature, which also doubles as an emergency medical helicopter landing site. Students use this site as an outdoor classroom to learn about nature through the Open Space District's In Our Own Back Yard educational program. Restoration plantings have also been implemented by Laguna Keepers and other volunteers organized by the Laguna de Santa Rosa Foundation

Ragle Ranch Regional Park (Ragle Ranch), is a 157-acre Sonoma County Regional Park, located to the west of Sebastopol and immediately adjoining the City border. The park contains a number of amenities: Baseball fields, soccer fields, volleyball courts, picnic areas, a playground, a dog park, a peace garden with a sculpture, a small pond, a large grove of California Live Oak trees, and several miles of trails, including a nature trail that connects to Atascadero Creek. Ragle Park is also home to the annual Gravenstein Apple Fair, held in August.

Sebastopol has approximately 36.3 acres of developed parkland, and approximately 240 acres of undeveloped park space. Much of the undeveloped park space contains developed trails that count toward developed parkland within the city.

A summary of existing City parks with notable amenities, including locations and acreages is provided in Table 3.3-1.

Table 3.3-1 Existing Park Facilities

Park	Location	Acreage	Facilities
Ives Park	7400 Willow Street	6.4	Swimming pool, baseball field, play structure, ponds, stage area, grass fields, picnic areas, restrooms, and 3 bridges
Laguna de Santa Rosa Wetlands Preserve	Adjacent to Laguna Youth Park	81*	Passive recreation uses: Trails, outdoor classroom for 50, and wildlife observation areas
Laguna Youth Park	Adjacent to Community Center	6.0**	2 baseball fields, play structure, and picnic areas.
Gold Ridge Experiment Farm	7777 Bodega Avenue	3.2	Cottage, walking trails, and historical plantings.
Skategarden Park	6750 Laguna Park Way	1.1***	Skate structure, 23 garden plots, art wall, and chess table.
Spooner Park	910 South Main Street	0.5	Grass, solar panels, and 'welcome' sign.
Tomodachi Park	6665 Sebastopol Avenue	8.7****	Picnic area, short walking trail in Oak Woodland area
Mario Savio Free Speech Town Plaza	6901 McKinley Street	0.9	Gazebo, fountain, benches, and restrooms.
Libby Park	7985 Valentine Avenue	5.5	Parks Play structure, bocce ball court, volleyball court, gazebo, pond, and Garzot Community Building.
Laguna Uplands	Adjacent to the former Palm	8.0	Natural Laguna landscape, short walking

Table 3.3-1 Existing Park Facilities			
Park	**Location**	**Acreage**	**Facilities**
	Drive Hospital		trail, and outdoor classroom/helicopter landing area.
Ragle Ranch Regional Park	500 Ragle Road	155.9	Regional park with soccer fields, tennis courts, play structure, pond, picnic areas, dog park, extensive walking trails.
Total Park Acreage		277.2	

SOURCE: SEBASTOPOL PARKS AND RECREATION REPORT. ACCESSED JUNE 2014; CITY OF SEBASTOPOL STAFF

*Acreage approximate due to overlap with Youth Park and other parcels; includes area behind/around Youth Park, Meadowlark Field, natural areas along west side of Laguna channel, Railroad Forest.
**Acreage approximate; includes Youth Park, ball fields
***Does not include 0.5 acre Expansion Project area
****Park/open space area only; does not include Village Mobile Home area.

PRESERVE

The Laguna de Santa Rosa Wetlands Preserve is an area adjacent to Laguna Youth Park which consists of several miles of trails on both sides of the Laguna de Santa Rosa, and an outdoor classroom designed to accommodate approximately 50 people. The City of Sebastopol's Laguna Wetland Preserve is the only publicly designated natural park in the Laguna. The Laguna is one of the premier bird-watching areas in Northern California. By providing public access to the Laguna and education about it, this project facilitates access to persons within and well beyond Sonoma County. In addition, the improvements are designed to be accessible to the elderly, the disabled, and with no cost of admission, the economically disadvantaged.

TRAILS

Laguna de Santa Rosa Wetlands Preserve has a short walking trail that adjoins the Laguna channel, looping around the City's former wastewater ponds. From late Spring to early Fall, a floating pedestrian bridge is in place that crosses the channel and connects to a longer trail that loops around Meadowlark Field. Bluebird Trail traverses the field. The City has conducted extensive native plant restoration along the perimeter trail, and more recently has begun restoration efforts in the central part of Meadowlark Field.

The Railroad Forest and bike path, completed in 2005, is a Class I facility, approximately 1/4 mile in length, which runs northerly from the Joe Rodota Trail, east of Petaluma Avenue (SR 116) to the intersection of Sebastopol Avenue (SR 12) and Morris Street. It forms part of the linkage through the Sebastopol, which connects the County's Joe Rodota and West County Trail, providing a continuous route for recreational users and bike commuters between western Sonoma County and Santa Rosa. It includes two bridges that span the lower reaches of Calder Creek and jurisdictional wetlands. The path was designed and constructed by the City, using a combination of funding sources including TDA Article 3, BAAQMD (Air District) funds and a State Recreational Trails grant.

Joe Rodota Trail is an 8.47 mile paved trail that is located between Santa Rosa and Sebastopol. The trail starts at the pedestrian/bicycle bridge intersection with the Prince Memorial Greenway (between West 3rd Street and Railroad Street), southwest of the Marriott Courtyard Hotel. The trail ends near the intersection of Mill Station Road and Highway 116 in Sebastopol. Access to the trail is located off the following public streets: Roberts Avenue, Dutton Avenue, Stony Point Road, Wright Road, Sebastopol Road, Merced Avenue, Llano Road, Petaluma Avenue, High School Road, Cleveland Avenue, Ellis Court, DuFranc Avenue, Hurlbut Avenue, and Highway 116. Sections of the trail run along an abandoned

railroad line. The trail offers an opportunity for families with young children to experience an outdoor outing for walking, bicycle riding, horseback-riding, and roller-skating. The trail meanders along agricultural ranches, and the Laguna of Santa Rosa. There are signs of the historic railroad throughout the property. Three bridges are on top of the old train trestles. The trail is especially popular in the spring with a burst of color from wildflowers. The trail is an excellent place for year-round bird watching.

The West County Trail parallels Highway 116, going from Sebastopol to Forestville. The Joe Rodota and West County Regional Trails are built along land that was once the Petaluma and Santa Rosa Railway, a line that linked Petaluma and Santa Rosa with Sebastopol and Forestville. The trails are paved and total 14 miles. An unpaved equestrian trail runs parallel to the paved trail. The trail offers beautiful views of farms, vineyards, and other agricultural lands.

3.4 SCHOOLS, LIBRARIES, AND OTHER PUBLIC FACILITIES

REGULATORY FRAMEWORK

STATE

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

The "Leroy F. Greene School Facilities Act of 1998," also known as Senate Bill No. 50 or SB 50 (Chapter 407, Statutes of 1998), governs a school district's authority to levy school impact fees. This comprehensive legislation, together with the $9.2 billion education bond act approved by the voters in November 1998 known as "Proposition 1A," reformed methods of school construction financing in California. SB 50 instituted a new school facility program by which school districts can apply for State construction and modernization funds. It imposed limitations on the power of cities and counties to require mitigation of school facilities impacts as a condition of approving new development and provided the authority for school districts to levy fees at three different levels:

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

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

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

California Department of Education

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

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

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

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

SCHOOLS

The City of Sebastopol is served by the Sebastopol Union School District, serving Kindergarten through 8th grade students, and the West Sonoma County Union High School District, serving grades 9 through 12. Analy High School has a student population of approximately 1,300. Brookside Park Side Elementary School serves Kindergarten through 5th graders. Park Side is an International Baccalaureate School offering the Primary Years Program, with a student population of approximately 220. Brook Haven School, formerly the District's Middle School, is now a K-8 school. There are Multi-age classrooms K-5, a core program for 6th graders to help transition to departmentalized instruction, and a fully departmentalized 7-8 program. Brook Haven serves a student population of 400. Table 3.4-1 provides a summary of the public schools serving the city's population.

Table 3.4-1 Public Schools Serving Sebastopol			
School	**Grades Served**	**Address**	**Enrollment (2011-2012 School Year)**
Elementary Schools			
Analy High School	9-12	6950 Analy Avenue	1300
Brook Haven School	K-8	7905 Valentine Avenue	400
Park Side Elementary	K-5	7450 Bodega Avenue	220

SOURCES: SEBASTOPOL UNION SCHOOL DISTRICT; WEST SONOMA COUNTY UNION HIGH SCHOOL DISTRICT

SEBASTOPOL LIBRARY

The Sebastopol Library is the only public library located in the City of Sebastopol. The Sebastopol Library is part of the Sonoma County Library system. This enables the relatively small Sebastopol Library to access all of the other libraries that are part of the Sonoma County Library system to obtain information not found in the Sebastopol Library, which has been requested by customers. The Sebastopol Library is located at 7140 Bodega Avenue. The library is open from 10 a.m. to 6 p.m. Tuesdays, Thursday, and Fridays, from 10 a.m. to 8 p.m. on Wednesdays, and from 10 a.m. to 4 p.m. on Saturdays. The library collection includes materials in both Spanish and English. It also offers a wide variety of media, including DVDs, CDs and audiobooks, as well as a large print collection. The library offers a number of programs for all ages, including families, children, teens, and adults.

SEBASTOPOL COMMUNITY CULTURAL CENTER

The Sebastopol Community Cultural Center, located at 390 Morris Street, is open Tuesday through Friday from 10:00 a.m. to 4:00 p.m. Tennis, American Tribal Belly Dancing, and children's dance programs are offered. The Center offers a variety of in-house programming, including Tiny Tots Preschool, Kindergym, and Jugalbandi, as well as summer camps. Collaborative programs and those sponsored by other community groups are also offered.

SEBASTOPOL CENTER FOR THE ARTS

The Sebastopol Center for the Arts (Center for the Arts) is located in the Veterans Building, adjacent to Ives Park and Ives Pool, at 282 South High Street. The Center presents exhibits, performances, classes and events, in the visual, performing, literary and film arts. In 2013 the Center had 18 gallery exhibitions that displayed 825 works of art from 550 artists. The Center also presents concerts. In addition, the Center produces the acclaimed annual Sebastopol Documentary Film Festival, which in 2014 showed 52 films and drew filmmakers from Los Angeles, Pennsylvania, New York, and Ireland. In addition, the Center conducts numerous art, music, movement and writing classes for adults and children.

IVES POOL RECREATION FACILITY

Ives Pool is located within Ives Park on City-owned land at 7400 Willow Street. The facility includes two pools. A six lane pool that measures 16 yards by 25 yards and a smaller pool that measures 16 yards by 14 yards. Ives Pool is used by both the Analy High School and El Molino High School swim teams and home to a wide variety of programs, serving a large number of users. Ives Pool is the only public pool in Sonoma County that is successfully operated by a non-profit organization. While substantially maintained by the pool non-profit organization, the City provides maintenance support for Ives Pool.

SEBASTOPOL AREA SENIOR CENTER

This facility is located at 167 High Street. It serves as a multi-use facility. Currently, activities offered include public computer use, senior social club, Mah Jong, poker, dancing, mediation, and yoga. The Council on Aging also provides lunch. Health classes and clinics are also offered at the facility. The facility includes a classroom, program room, and the Rotary room.

REFERENCES

ABAG Hazard Mitigation Plan www.abag.ca.gov (accessed May 2014)

ABAG Multijurisdictional Emergency Plan www.abag.ca.gov (accessed May 2014)

California Department of Education, Educational Demographics Unit, California Public School Enrollment-School Report (2011-2012)

CalRecycle. 2014. http://www.calrecycle.ca.gov/databases/. Accessed August 2014.

Cascadia Consulting Group. 2007. Sonoma County Waste Management Agency Waste Characterization Study.

City Contract with Redwood Empire, 2008 www.ci.Sebastopol.ca.us (accessed May 2014)

City of Sebastopol Demographics www.ci.Sebastopol.ca.us (accessed June 2014)

City of Sebastopol General Plan (date)

City of Sebastopol http://www.ci.Sebastopol.ca.us/links/school.cfm (accessed June 2014)

City of Sebastopol Water Production and Usage, and Wastewater Statistics for Annual Level of Service Report Calendar Year 2012

City of Sebastopol, 2013 Annual Level of Service Report, May 6, 2014.

City of Sebstopol http://www.ci.Sebastopol.ca.us/page/city-parks. (accessed June 2014)

Coastland Civil Engineering, City of Sebastopol Sanitary Sewer System Utility Master Plan, December 2005.

Coastland Civil Engineering, City of Sebastopol Storm Drain System Utility Master Plan, December 2005.

Coastland Civil Engineering, City of Sebastopol Water System Master Plan, September 2005.

GHG, Drinking Water Regulatory Compliance Feasibility Study, November 2012.

http://www.recyclenow.org/agency/waste_stream_profiles.asp Accessed August 1, 2014.

Laguna de Santa Rosa Park Master Plan, Volume 1. 2011.

North Coast Regional Water Quality Control Board http://www.swrcb.ca.gov/northcoast/water_issues/programs/basin_plan/ (accessed June 2014)

PES Environmental, Inc., Water Supply Assessment, Northeast Area Specific Plan, June 27, 2007.

R3 Consulting Group. 2003. Sonoma County 2003 Solid Waste Generation Study.

SCWA Waste Stream Profiles. Available at:

Sebastopol Area Senior Center www.sebastopolseniorcenter.org (accessed June 2014)

Sebastopol Community Cultural Center www.seb.org (accessed June 2014)

Sebastopol Union School District http://sebastopolschools.org (accessed June 2014)

Sonoma County Library www.sonomalibrary.org/branches/Sebastopol.html (accessed June 2014)

Sonoma County Waste Management Agency. 2003. Countywide Integrated Waste Management Plan.

Sonoma County Water Agency. 2007. Sonoma Valley Groundwater Management Plan.

Sonoma State University Existing Conditions Report. 2011.

USGS, Hydrologic and Geochemical Characterization of the Santa Rosa Plain Watershed, Sonoma County, California, Scientific Investigations Report 2013-2118, 2013.

4. HAZARDS AND SAFETY

Issues and topics related to hazards and safety within the City of Sebastopol 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, exposure to hazardous materials, and electromagnetic fields.

This chapter is divided into the following sections:

- Seismic and Geologic Hazards (4.1)
- Fire Hazards (4.2)
- Flooding (4.3)
- Hazardous Materials and Waste (4.4)
- Air Traffic (4.5)
- Electromagnetic Fields EMF (4.6)

4.1 SEISMIC AND GEOLOGIC HAZARDS

This section addresses seismic and geologic hazards in the City of Sebastopol.

REGULATORY SETTING

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 California Building Code (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. Through the CBSC, the State provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

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 Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following goals, policies, and programs related to seismic and geologic hazards:

Section 1: Safety: Geological Hazards I

A. Seismic Effects on Structures and Public Facilities

Goal 1 Reduce seismic hazards.

P.1 Reduce Risk of Seismic Hazards: Reduce the risk of loss of life, personal injury and damage to property resulting from seismic hazards.

Program 1.1: Continue to require geotechnical reports by a state-registered geologist for development proposals on sites in seismically and geologically hazardous areas and for all critical structures. These reports should include, but not be limited to: evaluation of and recommendations to mitigate the effects of fault displacement, ground shaking, landslides,

expansive soils, and subsidence and settlement.

Program 1.2: Continue to comply with the provisions of the State *Alquist-Priolo Act*.

Program 1.3: Continue to require, as conditions of approval, measures to mitigate potential seismic and geologic safety hazards for structures.

Program 1.4: Continue to require professional inspection of foundation and excavation, earthwork and other geotechnical aspects of site development during construction on those sites specified in soils, geologic, and geotechnical studies as being prone to moderate levels of seismic hazard.

Program 1.5: Continue to monitor and review existing critical, high priority buildings to ensure structural compliance with seismic safety standards.

Program 1.6: Provide information to the public on ways to reinforce buildings to reduce damage from earthquakes.

Program 1.7: Encourage Caltrans to seismically reinforce bridges in the Sebastopol Planning Area.

P.2 Limit Building in Areas with Significant Risk Potential: Discourage construction of high density residential and other critical, high-occupancy or essential services buildings in high-risk zones.

Program 2.1: Review all projects in relation to available hazards information contained in Map 2 and other similar documents available in the Planning Department.

B. Non-Seismic Geologic Hazards

Soils Hazards

Potential hazards may be present when there are shallow soils, soils on steep slopes, and expansive soils which, in the presence of moisture, swell and shrink when returning to a dry condition. This hazard is compounded when unstable soils overlay geologically unstable formations, such as fault zones prone to earthquakes.

Goal 2 Minimize the risk of personal injury and property damage resulting from slope instability.

P.3 Slope Instability: Continue to enforce existing regulations and procedures to identify potential hazards relating to geologic and soils conditions.

Program 3.1: Evaluate slopes over 15 percent and/or unstable land, areas susceptible to liquefaction, settlement or containing expansive soils for safety hazards prior to issuance of any discretionary approvals and require appropriate mitigation measures.

Program 3.2: Require financial protection for public agencies and individuals as a condition of development approval where geological conditions indicate a potential for high maintenance

costs.

Chapter III Conservation, Parks, and Open Space

Goal 4 Protect and preserve soil as a natural resource.

P.9 Encourage Agriculture in the Referral Area: Encourage the continuation and strengthening of agricultural practices which are compatible with the surrounding wetlands in the Referral Area.

P.10 Control Soil Erosion: Control soil erosion to prevent flooding and destruction of natural waterways, to maintain water quality, and to reduce public costs for flood control and watercourse maintenance.

Program 10.1: Continue to require grading permits for new construction, wherever applicable. The grading permit will control erosion and will include a revegetation plan wherever appropriate.

Program 10.2: Include in the revised Zoning Ordinance provisions for hillside protection that includes specific performance criteria.

P.11 Reduce Soil Contamination: Reduce soil contamination from chemicals through careful regulation of the storage, transportation and use of chemicals.

Program 11.1: Reduce City use of chemical herbicides and fertilizers to the maximum extent possible. Wherever feasible use substitutes which are biologically safe and/or organic.

Program 11.2: Continue to enforce the city's Hazardous Materials Storage Ordinance.

ENVIRONMENTAL SETTING

The City of Sebastopol is located in Sonoma County, approximately 15 miles east of the Pacific Ocean, and 52 miles north of San Francisco. The Sebastopol City limits encompass approximately 1,184 acres. The City's Sphere of Influence covers an additional 230 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 Sebastopol lies within the Coastal 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 Santa Rosa Plain is an important region within Sonoma County. The Valley forms a wide basin that stretches from the San Pablo Bay in the south to Santa Rosa in the north. The Mayacamas and Sonoma Mountains geographically physically separate Sonoma County from Lake and Napa Counties. The Sonoma Valley runs north-south between the Sonoma Mountains on the west and the taller Mayacamas Mountains to the east. The City of Sebastopol is located on the northwest section of the Santa Rosa Plain, which is bordered by the Sonoma Mountains to the east, and a series of rolling hills and mountainous areas to the west. Southwest of Sebastopol are the Estero Lowlands (aka Petaluma Gap), which opens to the Pacific Ocean, and Bodega Bay.

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 subduction of the Pacific Plate under the North American Plate causing accretionary wedging (the scraping of material at convergent plate boundaries). 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 11 miles west of the City of Sebastopol. The San Andreas Fault system is responsible for the structural alignment and orientation of the mountains and valleys in the Coast Range (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).

Local Hydrogeology

The City of Sebastopol is located within the Lower Laguna de Santa Rosa Subbasin, and the Green Valley Subbasin. The Laguna de Santa Rosa Subbasin drains an area of 62 square miles in Sonoma County, and includes the majority of the City of Sebastopol. The Green Valley Subbasin is a tributary to the Russian

River, and drains an area of approximately 38 square miles. The northwest portion of Sebastopol and the town of Forestville are located in this watershed.

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. (Sonoma County Water Agency, 2013).

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 does not have evidence of surface displacement within the past 1.6 million years. The probability of fault rupture is considered low; however, this classification does not mean that inactive faults cannot, or will not, rupture.

There are no known active or potentially active faults located within the Planning Area. However, there are numerous faults located in the region. Figure 4.1-1 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 11 miles west of the City of Sebastopol. 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 Prleta 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 6 miles to the east of the City of Sebastopol. 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 approximately 6 miles east of the City of Sebastopol. The Healdsberg Fault extends north from the Rodgers creek fault in Santa Rosa, and 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 Sebastopol. 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. Table 4.1-1 represents effects that would be commonly associated with Richter Magnitudes:

TABLE 4.1-1: RICHTER MAGNITUDES AND EFFECTS	
Magnitude	**Effects**
< 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 Sebastopol Planning Area, as well as other communities within the Santa Rosa Plain. As one moves 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. Table 4.1-2 represents the California Geological Survey's estimates of the 10 percent probability of exceedance in 50 years for City of Sebastopol, as well as the foothill and mountainous regions to the east and west of the Sebastopol.

TABLE 4.1-2: 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS (%G)		
Sebastopol Planning Area	**Foothills**	**Mountains**
40-50%	50-60%	60-70%

SOURCE: CALIFORNIA GEOLOGICAL SURVEY, 2013

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 Sebastopol, the area could experience considerable ground shaking generated by faults outside the City. For example, the City of Sebastopol 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 4.1-3: 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 – 2009 data published by the USGS in the National Atlas identifies earthquakes that caused deaths, property damage, geologic effects, or were felt by populations near the epicenter. No significant earthquakes are identified within Sebastopol. However, significant earthquakes are documented in the regional vicinity, as identified in the following tables.

TABLE 4.1-4: SIGNIFICANT EARTHQUAKES IN THE REGION		
Magnitude	**Location**	**Year**
5.6	San Jose (Calaveras fault)	2007
5.1	Napa (West fault)	2001
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, 2012.

The City of Sebastopol 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.

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 Sebastopol; however, approximately 7.5 miles to the east lies the Rodgers Creek Fault, which is delineated as an Alquist-Priolo Fault Zone. Additionally, approximately 11 miles to the west lies the San Andres Fault, which is also delineated as an Alquist-Priolo Fault Zone. Figure 4.1-1 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.

Although there are no fault lines within the Planning Area, the potential damage to structures and to public safety from earthquakes remains significant. The 1906 earthquake reduced most of the Downtown Sebastopol area to rubble, and even the milder 1969 earthquake and the 1990 Loma Prieta earthquake caused minor damage to buildings Downtown. Since the 1969 earthquake, the City has implemented a successful program to reinforce masonry buildings. Currently, all unreinforced masonry structures have been renovated to comply with today's seismic standards (Sebastopol General Plan 1994).

Liquefaction

Liquefaction, which is primarily associated with unconsolidated, saturated materials, is most common in areas of sand and silt or on reclaimed earth fill 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.

TABLE 4.1-5: LIQUEFACTION POTENTIAL BASED ON SEDIMENT TYPE AND AGE OF DEPOSIT

Sediment	Susceptibility Based on Age of Deposits (Years Before Present)			
	Modern (< 500 years)	Holocene (< 10,000)	Pleistocene (< 2Million)	Pre-Pleistocene (> 2 Million)
River Channel	Very High	High	Low	Very Low
Flood Plain	High	Moderate	Low	Very Low
Alluvial Fan/Plain	Moderate	Low	Low	Very Low
Lacustrine/Playa	High	Moderate	Low	Very Low
Colluvium	High	Moderate	Low	Very Low
Talus	Low	Low	Very Low	Very Low
Loess	High	High	High	- ? -
Glacial Till	Low	Low	Very Low	Very Low
Tuff	Low	Low	Very Low	Very Low
Tephra	High	High	- ? -	- ? -
Residual Soils	Low	Low	Very Low	Very Low
Sebka	High	Moderate	Low	Very Low
Un-compacted Fill	Very High	NA	NA	NA
Compacted fill	Low	NA	NA	NA

SOURCE: YOUD AND PERKINS, 1978

The CGS Liquefaction Susceptibility Maps and "Zones of Required Investigation" are produced per the state's Seismic Hazard Zonation Program. In Northern California, the areas of high liquefaction potential identified by the CGS are confined to the nine counties comprising the Bay Area, which includes Sonoma County.

Liquefaction potential in the Planning Area includes designations ranging from "Very Low" to "Very High" potential. Approximately 78 acres in Sebastopol are considered "Moderately" susceptible to liquefaction, while 78 acres are "High", and 9 acres are considered "Very High". The remainder of the city is considered to have a very low susceptibility to liquefaction hazards. Areas within Sebastopol that are susceptible to liquefaction are predominantly located in the northeastern portion of the City. Figure 4.1-2 illustrates the liquefaction potential in the Planning Area.

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 Sebastopol 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 Sebastopol 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.

According to the Association of Bay area Governments (ABAG), the City of Sebastopol contains approximately 150 acres of land that is in the high category of shaking potential. Furthermore, ABAG notes that 1,075 acres within the City are at moderate risk for shaking potential, due to the close proximity to both the Rogers Creek and San Andreas Fault zones.

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 (2013), there are eight different soil series located in the Sebastopol Planning Area. These include the Blucher, Clear Lake, Cortina, Goldridge, Pajaro, Sebastopol, Steinbeck, and Wright series. Figure 4.1-3 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 drainageways. 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.

- **Cortina:** The Cortina series consists of very deep, somewhat excessively drained soils on alluvial fans and floodplains. These soils formed in gravelly alluvium from mixed rock sources. Slope ranges from 0 to 15 percent. The mean annual precipitation is about 16 inches and the mean annual temperature is about 62 degrees F.

- **Goldridge:** The Goldridge series consists of deep and very deep, moderately well drained soils formed in material weathered from weakly consolidated sandstone. Goldridge soils are on rolling uplands with slopes of 2 to 50 percent. The mean annual precipitation is 45 inches and the mean annual temperature is 56 degrees F.

- **Pajaro:** The Pajaro series consists of somewhat poorly drained fine sandy loam. These soils are underlayn by mixed alluvial material derived from a variety of sedimentary sources. The soils are on alluvial floodplains in the valley, and low terraces areas. They are mainly found in the south-central and southwestern portion of the country between Petaluma and Two Rock, but are also found in the vicinity of Sebastopol. Slopes are 0 to 5 percent. Elevation ranges from 50 to 300 feet. Annual rainfall is 30 to 35 inches, annual temperature is 51 to 53 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.
- **Steinbeck:** The Steinbeck series consists of deep, well drained soils that formed in material weathered from soft sand-stone. Steinbeck soils are on smooth rolling hills and have slopes of 2 to 50 percent. The mean annual precipitation is about 30 inches and the mean annual temperature is about 55 degrees F.
- **Wright:** The Wright series consists of deep, somewhat poorly drained soils formed in alluvium from mixed rock sources. Wright soils are on low terraces and have slopes of 0 to 9 percent. The mean annual precipitation is 30 inches and the mean annual temperature is 59 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 erodibiity of the fine soils. The estimates of Kw are modified by the presence of rock fragments. Value listed for K factor are used for factor K in the Universal Soil Loss Equation (USLE).

Soil erosion data for the City of Sebastopol were obtained from the NRCS. Figure 4.1-4 depicts the soil erosion susceptibility in the Planning Area. As identified in the table below, the erosion factor Kw varies from 0.10 to 0.43, which is considered low to high potential for erosion. Within Sebastopol the majority of soils fall within the low to moderate range for erosion potential. Table 4.1-6 displays the soil erosion factors for soils found within the Planning Area.

TABLE 4.1-6: SOIL EROSION FACTORS

Map symbol and soil name	Kw	Representative value		
		% Sand	% Silt	% Clay
BcA—BLUCHER FINE SANDY LOAM, OVERWASH, 0 TO 2 PERCENT SLOPES	0.2	53.6	22.8	23.6
BhB—BLUCHER LOAM, 2 to 5 PERCENT SLOPES	0.32	32.9	41.8	25.3
CeA—CLEAR LAKE CLAY, 0 TO 2 PERCENT SLOPES	0.15	22.1	27.9	50
CfA—CLEAR LAKE CLAY, PONDED, 0 TO 2 PERCENT SLOPES	0.15	22.1	27.9	50
CrA—CORTINA VERY GRAVELLY SANDY LOAM, 0 TO 2 PERCENT SLOPES	0.10	48.0	40.4	11.6
GdC—GOLDERIDGE FINE SANDY LOAM, 2 TO 9 PERCENT SLOPES	0.10	60.5	15.0	24.5
GdD—GOLDRIDGE FINE SANDY LOAM, 9 TO 15 PERCENT SLOPES	0.10	60.5	15.0	24.5
GdE —GOLDRIDGE FINE SANDY LOAM 15 TO 30 PERCENT SLOPES	0.10	60.5	15.0	24.5
GdE2—GOLDRIDGE FINE SANDY LOAM 15 TO 30 PERCENT SLOPES, ERODED	0.17	63.2	14.9	21.9
SbC—SEBASTOPOL SANDY LOAM, 2 TO 9 PERCENT SLOPES	0.24	46.6	24.1	29.3
SbD—SEBASTOPOL SANDY LOAM, 9 TO 15 PERCENT SLOPES	0.28	39.3	27.0	33.7
SbD2—SEBASTOPOL SANDY LOAM, 9 TO 15 PERCENT SLOPES, ERODED	0.28	39.3	27.0	33.7
SbE—SEBASTOPOL SANDY LOAM, 15 TO 30 PERCENT SLOPES	0.28	39.3	27.0	33.7
SnD2—STEINBECK LOAM, 9 TO 15 PERCENT SLOPES, ERODED	0.24	53.4	24.1	22.5
SnE2—STEINBECK LOAM 15 TO 30 PERCENT SLOPES, ERODED	0.24	55.5	19.1	25.4
WgC—WRIGHT LOAM, 0 TO 9 PERCENT SLOPES	0.43	37.3	31.1	31.6
WoA—WRIGHT LOAM, SHALLOW, WET, 0 TO 2 PERCENT SLOPES	0.43	35.2	29.7	35.1
PaA—PAJARO FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES	0.24	65.6	24.7	9.7

SOURCE: NATURAL RESOURCE CONSERVATION SERVICE, 2013.

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" used to determine the shrink-swell potential of soils, 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, ratio, 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 Sebastopol ranges from Low to High. Figure 4.1-5 illustrates the shrink-swell potential of soils in the Planning Area. Over 95 percent of the Planning Area has low expansive soils, while a small area in the northwestern portion of the Planning Area has high expansive

soils. The high expansive soils located within the city limits are in areas that are currently used as parks and open space near the Laguna De Santa Rosa, including Clahan Park and the Laguna Wetlands Preserve. No portion of the high expansive soils are located in highly developed areas of Sebastopol. The areas with high expansive soils would require special design considerations due to shrink-swell potentials.

Landslides

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 lower susceptibility. Figure 4.1-6 illustrates the landslide potential in the vicinity of the Planning Area. Given the relatively gentle slopes throughout the City of Sebastopol, the landslide potential is moderate in the majority of the City, and low in a small portion in the northeast corner of the City. The landslide potential increases in the foothills and mountains to the west of the Planning Area, and decreases to the west of the Planning Area. Furthermore, according to the Association of Bay Area Government's Risk Assessment Data, approximately 1063 acres within the City of Sebastopol are subject to "few landslides".

Naturally Occurring Asbestos

The term "asbestos" is used to describe a variety of naturally occurring 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 metamorphosis, 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 Sebastopol. Figure 4.1-7 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, oxidation of organic material, or both, following drainage, or the over extraction of groundwater. 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 Sebastopol.

Tsunami/Seiches

A tsunami is a series of ocean waves generated by sudden displacements in the sea floor, landslides, or volcanic activity. Seiches are standing oscillating waves that can occur in any semi-enclosed or fully-enclosed body of water (i.e. Bays and Lakes). Seiches are typically caused when strong winds and rapid changes in atmospheric pressure push water from one end of a body of water to the other. Both of these events 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 displaced upward in the lateral movements caused by strike-slip faults. Although parts of Sonoma County are at risk of tsunami and seiche events, the City of Sebastopol is not within a tsunami or seiche hazard area due to its geographic location within the county.

Volcanic Hazards

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 Sebastopol, 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).

TABLE 4.1-7: CLEAR LAKE VOLCANIC CENTER HOLOCENE ERUPTIONS	
Recognized Products of Recent Eruptions	
Lava Flows/Cinder Cones	--
Domes	--
Tephra	Mafic tephras from eruptions ±10,000 YBP
Pyroclastic Flows	--
Blasts and Pyroclastic Surges	Phreatic eruptions, hydro-magmatic explosions, base-surges
Debris Flows/Avalanches	--

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 Sebastopol, the Clear Lake Field is not likely to generate and significant impacts in the City of Sebastopol.

REFERENCES

The primary sources of data referenced for this section are 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. 2003. 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. 2014. 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 Sebastopol Quadrangles. California Geological Survey.

California Geological Survey. Revised 2003 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.

California Geological Survey. 2013 Peak Ground Acceleration Atlas. Available at: http://www.consrv.ca.gov/cgs/rghm/psha/Map_index/Pages/Santa_Rosa.aspx

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 Sebastopol. 1994 General Plan.

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. 2014. General Plan Update 2020 Draft EIR Hydrology and Water Resources.

Sonoma County Water Agency. 2011. Available at http://www.scwa.ca.gov

United State Department of Agriculture, Natural Resource Conservation Service. 2013. 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.

4.2 FIRE HAZARDS

This section addresses the hazards associated with wildfires in City of Sebastopol. The discussion of fire suppression resources in located in the Community Services and Facilities section (Section 3.2.1) of this Report.

REGULATORY SETTING

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 Sebastopol General Plan

The current City of Sebastopol General Plan identifies the following policies related to fire hazards:

Section VI. Fire Protection: Wildland and Urban Fires

Goal 5 Reduce fire hazards.

P.18 Utilize the Fire Hazard Severity Scale: Adopt and utilize the Fire Hazard Severity Scale for the classification of fire hazard in wildland areas.

P.19 Review Development Projects for Fire Risk: Review all development proposals for fire risk and require mitigation measures to reduce the probability of fire.

Program 19.1: The Sebastopol Fire Department shall review all development proposals and recommend measures to reduce fire risk.

Program 19.2: Prohibit development beyond a five-minute response time of a fire station, unless acceptable mitigation measures are provided.

Program 19.3: Continue to enforce the Fire Safety Ordinance requiring sprinkler systems for certain structures.

Program 19.4: Work with property owners of the eucalyptus grove in the Laguna to reduce fire hazards.

P.20 Weed Abatement: Continue to implement an effective and environmentally sound weed abatement program.

Program 20.1: Continue to use the following methods of weed abatement wherever possible: use of mechanical rather than chemical removal of weeds; reseeding with native bunchgrass varieties in sloping disturbed soils; and limiting weed abatement activities in areas with known endangered plant and animal species.

P.21 Uniform Building Code: Continue to enforce the Uniform Building Code (UBC) for all new construction and renovation and when occupancy or use changes occur.

Program 21.1: Continue to update and enforce the City's Uniform Building Code and Uniform Fire Code provisions.

Program 21.2: Require a greater degree of fire resistance in roof coverings and exterior building materials for structures within or adjacent to hazardous areas than what is specified in the UBC, as determined by the Fire Chief.

Program 21.3: Require the use of non-combustible roofing materials as specified by the Fire Chief.

P.22 Use Redevelopment Funds: Consider use of Redevelopment tax-increment funds to assist property owners in the Redevelopment Area to complete renovations that increase fire safety.

P.23 Fire Hydrant Water Flows: Ensure that there exists sufficient water flow in fire hydrants throughout Sebastopol.

"The standard adopted by the City is a minimum of 1,000 gallons per minute with 20 pounds per square inch residual pressure."

Program 23.1: Continue to require that all new developments be provided with sufficient fire flow facilities at the time of permit issuance.

P.24 Funding for Fire Protection: Continue to adequately fund and staff the Sebastopol Fire Department.

Program 24.1: Continue to levy a fee for the Fire Protection Fund. Periodically review and revise the fee structure for the Fire Protection Fund.

P.25 Mutual Aid Agreements: Continue to participate in mutual aid agreements with the County and State firefighting agencies.

P.26 Maintain Adequate Personnel and Equipment Levels: Continue to evaluate and update the personnel and equipment requirements of the Fire Department to maintain a high level of readiness.

Sonoma-Lake-Napa Unit Strategic Fire Plan (2011)

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. Currently the LNU does not list Sebastopol as a community at risk area for wildland fires.

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.

Wildland fire season in Sonoma County spans the months after the last spring rains have fallen and until the first fall or winter rains occur. The months of August, September and October have the greatest potential for wildland fires as vegetation dries out, humidity levels fall, and off shore winds blow. Wildfire behavior is based on three primary factors: fuel, weather, and topography.

The City of Sebastopol is primarily devoid of CalFire fuel ranks. In contrast, CalFire data for the foothill and mountain areas to west of the City of Sebastopol include a many areas of “high” and “very high” fuel ranks. (California Department of Forestry and Fire Protection, 2014).

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, 2014).

FIRE HAZARD SEVERITY ZONES

The state has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the state Fire Marshall as a basis for the adoption of applicable building code standards. The nearest moderate and high level FHSZ is located approximately three miles to the west of the City of Sebastopol. FHSZ Zones in and around Sebastopol are shown in Figure 4.2-1. (California Department of Forestry and Fire Protection, 2013).

Local Responsibility Areas

Local Responsibility Areas (LRA) are concentrated in the incorporated areas of Sonoma County. The City of Sebastopol is an LRA that is served by the Sebastopol Fire Department within the city limits, and the Gold Ridge Fire Protection District, which provides fire protection services to unincorporated rural areas surrounding Sebastopol.

The City of Sebastopol is not categorized as a "Very High" FHSZ by CalFire. (California Department of Forestry and Fire Protection, 2011). The combination of vegetation, topography, climate, and population density create a low potential for wildfires in Sebastopol. There are few vacant and undeveloped areas within the city and in the Sphere of Influence, particularly south of the city limits and west of Highway 116. According to the current Sebastopol General Plan, portions of Lynch Road, Beattie Lane and Redwood Heights have the highest risk of wildland fires in the Planning Area.

The 2011 Sonoma County Hazard Mitigation plan identifies several spot zones with low to moderate risk of wildfire just outside the City of Sebastopol, but none are located within the city limits. However, ABAG's 2009 hazard mapping identified 16 acres of urban land in Sebastopol that are in areas of high or very high wildfire threat.

State Responsibility Areas

State Responsibility Areas within the vicinity of Sebastopol are primarily found to the south and west of the city limits. Approximately four miles to the west of the city limits is a combination of "Moderate" and "High" FHSZs. This area is generally rolling to steep slopes with increased vegetation. (California Department of Forestry and Fire Protection, 2013).

Federal Responsibility Areas

There are no Federal Responsibility Areas within the vicinity of City of Sebastopol. (California Department of Forestry and Fire Protection, 2013).

REFERENCES

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

California Department of Forestry and Fire Protection. 2013. 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. 2014. GIS Data.

Sonoma County Hazard Mitigation Plan 2011 Wildfire Hazard and Risk Assessment.

Gold Ridge Fire Protection District. 2014. http://www.goldridgefire.org/

4.3 FLOODING

This section addresses the hazards associated with flooding in City of Sebastopol. The discussion of storm drainage infrastructure is located in the Community Services and Facilities section (Section 3.1.3) of this Report.

REGULATORY FRAMEWORK

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 Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following policies related to flooding:

Section II. Flood Hazards

Goal 3 Reduce flood hazards.

P.4 Encourage Enhanced Floodwater Storage in the Laguna: Support strong local and countywide measures to protect and increase the floodwater storage capacity in the *Laguna de Santa Rosa*.

P.5 Utilize Updated FIRM Maps: Utilize the Federal Emergency Management Agency's Flood Insurance Rate Maps (FIRM) to reduce risk of flooding; identify 100 Year Flood Events; and calculate flow rates within identified stream channels.

Program 5.1: Utilize updated Flood Insurance Rate Maps in the review of development proposals.

Program 5.2: Enforce the City's Flood Damage Prevention Ordinance.

P.6 Cooperate with Sonoma County: Continue to work with the Sonoma County Water Agency to ensure that additional storm drain runoff resulting from development occurring in unincorporated areas upstream from drainage channels in the Sebastopol Planning Area is adequately mitigated through improvements on site and/or downstream.

Program 6.1: Request that the County refer all development proposals located in the Sebastopol Planning Area to the City of Sebastopol.

P.7 Discourage Wastewater Discharge into the *Laguna de Santa Rosa*: Monitor and discourage wastewater discharge into the *Laguna de Santa Rosa*.

Program 7.1: Work with other jurisdictions to reduce the volume of wastewater discharge into the *Laguna de Santa Rosa*.

Program 7.2: Monitor the volume of wastewater discharge and water quality in the *Laguna de Santa Rosa*. Use existing documents and reports.

P.8 Pursue Available Funding Sources: Continue to cooperate with the Sonoma County Water Agency in pursuing all available sources of funding to finance improvements to storm drain facilities.

P.9 Reduce Flood Hazards: Reduce flood risk by maintaining effective flood drainage systems and regulating construction.

Program 9.1: Prohibit all development in the 100 year flood zone unless mitigation measures meeting the City's Flood Damage Protection Ordinance criteria are met.

Program 9.2: Continue to work with the Sonoma County Water Agency in the project review process to ensure that adequate measures are implemented to prevent flooding, to establish and maintain effective storm drainage systems and collect the required mitigation fees.

Program 9.3: Continue to participate in the National Flood Insurance program.

Program 9.4: Continue to require new development to prepare hydraulic storm drainage studies defining the net increase in storm water run-off resulting from construction and require mitigation of those impacts.

Program 9.5: Require developers to cover the costs of drainage facilities needed for surface runoff generated as a result of new development.

Program 9.6: Prepare inundation maps and drainage plans for existing and new water shortage tanks constructed within the city.

P.10 Storm Drainage System: Maintain unobstructed water flow in the storm drainage system.

Program 10.1: Enforce measures to minimize soil erosion and volume and velocity of surface runoff both during and after construction through implementation of the Grading Ordinance.

Program 10.2: Continue the annual inspection of the drainage systems and informing residents and property owners of illegal structures and debris must be removed.

Program 10.3: Require, where necessary, construction of siltation/retention ponds to be incorporated into the design of development projects.

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 Sebastopol is located within Zone 1A, which has a Zone Advisory Committee that annually prioritizes and approves 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, 2014).

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 City of Sebastopol is located within the North Coast 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 4.3-1 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 4.3-1: 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 City of Sebastopol is located within the North Coast Hydrologic Region. (CalWater, 2009).

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).

HYDROLOGIC UNITS

The City of Sebastopol is located within the Russian hydrologic unit, which covers approximately 950,249 acres. Figure 4.3-1 illustrates the boundaries of the Sphere of Influence and City Limits relative to the boundaries of the hydrologic sub-areas within the Russian Unit.

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 Sebastopol is located within the Lower Laguna de Santa Rosa, and the Green Valley Creek hydrologic subarea of the Russian hydrologic unit. Table 4.3-2 provides a breakdown of the size of the local watershed and hydrologic sub areas.

TABLE 4.3-2: WATERSHED INFORMATION--RUSSIAN

Hydrologic Information	Description	Acres	Square Miles	Percent of Watershed
HUC8 (Catalog Unit)	Russian	950,249	1,485	100%
HUC10 (Hydrologic Area)	Laguna de Santa Rosa	162,784	254	17%
HUC12 (Hydrologic Sub Area)	Lower Laguna de Santa Rosa	39,712	62	4%
HUC12 (Hydrologic Sub Area)	Green Valley Creek	24,320	38	2.5%

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 4.3-2.

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 Sebastopol is subject to flooding problems along the natural creeks and drainages that traverse the area. The Laguna de Santa Rosa and Atascadero Creek are the most prominent drainages in Sebastopol 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 east of Highway 116 in the northeastern, and southeastern portions of Sebastopol, are within the 500 year floodplain. The flood hazards in Sebastopol are illustrated in Figure 4.3-2. Table 4.3-4 presents a breakdown of the acreage and percentage of the City, and Sphere of Influence, that are designed as a FEMA flood zone under the Federal Flood Insurance Rate Map (FIRM).

Table 4.3-3: FEMA Flood Zone Surface Areas in City of Sebastopol

Zone	Acres - City	% of City	Acres - SOI	% of SOI
X (shaded) (500yr)	27.14	2.3%	0	0.0%
AE (100yr)	184.88	15.6%	13.87	6.0%
X (unshaded)	972.02	82.1%	216.27	94.0%
TOTAL	1184.04	100.0%	230.146	100.0%

SOURCE: USGS NATIONAL HYDROGRAPHY DATASET, FEMA, CALIFORNIA DWR, SEBASTOPOL GIS. MAP DATE: JULY 24, 2014.

Within the City of Sebastopol approximately 15.6 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). Furthermore, approximately 6.0 percent of land within the City's Sphere of Influence is also located within this AE Zone.

Approximately 2.3 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 0.2 percent chance of being flooded in any given year). There is no land within the Sphere of Influence located within the 500-year flood zone. Areas within the 500-year flood zone are considered a low to moderate risk of flood hazards.

Approximately 82.1 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, and 100-year floodplain. Approximately 94 percent of the land within the Sphere of Influence is located within the X (unshaded) zone. These areas are considered to be at minimal risk from 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. In The City of Sebastopol approximately 195 acres are subject to dam inundation. These areas lie in the northern-most, and southwestern portions of the city. (ABAG, and Sonoma County hazard mitigation plan). Figure. 4.3-3 shows the extent of dam inundation in the City of Sebastopol.

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. 2010. Final 2010 Integrated Report (CWA Section 303(d) List / 305(b) Report).

California Dept. of Water Resources. 2014. 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

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. 2014. Available at: http://www.scwa.ca.gov/flood-protection-zones/

Sonoma County 2020 General Plan Update. 2014. Available at: http://www.sonoma-county.org/prmd/docs/eir/gp2020deir/sec4-05.pdf

4.4 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

FEDERAL

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 introduced active Federal involvement to emergency response, site remediation, and spill prevention, most notably the Superfund program. The Act was intended to be comprehensive in encompassing both the prevention of, and response to, uncontrolled hazardous substances releases. The Act deals with environmental response, providing mechanisms for reacting to emergencies and to chronic hazardous material releases. In addition to establishing procedures to prevent and remedy problems, it establishes a system for compensating appropriate individuals and assigning appropriate liability. It is designed to plan for and respond to failure in other regulatory programs and to remedy problems resulting from action taken before the era of comprehensive regulatory protection.

This act, commonly associated with the term “Superfund,” established:

- Regulations concerning closed and abandoned hazardous waste sites
- Liability of parties responsible for any releases of hazardous waste at these sites
- Funding for cleanup when responsible parties cannot be identified

Resource Conservation and Recovery Act (RCRA)

This act established EPA’s “cradle to grave” control (generation, transportation, treatment, storage and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

The 1976 Federal Resource Conservation and Recovery Act (RCRA) and the 1984 RCRA Amendments regulate the treatment, storage, and disposal of hazardous and non-hazardous wastes. The legislation mandated that hazardous wastes be tracked from the point of generation to their ultimate fate in the

environment. This includes detailed tracking of hazardous materials during transport and permitting of hazardous material handling facilities.

The 1984 RCRA amendments provided the framework for a regulatory program designed to prevent releases from Underground Storage Tanks (UST). The program establishes tank and leak detection standards, including spill and overflow protection devices for new tanks. The tanks must also meet performance standards to ensure that the stored material will not corrode the tanks. Owners and operators of USTs had until December 1998 to meet the new tank standards. As of 2001, an estimated 85 percent of USTs were in compliance with the required standards.

Natural Gas Pipeline Safety Act

The Natural Gas Pipeline Safety Act authorizes the U.S. Department of Transportation Office of Pipeline Safety to regulate pipeline transportation of natural (flammable, toxic, or corrosive) gas and other gases as well as the transportation and storage of liquefied natural gas. The Office of Pipeline Safety regulates the design, construction, inspection, testing, operation, and maintenance of pipeline facilities. While the Federal government is primarily responsible for developing, issuing, and enforcing pipeline safety regulations, the pipeline safety statutes provide for state assumption of the intrastate regulatory, inspection, and enforcement responsibilities under an annual certification. To qualify for certification, a state must adopt the minimum Federal regulations and may adopt additional or more stringent regulations as long as they are not incompatible.

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 Sebastopol General Plan

The current City of Sebastopol General Plan identifies the following policies related to hazardous materials and waste:

Section IX. Transportation and Storage of Hazardous Materials**Goal 8 Reduce hazards of transportation, storage and disposal of hazardous wastes and hazardous materials.**

P.33 Measures to Reduce Hazards: Provide measures to protect the public health from the hazards associated with the transportation, storage and disposal of hazardous wastes (TSD Facilities).

Program 33.1: Continue to ensure that land use and transportation decisions and other programs are in accordance with the County's Hazardous Waste Management Plan.

Program 33.2: Support and improve the convenience of, and attempt to obtain permanent funding for a household hazardous waste disposal program.

Program 33.3: Consider adoption of a Hazardous Materials and Waste Ordinance that defines hazardous waste; hazardous materials; facilitates implementation of State and County hazardous materials and hazardous waste regulations and management programs.

Program 33.4: Require as a condition of City approvals, that the Fire Department be notified of all hazardous substances that are transported, stored, treated or could be released accidentally into the environment.

P.34 CEQA Review of proposed TSD Facilities: Support thorough environmental review for Hazardous Waste Transportation, Storage and Disposal (TSD) Facilities proposed in the Sebastopol Planning Area and throughout the County, since the potentially significant, widespread and long-term impacts on public health and safety of these facilities do not respect jurisdictional boundaries.

Program 34.1: Request that the Environmental Review of proposed hazardous waste TSD facilities shall, at a minimum, contain the following analysis and information:

- A worst case generic description, estimating the number, type, scale, scope, location and operating characteristics of proposed TSD facility(ies) based on the projected volumes and types of hazardous waste. Data from existing facilities regarding the probability of accidents, spills, and explosions should be documented and included;
- An assessment of risk resulting from the accidental release, fire, and explosion of hazardous waste. This assessment should take into account all phases of operation including transport, storage, and treatment. The assessment of risk should include the probability of occurrence and magnitude of impact;
- Quantitative estimates of air emissions, by applying emissions rates of existing facilities to the future volumes of hazardous waste, and identifying emissions for incinerator facilities under worse case circumstances;
- An assessment of non-incineration alternatives for hazardous waste treatment such as chemical dechlorination for the detoxification of PCB's, dioxins, solvents and pesticides; photolysis; and biological treatment; and
- Review of the operating characteristics of proposed TSD facilities, taking into account maintenance and operating procedures, emissions monitoring and safety devices to assure the ongoing enforceability of the mitigating measures that are required.

P.35 Regulate Hazardous Materials: Strictly regulate the storage of hazardous materials.

Program 35.1: Regulate and enforce the storage of hazardous materials under California Administrative Code Title 19 requirements.

Program 35.2: Revise the Zoning Ordinance to require secondary containment facilities and a buffer zone adequate to protect public health and safety on properties with hazardous materials storage and/or processing activities.

Program 35.3: Request that the Graton Fire Department conduct periodic pressure testing of fuel lines, competency testing for propane handling personnel, and general testing of the 20,000 gallon propane tank located at AmeriGas, 845 Gravenstein Highway North.

Program 35.4: Contact AmeriGas owners to encourage them to relocate.

P.36 Truck Routes for Hazardous Materials Transport: Develop, in cooperation with the County and neighboring cities, regulations prohibiting through-transport by truck of hazardous materials on the local street systems and requiring that this activity be limited to State highways.

Program 36.1: Consider establishing and enforcing local and enforcing a Local Hazardous Material Route Plan and install signage and publicize routes for hazardous materials transport in the Sebastopol Planning Area. Adopt an ordinance designating specific routes within the Planning Area for transport of hazardous materials.

ENVIRONMENTAL SETTING

The EPA Toxic Release Inventory (TRI) does not list data on disposal or other releases of toxic chemicals in the City of Sebastopol. (USEPA 2012).

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.

No sites in the DTSC database are within the City of Sebastopol. The nearest site is located in Sonoma County, approximately 5 miles northwest of the City of Santa Rosa, and 5 miles northeast of Sebastopol. Between 1942 and 1946, the U.S. acquired the land for the Santa Rosa Army Airfield. The Santa Rosa Army Air Field comprised 1,589.13 acres. The site once served as a Sonoma County Municipal Airport, but is now an abandoned airfield. Facilities included large underground storage tanks (USTs) and pumping facilities, sewage treatment, and an incinerator. Upon deactivation, the USTs were pumped dry and filled with water. The property was also used for chemical weapons storage. Possible contamination of the site includes petroleum hydrocarbons, and unexploded ordnance, and lead from a skeet range that was operated on the site (California Department of Toxic Substances Control, 2014). As of 2002 the RWQCB noted that the overall restoration program is behind schedule with the Two-Year Joint CA Execution Plan. Additional work was proposed by USACE staff, however, this work has not been completed. No further comments have been noted. The site details are listed in Table 4.4-1 below.

Table 4.4-1: DTSC *Envirostor* Data Management System

Envirostor	Site/Facility	Type	Status	City
49450002	Naval Auxiliary Air Station	Military Evaluation	Refer: RWQCB	Santa Rosa

SOURCE: DTSC ENVIROSTOR DATA MANAGEMENT SYSTEM, 2014.

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 Sebastopol has one active solid waste facility listed in the database. Atlas Tree Waste Recycling located at 6303 Sebastopol Road is listed under the category of composting facility with chipping and grinding of plant material being the main activity onsite. The main waste type is green materials and wood waste. The SWIS data also identifies one closed sites in Sebastopol. The Sebastopol Burn Dump is an inactive facility located off Morris Street near the northeast corner of Sebastopol. Site details are listed in Table 4.4-2 below. (California Department of Resources Recycling and Recovery, 2014)

Table 4.4-2: CIWMB Active and Closed Facilities/Sites

Number	Name	Activity	Regulatory	Status
49-AA-0393	Atlas Tree Waste	Plant Material Disposal Site	Notification	Active
49-AA-0357	Sebastopol Burn Dump	Solid Waste Disposal Site	Pre-regulations	Closed

SOURCE: CALIFORNIA DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY, 2014.

The transportation and storage of hazardous materials is an issue of regional concern. A large quantity of hazardous products are transported on highways where the potential for release of this material into the environment represents a potentially significant public health risk. Radioactive materials are distinguished from other hazardous materials and specific Federal and State regulations have been developed for these substances. The use and storage of radioactive materials in Sebastopol is limited to medical facilities, since no other primary users of radioactive materials, such as research laboratories, nuclear power plants or military facilities, are located within the Planning Area. The principal potential danger to Sebastopol residents from these materials is related to the possibility of a truck accident where containers holding radioactive materials would be ruptured.

REFERENCES

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

United State Environmental Protection Agency. 2012. Release Year 2013 National Analysis data set released to the public in November 2013. http://www.epa.gov/tri/

California Department of Toxic Substances Control. 2014. Envirostor Database. http://www.envirostor.dtsc.ca.gov/public/

California Department of Resources Recycling and Recovery. 2014. Solid Waste Information System (SWIS). http://www.calrecycle.ca.gov/SWFacilities/Directory/

4.5 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

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

Facilities Located in the City of Sebastopol

The City of Sebastopol does not have any airport facilities located within the city limits, sphere of influence, of urban growth boundary.

Facilities Located Near the City of Sebastopol

Charles M. Schulz - Sonoma County Airport (STS): Located 11 miles north of the City of Sebastopol the Sonoma County Airport offers scheduled air service into the North Bay region. Alaska Airlines offers daily

nonstop flights to and from Los Angeles, Portland, San Diego, and Seattle. The Sonoma County Airport is a 24-hour facility with Air Traffic Control Tower operating from 7:00 am until 8:00 pm, seven days a week. Both Twin engine turboprop and jet powered aircraft utilize the Sonoma County Airport. Currently, the Sonoma County Airport is the only point for commercial airline service in the County. Approximately 100,000 take-offs and landings are recorded at the Airport each year. (Sonoma County General Plan Air Transportation Element, 2011).

Petaluma Municipal Airport: The Petaluma Municipal Airport is located at the northeast edge of the City of Petaluma. This airport is the second closest airport to Sebastopol, located approximately 19 miles southeast of the Sebastopol 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 Sebastopol 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 Sebastopol from January of 1950 to June 2014. (National Transportation Safety Board, 2014).

REFERENCES

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.ntsb.gov/aviationquery/index.aspx

Sonoma County Airport Land Use Commission. 2001. Comprehensive Air Port Land Use Plan for Sonoma County.

Sonoma County, 2011. Sonoma County General Plan 2011. Air Transportation Element.

Sonoma County. 2014. Sonoma County Airport http://www.sonomacountyairport.org/

4.6 MAGNETIC FIELD HAZARDS

Electric and magnetic fields (EMF) are invisible lines of force that surround any electrical device that is plugged in or turned on. EMF are made up of waves of electric and magnetic energy moving together (radiating) through space. Electric fields are produced by electric charges and magnetic fields are produced by the flow of current through wires or electrical devices. Both electric and magnetic field strength decrease as the distance from the source increases (U.S. EPA, 2012).

REGULATORY FRAMEWORK

FEDERAL

The FCC authorizes and licenses devices, transmitters and facilities that generate Radio Frequency (RF) radiation. It has jurisdiction over all transmitting services in the U.S. except those specifically operated by the Federal Government.

The FCC guidelines for human exposure to RF electromagnetic fields were derived from the recommendations of two organizations, the National Council on Radiation Protection and Measurements (NCRP) and the Institute of Electrical and Electronics Engineers (IEEE). The exposure guidelines are based on thresholds for known adverse effects, and they incorporate prudent margins of safety. In adopting the most recent RF exposure guidelines, the FCC consulted with the EPA, FDA, OSHA and NIOSH.

The exposure limits used by the FCC are expressed in terms of Specific Absorption Rate (SAR - *a measure of the rate of absorption of RF energy by the body)*, electric and magnetic field strength and power density for transmitters operating at frequencies from 300 kHz to 100 GHz. Facilities under the jurisdiction of the FCC having a high potential for creating significant RF exposure to humans, such as radio and television broadcast stations, satellite-earth stations, experimental radio stations and certain cellular, PCS and paging facilities are required to undergo routine evaluation for compliance with RF exposure guidelines whenever an application is submitted to the FCC for construction or modification of a transmitting facility or renewal of a license. Failure to show compliance with the FCC's RF exposure guidelines in the application process could lead to the preparation of a formal Environmental Assessment, possible Environmental Impact Statement and eventual rejection of an application.

Low-powered, intermittent, or inaccessible RF transmitters and facilities are normally categorically excluded from the requirement of routine evaluation for RF exposure. These exclusions are based on calculations and measurement data indicating that such transmitting stations or devices are unlikely to cause exposures in excess of the guidelines under normal conditions of use. The FCC requires that all wireless communication devices sold in the United States follow safety guidelines that limit radiation exposure. The FCC also authorizes and licenses transmitters and facilities that generate RF and microwave radiation.

FCC has authority to take action if a wireless phone or device produces hazardous levels of RF energy. The FDA, in collaboration with the FCC, regulates wireless technology devices such as wireless computer networks and cellular phones. FDA monitors the health effects of wireless phones and has authority to take action if wireless phones are shown to emit RF at a level that is hazardous to the user.

STATE

In 1993, the California Public Utilities Commission (CPUC) voted to adopt many of the recommendations of the EMF Consensus Group - an advisory board made up of private citizens, consumer groups, health and state officials, and labor and utility representatives. The CPUC decision includes developing design guidelines for utilities to use in reducing EMF from new and upgraded facilities, developing public information and research programs directed by the California Department of Health Services, and offering free measurement services for homes and businesses. Financial support by utilities of the $65 million Federal Research Program was authorized. This annual bill insert was prepared as the result of cooperation between California utilities the CPUC and the State Department of Health Services.

In 2006, the California Public Utilities Commission adopted a policy where investor-owned electric utilities operating within the state agree to incorporate various "no-cost and low-cost" measures into the construction of new or upgraded power lines and substations (Decision 93-11-013). This decision also authorized each utility to develop and publish a set of "EMF Design Guidelines" implementing this policy. These EMF Design Guidelines are intended for new construction or major reconstruction of electric utility transmission, substation, and distribution facilities. They describe the methodology for evaluating "no-cost and low-cost" measures to reduce magnetic fields in new construction or major reconstruction.

LOCAL

City of Sebastopol General Plan

The current City of Sebastopol General Plan identifies the following policies related to electromagnetic exposure:

Goal 9 Minimize community exposure to EMF.

P.37 Consider EMF in Land Use Decisions: Consider information regarding EMF radiation from new electrical transmission lines and substations in making land use decisions.

Program 37.1: Adopt an EMF Regulation Ordinance that sets standards for EMF levels of new electrical transmissions lines and related facilities.

Program 37.2: Ensure that planners and developers are informed of EMF's.

Program 37.3: Review siting opportunities that will reduce or eliminate exposure to EMF.

P.38 Siting and Construction of Electrical Transmission Facilities: Minimize and reduce EMF radiation levels near sensitive areas such as schools, hospitals, and playgrounds when planning for electrical transmission facilities repair and new construction.

Program 38.1: Review siting opportunities which will reduce or eliminate exposure to EMF's.

Program 38.2: Require that all new electrical transmission projects have an EMF mitigation plan as part of the project's environmental review pursuant to CEQA.

Program 38.3: Request from PG&E full public disclosure of proposed electrical transmission projects and their anticipated EMF levels in the Sebastopol Planning Area.

Program 38.4: Consider EMF in relation to other issues.

P.39 Siting of Schools: Work with the local school districts to continue enforcement of the California State Board of Education regulations requiring that new schools be sited at least 100 feet from the edge of the right-of-way of 100-110 kV lines; 150 feet from 220-230 kV lines; and 250 feet away from 345 kV lines.

ENVIRONMENTAL SETTING

Wireless technology has become an increasingly controversial topic. The steady increase in cell phone use and the location of cell towers, as well as the increased use of wireless networks and devices, has made the potential effects of wireless technology on health and safety a concern to many people.

The type of energy used in wireless technology is radio frequency (RF). RF radiation is non-ionizing (it is not strong enough to affect the structure of atoms it contacts). RF can be dangerous at very high levels because it creates heat, and has the ability to heat tissue rapidly. This is the principle by which microwave ovens cook food. Cell phones and wireless networks produce RF, but not at levels that can cause significant heating. For cell towers, RF energy decreases rapidly with distance and ground-level exposures are typically well below exposure limits set by the Federal Communications Commission (FCC). In the U.S., and California there are no federal, or state standards limiting occupational or residential exposure to power line EMF. Seven states set standards for the width of right-of-ways under high-voltage transmission lines because of potential for electric shock.

The California Public Utilities Commission claims final authority over the installation of all utility equipment, including meters, within the state. Some local and state jurisdictions have enacted rules and regulations pertaining to human exposure to RF energy. However, the Telecommunications Act of 1996 contained provisions relating to federal jurisdiction to regulate human exposure to RF emissions from certain transmitting devices. In particular, Section 704 of the Act states that, "No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions." (Note, the term “environmental effects” is broadly interpreted and applied by the FCC to include health effects of RF emissions). However, the federal law does not prohibit local regulations as to the placement of facilities on the basis of health and safety when the local regulations are not related to RF emissions.

REFERENCES

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

U.S. EPA. 2012. Electric and Magnetic Fields (EMF) Radiation from Power Lines
http://www.epa.gov/radtown/power-lines.html

Centers for Disease Control and Prevention. 2014. Workplace Health and Safety Topics (EMF)
http://www.cdc.gov/niosh/topics/emf/

U.S. Federal Communications Comission. 2014. OET Bulliten 56 Fourth Edition August 1999.
http://transition.fcc.gov/oet/rfsafety/

California Public Utilities Commission. 2006. Order Instituting Rulemaking to update the Commission's policies and procedures related to electromagnetic fields emanating from regulated utility facilities.

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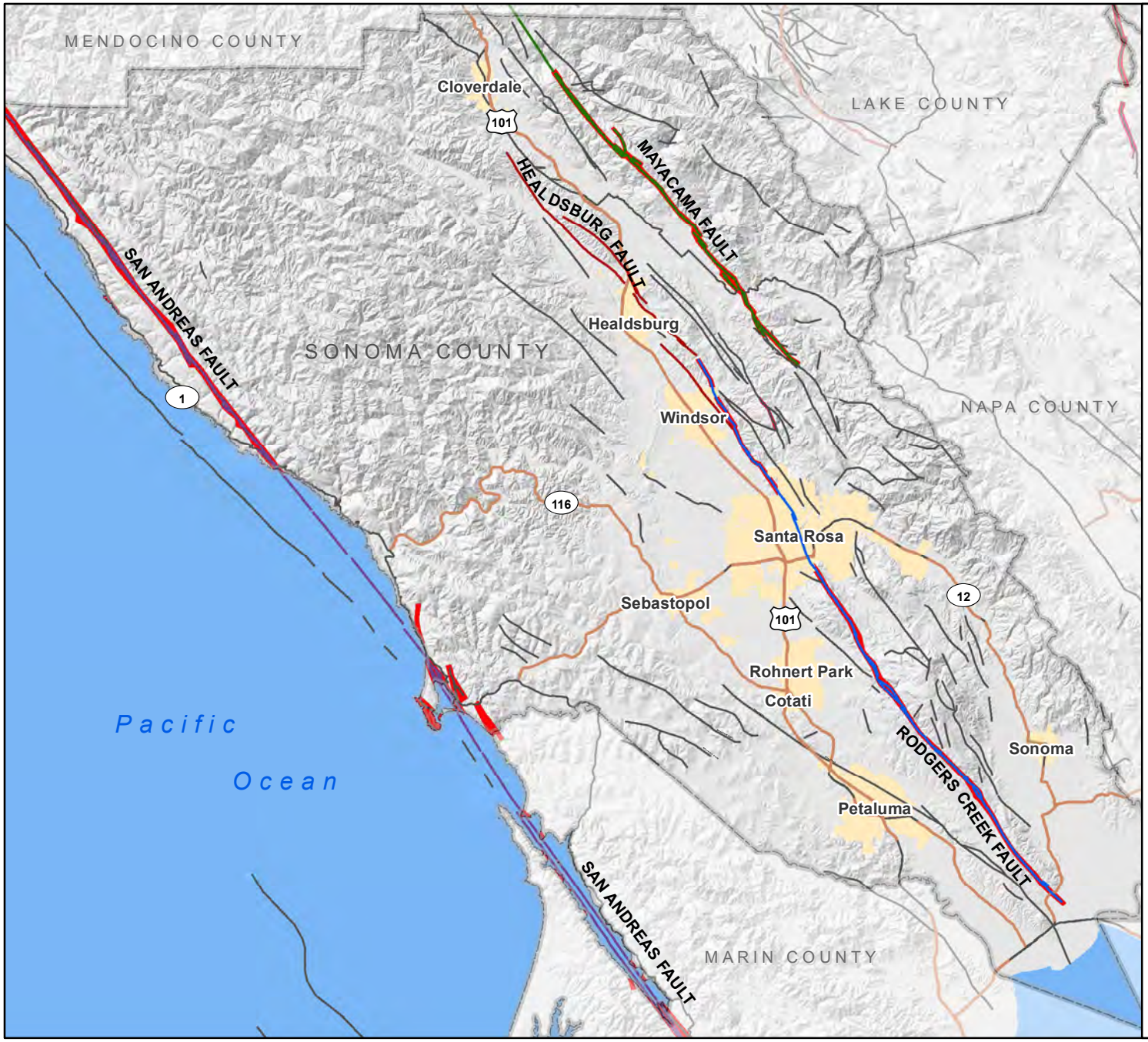

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-1: Faults and Alquist-Priolo Zones

- Healdsburg Fault
- Mayacama Fault
- Rodgers Creek Fault
- San Andreas Fault
- Other Quaternary Faults
- Alquist-Priolo Fault Zones
- City Areas

N

0 2.5 5
Miles

1:500,000

Data sources: California Geological Survey; USGS National Hydrography Dataset; Sonoma County GIS. Map date: June 26, 2014. (Sebas_Faults_140626_4-1-1)

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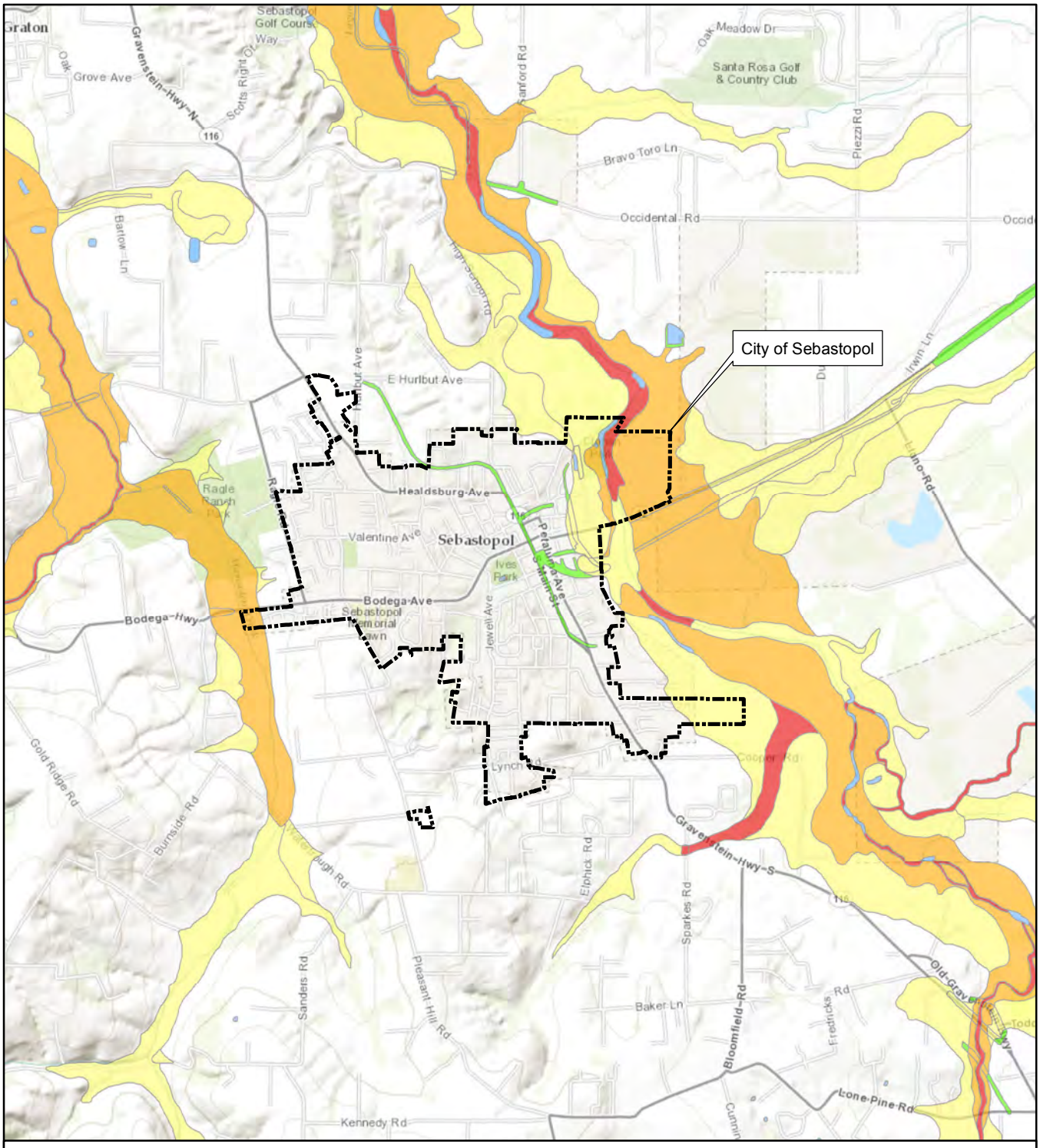

Susceptibility

- Very High
- High
- Moderate
- Low
- Very Low
- Water

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-2: Liquefaction Susceptibility

N

0 1,750 3,500
Feet

1:42,000

Data sources: U.S. Geological Survey in cooperation with the California Geologic Survey Open File Report 06-1037: Liquefaction Susceptibility, 2000; ArcGIS Online World Topo Basemap; Sonoma County GIS. Map date: June 26, 2014. (Sebas_Liquefaction_140626_4-1-2)

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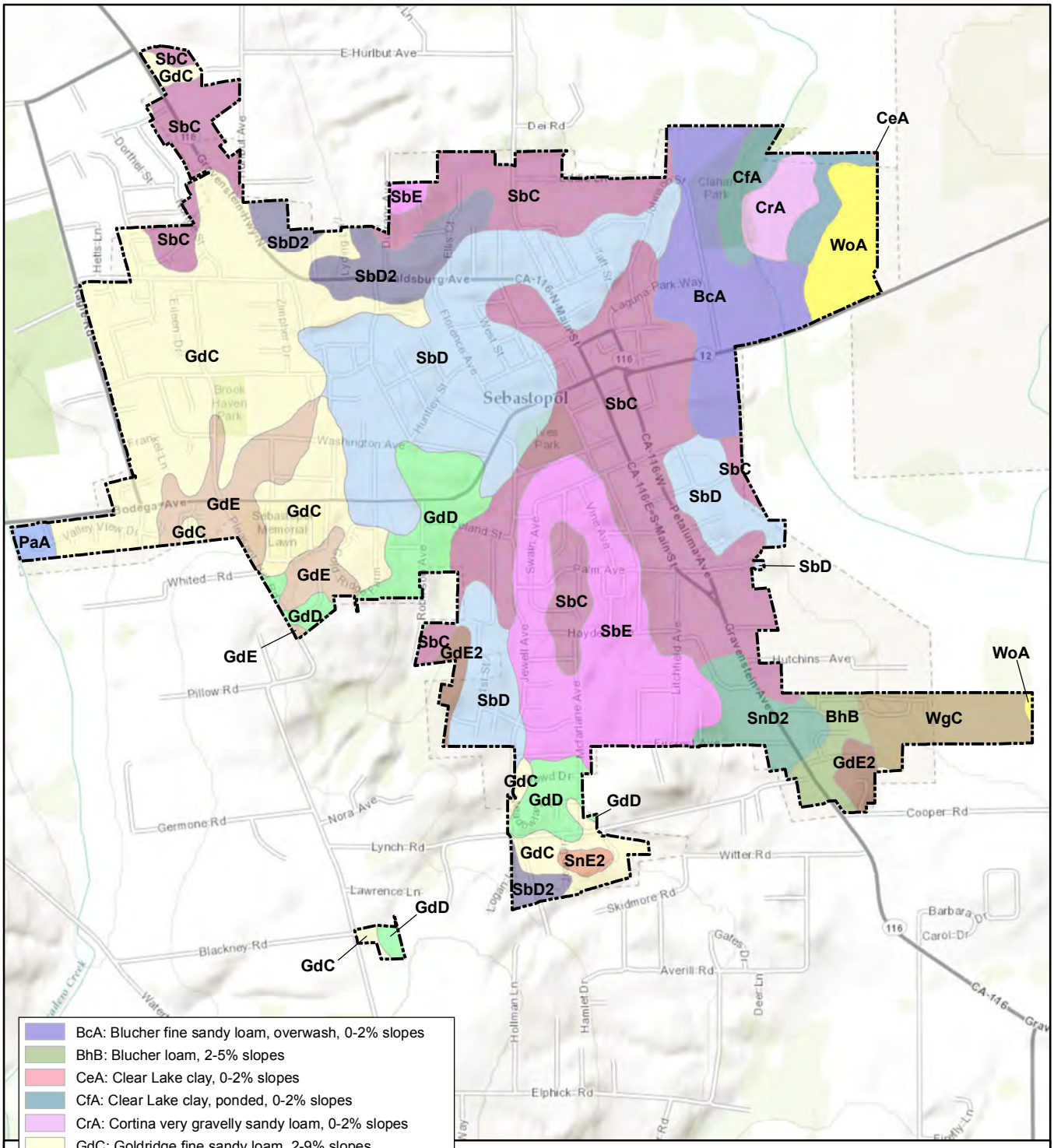

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-3: Soils Map

Data sources: Data sources: U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database for Sonoma County, California 11-27-2013; Sonoma County GIS; ArcGIS Online World Topo Map Basemap. Map date: June 26, 2014. (Sebas_Soils_140626_Fig4-1-3)

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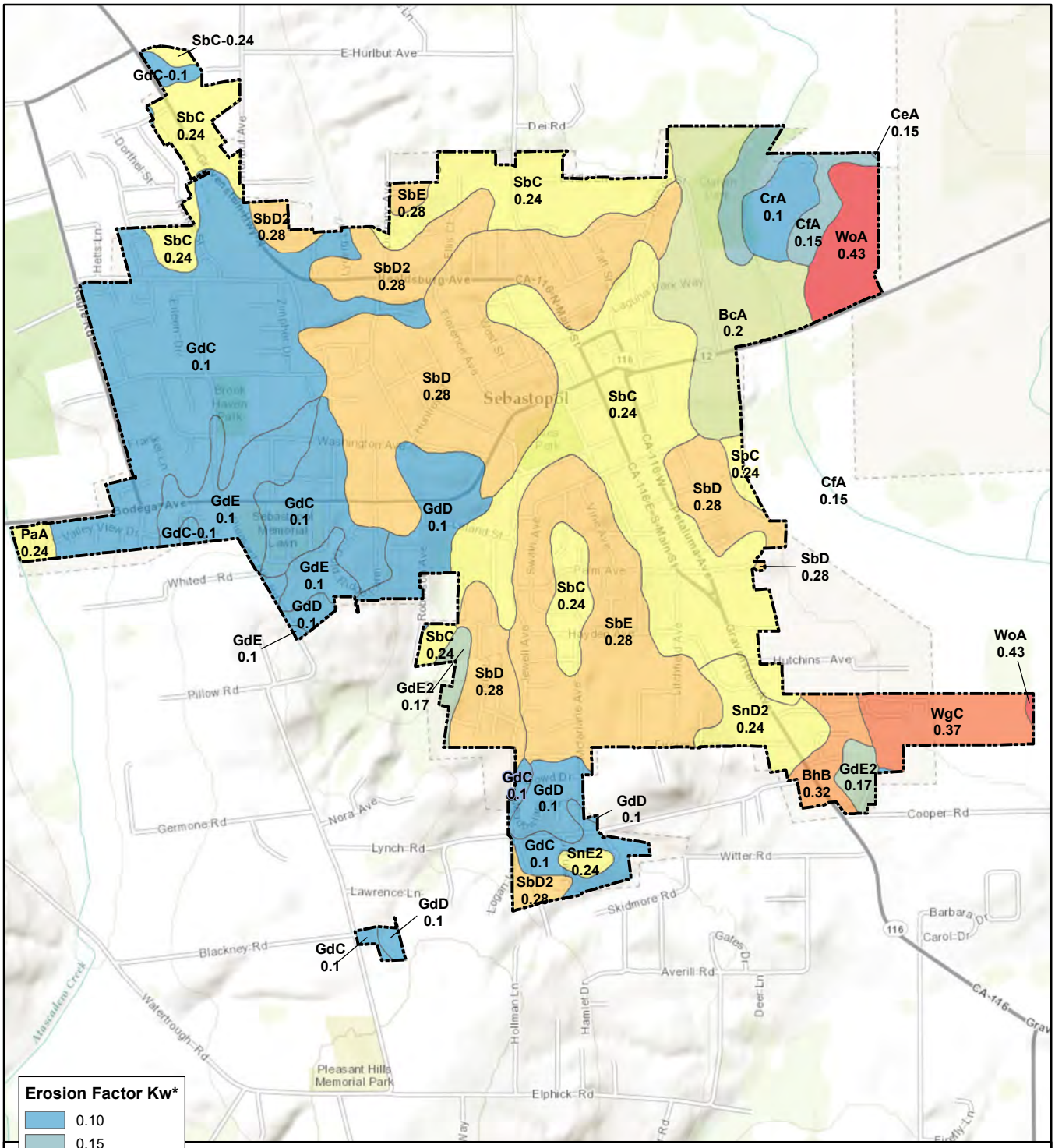

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-4: Soil Erosion Susceptibility

N

0 750 1,500 Feet

1:21,000

** Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation and the Revised Universal Soil Loss Equation to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soils structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soils is to sheet and rill erosion.*

Erosion factor Kw indicates the erodibility of the whole soil. Estimates are modified by the presence of rock fragments.

Data sources: Data sources: U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database for Sonoma County, California 11-27-2013; Sonoma County GIS; ArcGIS Online World Topo Map Basemap. Map date: July 23, 2014. (Sebas_SoilErosion_140723_Fig4-1-4)

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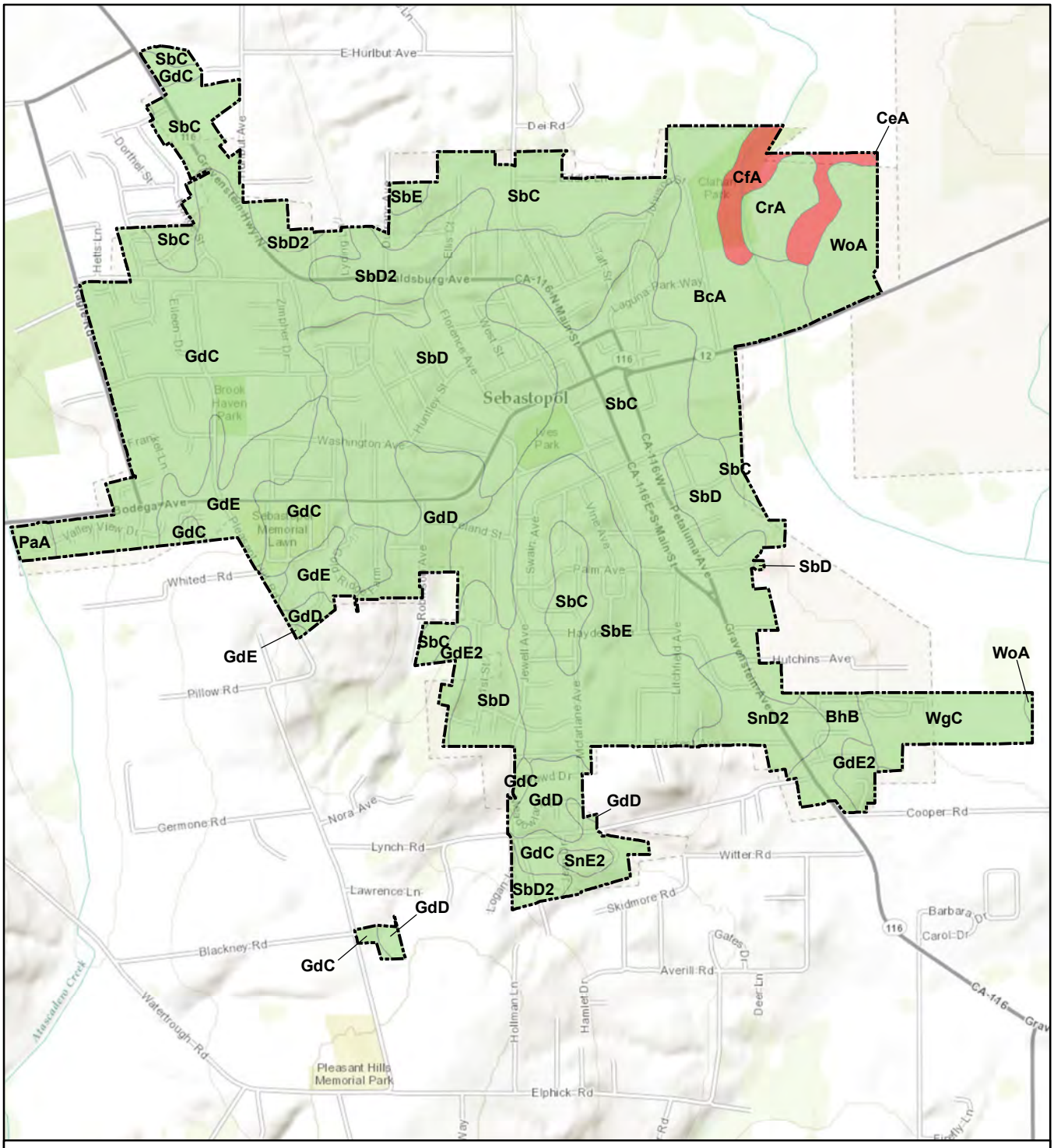

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-5: Shrink-Swell Potential of Soils

Shrink-Swell Potential of Surface Horizon

- High (Linear Extensibility: 6-9%)
- Low (Linear Extensibility: < 3%)

N

0 750 1,500
Feet

1:21,000

Data sources: Data sources: U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) database for Sonoma County, California 11-27-2013; Sonoma County GIS; ArcGIS Online World Topo Map Basemap. Map date: June 26, 2014. (Sebas_LinearExten_140626_4-1-5)

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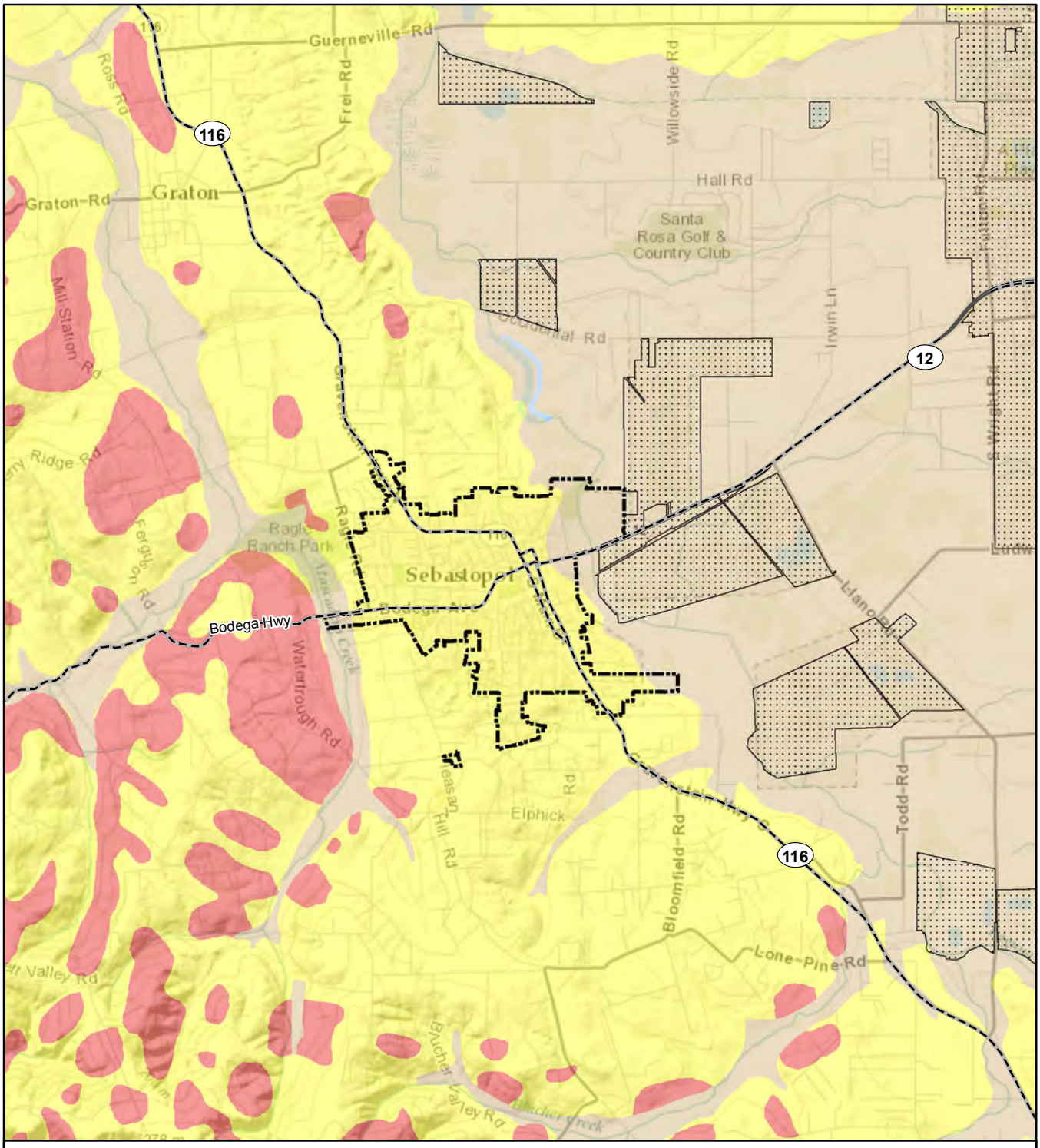

Landslide Potential

- Very High
- High
- Moderate
- Low
- Very Low
- Water

City Boundaries

- Sebastopol
- Santa Rosa

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-6: Landslide Potential

N

0 0.5 1
Miles

1:60,000

Data sources: Data sources: U.S. Department of the Interior, U.S. Geological Survey Open File Report 97-745 C; Sonoma County GIS. Map date: June 26, 2014. (Sebas_Landslide_140626_Fig4-1-6)

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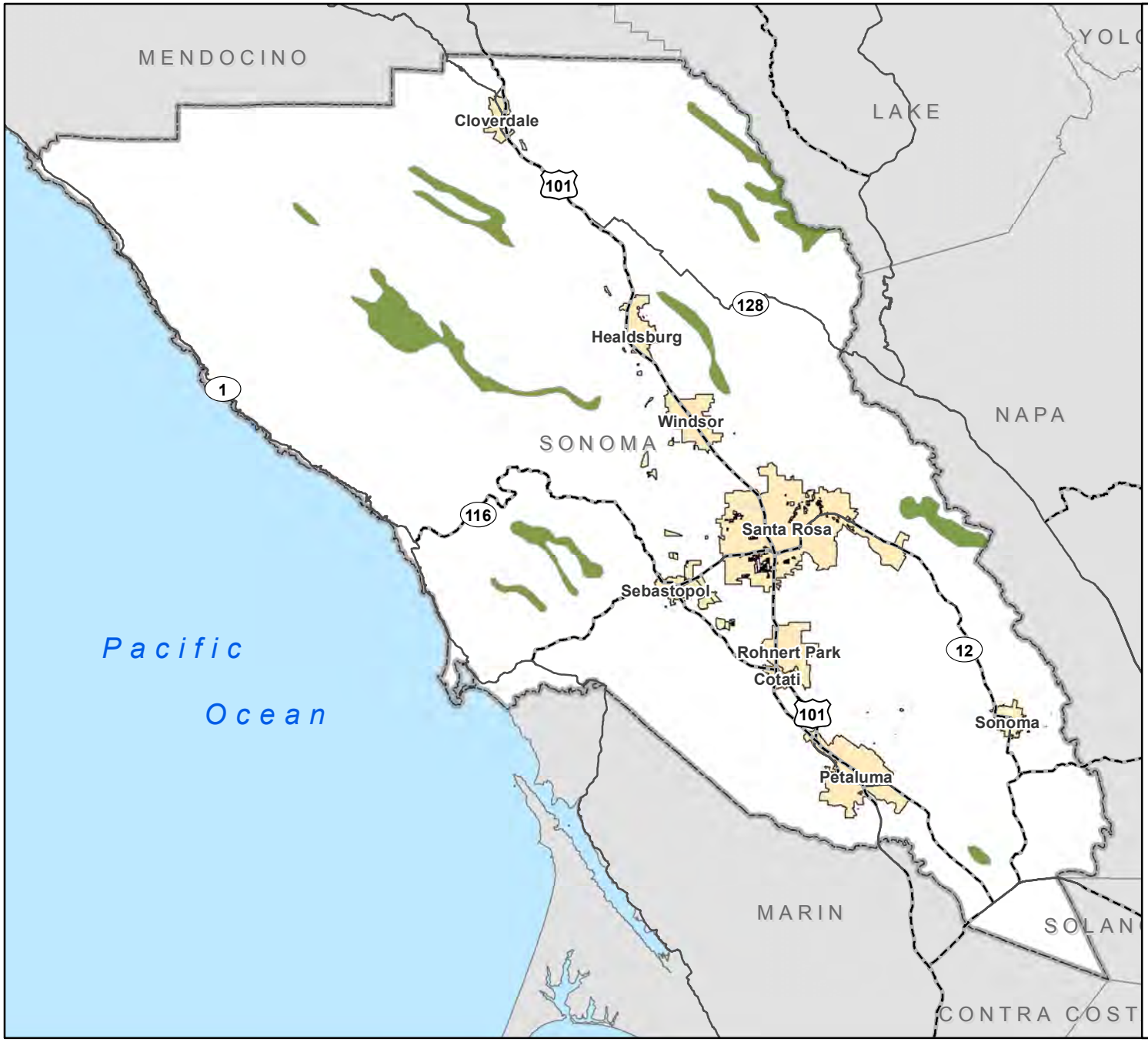

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.1-7: Areas More Likely to Contain Naturally Occurring Asbestos

Ultra-Mafic Rocks*

City Areas

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, hornblendite (IUGS classification of ultramafic rocks, in Philpotts, 1990*). These igneous rocks contain 90 percent or more of the dark colored iron-magnesiumsilicate 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.*

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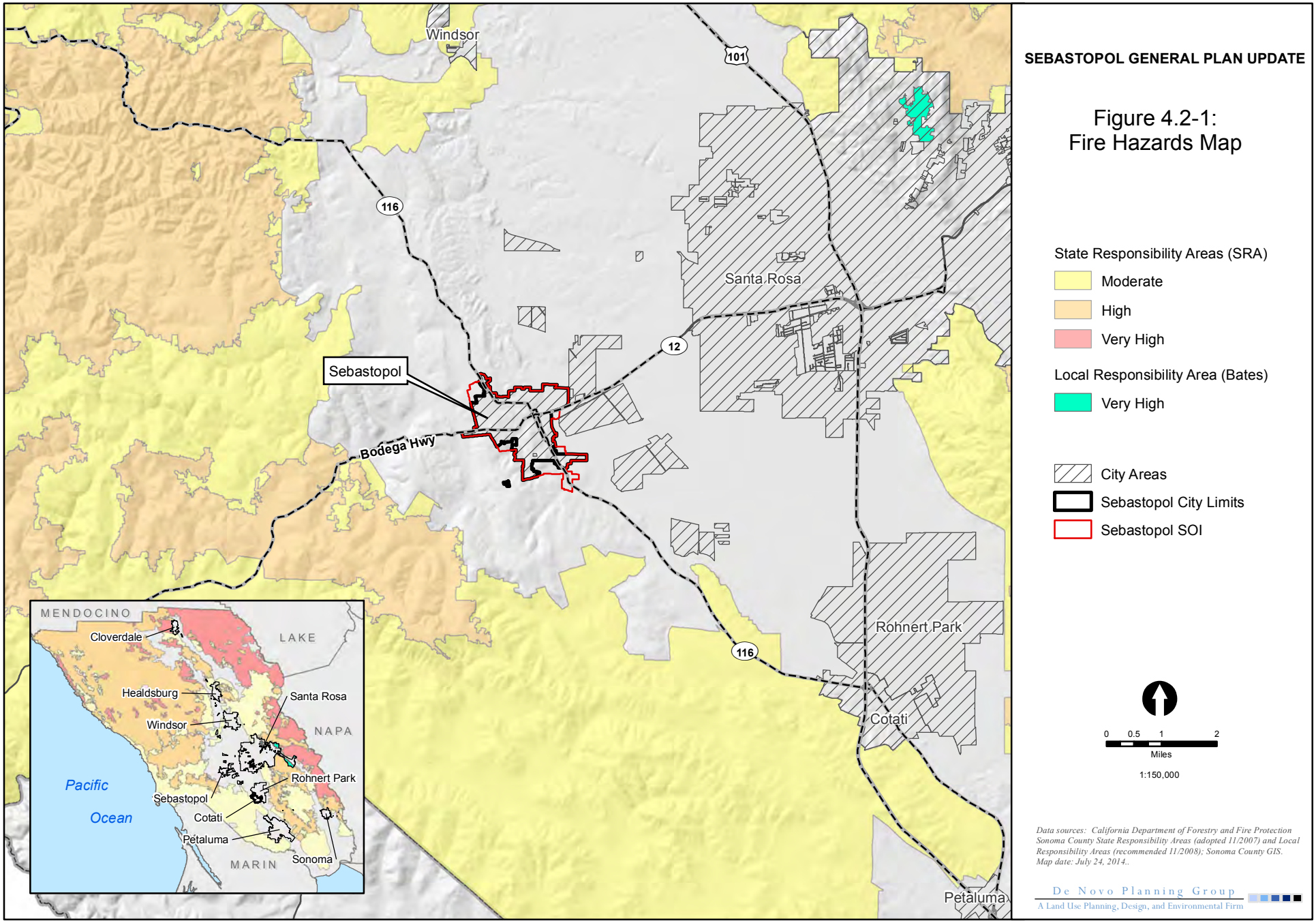
SEBASTOPOL GENERAL PLAN UPDATE
Figure 4.2-1:
Fire Hazards Map
State Responsibility Areas (SRA)
Moderate
High
Very High
Local Responsibility Area (Bates)
Very High
City Areas
Sebastopol City Limits
Sebastopol SOI
0 0.5 1 2
Miles
1:150,000
Data sources: California Department of Forestry and Fire Protection Sonoma County State Responsibility Areas (adopted 11/2007) and Local Responsibility Areas (recommended 11/2008); Sonoma County GIS. Map date: July 24, 2014..
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Windsor
Santa Rosa
Sebastopol
Bodega Hwy
Rohnert Park
Cotati
Petaluma
101
116
12
MENDOCINO
LAKE
NAPA
MARIN
Cloverdale
Healdsburg
Windsor
Santa Rosa
Rohnert Park
Sebastopol
Cotati
Petaluma
Sonoma
Pacific
Ocean

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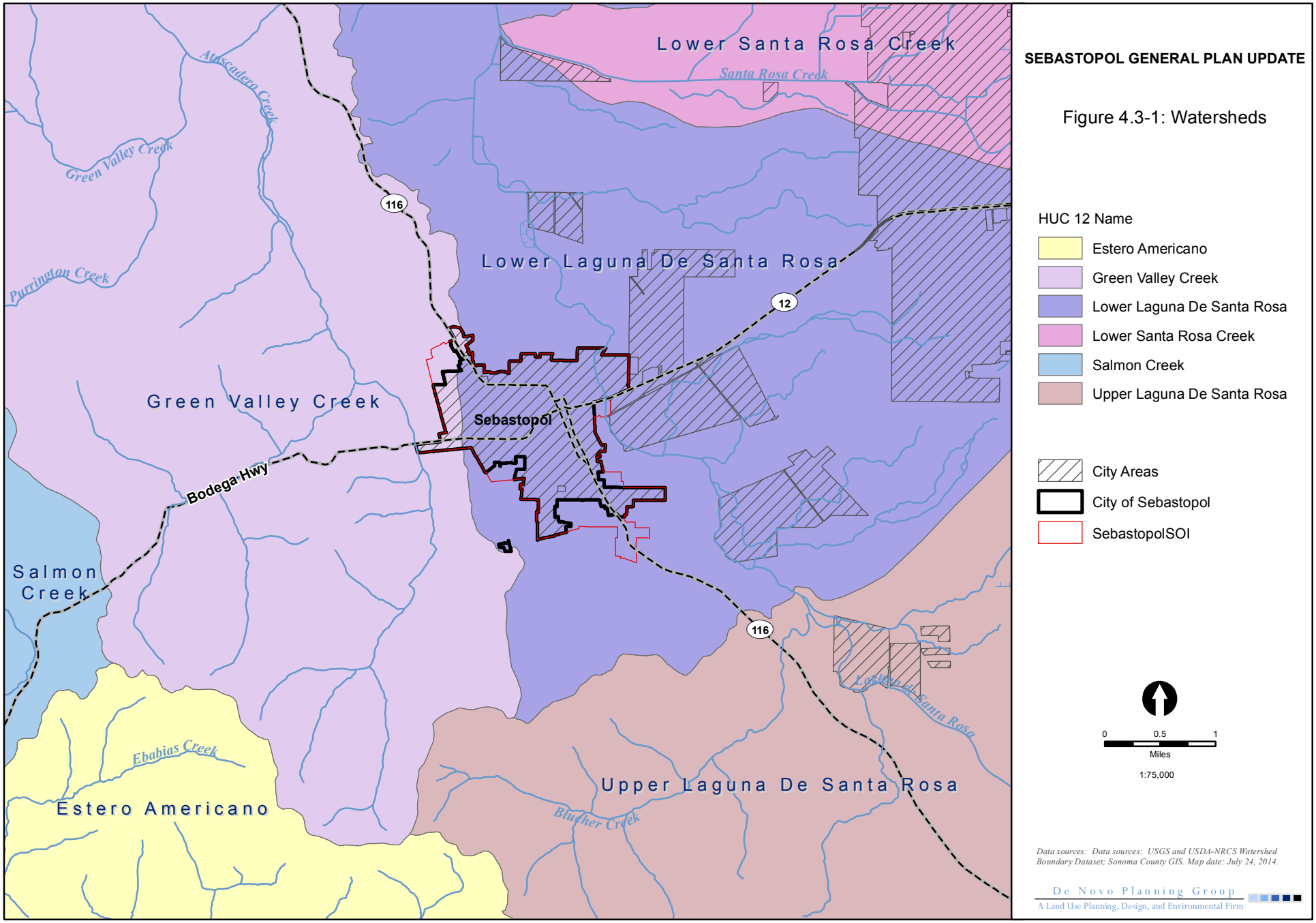
SEBASTOPOL GENERAL PLAN UPDATE
Figure 4.3-1: Watersheds
HUC 12 Name
Estero Americano
Green Valley Creek
Lower Laguna De Santa Rosa
Lower Santa Rosa Creek
Salmon Creek
Upper Laguna De Santa Rosa
City Areas
City of Sebastopol
SebastopolSOI
0
0.5
1
Miles
1:75,000
Lower Santa Rosa Creek
Santa Rosa Creek
Lower Laguna De Santa Rosa
Green Valley Creek
Sebastopol
Bodega Hwy
Salmon Creek
Estero Americano
Upper Laguna De Santa Rosa
Atascadero Creek
Green Valley Creek
Purrington Creek
Ebabias Creek
Blucher Creek
Laguna de Santa Rosa
116
12
116
Data sources: Data sources: USGS and USDA-NRCS Watershed Boundary Dataset; Sonoma County GIS. Map date: July 24, 2014.
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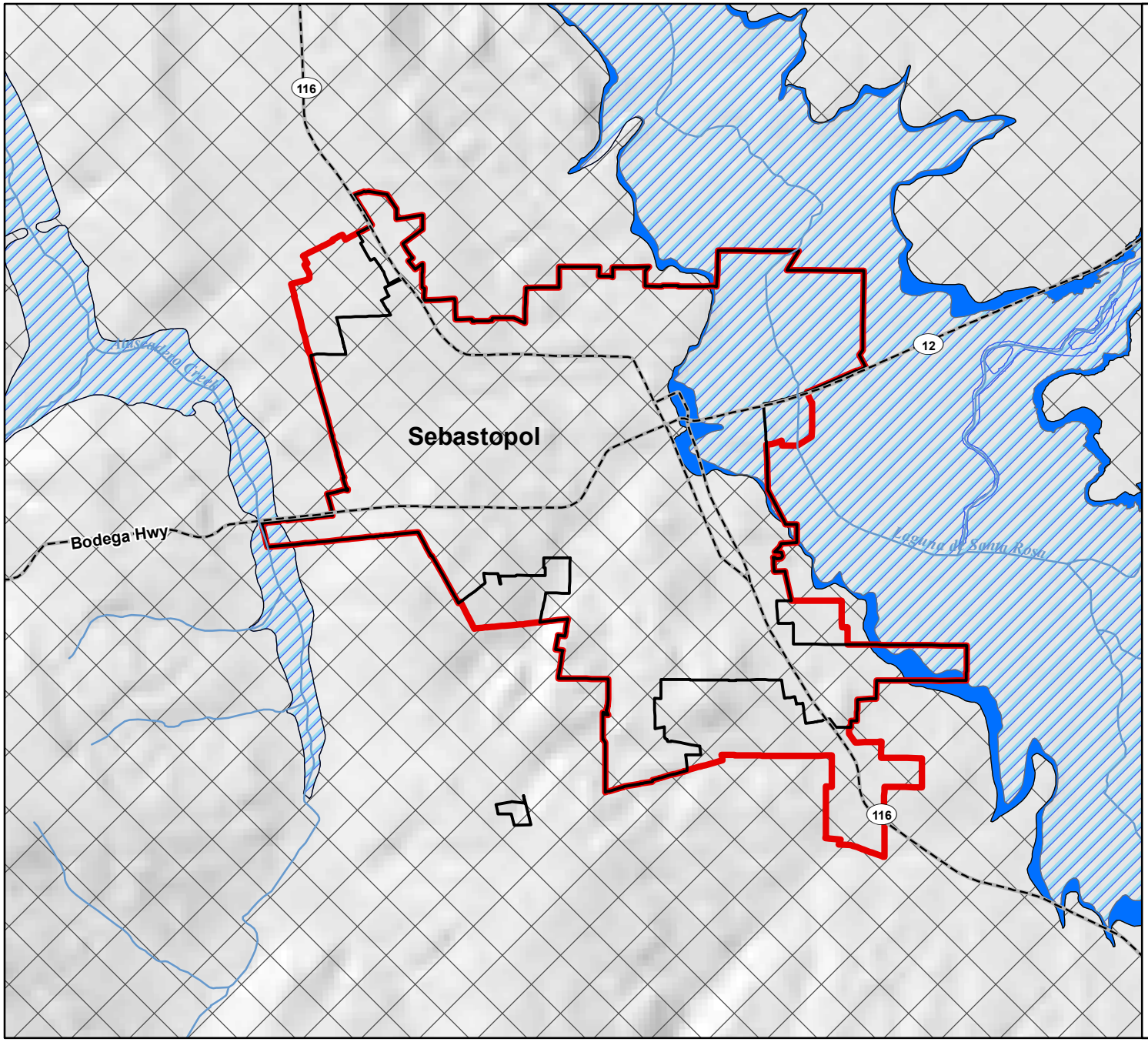

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.3-2: Flood Hazards Map

FEMA Designation

- A/AE - 100-yr Flood Zone
- 500-yr Flood Zone
- Area of Minimal Flood Hazard
- Sebastopol City Limits
- Sebastopol SOI

0 0.25 0.5
Miles
1:30,000

Data sources: Data sources: USGS National Hydrography Dataset; FEMA Map Service Center; Sonoma County GIS. Map date: July 24, 2014.

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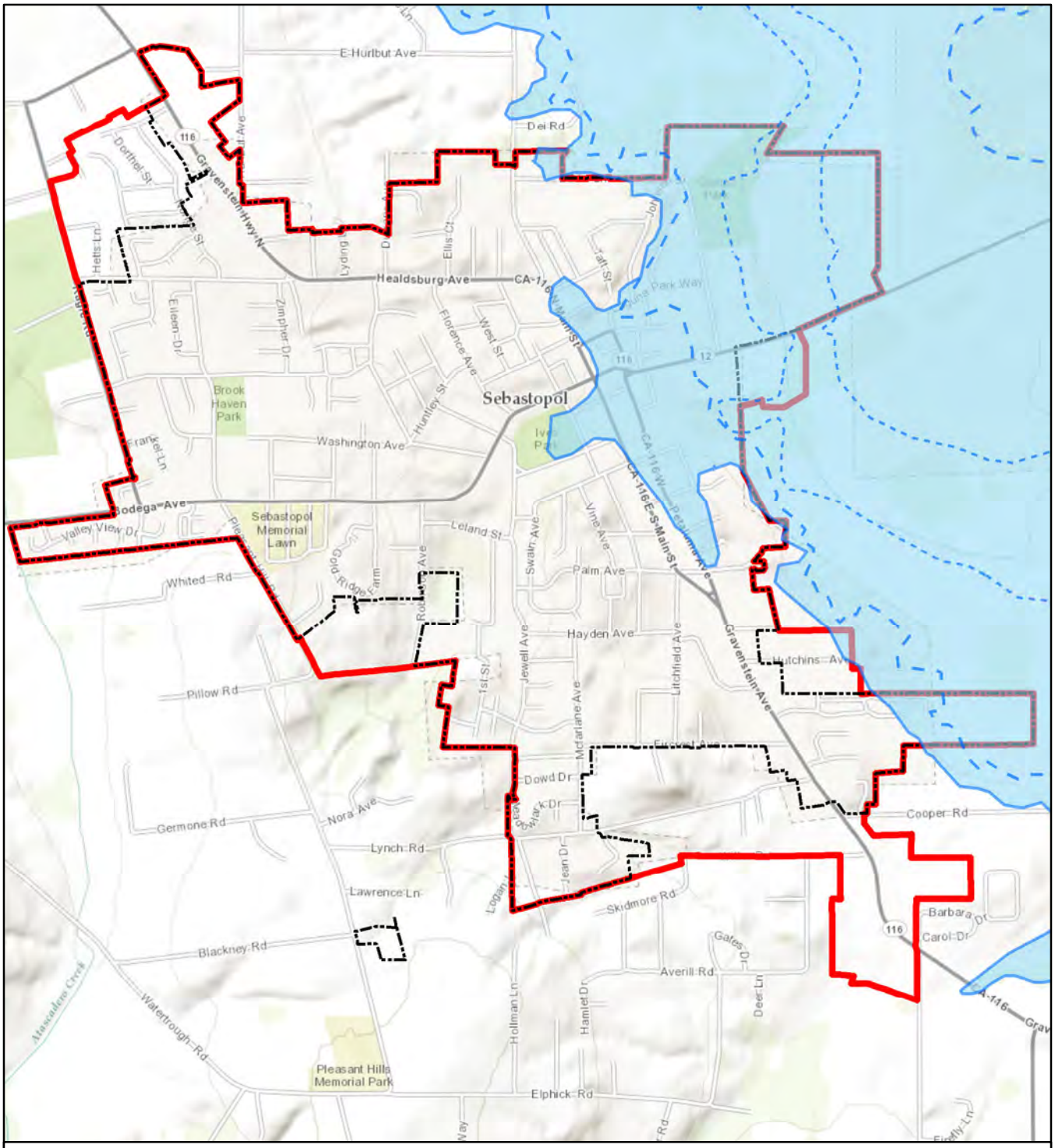

Dam Inundation Area

Individual Dam Inundation Boundaries

Matanzas Creek Reservoir

Coyote Valley Dam (Lake Mendocino)

Warm Springs (Lake Sonoma)

City of Sebastopol

Sebastopol SOI/UGB

SEBASTOPOL GENERAL PLAN UPDATE

Figure 4.3-3: Dam Inundation

N

0 750 1,500 Feet

1:21,000

Data sources: Cal EMA; Sonoma County GIS; ArcGIS Online World Topo Map Basemap. Map date: August 8, 2014. (Sebas_DamInundation_140808_Fig4-3-3)

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5.0 CONSERVATION AND NATURAL RESOURCES

The city's natural resources form an important part of its unique character and quality of life. In an effort to identify and understand the key natural resources of the city, this chapter is divided into the following sections:

- 5.1 Cultural and Historic Resources
- 5.2 Biological Resources
- 5.3 Air Quality
- 5.4 Greenhouse Gases and Climate Change
- 5.5 Scenic Resources

Topics related to the Planning Area's hydrology, water quality, and surface water resources are addressed in Sections 4.3 (Flooding), 3.1.1 (Water), and 3.1.3 (Stormwater and Drainage) of this report.

5.1 CULTURAL AND HISTORIC RESOURCES

These resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the city's cultural heritage should be considered when planning for the future.

KEY TERMS

Archaeology. The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

Complex. A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

Ethnography. The study of contemporary human cultures.

Midden. A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

Paleontology. The science of the forms of life existing in former geologic periods, as represented by their fossils.

REGULATORY SETTING

FEDERAL

National Historic Preservation Act

Most regulations at the Federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for Federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any Federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and

NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

American Indian Religious Freedom Act and Native American Graves and Repatriation Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

Other Federal Legislation

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on Federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on Federal land. New permits are currently issued under the Archeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

STATE

California Register of Historic Resources (CRHR)

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

California Environmental Quality Act (CEQA)

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historic Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible,

an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources,
- evaluate the significance of the cultural resources found,
- evaluate the effects of the project on cultural resources, and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in a project's area of potential affect, assessment of potential impacts on significant or unique resources, and development of mitigation measures for potentially significant impacts, which may include monitoring combined with data recovery and/or avoidance.

State Laws Pertaining to Human Remains

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-Federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

Several sections of the California Public Resources Code protect paleontological resources.

Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any "vertebrate paleontological site, including fossilized footprints," on public lands, except where the agency with jurisdiction has granted express permission. "As used in this section, 'public lands' means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof."

California Public Resources Code, Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The sections of the California Administrative Code relating to the State Division of Beaches and Parks afford protection to geologic features and "paleontological materials" but grant the director of the State park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the State park system and for State park purposes (California Administrative Code, Title 14, Section 4307–4309).

Senate Bill 18 (Burton, Chapter 905, Statutes 2004)

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places ("cultural places") through

local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §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 on how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

LOCAL

City of Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following goals and policies related to cultural resources:

Chapter 5: Community Identity, Section III: Historic Resources, Scenic Views and Public Art

GOAL 11 - Preserve archaeological and historic resources.

P.38 **–** Preserve Archaeological Resources: Continue to protect archaeological resources.

Program 38:1 Require that areas found to contain significant historic or prehistoric artifacts be examined by a qualified archaeologist.

Responsibility: Planning Department

The California Environmental Quality Act (CEQA) requires evaluation of any archaeological resource on the site of a development project. Unique resources, as defined by State law, should be protected, either by physical measures or by locating development away from the site.

P.39: Historic Buildings, Sites and Districts: Identify, recognize and protect sites, buildings, structures and districts with significant cultural, aesthetic and social characteristics which are part of Sebastopol's heritage.

Program 39.1: Adopt a cultural resources management ordinance to identify, recognize, protect and preserve sites, buildings, structures, districts and objects that reflect significant elements of Sebastopol's cultural, social, economic, political, aesthetic, architectural or natural heritage.

Responsibility: Planning Department

Program 39.2 Revise the Zoning Ordinance to require Design Review Board and City Council approval prior to demolishing or significantly altering structures listed in the *Historic Survey of Sebastopol* as potentially eligible for the National Register or State Landmark Status

Responsibility: Planning Department

Program 39.3: Publish and distribute copies of *Historic Survey of Sebastopol* at the public library, the Chamber of Commerce office, and the West County Museum.

Responsibility: Planning Department

Program 39.4: Establish incentives for preservation and restoration of historic buildings and sites. Consider the following incentives: Interest-free or reduced interest loans for rehabilitation work consistent with the original character of the building; tax incentives for the preservation of historic structures, including the use of Mills Act preservation contracts; reduced processing fees for preservation and protection of outstanding buildings; use of the State Historic Building Code where applicable; and awards and grants for the preservation and protection of outstanding buildings.

Responsibility: Planning Department

Program 39.5: Continue to refer projects to Sonoma State University's Archaeological Resource Center and Western Sonoma County Historical Society.

Responsibility: Planning Department

Program 39.6: Seek funding for the restoration and preservation of archaeological and historical resources.

Responsibility: Planning Department

PREHISTORY

Harrington's (1948) investigation at CA-Lak-36--the Borax Lake Site--is the first major archeological project undertaken in the North Coast ranges. He found temporally diagnostic artifact forms that are now believed to span some 6,000 to 7,000 years duration. Meighan and Haynes (1970) returned to the Borax Lake Site in an attempt to differentiate temporally discrete archeological components. They were only partially successful in this endeavor, since radiometric dating was not possible. They used obsidian hydration analysis to sort the artifacts into temporal units. They tentatively established a hydration rate for the Borax Lake obsidian source and, thus, projected ages for the three components they recognized. These three basic components were an early fluted point tradition, a Borax Lake Complex occupation, and a later occupation characterized by Concave Based points.

The first regional synthesis of North Coast Ranges prehistory was formulated by Meighan (1955). He drew upon his own work at CA-Men-500 and data from as far north as Shasta County. Six complexes were defined: The Borax Lake, Mendocino, McClure, Wooden Valley, Clear Lake, and Shasta. He did not distinguish a fluted point component preceding the Borax Lake component, and he assigned the Borax Lake Complex to an age range considerably earlier than is believed correct today. The succeeding Mendocino Complex was believed to be as broadly distributed as the Borax Lake Complex. It is characterized by Concave Base, Side Notched, and other comparatively large projectile point forms as well as the mano/metate and some use of the pestle/mortar.

The other complexes Meighan defined are regionally distinct, Late (i.e. Emergent) Period complexes, and only the Clear Lake Complex is applicable to the Sebastopol area. This complex apparently corresponds to the ethnographic Pomo. Its definition has been generally accepted by later investigators (Fredrickson 1973).

Fredrickson (1973) recognized four patterns in the North Coast Ranges. The earliest pattern is the Borax Lake Pattern, which he originally divided into two aspects: The Borax Lake aspect and the Thomes Creek Aspect. The early phase of the Borax Lake Pattern -- the Borax Lake Aspect -- is assigned by Fredrickson (1973) to the Early Archaic Period (6000 B.C. to 3000 B.C.). The millingstone (i.e. metate) and mano are

common in this period, and Fredrickson believed that the people of these times were adapted primarily to grass seed collection and hunting, with a decided emphasis on the latter. The population units were small and highly mobile, and the entire social groups systematically moved to targeted, key resources. There was little occupation specialization in this adaptive strategy. Sites are often located above 5,000 feet in elevation.

The Mendocino Aspect was characterized by Concave Base and Willits Side Notch projectile points, manos and metates, and also the mortar and pestle. Sites generally occur in low elevation. This aspect existed in the area south and west of Clear Lake, and began no earlier than 3,000 B. C. on the north shores of the lake. The late Borax Lake Aspect, which continued to occupy the northern end of the lake, was characterized by Wide Stem and Concave Base points and manos and metates, with no mortar and pestle. Around 1 B.C., on the east side of the lake basin, the Mendocino- Aspect is replaced or assimilated by the Houx Aspect of the Berkeley Pattern, which emanated from the shores of San Francisco Bay to the south.

The Houx Aspect completely replaced the Mendocino Aspect in southern Sonoma County. However, within northern Sonoma County there is a mixture of Houx Aspect and Mendocino Aspect traits. The characteristic artifacts of the Houx Aspect of the Berkeley Pattern are the Excelsior point series, Houx Wide Stems, “burinated flakes,” and the heavy use of the bowl mortar and pestle. The processing of acorns is obviously of considerable importance to the Houx economy. Hunting is also inferred to be of importance because of the large number of projectile points found in many sites. The Houx Aspect endured until the beginning of the Emergent Period -- circa A.D. 500.

Hildebrandt and Hayes (1983) suggest that the Emergent Period was characterized by changes consisting of relative, if not absolute, population increase due to influxes of new peoples and a reduced resource base The adaptational strategy changed from “foraging” to “collecting.” The Emergent Period is characterized by the appearance of small comer-notched, side-notched, and triangular projectile points; the hopper mortar and pestles; clam shell disc beads; and smoking pipes -- all traits of the Augustine Pattern. Ethnology

Southern Pomo

The inhabitants of Sebastopol at the time of Euro-American contact were members of the Southern Pomo (McLendon and Oswalt 1978). It is common to refer to the Pomo as if they were a tribe in the normal since of the word, but in fact, the term Pomo covers groups speaking seven mutually unintelligible, though related, languages. Therefore, the Southern Pomo had as much difficulty communicating with their Pomoan neighbors (the Central Pomo to the north and Kashaya to the west) as they did with the completely unrelated Wappo to the east and Coast Miwok to the south. The word Pomo is derived from two northern Pomo words, one the name of a village and the other a suffix indicating "those who live at ..." (McLendon and Oswalt 1978:277).

Pomo society was based on residential kin groups, with an emphasis on patrilineal ties. A village was comprised of one or more kin groups and had a chief or headman whose position was inherited patrilineally, although group approval was essential (Gifford and Kroeber 1939). The chief had little authority and acted in an advisory capacity to his people. The chief was aided by others who held leadership positions.

Residences were often multi-family and could house two to five nuclear families. Each family had their own entrance and fire hearth. Single-family dwellings were used. Menstrual huts were small and attached to the main house. A major village contained a semi-subterranean dancehouse that was owned

by the headman. This was the largest structure in the village and had a tunnel entrance. The roof was heavily covered by earth (Peri et al. 1985:25, Figure 3b). Religious ceremonies and dances were conducted in the large structure. Many villages also had at least one semi-subterranean sweathouse similar to the dancehouse but smaller. The sweathouse was also owned by the chief. The sweathouse was used by the men of the village and served as a clubhouse.

Socially, there was considerable interaction between tribelets, and many groups assembled together for the annual "Big Time." These assemblages served several purposes, including ceremonies, arrangement of new marriages, and visiting by kin. Renewal of ceremonial and political relationships was a direct result of these “Big Times.” Trade was also conducted during these gatherings.

Trade was extensive, and exchange systems extended to the coast and also beyond the Central Valley. The Southern Pomo exchanged food, obsidian, wealth items, and other commodities. Their local food resources were augmented by import of seafoods from the west (Davis 1961). The production of clam shell disc beads was practiced by the Southern Pomo, who procured the shells from the Bodega Bay area. Magnesite occurs naturally near Clear Lake, and both finished and partially finished pieces were obtained.

The religious system of the Southern Pomo was complex, but much of the mythology has been lost. Rituals were performed during and individual's life cycle to insure his well-being (Peri et al. 1985: 149-154). Herbal treatment for minor illnesses was a common practice, but major illnesses required a special doctor. Both singing and sucking doctors were known.

The Southern Pomo held Ghost Society and Kuksu ceremonies. While the Ghost Society ceremonies were secret and attended only by initiated men, the Kuksu ceremonies were open to all and other villages were often asked to participate in the four-day-long happening that included dances, feasting, and speeches.

The Southern Pomo occupied permanent villages during the winter months, utilizing the stored foods collected during the preceding seasons. As spring commenced and vegetables began to ripen, the population dispersed into smaller camps away from the main villages. This was a strategy designed to better exploit the various food resources as they seasonally ripened.

Bulbs, seeds, berries, and nuts (particularly acorns) were gathered. Some were used raw while others were prepared for storage against the winter months. The acorns, the dietary staple, were harvested and dried for storage. The acorn contains tannin, and this bitter material required special treatment to remove it. The acorns were hulled and pounded with a pestle until a fine meal was obtained. The meal was then subjected to a leaching process that extracted the bitter tannin. Soup or bread could then be made of the processed meal. The men's activities were centered on fishing and hunting to provide the necessary protein for the diet. large game animals as well as a variety of small mammals were taken. Quail, pigeons, doves, and wild fowl were also hunted (Peri et al. 1985:86-95). Most game was consumed immediately, although venison was dried for winter use.

The Euro-American intrusions into California caused a disruption of Native lifeways that was catastrophic in scope. Shortly after the establishment of San Francisco Solano de Sonoma in 1823, the pressures of the zealous missionaries were brought to bear on the Southern Pomo. The Sonoma mission converted 996 Indians in the year of 1823 (Barrett 1908:44). To the west, the Russians were also causing disruption through their farming and fur trapping on the Russian River. Introduced diseases were perhaps the most serious problem the Indians then faced as they had no immunity to combat the contagious diseases.

After 1822, when Mexico declared itself independent of Spain, the expansion of land grants and encouragement of settlement intensified the problems of the Native populations. Enslavement of the Indians was a common practice as the rancheros needed a large labor force.

However deleterious the Spanish and Mexican intrusions were to the Pomo and other tribes, the American invasion of the 1840s was the most crushing. Certainly, the ravages of diseases and enforced labor were extensive, but the deliberate depopulation of the area by the Americans was nearly overwhelming. The Pomo were forced to march with little food to one of the several reservations (Theodoratus et al. 1975:50-52). Collecting his data long after these disruptions, Barrett was able to identify only one major village in Sebastopol: lá?lahqha meaning "wild goose spring" (McLendon and Oswalt 1978:280, Figure 3).

HISTORIC PERIOD BACKGROUND

The City lies at the near juncture of two Mexican land grants: Cañada de Jonive and Llano de Santa Rosa.

Cañada de Jonive, to the west, a 10,787 acre Mexican land grant, acquired by James Black from Governor Pío Pico in 1845. In 1849, Black traded this rancho to Jasper O'Farrell for his land grant Ranch Nicasio. O'Farrell married in 1849, and he and his wife settled on the Jonive Rancho, which they renamed the "Annaly Ranch." The spelling of the ranch name was later corrupted to "Analy." The O'Farrells' home was an adobe at the foot of Jonive Hill near the community of Freestone, which was later a store, and fell in 1906. The patent for the Rancho lands was issued in 1858 to Jasper O'Farrell (Hoover, Rensch and Rensch 1970).

The Llano de Santa Rosa land grant of 13,361 acres was made to Joaquín Carrillo, a brother-in-law of General Vallejo in 1845 by Governor Manuel Micheltorena. Carrillo built an adobe house near the western edge of the grant in 1846 on what is now Petaluma Avenue. Carrillo became the owner of two hotels in Sebastopol (the Analy and the Pioneer) as well as a saloon and boarding house. In 1871, the patent for the lands was issued to Carrillo. Carrillo lived in Sebastopol until his death in 1899 (Hoover, Rensch and Rensch 1970; Western Sonoma County Historical Society 2003).

The town of Sebastopol was started on the lands between the two ranchos by Joseph H.P. Morris. It was first named "Pine Grove" in 1853. At one point, there were five Sebastopols in California, all named soon after 1854 and the siege of the Russian seaport of that name by British and French forces.

This is the only town with this name to survive—Napa's Sebastopol is now Yountville and the Sebastopols in Tulare, Sacramento, and Nevada counties no longer exist. Local tradition places the renaming of the town as a result of a war of words between two parties at the general store, with one party waiting all day for the other to exit the store. When the post office was set to be established in the town, it was found there was already a Pine Grove in California so the name Sebastopol was selected (Gudde 1969; Western Sonoma County Historical Society 2003).

The early settlers of the region soon discovered the agricultural value of the land. Early crops included fruit, especially grapes and apples. Hops, cherries and berries later became important crops.

Another individual to recognize the importance of the agricultural value of the area was famed horticulturalist Luther Burbank. He started his work in Santa Rosa in 1878, but rapidly needed more space, and purchased 18 acres near Sebastopol on which he established the Gold Ridge Experimental Farm. He could plant large fields and was able to carry on even more extensive experiments with improvements to various crops through plant breeding, election and hybridization (Hoover, Rensch and

Rensch 1970; Western Sonoma County Historical Society 2003). The cottage and three acres of the Gold Ridge Farm are now maintained by volunteers and is associated with the Western Sonoma County Historical Society.

An early connection was established with the completion of the Santa Rosa, Sebastopol & Green Valley Railroad, organized in 1887, and built as a standard gauge line from Santa Rosa to Sebastopol. The rail line was leased to the California Northwestern Railway in 1898, and sold to the Northwestern Railway Company in 1907 (Fickewirth 1992).

The City of Sebastopol was incorporated in 1902, reportedly with the main purpose of taking care of sewage problems. The City acquired land to build a sewage farm along the Laguna de Santa Rosa (Western Sonoma County Historical Society 2003).

In 1903, the Petaluma and Santa Rosa Railway Company was incorporated. The electric railway line was started in April of the following year, and completed by October 1904. The route provided transportation for Sebastopol residents to Santa Rosa, connecting to points beyond, especially with overnight freight service to San Francisco. The railroad line provided a means of quickly getting produce, lumber and dairy products to a wider market, as well as a means for more efficiently getting goods to Sebastopol.

As with the electric railway systems in other areas, the automobile brought about the end of the system in the 1920s and 1930s. People preferred personal automobiles, eliminating the passenger carrying needs, and trucking allowed the economical shipment and delivery of goods and products.

The original wooden depot built in Sebastopol for the railway in 1904, was replaced in 1917 by a stucco and stone building. This building is currently the site of the West County Museum, preserving and interpreting the history of the region (Western Sonoma County Historical Society 2003).

CULTURAL RESOURCES IN SEBASTOPOL GENERAL PLAN STUDY AREA

One hundred and eleven cultural resources have been identified within the Sebastopol area, according to files maintained by the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS). Please note that a number of these site are not in the City limits. The 111 recorded cultural resources span both the prehistoric and historic periods and range from Native American village sites to historic period farms and ranches. 101 of the 111 recorded resources are public and privately-owned buildings within the City of Sebastopol General Plan Area as identified on the Sonoma County Historic Property Data File Directory (see Table 5.1-1).

TABLE 5.1-1: SEBASTOPOL AREA BUILDINGS LISTED ON THE SONOMA COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

Property #	Address	Year Built	Name
004010	10145 Cherry Ridge Road, Sebastopol	1890	Not Listed
004011	1466 Cooper Road, Sebastopol	1890	Not Listed
003890	8008 Covert Lane, Sebastopol	1895	Mary Drake Sinclair House
004012	1301 Cunningham Road, Sebastopol	1890	Not Listed
004013	1420 Cunningham Road, Sebastopol	1880	Not Listed
003779	6794 Depot Street, Sebastopol	1935	Sebastopol Lumber Company
003780	6828 Depot Street, Sebastopol	1935	Diamond Lumber Company

TABLE 5.1-1: SEBASTOPOL AREA BUILDINGS LISTED ON THE SONOMA COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

Property #	Address	Year Built	Name
003816	686 Du Franc Avenue, Sebastopol	1915	Not Listed
003817	695 Du Franc Avenue, Sebastopol	1915	Not Listed
003818	775 Du Franc Avenue, Sebastopol	1915	Not Listed
004014	Dupont Road, Sebastopol	1888	Old Morelli House
003902	746 Eastside Avenue, Sebastopol	1895	Not Listed
003947	Eleanor Avenue, Sebastopol	1905	Multiple Resource F
003945	460 Eleanor Avenue, Sebastopol	1905	Not Listed
003946	470 Eleanor Avenue, Sebastopol	1905	Not Listed
163277	483 Eleanor Avenue, Sebastopol	1936	Not Listed
003903	490 Eleanor Avenue, Sebastopol	1895	Not Listed
171224	7063 Elphick Road, Sebastopol	1930	Olson Ranch
003904	6851 Fannen Avenue, Sebastopol	1904	Not Listed
003905	6869 Fannen Avenue, Sebastopol	1900	Not Listed
163246	136 Florence Avenue, Sebastopol	1956	Not Listed
161670	136 Florence Avenue, Sebastopol	1956	Not Listed
003819	218 Florence Avenue, Sebastopol	1890	Borba House
003820	231 Florence Avenue, Sebastopol	1905	Not Listed
003821	241 Florence Avenue, Sebastopol	1905	Not Listed
003822	253 Florence Avenue, Sebastopol	1903	George Strout House/Strout Kimball
003823	331 Florence Avenue, Sebastopol	1905	Not Listed
003824	348 Florence Avenue, Sebastopol	1890	Not Listed
003825	382 Florence Avenue, Sebastopol	1905	Not Listed
003826	470 Florence Avenue, Sebastopol	1905	Not Listed
004015	5800 Fredericks Road, Sebastopol	1900	Not Listed
136842	655 Gold Ridge Road, Sebastopol	1905	Nicolas W. Meyer Fruit Ranch
003896	Golden Ridge Avenue	1900	Multiple Resource G
004016	11062 Graton Road, Sebastopol	1910	Not Listed
004018	Gravenstein Highway, Sebastopol	1880	Not Listed
004019	1200 Gravenstein Highway, Sebastopol	1932	Enmanji Temple
004017	4353 Gravenstein Highway, Sebastopol	1850	Llano Roadhouse
171300	Gravenstein Highway S, Sebastopol	1960	Apartment #3
171242	Gravenstein Highway S, Sebastopol	1913	Davis Farm / Craftsman House
171223	1235 Gravenstein Highway S, Sebastopol	1930	Not Listed
171226	1382 Gravenstien Highway S, Sebastopol	1949	Sequoia Mini-Mart and Drive-In
171225	1382 Gravenstein Highway S, Sebastopol	1885	Italianate House
171228	1382 Gravenstein Highway S, Sebastopol	1915	Antique Store

TABLE 5.1-1: SEBASTOPOL AREA BUILDINGS LISTED ON THE SONOMA COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

Property #	Address	Year Built	Name
171227	1382 Gravenstein Highway S, Sebastopol	Not Listed	Discount Store
171233	1550 Gravenstein Highway S, Sebastopol	1958	Ranch House
171232	1550 Gravenstein Highway S, Sebastopol	1940	Craftsman House
171235	1610 Gravenstein Highway S, Sebastopol	1920	Craftsman House
171236	1610 Gravenstein Highway S, Sebastopol	1950	Chicken Coop House
003871	7215 Bodega Avenue, Sebastopol	1920	Not Listed
003811	7220 Bodega Avenue, Sebastopol	1910	Not Listed
003872	7224 Bodega Avenue, Sebastopol	1920	Not Listed
003873	7238 Bodega Avenue, Sebastopol	1920	Not Listed
003874	7246 Bodega Avenue, Sebastopol	1920	Not Listed
003875	7249 Bodega Avenue, Sebastopol	1920	Not Listed
003876	7308 Bodega Avenue, Sebastopol	1920	Not Listed
003877	7311 Bodega Avenue, Sebastopol	1920	Not Listed
003878	7320 Bodega Avenue, Sebastopol	1920	Not Listed
003879	7330 Bodega Avenue, Sebastopol	1920	Not Listed
003880	7340 Bodega Avenue, Sebastopol	1920	Not Listed
003812	7402 Bodega Avenue, Sebastopol	1890	Not Listed
003813	7410 Bodega Avenue, Sebastopol	1906	Joseph Frates House, Frates House
003814	7450 Bodega Avenue, Sebastopol	1930	Sebastopol Union Elementary School
003887	7691 Bodega Avenue, Sebastopol	1900	Not Listed
003888	8124 Bodega Avenue, Sebastopol	1905	Not Listed
004002	Bodega Highway, Sebastopol	1860	Not Listed
003889	7777 Bodega Highway, Sebastopol	1890	Gold Ridge Farm
004003	Bohemian Highway, Sebastopol	1860	Freestone, Freestone Historic District
003999	160 Bohemian Highway, Sebastopol	1900	Not Listed
004004	201 Bohemian Highway, Sebastopol	1887	Freestone School
003996	215 Bohemian Highway, Sebastopol	1910	Not Listed
003995	281 Bohemian Highway, Sebastopol	1900	Not Listed
004005	306 Bohemian Highway, Sebastopol	1873	Hends Hotel, Freestone Hotel
003997	475 Bohemian Highway, Sebastopol	1880	Not Listed
004001	480 Bohemian Highway, Sebastopol	1900	Not Listed
003998	489 Bohemian Highway, Sebastopol	1890	Not Listed
004006	500 Bohemian Highway, Sebastopol	1872	Wards General Merchandise
004000	500 Bohemian Highway, Sebastopol	1872	Not Listed
004007	520 Bohemian Highway, Sebastopol	1880	Not Listed
003886	Bonnardel Avenue, Sebastopol	1920	Multiple Resource B

TABLE 5.1-1: SEBASTOPOL AREA BUILDINGS LISTED ON THE SONOMA COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

Property #	Address	Year Built	Name
003815	422 Bonnardel Avenue, Sebastopol	1900	Not Listed
003882	428 Bonnardel Avenue, Sebastopol	1920	Not Listed
003883	442 Bonnardel Avenue, Sebastopol	1920	Not Listed
003884	452 Bonnardel Avenue, Sebastopol	1920	Not Listed
003885	462 Bonnardel Avenue, Sebastopol	1920	Not Listed
003807	Burnett Street, Sebastopol	1905	Multiple Resource C
003778	7136 Burnett Street, Sebastopol	1895	Not Listed
003804	7147 Burnett Street, Sebastopol	1905	Not Listed
003805	7159 Burnett Street, Sebastopol	1905	Not Listed
003806	7169 Burnett Street, Sebastopol	1905	Not Listed
004008	4300 Burnside Road, Sebastopol	1870	Not Listed
003944	Calder Avenue, Sebastopol	1895	Multiple Resource D
003938	7127 Calder Avenue, Sebastopol	1905	Not Listed
003939	7137 Calder Avenue, Sebastopol	1905	Not Listed
003940	7138 Calder Avenue, Sebastopol	1905	Not Listed
003941	7148 Calder Avenue, Sebastopol	1895	Not Listed
003942	7149 Calder Avenue, Sebastopol	1905	Not Listed
003943	7158 Calder Avenue, Sebastopol	1895	Not Listed
003898	7224 Calder Avenue, Sebastopol	1895	Van Loghem House
003899	7231 Calder Avenue, Sebastopol	1910	Duer House
003900	7301 Calder Avenue, Sebastopol	1915	B D Lindermann House, Vina Mylan House
003901	7304 Calder Avenue, Sebastopol	1915	Not Listed
004009	4200 Canfield Road, Sebastopol	1860	John Taber House

SOURCE: SONOMA COUNTY HISTORIC PROPERTY DATA FILE DIRECTORY

TABLE 5.1-2: ADDITIONAL BUILDINGS LISTED ON THE CALIFORNIA INVENTORY OF HISTORIC RESOURCES

Location	Name
Sebastopol	Petaluma and Santa Rosa Railway Powerhouse (N1707)
Sebastopol	Sebastopol Depot of the Petaluma and Santa Rosa Railway (N1937)

NATIVE AMERICAN CONSULTATION

As part of the outreach efforts associated with the General Plan Update, letters were sent to the following tribes and tribal contacts, in compliance with SB 18, to request information regarding the General Plan Area:

- The Native American Heritage Commission;
- Ms. Patricia Hermosillo, Chairperson, Cloverdale Rancheria of Pomo Indians;
- Mr. Mario Hermosillo, Jr., Tribal Environmental Planner, Cloverdale Rancheria of Pomo Indians; Mr. Harvey Hopkins, Chairperson, Dry Creek Rancheria of Pomo Indians;
- Ms. Marjorie Mejia, Chairperson, Lytton Rancheria of California;
- Ms. Lisa Miller, Tribal Administrator, Lytton Rancheria of California;
- Mr. Emilio Valencia, Chairperson, Stewarts Point Rancheria;
- Ms. Nina Hapner, Environmental Planning Department, Stewarts Point Rancheria;
- Mr. Otis Parish, Tribal Historic Preservation Office, Stewarts Point Rancheria;
- Mr. Greg Sarris, Chairperson, The Federated Indians of Graton Rancheria; Mr. Gene Buvelot, The Federated Indians of Graton Rancheria;
- Ya-Ka-Ama; and
- Western Sonoma County Historical Society

The Native American Heritage Commission responded with a letter dated February 21, 2014. On June 3, 2014, Mr. Otis Parish, Tribal Historic Preservation Office, Stewarts Point Rancheria, responded via email stating: "This letter constitutes our answer to your letter regarding The City of Sebastopol General Plan Study Area consultation. The City of Sebastopol is out of The Kashia Band of Pomo Indians of the Stewarts Point Rancheria's aboriginal cultural area of concern. Thus, we have no interest." A response dated June 16, 2014 has also been received from Nick Tipon of the Sacred Sites Protection Committee of the Federated Indians of the Graton Rancheria. The Committee has requested a meeting with the City to discuss existing policies and potential changes to policies.

PALEONTOLOGICAL RESOURCES

Among the natural resources deserving conservation and preservation, and existing within the update Study Area, are the often unseen records of past life buried in the sediments and rocks below the pavement, buildings, soils, and vegetation which now cover most of the area. These records – fossils and their geologic context – undoubtedly exist in large quantities below the surface in many areas in and near the City of Sebastopol, and span millions of years in age of origin. Fossils constitute a non-renewable resource: Once lost or destroyed, the exact information they contained can never be reproduced.

Paleontology is the science that attempts to unravel the meaning of these fossils in terms of the organisms they represent, the ages and geographic distribution of those organisms, how they interacted

in ancient ecosystems and responded to past climatic changes, and the changes through time of all of these aspects.

The sensitivity of a given area or body of sediment with respect to paleontologic resources is a function of both the potential for the existence of fossils and the predicted significance of any fossils which may be found there. The primary consideration in the determination of paleontologic sensitivity of a given area, body of sediment, or rock formation is its potential to include fossils. Information that can contribute to assessment of this potential includes: 1) direct observation of fossils within the project area; 2) the existence of known fossil localities or documented absence of fossils in the same geologic unit (e.g., "Formation" or one of its subunits); 3) descriptive nature of sedimentary deposits (such as size of included particles or clasts, color, and bedding type) in the area of interest compared with those of similar deposits known elsewhere to favor or disfavor inclusion of fossils; and 4) interpretation of sediment details and known geologic history of the sedimentary body of interest in terms of the ancient environments in which they were deposited, followed by assessment of the favorability of those environments for the preservation of fossils.

The most general paleontological information can be obtained from geologic maps, but geologic cross sections (slices of the layer cake to view the third dimension) must be reviewed for each area in question. These usually accompany geologic maps or technical reports. Once it can be determined which formations may be present in the subsurface, the question of paleontological resources must be addressed. Even though a formation is known to contain fossils, they are not usually distributed uniformly throughout the many square miles the formation may cover. If the fossils were part of a bay environment when they died, perhaps a scattered layer of shells will be preserved over large areas. If on the other hand, a whale died in this bay, you might expect to find fossil whalebone only in one small area of less than a few hundred square feet. Other resources to be considered in the determination of paleontological potential are regional geologic reports, site records on file with paleontological repositories and site-specific field surveys.

Paleontologists consider all vertebrate fossils to be of significance. Fossils of other types are considered significant if they represent a new record, new species, an oldest occurring species, the most complete specimen of its kind, a rare species worldwide, or a species helpful in the dating of formations. However, even a previously designated low potential site may yield significant fossils.

5.2 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

The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

Hydric Soils. One of the three wetland identification parameters, according to the Federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

Hydrophytic Vegetation. Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

Sensitive Natural Community. A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, State, or Federal agencies. CEQA identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Wildlife (CDFW) tracks sensitive natural communities in the California Natural Diversity Database (CNDDB).

Special-Status Species. Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by Federal, State, or other agencies. Some of these species receive specific protection that is defined by Federal or State endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term “special status” includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);
- State listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the U.S. Fish and Wildlife Service (USFWS) or the CDFW as a species of concern (USFWS), rare (CDFW), or of special concern (CDFW);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);

- 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 California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), the U.S. Army Corps of Engineers (USACE), and the National Marine Fisheries Service (NMFS). These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the Federal, State, and local regulations that are applicable to implementing the General Plan.

FEDERAL

Federal Endangered Species Act

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a "take" unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

Migratory Bird Treaty Act

To kill, posses, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Section 668) protects these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews Federal agency actions that may affect these species.

Clean Water Act – Section 404

Section 404 of the Clean Water Act (CWA) regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §323.2(f)].

Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows [33 C.F.R. §328.3(a)]. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

The USACE is the agency responsible for administering the permit process for activities that affect waters of the U.S. Executive Order 11990 is a Federal implementation policy, which is intended to result in no net loss of wetlands.

Clean Water Act – Section 401

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the water quality certification, the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the State.

Department of Transportation Act - Section 4(f)

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

> *It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture,*

and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of a historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

STATE

Fish and Game Code §2050-2097 - California Endangered Species Act

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

Fish and Game Code §1900-1913 California Native Plant Protection Act

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the State. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFW 10 days in advance of approving a building site.

Fish and Game Code §3503, 3503.5, 3800 - Predatory Birds

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called “raptors,” are protected. The law indicates that it is unlawful to take, posses, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

Fish and Game Code §1601-1603 – Streambed Alteration

Under the California Fish and Game Code, CDFW has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a “Streambed Alteration Agreement” from CDFW prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFW may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements

are usually initiated through the local CDFW warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

Public Resources Code § 21000 - California Environmental Quality Act

The California Environmental Quality Act (CEQA) identifies that a species that is not listed on the Federal or State endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e., candidate or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of "Species of Special Concern," developed by the CDFW. Additionally, the California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

Public Resources Code § 21083.4 - Oak woodlands conservation

In 2004, the California legislature enacted SB 1334, which added oak woodland conservation regulations to the Public Resources Code. This new law requires a county to determine whether a project, within its jurisdiction, may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county must require oak woodland mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining an appropriate number of replacement trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the county.

California Oak Woodland Conservation Act

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California's oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the State.

California Wetlands Conservation Policy

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- 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 Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following goals, policies related to biological resources:

Chapter III Conservation, Parks, and Open Space

Goal 1 Preserve areas with important biotic resources such as wetlands, riparian corridors, and areas with scenic features.

P.1 Coordination with other jurisdictions: Work with other jurisdictions and regional and state agencies in developing open space programs.

Program 1.1: Continue to work with the Sonoma County Agriculture and Open Space District to establish priorities and implement their Acquisition Plan.

Responsibility: Planning Department

P.2 Specific Use Objectives for Open Space: leave and/or restore open space areas in their natural state; limit uses to those with a minimal environmental impact.

P.3 Access to Open Space: Provide public access to open space and parkland in a manner compatible with the preservation and enhancement of the natural environment.

P.4. Conservation Easements: Use conservation easements wherever possible to protect, in perpetuity, environmentally sensitive areas.

Program 4.1: Require development proposals for land which includes or is adjacent to environmentally sensitive areas to develop a resource analysis of the property to determine the boundary of wetlands, upland habitat, the presence and location of endangered plant and animal species, and any other information relevant to the preservation of biotic resources.

The resource analysis will identify and locate, at a minimum, the following:

a) the type and location of endangered plant and animal species;
b) riparian vegetation on and within 50 feet of subject property;
c) the location of wetlands, if applicable;
d) potential archaeological resources, if applicable; and

e) flood hazard areas.

The resource analysis will contain, at a minimum, the following types of investigations and mitigations:

a) Determine, if applicable, the area and location of undeveloped land required to protect and enhance the continued viability of biotic resources, wetlands, and sensitive areas. (This involves identifying land that is functionally a part of the wetlands ecosystem and which should be preserved in a natural state.)
b) Recommend measures for proposed development that will mitigate impacts on biotic resources and sensitive habitat.

Responsibility: Planning Department

The resource analysis will take place before complete development proposals are formally submitted to the City. Qualified biologists and other professionals will be selected by the City to conduct the resource analysis paid for by the developer.

P.5 Securing Permanent Open Space as a Condition of Development: Require that open space which is dedicated as a condition of development approval be permanently restricted to open space by recorded map or deed.

Program 5.1: Establish the following criteria for mitigations implemented subject to the resource analysis specified in Program 5.1:

a) A mitigation program prepared by a qualified biologist selected by the City will be prepared indicating the measures required to restore and enhance the biotic resources to a level equal to or better than existing conditions. The mitigation program will contain specific and measurable performance criteria.
b) Mitigations will be subject to a detailed mitigation monitoring program which will include regular field surveys by a qualified biologist to evaluate the success of the mitigation program and recommend remedial measures, as needed to meet the criteria established in the mitigation program.
c) The mitigation monitoring program will prepare annual reports for a period of time specified by the biologist on the progress and success of the program. These reports will be submitted to the City for review and approval.
d) Establishment of a financial mechanism, such as a bond, to ensure that the mitigation measures are implemented, monitored, and maintained according to the mitigation monitoring program.

Responsibility: Planning and Public Works Departments

P.6. Protect environmentally sensitive areas.

Program 6.1: Work with Sonoma County to establish a joint program to transfer Development Rights from environmentally sensitive areas to receiver areas where development may be allowed at increased densities.

Responsibility: Planning Department

Program 6.1: Establish standards for the management and maintenance of open space within and adjoining subdivisions. Regulations should include standards to ensure control of potential hazards and mechanisms for repair of damage.

Responsibility: Planning and Public Works Departments

Goal 2 Ensure the maintenance of wetlands areas adjacent to City boundaries as permanent open space.

P.7. Preserve and enhance the Laguna de Santa Rosa and Atascadero Creek:

Program 7.1: Preclude development that would adversely affect the natural vegetation, wildlife habitat, or rare or endangered species in designated wetland and riparian areas, pursuant to Map 2: Environmentally Sensitive Areas.

Responsibility: Planning Department

A list of rare and endangered species found within the Planning Area is contained in the Background Report.

Program 7.2: Revise the Zoning and Subdivision Ordinances to prohibit development on land adjacent to designated environmentally sensitive areas unless environmental impacts are mitigated.

Responsibility: Planning Department

Program 7.3: Revise the Zoning and Subdivision Ordinances to establish building envelopes that avoid environmentally sensitive areas.

Responsibility: Planning Department

Program 7.4: Revise the Zoning and Subdivision Ordinances to establish minimum building and activity setbacks from the edges of any wetland and upland riparian areas.

Responsibility: Planning Department

Program 7.5: Revise the Zoning and Subdivision Ordinances to limit new roads, structures, and utility lines within environmentally sensitive areas as defined in Map 2.

Responsibility: Planning Department

Program 7.6: Revise the Zoning and Subdivision Ordinances to prohibit dumping or filling within environmentally sensitive areas.

Responsibility: Planning Department

Program 7.7: Revise the Zoning Ordinance to establish an overlay zoning district for environmentally sensitive areas.

Responsibility: Planning Department

Program 7.8: Provide the Planning Commission and City Council with information regarding actions of the North Coast Regional Water Quality Control Board, the City of Santa Rosa, the Sonoma County Water Agency and other agencies within the Referral Area.

Responsibility: Planning Department

Map 2: Environmentally Sensitive Areas shall be consulted by Planning Staff in the review of development proposals submitted to the City. Additional policies and programs regarding flood hazards are contained in the Safety Chapter.

Goal 3 Protect, maintain and restore wetlands areas.

P.8. Floodwater Capacity and Creek Restoration. Preserve the existing and future floodwater carrying capacity of creeks and channels during creek restoration.

Program 8.1: Develop maintenance guidelines for creeks and wetlands areas to reduce flooding, sedimentation and erosion while maintaining and/or enhancing the riparian vegetation and wildlife.

Responsibility: Planning and Public works Departments

Program 8.2: Install signs indicating the location and names of local creeks and wetlands areas.

Responsibility: Public Works Department

Program 8.3: Label each stormwater inlet in the City to identify receiving waters. Signs should indicate the receiving watercourse and state that no dumping is permitted.

Responsibility: Public Works Department

Program 8.4: Require development applications which would generate runoff into wetlands to include design features ensuring detention of sediment and contaminants.

Responsibility: Planning and Public works Departments

Goal 4 Protect and preserve soil as a natural resource.

P.9 Encourage Agriculture in the Referral Area: Encourage the continuation and strengthening of agricultural practices which are compatible with the surrounding wetlands in the Referral Area.

P.10 Control Soil Erosion: Control soil erosion to prevent flooding and destruction of natural waterways, to maintain water quality, and to reduce public costs for flood control and watercourse maintenance.

Program 10.1: Continue to require grading permits for new construction, wherever applicable.

The grading permit will control erosion and will include a revegetation plan wherever appropriate.

Responsibility: Planning and Building Departments

Program 10.2: Include in the revised Zoning Ordinance provisions for hillside protection that includes specific performance criteria.

Responsibility: Planning Department

P.11 Reduce Soil Contamination: Reduce soil contamination from chemicals through careful regulation of the storage, transportation and use of chemicals.

Program 11.1: Reduce City use of chemical herbicides and fertilizers to the maximum extent possible. Wherever feasible use substitutes which are biologically safe and/or organic.

Responsibility: Public Works Department

Program 11.2: Continue to enforce the city's Hazardous Materials Storage Ordinance.

Responsibility: Fire Department

Refer to the Safety Chapter for additional policies and programs regarding hazardous materials storage and transportation. The Background Report contains information regarding soil types found in the Planning Area.

Goal 5 Conserve, protect and enhance trees and native vegetation.

P.12 Encourage Planting of Native Trees and Native Vegetation: Encourage the planting of native and drought-resistant trees and vegetation in new developments and in City owned parks, trails and recreational facilities.

P.13 Preserve and Plant Trees: Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction or by other means.

Program 13.1: Continue to implement the Tree Protection Ordinance.

Responsibility: Building and Public Works Departments

The Tree Protection Ordinance requires a Tree Protection Plan (TPP) prepared by a certified arborist for projects which result in tree removal. The TPP includes a replacement program; indicates the location of existing mature trees, tree stands, and species; the fencing of sensitive areas; and other measures to protect trees.

Program 13.2: Prepare and adopt a Street Tree Planting and Management Program establishing varieties, size and spacing requirements, maintenance standards, and priority planting schedules. This program shall give priority to those streets with heavy vehicular traffic and those which link open space and activity centers.

Responsibility: Planning and Public Works Departments

Program 13.3: Continue requiring the planting of trees in parking lots to provide shade and visual screening.

Responsibility: Planning Department

(The Community Identity Chapter has additional policies relating to landscaping parking areas.)

P.14 Preserve and Plant Trees: Require new commercial and industrial development to incorporate trees in landscape plans.

P.22 Water Conservation: Develop and implement water conservation programs for Sebastopol.

Program 22.1: Implement the Water Reduction and Landscaping Ordinance. Consider the use of water saving devices for residential and commercial uses; limits to the amount of turf area in new developments; and the use of drip irrigation systems.

Responsibility: Planning, Building Inspection, and Public Works Departments

Program 22.2: Develop and implement a Water Conservation Program.

Responsibility: Public Works Department

The Water Conservation Program would continue to provide incentives for the installation of water saving toilets, and develop guidelines for water efficient irrigation systems and xeric scape landscaping.

Goal 11 Incorporate open space in all major developments.

P.41 Open Space in Commercial Developments: Require usable open space for residential and commercial developments.

Program 41.1: Establish a formula in the Zoning Ordinance for the amount of on-site open space to be provided per square foot of building area for commercial, office and industrial developments.

Responsibility: Planning Department

This would require establishing in the Zoning Ordinance a threshold size for commercial, office and industrial development beyond which the provision of on-site open space would be required. The ordinance would also specify the amount and type of on-site open space and related amenities that would be required, related to the size of the development. The open space provided in commercial development would be used to complete the City-wide trails system, and provide on-site amenities for employees.

The City's Parkland Dedication Ordinance requires residential development to provide land for parks and open space or pay an in-lieu fee. The policy and program above requires developers of commercial property to provide a specific amount of open space on-site for use by employees and, where applicable, access for trails and pedestrian paths. Major development is defined as commercial development over 15,000 square feet. The amount of open space will vary with the size of the commercial development and will be specified in the Zoning Ordinance.

Goal 14 Protect and enhance existing sensitive habitats in the Laguna.

P.45 Seek Purchase Agreements from Willing Sellers: Seek purchase or easement on private lands from willing sellers only.

Program 45.1: Adopt an ordinance that would prohibit any filling of natural lands south of Highway 12. "Natural Lands" are those that are below the 76 foot elevation and are classified as riparian woodland, seasonal wetlands, annual grassland, marsh, vernal pool, pasture and oak woodland.

Responsibility: Planning Department

P.46 Buffer Areas: Provide buffer areas to avoid or minimize potential adverse ecological effects of proposed developments, existing uses adjacent to the Laguna and the area defined by the Laguna Park Master Plan.

Program 46.1: Establish the following buffers for redevelopment of existing urban land adjacent to Laguna habitats. Refer to Map 4.

Zone 1: Buffers for Redevelopment of Existing Urban Land Adjacent to Laguna Habitats: Zone 1 is defined as the area north of the Joe Rodota Trail. Where new development or redevelopment is proposed in this area, a minimum buffer of50 feet should be adopted, or local wetland zoning regulations followed, whichever provides the greater buffer width. The 50 foot minimum buffer setback begins at the edge of the riparian dripline, or other wetland habitat. The dripline begins at the edge of the tree canopy. A 20 foot wide trail and landscaped area can be installed along the urban fringe within this zone.

Zone 2: Buffers for New Development in Existing Laguna Habitat: Zone 2 is defined as the area south of the Joe Rodota Trail. Where redevelopment or new development is proposed in existing natural areas within this zone, the following buffer setbacks would be applied: a protected buffer of at least 200 feet from the edge of a wetland, endangered species population or California Department of Fish and Wildlife (DFW) preserve. The buffer setback will be a minimum of 50 feet from the 100 year flood contour. Within this buffer no new development would be allowed, except as allowed under Program 5.1 in Section 1 of this Chapter requiring a resource analysis.

Responsibility: Planning Department

Program 46.2: Provide buffers for farm management activity. Develop measures to protect riparian habitats along the Laguna channel, and other sensitive habitats.

Responsibility: Planning Department

Program 46.3: Establish a City-sponsored educational program to seek voluntary compliance with best management practices that will promote and enhance riparian habitats and endangered species on privately-owned land.

Responsibility: Planning Department

P.47 Buffer Areas are Minimum Requirements: The buffer areas described in Program 1.1 are intended to be the minimum required. Development proposals for land within or adjacent to natural lands are to develop a resource analysis of the property to determine the boundary of wetlands, upland habitat, the presence and location of endangered plant and animal species, and any other information relevant to the preservation of biotic resources and sensitive habitats or natural lands.

Refer to Program 5.1 in Section I of this Chapter for the requirements of the resource analysis.

P.48 Provide Buffers for Farm Management Activity: Develop measures to protect riparian habitats along the Laguna channel, and other sensitive habitats.

(Specific buffers and fencing setbacks for the City owned Barlow Field are specified in F. Operations and Management, which follows.)

Program 48.1: Obtain where possible, easements from willing sellers to fence a minimum distance of 50 feet from the Laguna's edge to protect the channel from impacts associated with grazing animals.

Responsibility: Planning Department

P.49 Building and Road Construction Standards: Establish design standards for construction of new roads and buildings adjacent to Laguna habitats.

Residential and commercial developments where backyards face a creek or other open space have a number of negative qualities:

- Attract litter, vandals and motorcycles
- Waste valuable open space
- Can be hazardous to youngsters exploring waterways
- Boring, outmoded single purpose land use.

Provide public right-of-way which give access between residential and commercial buildings, and the Laguna open space to:

- Provide more homeowner privacy and security
- Generally equal or better the development's lot yield
- Provide more useable open space
- Often make homes more valuable
- Enhance ecological values for wetland and neighborhood environments.

P.50 Minimize Impacts of Backyards: Minimize the negative environmental effects associated with backyards adjacent to the Laguna habitats.

Program 50.1: Establish the following design criteria in the Zoning Ordinance:

a) New development in Zone 2 (south of the Rodota Irail) shall provide access by means of public right-of-way which are peripheral to Laguna habitats and serve to separate the fronts of residences from open space. (Refer to Map 4.)

b) New developments shall have the fronts of buildings facing toward the Laguna open space, with public right-of-way in between.

Responsibility: Planning Department

Goal 15 Restore and enhance Laguna habitats

Laguna wetlands (riparian woodland, marsh, seasonal wetlands and vernal pools) provide free "ecosystem services" which have a number of important benefits for humans and wildlife:

- waterfowl breeding (mallards, wood duck)
- habitat for waterfowl and other birds (willow flycatcher)
- wildlife habitat (deer, river otter, western pond turtle)
- habitat for endangered species (Sebastopol meadowfoam, yellow billed cuckoo)
- anadromous marine fish production (steelhead)
- freshwater fish production (trout, native fish)

- flood control (75,000 acre-feet offlood retention during a 100 year storm)
- water quality (natural water filter and purification)
- shoreline stabilization (wetland vegetation prevents erosion)
- recreational opportunities (hiking, photography, fishing, and hunting)
- education (outdoor biology classrooms)

Within the Laguna ecosystem, wetlands have undergone drastic losses: 94 percent of the vernal pool habitat has been lost, 92 percent of the riparian woodland has been lost, and 57 percent of seasonal and perennial freshwater marsh has been lost. The Department of Fish and Wildlife has an official policy to double wetland acreage in the State. Refer to Figure 2d in the Laguna Park Master Plan for an illustration of the restoration scheme. The following policies and programs build on those of the California Department of Fish and Wildlife and the County of Sonoma to enhance and restore the Laguna habitats.

P.51 Riparian Woodland: Revegetate and enhance those areas identified as "Restored Riparian Habitat" in Figure 2d in the Laguna Park Master Plan.

The greatest amount of change in habitat will be conversion of seasonal wetland to riparian woodland. A substantial acreage of grassland also will be converted to riparian woodland. For those areas not owned by the City of Sebastopol, seek voluntary cooperation of public landowners. For private property owners, seek the purchase of easements or lands from willing sellers. In the absence of purchase or easement, seek voluntary landowner cooperation for publicly-financed fencing of a minimum 50 foot buffer zone along the Laguna channel to eliminate grazing impacts and allow for the reestablishment of riparian trees.

P.52 Freshwater Marsh. Restore freshwater marsh by renovating the City owned "sewer farm ponds". (Refer to Map 7 in Volume 1: Laguna Park Master Plan). Also, seek creation of marsh at the Subregional System's Brown Farm retention basin, in the area shown as "Restored Marsh" and "New Open Water Configuration" in Map 3.

P.53 Vernal Pools and Endangered Species: Seek voluntary landowner cooperation for elimination of irrigation and fill on those areas identified as vernal pool or sensitive area in Map 3 in the absence of purchase or conservation easement.

P.54 Restore and Enhance Oak woodland: Restore and enhance oak woodland in the Laguna.

The majestic valley oaks are the aesthetic signature of the Laguna ecosystem. A valley oak provides nesting, roosting and feeding habitat for numerous bird species and its acorns provide an important food source for many species including deer, squirrels and the acorn woodpecker. Oaks have undergone a state-wide and local decline because regeneration has virtually stopped as a result of livestock grazing and mowing. On privately-owned agricultural lands in the Laguna area, irrigation continues to weaken mature trees with root rot, accelerating mortality.

Unirrigated oak woodland has undergone a 94 percent decrease in acreage in the Laguna ecosystem. The restoration programs for oak woodlands constitute an essential part of the Laguna Park Master Plan.

P.55 Protect Oaks: Protect all oaks on City owned land from grazing and irrigation impacts.

Program 55.1: Plant oak trees in areas designated as "Restored Oak Woodland" and "Restored Riparian/Oak Woodland" in Map 3. (Refer to the Tree Protection Ordinance,)

Responsibility: Department of Public Works

Goal 16 Recover declining rare or endangered species.

One of the benefits anticipated in the restoration of woodlands and wetlands in the Laguna Park Master Plan Area would be the possibility of developing programs with wildlife agencies and resource groups for the re-introduction or re-stocking of declining, rare or endangered species native to the Laguna ecosystem. Preservation and restoration would provide a reasonable expectation of returning the endangered California yellow-billed cuckoo to the Laguna. Other rare or endangered species associated with riparian habitat that would benefit from this enhancement are: yellow warbler, wood duck, osprey, bald eagle, willow flycatcher, yellow-breasted chat, red-legged frog, western pond turtle, ringtailed cat and the California freshwater shrimp.

P.56 Enhance the native salmonid fishery.

Program 56.1: Establish a program with California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and Trout Unlimited (TU) to improve fishery habitat by revegetating the banks of the Laguna to cast shade added by trees and place instream cover (boulders, logs). Upstream spawning habitats should be identified.

Responsibility: Public Works Department and organizations listed above.

P.57 Endangered Species: Reintroduce extirpated or endangered species and expand existing populations of those present in the Laguna Park Master Plan Area.

Program 57.1: Reintroduce the following species:

a) California Freshwater Shrimp (Syncaris pacifica)

This aquatic invertebrate is a State and Federally listed endangered species. Begin a program with CDFW, USFWS, NMFS and TU for restoration of tributaries and Laguna channel banks which would provide the kind of below-water root structure required by the shrimp.

b) California Yellow-billed Cuckoo (Coccyzus americanus occidentalis)

This is a State-listed endangered species. A critical habitat element required is relatively broad expanses (20 acre minimum) of willow and/or cottonwood riparian woodland. Begin a program with CDFW and the Audubon Society for restoration of woodland in the study area which would allow for reintroduction. Promote similar efforts in other areas of the Laguna.

c) White Sedge (Carex albida)

Begin a program with CDFW and the California Native Plant Society (CNPS) to reintroduce the white sedge (Carex albida). This State- listed endangered species once occurred in the Laguna marshes. It could be reintroduced into existing or restored habitat.

Responsibility: Public works Department and organizations listed above.

Program 57.2: Reintroduce Other Rare or Uncommon Plants.

Begin a program with CDFW and CNPS to experimentally establish populations of two rare plants, California beaked rush (Rhynchospora californica) and Round-headed beaked rush (R. globularis). Expand Populations of Endangered Plants.

Responsibility: Public Works Department and organizations listed above.

Program 57.3: Begin a program with USFWS, CDFW and CNPS to distribute seed into available habitat for Sebastopol meadowfoam, Sonoma sunshine and Burke's goldfield. Successful efforts can increase populations of these endangered plants in the study area.

Responsibility: Public Works Department and organizations listed above.

Program 57.4: Expand Populations Rare or Uncommon Animals.

Yellow warbler (Dendroica petechia brewsteri), and yellowbreasted chat (Leteria virens) are bird species of special concern which will benefit from the restoration of riparian habitat in the rural reaches. Begin a program with CDFW and the Audubon Society to expand populations of these birds. Also, install wood duck nest boxes to reestablish these birds in the local woodlands.

Responsibility: Public Works Department and organizations listed above.

Goal 17 Establish a Revegetation Scheme to Implement the Restoration Plan and a Monitoring Program for the Revegetation and Restoration Plan.

The revegetation scheme for the Laguna Park Master Plan Area is based on planting appropriate plant materials in habitats offered by the man-made and natural environments. Revegetation will occur in the Laguna where soil and hydrology support a particular assemblage ofplant species tolerant of the environmental conditions. The resultant increase in local native riparian forest will improve the wildlife habitat value, and maximize biodiversity, especially for birds, small mammals, and the insect prey base.

P.58 Additional Fencing: Provide additional fencing for a buffer strip.

Program 58.1: Establish a funding mechanism to purchase and install fencing for the buffer area delineated in the Laguna Park Master Plan (Map 3).

Responsibility: Planning Department

P.59 Planting Zones: Utilize the planting zones and typical species for restored Laguna indicated in Table 3 below.

P.60 Ensuring Effective Restoration: Ensure that preservation and restoration efforts are implemented and effective.

Program 60.1: Ensure that a revegetation contractor monitors plant development and survival in the spring and fall for three years after planting. Annual reports will be written, with a final report in the third year. Remedial planting will occur annually to bring any shortcomings into compliance with the revegetation success criteria.

Responsibility: Public Works Department

Program 60.2: Promote cooperative studies with local and regional colleges and universities.

Responsibility: Planning Department

Program 60.3: Develop a steelhead, trout and possibly salmon, restocking program in cooperation with the Laguna Foundation, California Department of Fish and Wildlife (CDFW), U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), the Subregional System and Trout Unlimited (TU).

Responsibility: Public Works Department

Program 60.4: Develop a program to restore endangered species in cooperation with the Laguna Foundation, CNPS, Audubon, TU, CDFW and USFWS (agencies which have permit authority over collection and translocation). .

Responsibility: Public Works Department and organizations listed above.

An organization independent of the City could oversee these programs.

Goal 18 Manage Barlow field on an interim basis to enhance biotic resources.

Recent apple waste effluent disposal at Barlow field, and resultant mosquito abatement activity involving dredging have resulted in a need to reform management practices which degrade the ecological integrity of this site which is located east of Morris Street. Irrigation in the Laguna should be allowed while protecting oak trees from the negative effects of such irrigation, including on the City owned land east of the Laguna.

P.61 Revise Mosquito Abatement Practices: Develop measures to rectify the impacts from the mosquito abatement activities and manage this task to enhance biotic resources.

Program 61.1: Establish the following programs for the Barlow field area:

a) Dredge Spoil Mitigation: Move dredge spoil pi les onto appropriate areas on site and rehabilitate injured trees (accomplished).

b) Irrigation of Oaks Trees: Install ditches to drain the stand of injured oaks to avoid further mortality (accomplished). Discontinue irrigation within the dripline of all trees on the site.

c) Fenced Buffer Strip: Maintain the 100-300 foot variable strip of land near the Laguna in an nonirrigated condition. Extend fencing as shown in Map 3 to prevent grazing impacts. This measure will allow for regeneration of oak trees and provide increased buffering from potential irrigation impacts.

d) Habitat Elements: Dead or downed trees (Le., snags, logs) will no longer be removed from the site so that associated wildlife values will be preserved.

e) Mosquito Abatement Practices: Require the Marin-Sonoma Mosquito Abatement District (M/SMAD) to obtain a Section 404 permit from the U.S. Army Corps of Engineers before any more projects involving fill of wetlands occur on lands within the Laguna Master Plan Area. The fill permit shall be comprehensive, to include all lands within the Master Plan Area, as defined by Map 3.

f) Marin-Sonoma Mosquito Abatement District: Keep the Marin-Sonoma Mosquito Abatement District informed of changes to the Laguna de Santa Rosa Plan.

g) Marin-Sonoma Mosquito Abatement District: Work with the Marin-Sonoma Mosquito Abatement District to develop long-term best management practices compatible with City policies and components of the Laguna Park Master Plan.

h) Biologic Review of all Filling and Dredging Plans: Require M/SMAD to conduct a biological review of all filling and dredging plans for the study area. A field survey to determine whether impacts to species of concern, sensitive habitats or protected trees should also be conducted by M/SMAD. All biological reports shall be reviewed by the City, CDFW and concerned groups (ie. CNPS, Audubon, Laguna Foundation, etc.)

i) Oak Regeneration Areas: Driplines of all oak trees should be surrounded with steel stakes posted with "No Irrigation - Oak Regeneration Area" signs. Groves of trees in the interior portions of Barlow field should be identified and fenced to prevent intrusion of cattle.

j) Tree Planting Program: Trees should be planted to replace those lost as a result of mosquito abatement activity and irrigation. An inventory of dead trees should be conducted and replaced at a ratio of 10:1.

Responsibility: Public Works Department in cooperation with organizations listed above.

P.62 Restoration of the Barlow field: Identify and implement alternate means of waste disposal from the Barlow Processing Plant so that the Barlow field can be restored to its original habitat.

Goal 19 Preserve and Enhance the Visual Character of the Laguna.

P.63 Minimize Physical and Visual Impacts: Minimize the physical and visual encroachment of development into the Laguna and its environs on publicly-owned lands.

Program 63.1: Prohibit additional building construction in the area of the Laguna Youth Park and adjacent sewer ponds beyond a distance of 200 feet from the center line of Morris Street.

Responsibility: Planning Department

Program 63.2: Prohibit new building construction on the Barlow field parcel.

Responsibility: Planning Department

P.64 Discourage Building near the Laguna Channel: Discourage other public agencies from developing building structures within 800 feet of the center line of the Laguna Channel.

Program 65.1: Analyze proposed structures within 1250 feet of the Laguna de Santa Rosa for their effect on the views of and from the Laguna de Santa Rosa.

Responsibility: Planning Department

Program 65.2: Analyze proposed structures within 1250feet of the Laguna de Santa Rosa for their potential effect on the Laguna skyline. Do not permit massive, uninterrupted penetrations of the tree line by roofs or other building structures.

Responsibility: Planning Department

Program 65.3: Discourage additional building construction in the area of the Laguna Youth Park and adjacent sewer ponds 200 feet from the center line of Morris Street.

Responsibility: Planning Department

Program 65.4: Prohibit building construction on the Barlow field parcel.

Responsibility: Planning Department

Program 65.5: Develop design standards for development within the viewshed within 1250 feet of the Laguna de Santa Rosa.

Responsibility: Design Review Board

P.66 Encourage Clustering of Structures: Encourage the clustering of structures to develop open space that physically and visually relates to the Laguna.

Goal 20 Develop a Comprehensive Recreation and Interpretive Trail System.

P.67 Complete the Sebastopol segment of the Sonoma County Recreation Trail.

Program 67.1: Develop a trail on the south side of Highway 12 west to the intersection of Morris Street.

Responsibility: Planning and Public Works Departments

Program 67.2: Develop a bicycle trail along Morris Street.

Responsibility: Planning and Public Works Departments

Program 67.3: Develop a new recreation trail running in a north-south direction from the Joe Rodota Trail to the southern boundary of the Planning Area.

Responsibility: Planning and Public Works Departments

Program 67.4: Develop a new recreation trail through easements and opportunity acquisitions along the 76 foot contour line indicated in Map 3.

Responsibility: Planning and Public Works Departments

The Transportation Chapter contains policies and programs which call for a comprehensive trails system. The policies and programs above are summarized from the Laguna Park Master Plan and implemented by Map 4: Bicycle and Pedestrian Trails System contained in the Transportation Chapter.

P.68 Interpretive Trails: Develop a system of interpretive trails that provide access to the Laguna and its environs for the purpose of nature study and hiking.

Program 68.1: Obtain through opportunity acquisition, joint use agreements and/or easements for interpretive trails alignments as indicated on Map 3.

Responsibility: Planning and Public Works Departments

Program 68.2: Construct interpretive trails with an unpaved hiking surface four to five feet wide with minimal disturbance to topography and vegetation.

Responsibility: Planning and Public Works Departments

Program 68.3: Pursue development of two pedestrian bridge crossings at the Laguna as indicated on Map 3 to connect interpretive trails on opposite sides of the Laguna.

Responsibility: Planning and Public Works Departments

Program 68.4: Develop in conjunction with the interpretive trails system a sub-system of controlled interpretive trails that allow limited access to sensitive habitats for the purpose of environmental education

Responsibility: Planning and Public Works Departments

Program 68.5: Obtain, through opportunity acquisition, joint use agreements and/or easements, alignments for docent-led interpretive trails as indicated in Map 3.

Responsibility: Planning and Public Works Departments

P.69 Docent-Led Use on Sub-system Interpretive Trails: Limit the number of persons on docent-led trails to a number determined by the Parks and Recreation Department.

The number of people using the subsystem of interpretive trails in sensitive environmental areas should be carried out in a manner to discourage unauthorized use and prevent negative impacts on the environment.

P.70 Prohibit bicycle and equestrian use of interpretive trails.

ENVIRONMENTAL SETTING

The City of Sebastopol is located in Sonoma County, California approximately 15 miles east of the Pacific Ocean, and 52 miles north of the San Francisco Bay. 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 Sebastopol 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 Sebastopol is located in the Coast Range geomorphic province 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 Sebastopol is located within the Bay Area/Delta bioregion. A brief description of the Bay Area/Delta bioregion is presented below.

Bay Area/Delta Bioregion: The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras counties. The bioregion is bounded by the Klamath/North Coast on the north and the Central Coast Bioregion to the south. The Bay Area/Delta Bioregion is one of the most populous areas of the state, encompassing the San Francisco Bay Area and the Sacramento-San Joaquin River Delta. The water that flows through the Delta supplies two-thirds of California's drinking water, irrigating farmland, and sustaining fish and wildlife and their habitat. The bioregion fans out from San Francisco Bay in a jagged semi-circle that takes in all or part of 12 counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, and parts of Sacramento, and Yolo. The habitats and vegetation of the Bay Area/Delta Bioregion are as varied as the geography.

CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM

The California Wildlife Habitat Relationship (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988, the classification scheme had 53 habitats. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

According to the California Wildlife Habitat Relationship System there are ten cover types (wildlife habitat classifications) in regional vicinity of the Planning Area out of 59 found in the State. These include: Agriculture, Annual Grassland, Eucalyptus, Fresh Emergent Wetland, Montane Hardwood, Montane Riparian, Urban, Valley Foothill Riparian, Water, and Wet Meadow. The majority of the land within the city limits is Urban, with minimal Agriculture, Annual Grassland, Eucalyptus, and Wet Meadow in a few locations along the city limits. Figure 5.2-1 illustrates the location of each cover type (wildlife habitat classification) within Sebastopol and in the regional vicinity. A brief description of each cover type follows.

Developed Cover Types

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 Cover Types

Annual Grassland habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost-free season averages 250 to 300 days. Annual precipitation is highest in northern California.

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.

Wet meadows occur where water is at or near the surface most of the growing season, following spring runoff. Hydrologically, they occupy lotic, sunken concave, and hanging sites. Lotic sites are those with main input flow (other than precipitation) from upstream sources; at least early in the growing season, water flows across them at depths of 4-8 inches. Downstream runoff is the principal output flow. Lotic sites are topographic basins but have a slight slope, which permits drainage of surface water. Percolation is nil due to the saturated or slowly permeable nature of underlying materials. Sunken concave sites also receive water input from upstream sources, but evapotranspiration is the main output flow. Percolation is slowed by heavy-textured soils and/or shallow bedrock; however, in contrast to lotic and hanging sites, soil of sunken concave sites may dry to considerable depth by fall. Hanging sites are watered by hydrostatic flows as springs or seeps. They frequently occur on rather steep slopes, and downstream runoff is the main output flow. Surface flows, although constant, are usually no more than 0.4 inches deep.

Hardwood Woodland Cover Types

Valley-foothill riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly, or rocky soils more or less permanently moist, but probably well aerated. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). This habitat is characterized by hot, dry summers and mild and wet winters. Temperatures range from 75 to 102 F in the summer to 29 to 44 F in the winter. Average precipitation ranges from 6-30 inches, with little or no snow. The growing season is 7 to 11 months.

Hardwood Forest

Montane hardwood habitat is found on a wide range of slopes, especially those that are moderate to steep. Soils are for the most part rocky, alluvial, coarse textured, poorly developed, and well drained. Soil depth ranges from shallow to deep. Summer temperatures vary between 68 and 77 F and winter vary from 37 to 45 F. Frost-free days range from 160 to 230. Annual precipitation varies from 110 inches in the northern Coast Range to 36 inches in the mountains of southern California.

Montane Riparian areas are found associated with montane lakes, ponds, seeps, bogs and meadows as well as rivers, streams and springs. Water may be permanent or ephemeral. The growing season extends from spring until late fall, becoming shorter at higher elevations. Most tree species flower in early spring before leafing out.

Other Habitats

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.

Aquatic Habitats

Water is a general classification that typically includes riverine and lacustrine, both of which are described below:

Riverine habitats can occur in association with many terrestrial habitats. Riverine 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.

Lacustrine habitats are inland depressions or dammed riverine channels containing standing water. These habitats may occur in association with any terrestrial habitats, Riverine, or Fresh Emergent Wetlands. They may vary from small ponds less than one acre to large areas covering several square miles. Depth can vary from a few inches to hundreds of feet. Typical lacustrine habitats include permanently flooded lakes and reservoirs, and intermittent lakes and ponds (including vernal pools) so shallow that rooted plants can grow over the bottom. Most permanent lacustrine systems support fish life; intermittent types usually do not.

SPECIAL-STATUS SPECIES

The following discussion is based on a background search of special-status species that are documented in the California Natural Diversity Database (CNDDB), the California Native Plant Survey (CNPS) Inventory of Rare and Endangered Plants, and the USFWS endangered and threatened species lists. The background search was regional in scope and focused on the documented occurrences within 10 miles of Sebastopol.

Special Status Plants

The search revealed documented occurrences of the 57 special status plant species (including one non-vascular plant) within 10 miles of the City of Sebastopol. Table 5.2-1 provides a list of special-status plant species that are documented within 10 miles of the City of Sebastopol, their habitat, and current protective status. Figure 5.2-2 illustrates the special status species located within one mile of the City of Sebastopol. Figure 5.2-3 illustrates the special status species located within 10 miles of the City of Sebastopol.

TABLE 5.2-1: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN SEBASTOPOL

Species	Status	Habitat
Plants		
Alopecurus aequalis var. sonomensis Sonoma alopecurus	FE;--;1B	Freshwater marshes and swamps, riparian scrub. Wet areas, marshes, and riparian banks with other wetland species. 5-360M.
Amorpha californica var. napensis Napa false indigo	--;--;1B	Broadleaved upland forest, chaparral, cismontane woodland. Openings in forest or woodland or in chaparral. 150-2000M
Amsinckia lunaris bent-flowered fiddleneck	--;--;1B	Cismontane woodland, valley and foothill grassland. 50-500M.
Arctostaphylos bakeri ssp. bakeri Baker's manzanita	--;CR;1B	Broad-leafed upland forest, chaparral. Entire species state-listed rare. Often on serpentine. This is the state-listed rare taxon, also known as A. bakeri in Title 14. 75-230M.
Arctostaphylos canescens ssp. *sonomensis* Sonoma canescent manzanita	--;--;1B	Chaparral, lower montane coniferous forest. Sometimes found on serpentine. 180-1700M.
Arctostaphylos densiflora Vine Hill manzanita	--;CE;1B	Chaparral. Acid marine sand. 50-100M.
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	--;--;1B	Chaparral. Highly restricted endemic to red rhyolites in Sonoma County. 75-310M.
Balsamorhiza macrolepis var. macrolepis Big-scale balsamroot	--; --;1B	Chaparral, cismontane woodland, and valley and foothill grassland (Open, grassy slopes, and valleys, sometimes on serpentine soils)
Blennosperma bakeri Sonoma sunshine	FE;CE;1B	Vernal pools, valley and foothill grassland. Vernal pools and swales. 10-100M.
Brodiaea californica var. leptandra narrow-anthered California brodiaea	--;--;1B	Broadleaved upland forest, chaparral, lower montane coniferous forest. 110-915M.
Calamagrostis crassiglumis Thurber's reed grass	--;--;2B	Coastal scrub, freshwater marsh. Usually in marshy swales surrounded by grassland or coastal scrub. 10-45 M.
Campanula californica 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.

TABLE 5.2-1: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN SEBASTOPOL

Species	Status	Habitat
Carex comosa Bristly sedge	--;--;2B	Marshes and swamps. Lake margins, wet places; site below sea level is on a delta island. -5-1005M.
Castilleja uliginosa Pitkin Marsh paintbrush	--;CE;1A	Freshwater marsh. Last known remaining plant died in 1987; was known from overgrown freshwater marsh. 60M.
Ceanothus confusus Rincon Ridge ceanothus	--;--;1B	Closed-cone coniferous forest, chaparral, cismontane woodland. Known from volcanic or serpentine soils, dry shrubby slopes. 75-1065M.
Ceanothus divergens Calistoga ceanothus	--;--;1B	Chaparral, cismontane woodland. Rocky, serpentine or volcanic sites. 165-950M.
Ceanothus foliosus var. vineatus Vine Hill ceanothus	--;--;1B	Chaparral. Sandy, acidic soil in chaparral. 45-85M.
Ceanothus purpureus holly-leaved ceanothus	--;--;1B	Chaparral. Rocky, volcanic slopes. 120-640M.
Ceanothus sonomensis Sonoma ceanothus	--;--;1B	Chaparral. Sandy, serpentine or volcanic soils. 210-800M.
Centromadia parryi ssp. parryi pappose tarplant	--;--;1B	Coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernally mesic, often alkaline sites. 2-420M.
Chorizanthe valida Sonoma spineflower	FE;CE;1B	Coastal prairie. Sandy soil. 10-50M.
Clarkia imbricate Vine Hill clarkia	FE;CE;1B	Chaparral, valley and foothill grassland. Acidic, sandy soil. 50-75 M.
Cordylanthus tenuis ssp. capillaris Pennell's bird's-beak	FE;CR;1B	Closed-cone coniferous forest, chaparral. In open or disturbed areas on serpentine within forest or chaparral. 45-305 M.
Cuscuta obtusiflora var. glandulosa Peruvian dodder	--;--;2B	Marshes and swamps (freshwater). Freshwater marsh. 15-280M.
Delphinium bakeri Baker's larkspur	FE;CE;1B	Coastal scrub, grasslands. Only occurs on NW-facing slope, on decomposed shale. Historically known form grassy areas along fence lines too. 90-205M.
Delphinium luteum golden larkspur	FE;CR;1B	Chaparral, coastal prairie, coastal scrub. North-facing rocky slopes. 0-100M.
Dirca occidentalis western leatherwood	--;--;1B	Broad-leafed upland forest, chaparral, closed-cone conifer, cismontane woodland, North Coast conifer forest, riparian forest, riparian woodland, on brushy slopes, mesic sites; mostly in mixed evergreen and foothill woodland communities. 30-550M.
Downingia pusilla 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.
Erigeron greenei Greene's narrow-leaved daisy	--;--;1B	Chaparral. Serpentine and volcanic substrates, generally in shrubby vegetation. 75-1060M.

TABLE 5.2-1: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN SEBASTOPOL

Species	Status	Habitat
Erigeron serpentinus serpentine daisy	--;--;1B	Chaparral. Serpentine seeps. 60-670M.
Fritillaria liliacea fragrant fritillary	--;--;1B	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; various soils reported though usually clay, in grassland. 3-410M.
Gilia capitata ssp. tomentosa woolly-headed gilia	--;--;1B	Coastal bluff scrub. Rocky outcrops on the coast. 15-155M.
Hemizonia congesta ssp. congesta white seaside tarplant	--;--;1B	Coastal scrub, valley and foothill grassland. Grassy valleys and hills, often in fallow fields. 25-200M.
Horkelia tenuiloba thin-lobed horkelia	--;--;1B	Coastal scrub, chaparral. Sandy soils; mesic openings. 45-500M.
Lasthenia burkei Burke's goldfields	FE;CE;1B	Vernal pools, meadows and seeps. Most often in vernal pools and swales. 15-580M.
Lasthenia californica ssp. bakeri Baker's goldfields	--;--;1B	Closed-cone coniferous forest, coastal scrub. Openings. 60-520M.
Lasthenia californica ssp. Macrantha perennial goldfields	--;--;1B	Coastal bluff scrub, coastal dunes, coastal scrub. 5-520 M.
Lasthenia conjugens 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.
Legenere limosa legenere	--; --;1B	Vernal pools. Many historical occurrences are extirpated. In beds of vernal pools. 1-880M.
Leptosiphon jepsonii Jepson's leptosiphon	--;--;1B	Chaparral, cismontane woodland. Open to partially shaded grassy slopes. On volcanic or the periphery of serpentine substrates. 100-500M.
Lessingia arachnoidea Crystal Springs lessingia	--;--;1B	Coastal sage scrub, valley and foothill grassland, cismontane woodland. Grassy slopes on serpentine; sometimes on roadsides. 60-200M.
Limnanthes vinculans 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.
Microseris paludosa marsh microseris	--;--;2	Closed-cone coniferous forest cismontane woodland, coastal scrub, valley and foothill grassland. 5-300M.
Navarretia leucocephala ssp. *bakeri* 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.
Navarretia leucocephala ssp. plieantha many-flowered navarretia	FE;CE;1B	Vernal pools, volcanic ash flow vernal pools. 30-950 M.
Pleuropogon hooverianus 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-

TABLE 5.2-1: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT IN SEBASTOPOL

Species	Status	Habitat
		1150M.
Potentilla uliginosa Cunningham Marsh cinquefoil	--;--;1A	Presumed extinct. Freshwater marshes and swamps. Found in oligotrophic wetlands.30-40 M.
Rhynchospora alba white beaked-rush	--;--;2B	Bogs and fens, meadows and seeps, marshes and swamps. Freshwater marshes and sphagnum bogs. 60-2040M.
Rhynchospora californica 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.
Rhynchospora capitellata brownish beaked-rush	--;--;2	Lower montane coniferous forest, meadows and seeps, marshes and swaps, upper montane coniferous forest. Mesic sites. 455-2000M.
Rhynchospora globularis var. globularis round-headed beaked-rush	--;--;2	Marshes and swamps, freshwater marsh. 45-60M.
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	--;--;1B	Marshes and swamps. Freshwater marshes near the coast. 5-75(245)M.
Triquetrella californica 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.
Trifolium amoenum 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.
Trifolium hydrophilum saline clover	--;--;1B	Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0-300M.
Usnea longissima Methuselah's beard lichen	--;--;4B	North coast coniferous forest, broad-leafed upland forest. Grows in the “redwood zone” on a variety of trees including big leaf maple, oaks, ash, Douglas-fir, and bay. 50-1460M.
Viburnum ellipticum oval-leaved viburnum	--;--;2	Chaparral, cismontane woodland, lower montane coniferous forest. 215-1400M.

SOURCE: DFW CNDDB 2014

ABBREVIATIONS:

FE *FEDERAL ENDANGERED*
FT *FEDERAL THREATENED*
CE *CALIFORNIA ENDANGERED SPECIES*
CT *CALIFORNIA THREATENED*
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 22 special status animal species within 10 miles of the City of Sebastopol. This includes: three amphibians, eight birds, two fish, eight invertebrates, four mammals, and one reptile. Table 5.2-2 provides a list of the special-status animal species that are documented within 10 miles of the City of Sebastopol, their habitat, and current protective status; these species are considered present or potentially present in Sebastopol. Figure 5.2-3 illustrates the location of each occurrence documented by the CNDDB.

TABLE 5.2-2: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN SEBASTOPOL

Species	Status	Habitat
Amphibians/Reptiles		
Ambystoma californiense California tiger salamander	FT/CT	Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.
Emys marmorata western pond turtle	--/CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Rana aurora draytoni 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.
Rana boylii 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.
Birds		
Agelaius tricolor 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.
Athene cuniculari 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.
Coccyzus americanus occidentalis Western yellow-billed cuckoo	FSC/FC; CE	Nesting restricted to river bottoms and other mesic habitats where humidity is high.
Elanus leucurus 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.
Pandion haliaetus osprey	MBTA; CP	Ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.
Fish		
Eucyclogobius newberryi tidewater goby	FE/CSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need

TABLE 5.2-2: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT IN SEBASTOPOL		
Species	**Status**	**Habitat**
		fairly still but not stagnant water and high oxygen levels.
Hysterocarpus traski pomo Russian River tule perch	--;CSC	Low elevation streams of the Russian River system. Requires clear, flowing water with abundant cover. They also require deep (>1M) pool habitat.
Oncorhynchus mykiss irideus 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.
Invertebrates		
Andrena blennospermatis Blennosperma vernal pool andrenid bee	--;--	This bee is oligolectic on vernal pool blennosperma. Bees nest in the uplands around vernal pools.
Lavinia symmetricus navarroensis Navarro roach	--;CSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.
Linderiella occidentalis California linderiella	--;--	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.
Syncaris pacifica 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.
Speyeria zerene myrtleae 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 Viola adunca.
Mammals		
Arborimus pomo Sonoma tree vole	--;CSC	North coast fog belt from Oregon border to Sonoma Co. in Douglas-fir, redwood and montane hardwood-conifer forests. Feeds almost exclusively on Douglas-fir needles. Will occasionally take needles or grand-fir, hemlock or spruce.
Antrozous pallidus 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.
Lasiurus cinereus hoary bat	--;CSC	Prefers open habitats or habitats with mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.
Taxidea taxus 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.
Reptiles		
Actinemys marmorata 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: DFW CNDDB 2014

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 *CDFW SPECIES OF SPECIAL CONCERN*

Sensitive Natural Communities

The search revealed five sensitive natural communities within 10 miles of the City of Sebastopol. This includes Coastal and Valley Freshwater Marsh, Coastal Brackish Marsh, Northern Hardpan Vernal Pool, Northern Vernal Pool, and Valley Needlegrass Grassland. Of these five sensitive natural communities, none are located within the City of Sebastopol, but three are located just east of the city limits along the Laguna de Santa Rosa. A brief description of each sensitive natural community follows. Figure 5.2-3 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 Sebastopol. This sensitive natural community is documented along the Laguna de Santa Rosa just east of the city limits. While this sensitive natural community is not documented within the city limits, 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 Planning Area.

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 Sebastopol. The absence of saltwater in Sebastopol precludes this sensitive natural community from occurring in the City of Sebastopol.

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 Sebastopol. This sensitive natural community is documented along the Laguna de Santa Rosa just east of the city limits. While this sensitive natural community is not documented within the city limits, 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 Planning Area.

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 Sebastopol. 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 Planning Area.

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 Sebastopol. While Valley Needle Grassland is not documented within the CNDDB, there is annual grassland documented within the Planning Area, 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 Planning Area 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

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 Wildlife. 2013. "State and Federally Listed Endangered, Threatened, and Rare Plants of California."

California Dept. of Fish and Wildlife. 2013. "Special Vascular Plants, Bryophytes, and Lichens List." Natural Diversity Database.

California Dept. of Fish and Game. 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities.

California Dept. of Fish and Wildlife. 2013. "State and Federally Listed Endangered, Threatened, and Rare Animals of California."

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).

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.

McNulty, M. Eliza and Wickland, Matthew. University of California, Berkeley. 2003. Redesigning Marsh Creek Dam to allow Chinook salmon passage, flood protection, and mercury sedimentation.

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.

United States Army Corps of Engineers. 1987. Wetland Delineation Manual.

5.3 AIR QUALITY

This section discusses the regulatory setting, regional climate, topography, air pollution potential, and existing ambient air quality for criteria air pollutants, toxic air contaminants, odors, and dust. Information presented in this section is based in part on information gathered from the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (CARB).

REGULATORY SETTING

Air quality with respect to criteria air pollutants and toxic air contaminants (TACs) within the San Francisco Bay Area Air Basin (SFBAAB) is regulated by such agencies as the BAAQMD, CARB, and Federal EPA. Each of these agencies develops rules, regulations, policies, and/or goals to attain the goals or directives imposed through legislation. Although the EPA regulations may not be superseded, both State and local regulations may be more stringent.

FEDERAL

U.S. Environmental Protection Agency

At the Federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the Federal Clean Air Act (FCAA), which was enacted in 1963. The FCAA was amended in 1970, 1977, and 1990.

The FCAA required EPA to establish primary and secondary national ambient air quality standards (NAAQS). The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The Federal Clean Air Act Amendments of 1990 (FCAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformity to the mandates of the FCAAA and determine if implementation will achieve air quality goals. If the EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

Federal Hazardous Air Pollutant Program

Title III of the FCAA requires the EPA to promulgate national emissions standards for hazardous air pollutants (NESHAPs). The NESHAP may differ for major sources than for area sources of HAPs (major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources). The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology (MACT). These Federal rules are also commonly referred to as MACT standards, because they reflect the Maximum Achievable Control Technology. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards. The FCAAA required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic

emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, §219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

STATE

In 1992 and 1993, the California Air Resources Board (CARB) requested delegation of authority for the implementation and enforcement of specified New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS) to the following local agencies: Bay Area and South Coast Air Quality Management Districts (AQMDs). EPA's review of the State of California's laws, rules, and regulations showed them to be adequate for the implementation and enforcement of these Federal standards, and EPA granted the delegations as requested.

California Air Resources Board

CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), which was adopted in 1988. The CCAA requires that all air districts in the State endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

CARB is primarily responsible for developing and implementing air pollution control plans to achieve and maintain the NAAQS. CARB is primarily responsible for statewide pollution sources and produces a major part of the SIP. Local air districts are still relied upon to provide additional strategies for sources under their jurisdiction. The CARB combines this data and submits the completed SIP to EPA.

Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control and air quality management districts), establishing CAAQS (which in many cases are more stringent than the NAAQS), determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, and off-road vehicles.

Transport of Pollutants

The California Clean Air Act, Section 39610 (a), directs the CARB to “identify each district in which transported air pollutants from upwind areas outside the district cause or contribute to a violation of the ozone standard and to identify the district of origin of transported pollutants.” The information regarding the transport of air pollutants from one basin to another was to be quantified to assist interrelated basins in the preparation of plans for the attainment of State ambient air quality standards. Numerous studies conducted by the CARB have identified air basins that are impacted by pollutants transported from other air basins (as of 1993). Among the air basins affected by air pollution transport from the SFBAAB are the North Central Coast Air Basin, the Mountain Counties Air Basin, the San Joaquin Valley Air Basin, and the Sacramento Valley Air Basin. The SFBAAB was also identified as an area impacted by the transport of air pollutants from the Sacramento region.

State Toxic Air Contaminant Programs

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific

peer review before CARB can designate a substance as a TAC. To date, CARB has identified over 21 TACs, and adopted the EPA's list of HAPs as TACs. Most recently, diesel exhaust particulate was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate best available control technology (BACT) to minimize emissions. None of the TACs identified by CARB have a safe threshold.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level:

1. Prepare a toxic emission inventory;
2. Prepare a risk assessment if emissions are significant;
3. Notify the public of significant risk levels; and
4. Prepare and implement risk reduction measures.

CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors and generators). In February 2000, CARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for: 1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines, 2) zero-emission bus demonstration and purchase requirements applicable to transit agencies, and 3) reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, and diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures [e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

LOCAL

Bay Area Air Quality Management District

The BAAQMD attains and maintains air quality conditions in the SFBAAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA, FCAAA, and the CCAA.

The BAAQMD has regulated TACs since the 1980s. At the local level, air pollution control or management districts may adopt and enforce CARB's control measures. Under BAAQMD Regulation 2-1 (General Permit Requirements), Regulation 2-2 (New Source Review), and Regulation 2-5 (New Source

Review), all nonexempt sources that possess the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The BAAQMD limits emissions and public exposure to TACs through a number of programs. The BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. In addition, the BAAQMD has adopted Regulation 11 Rules 2 and 14, which address asbestos demolition renovation, manufacturing, and standards for asbestos containing serpentine.

BAAQMD Air Quality Plans

As stated above, the BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. The BAAQMD prepares ozone attainment plans (OAP) for the national ozone standard and clean air plans (CAP) for the California standard both in coordination with the Metropolitan Transportation Commission and the Association of Bay Area Governments (ABAG).

With respect to applicable air quality plans, the BAAQMD prepared the 2010 Clean Air Plan to address nonattainment of the national 1-hour ozone standard in the SFBAAB. The purpose of the 2010 Clean Air Plan is to:

1. Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement “all feasible measures” to reduce ozone;
2. Consider the impacts of ozone control measures on particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;
3. Review progress in improving air quality in recent years;
4. Establish emission control measures to be adopted or implemented in the 2009-2012 timeframe; and
5. Address nonattainment of the CAAQS.

City of Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following goals, policies related to air quality and energy:

Chapter III Conservation, Parks, and Open Space

Goal 6 Conserve energy.

P.15 Energy Conservation Measures in Buildings: Reduce energy consumption by requiring structures to meet the energy conservation requirements stipulated in the Uniform Building Code and State Title 24 regulations.

Program 15.1: Encourage retrofitting of energy-saving features in existing dwellings as a part of the City's Housing Rehabilitation Program by providing information, technical assistance, and other incentives.

Responsibility: Building Inspection Department

(Refer to the Housing Chapter for details regarding the Housing Rehabilitation Program.)

P.16 Reduce Vehicle Trips: Reduce the number of single-occupant vehicle trips and the number of vehicle miles travelled within the Planning Area.

(Refer to the Transportation Chapter for policies and programs to reduce vehicle trips.)

P.17 Development Review Process: Make energy conservation an important criterion in the development review process.

Program 17.1: Consider adopting a solar access ordinance which would require all development applications to be reviewed for potential energy conservation measures and designs including site orientation, building design and use of materials, landscaping and solar access.

Responsibility: Planning and Building Departments

Program 17.2: Include a section on energy efficient features in the Design Review Guidelines distributed to the public.

Responsibility: Planning and Building Departments

Program 17.3: Distribute PG&E literature on energy conservation.

Responsibility: Planning and Building Departments

Goal 7 Protect and Improve Air Quality.

P.18 Participate in Regional Planning to Improve Air Quality: Continue to cooperate with the Bay Area Air Quality Management District in implementing the regional Clean Air Plan.

P.19 Enforce Air Quality Standards: Continue to enforce air quality standards in collaboration with The BMQMD.

Program 19.1: Continue to enforce State and County regulations for wood stoves and fireplaces.

Responsibility: Building Department

P.20 Reduce Vehicle Trips: Encourage transportation facilities and modes which minimize motor vehicle use.

Program 20.1: Continue to implement a Trip Reduction Ordinance.

Responsibility: Planning Department

The City has adopted a Trip Reduction Ordinance which requires large employers to encourage ridesharing, flexible hours and other means to reduce peak hour trips. Refer to the Transportation Chapter for policies and programs relating to public transit, bike and pedestrian trails and other measures to reduce motor vehicle emissions.

P.21 Local Efforts: Encourage local efforts to improve air quality.

Program 21.1: Use the city's development review process and CEQA regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.

Responsibility: Planning Department

One method of maintaining air quality is to separate air pollution-sensitive land uses such as hospitals, convalescent homes, and schools, from sources of air pollution. Other possible mitigations include requiring air pollution point sources, such as manufacturing to use air pollutants to install filters, and other devices to reduce air pollution.

Program 21.2: Consider carbon monoxide levels at intersections when evaluating the need for intersection improvements.

Responsibility: Planning and Public Works Departments

Program 21.3: Include the Fire District in the review of proposed land uses which would handle, store or transport any potential air pollutant sources such as, but not limited to: lead; mercury; vinyl chloride; benzine; asbestos; beryllium; and all fuels.

Responsibility: Planning and Fire Departments

Program 21.4: Continue to require and enforce a dust emissions control plan for construction that includes regular watering during earthmoving operations or excavations, covering stockpiles or exposed earth and soil, spraying water or palliatives, pave or otherwise seal disturbances as soon as possible, and other measures to limit dust and reduce evaporative hydrocarbon emissions.

Responsibility: Planning and Building Departments

The Land Use; Conservation, Open Space and Parks, and Transportation Chapters contain policies and programs which reduce local emissions. These include a Transportation Management Program, improving the jobs housing ratio; establishing additional bicycle paths, and preserving open space land

P.22 Water Conservation: Develop and implement water conservation programs for Sebastopol.

Program 22.1: Implement the Water Reduction and Landscaping Ordinance. Consider the use of water saving devices for residential and commercial uses; limits to the amount of turf area in new developments; and the use of drip irrigation systems.

Responsibility: Planning, Building Inspection, and Public Works Departments

Program 22.2: Develop and implement a Water Conservation Program.

Responsibility: Public Works Department

The Water Conservation Program would continue to provide incentives for the installation of water saving toilets, and develop guidelines for water efficient irrigation systems and xeriscape landscaping.

Goal 8 Reduce the volume of solid waste generated by the City

P.23 Solid Waste Reduction: Encourage solid waste reduction methods.

Program 23.1: Develop and implement a Source Reduction and Recycling Program.

Responsibility: Planning and Public Works Departments

Program 23.2: Purchase goods containing recycled materials and which are themselves recyclable for City use wherever possible.

Responsibility: City Manager and Finance Department

Program 23.3: Promote development of backyard composting.

Responsibility: Public Works Department

P.24 Recycling Drop-off Areas: Require on-site drop-off areas for recycling in commercial/retail, office and multifamily residential developments.

Program 24.1: Revise the Zoning Ordinance to require all commercial/retail, office and multifamily developments to provide on-site drop-off areas for recycling. Coordinate with the City's refuse disposal contractor or other recycling services to ensure regular pick-up.

Responsibility: Planning Department

Program 24.2: Evaluate revision to the Zoning Ordinance allowing a solid waste recycling transfer station to locate in the light Industrial and the Community Facilities Zoning Districts with Conditional Use Permit approval.

Responsibility: Planning Department

P.25 Impacts of Waste-to-Energy Projects: The City will not endorse or support solid waste-to-energy projects until it has been fully demonstrated that such projects will not have detrimental environmental impacts, particularly to air quality.

Program 25.1: Review and provide written comments on Draft EIR's for solid waste-to-energy project proposals carried out by neighboring jurisdictions or special districts, and oppose such projects unless it is substantially determined that such projects would have negligible environmental effects.

Responsibility: Planning and Public Works Departments

Goal 9: Responsibly manage hazardous wastes to protect the health and safety of residents and the environment

P. 26: The Sonoma County Hazardous Waste Management Plan is incorporated by reference into the Sebastopol General Plan and shall be used to guide decision-making regarding the use, handling, storage, transfer, and proper disposal of hazardous waste.

Program 26.1: Development projects shall be required to submit information regarding the use, handling and disposal of hazardous wastes so that decision-makers can incorporate conditions and alter project design in accord with the Hazardous Waste Management Plan.

Program 26.2: Projects that generate or use hazardous waste must be consistent with the Sebastopol General Plan and the Hazardous Waste Management Plan goals and policies.

ENVIRONMENTAL SETTING

San Francisco Bay Area Air Basin

Sebastopol is located within the San Francisco Bay Area Air Basin (SFBAAB), which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the southern portion of Sonoma County, and the southwestern portion of Solano County. Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. These factors along with applicable regulations are discussed below.

CLIMATE, TOPOGRAPHY, AND AIR POLLUTION POTENTIAL

The SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns.

The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell. During the summer, the Pacific high pressure cell is centered over the northeastern portion of the Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface because of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band resulting in condensation and the presence of fog and stratus clouds along the Northern California coast.

In the winter, the Pacific high-pressure cell weakens and shifts southward resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential.

High Pressure Cell

During the summer, the large-scale meteorological condition that dominates the West Coast is a semi-permanent high pressure cell centered over the northeastern portion of the Pacific Ocean. This high pressure cell keeps storms from affecting the California coast. Hence, the SFBAAB experiences little precipitation in the summer months. Winds tend to blow on shore out of the north/northwest.

The steady northwesterly flow induces upwelling of cold water from below. This upwelling produces a band of cold water off the California coast. When air approaches the California coast, already cool and moisture-laden from its long journey over the Pacific, it is further cooled as it crosses this bank of cold water. This cooling often produces condensation resulting in a high incidence of fog and stratus clouds along the Northern California coast in the summer.

Generally in the winter, the Pacific high pressure cell weakens and shifts southward, winds tend to flow offshore, upwelling ceases, and storms occur. During the winter rainy periods, inversions (layers of warmer air over colder air; see below) are weak or nonexistent, winds are usually moderate, and air pollution potential is low. The Pacific high pressure cell does periodically become dominant, bringing strong inversions, light winds, and high pollution potential.

Topography

The topography of the SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays. This complex terrain, especially the higher elevations, distorts the normal wind flow patterns in the SFBAAB. The greatest distortion occurs when low-level inversions are

present and the air beneath the inversion flows independently of air above the inversion, a condition that is common in the summer time.

The only major break in California's Coast Range occurs in the SFBAAB. Here the Coast Range splits into western and eastern ranges. Between the two ranges lies San Francisco Bay. The gap in the western coast range is known as the Golden Gate, and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the SFBAAB and the Central Valley.

Wind Patterns

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more directly from the west as they stream through the Golden Gate. This channeling of wind through the Golden Gate produces a jet that sweeps eastward and splits off to the northwest toward Richmond and to the southwest toward San Jose when it meets the East Bay hills.

Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, the Golden Gate, or the San Bruno gap. For example, the average wind speed at San Francisco International Airport in July is about 17 knots (from 3 p.m. to 4 p.m.), compared with only 7 knots at San Jose and less than 6 knots at the Farallon Islands.

The air flowing in from the coast to the Central Valley, called the sea breeze, begins developing at or near ground level along the coast in late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity while spreading inland. The depth of the sea breeze depends in large part upon the height and strength of the inversion. If the inversion is low and strong, and hence stable, the flow of the sea breeze will be inhibited and stagnant conditions are likely to result.

In the winter, the SFBAAB frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds. Winter stagnation episodes are characterized by nighttime drainage flows in coastal valleys. Drainage is a reversal of the usual daytime air-flow patterns; air moves from the Central Valley toward the coast and back down toward the Bay from the smaller valleys within the SFBAAB.

Temperature

Summertime temperatures in the SFBAAB are determined in large part by the effect of differential heating between land and water surfaces. Because land tends to heat up and cool off more quickly than water, a large-scale gradient (differential) in temperature is often created between the coast and the Central Valley, and small-scale local gradients are often produced along the shorelines of the ocean and bays. The temperature gradient near the ocean is also exaggerated, especially in summer, because of the upwelling of cold ocean bottom water along the coast. On summer afternoons the temperatures at the coast can be 35ºF cooler than temperatures 15 to 20 miles inland. At night this contrast usually decreases to less than 10º.

In the winter, the relationship of minimum and maximum temperatures is reversed. During the daytime the temperature contrast between the coast and inland areas is small, whereas at night the variation in temperature is large.

Precipitation

The SFBAAB is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly

from one part of the SFBAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys.

During rainy periods, ventilation (rapid horizontal movement of air and injection of cleaner air) and vertical mixing are usually high, and thus pollution levels tend to be low. However, frequent dry periods do occur during the winter where mixing and ventilation are low and pollutant levels build up.

Air Pollution Potential

The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air. The topographic and climatological factors discussed above influence the atmospheric pollution potential of an area. Atmospheric pollution potential, as the term is used here, is independent of the location of emission sources and is instead a function of factors described below.

Wind Circulation

Low wind speed contributes to the buildup of air pollution because it allows more pollutants to be emitted into the air mass per unit of time. Light winds occur most frequently during periods of low sun (fall and winter, and early morning) and at night. These are also periods when air pollutant emissions from some sources are at their peak, namely, commute traffic (early morning) and wood burning appliances (nighttime). The problem can be compounded in valleys, when weak flows carry the pollutants upvalley during the day, and cold air drainage flows move the air mass downvalley at night. Such restricted movement of trapped air provides little opportunity for ventilation and leads to buildup of pollutants to potentially unhealthful levels.

Inversions

An inversion is a layer of warmer air over a layer of cooler air. Inversions affect air quality conditions significantly because they influence the mixing depth (i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground). The highest air pollutant concentrations in the SFBAAB generally occur during inversions.

There are two types of inversions that occur regularly in the SFBAAB. One is more common in the summer and fall, while the other is most common during the winter. The frequent occurrence of elevated temperature inversions in summer and fall months acts to cap the mixing depth, limiting the depth of air available for dilution. Elevated inversions are caused by subsiding air from the subtropical high pressure zone, and from the cool marine air layer that is drawn into the SFBAAB by the heated low pressure region in the Central Valley.

The inversions typical of winter, called radiation inversions, are formed as heat quickly radiates from the earth's surface after sunset, causing the air in contact with it to rapidly cool. Radiation inversions are strongest on clear, low-wind, cold winter nights, allowing the build-up of such pollutants as carbon monoxide and particulate matter. When wind speeds are low, there is little mechanical turbulence to mix the air, resulting in a layer of warm air over a layer of cooler air next to the ground. Mixing depths under these conditions can be as shallow as 50 to 100 meters, particularly in rural areas. Urban areas usually have deeper minimum mixing layers because of heat island effects and increased surface roughness. During radiation inversions downwind transport is slow, the mixing depths are shallow, and turbulence is minimal, all factors which contribute to ozone formation.

Although each type of inversion is most common during a specific season, either inversion mechanism can occur at any time of the year. Sometimes both occur simultaneously. Moreover, the characteristics

of an inversion often change throughout the course of a day. The terrain of the SFBAAB also induces significant variations among subregions.

Solar Radiation

The frequency of hot, sunny days during the summer months in the SFBAAB is another important factor that affects air pollution potential. It is at the higher temperatures that ozone is formed. In the presence of ultraviolet sunlight and warm temperatures, reactive organic gases and oxides of nitrogen react to form secondary photochemical pollutants, including ozone. Because temperatures in many of the SFBAAB inland valleys are so much higher than near the coast, the inland areas are especially prone to photochemical air pollution.

In late fall and winter, solar angles are low, resulting in insufficient ultraviolet light and warming of the atmosphere to drive the photochemical reactions. Ozone concentrations do not reach significant levels in the SFBAAB during these seasons.

Sheltered Terrain

The hills and mountains in the SFBAAB contribute to the high pollution potential of some areas. During the day, or at night during windy conditions, areas in the lee sides of mountains are sheltered from the prevailing winds, thereby reducing turbulence and downwind transport. At night, when wind speeds are low, the upper atmospheric layers are often decoupled from the surface layers during radiation conditions. If elevated terrain is present, it will tend to block pollutant transport in that direction. Elevated terrain also can create a recirculation pattern by inducing upvalley air flows during the day and reverse downvalley flows during the night, allowing little inflow of fresh air.

The areas having the highest air pollution potential tend to be those that experience the highest temperatures in the summer and the lowest temperatures in the winter. The coastal areas are exposed to the prevailing marine air, creating cooler temperatures in the summer, warmer temperatures in winter, and stratus clouds all year. The inland valleys are sheltered from the marine air and experience hotter summers and colder winters. Thus, the topography of the inland valleys creates conditions conducive to high air pollution potential.

Pollution Potential Related to Emissions

Although air pollution potential is strongly influenced by climate and topography, the air pollution that occurs in a location also depends upon the amount of air pollutant emissions in the surrounding area or transported from more distant places. Air pollutant emissions generally are highest in areas that have high population densities, high motor vehicle use, and/or industrialization. These contaminants created by photochemical processes in the atmosphere, such as ozone, may result in high concentrations many miles downwind from the sources of their precursor chemicals.

Cotati and Petaluma Valleys Climatological Subregion

There are 11 climatological subregions within the SFBAAB. Sebastopol is located within the Cotati and Petaluma Valleys subregion. This subregion stretches from Santa Rosa to the San Pablo Bay and is often considered as two different valleys: the Cotati Valley in the north and the Petaluma Valley in the south. To the east, the valley is bordered by the Sonoma Mountains, while to the west is a series of low hills, followed by the Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay is known as the Petaluma Gap. This low-terrain area allows marine air to travel into the SFBAAB.

Wind patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap, with winds flowing predominantly from the west. As marine air travels through the Petaluma Gap, it splits into northward and southward paths moving into the Cotati and Petaluma valleys. The southward path crosses San Pablo Bay and moves eastward through the Carquinez Strait. The northward path contributes to Santa Rosa's and Sebastopol's prevailing winds from the south and southeast. Petaluma's prevailing winds are from the northwest.

When the ocean breeze is weak, strong winds from the east can predominate, carrying pollutants from the Central Valley and the Carquinez Strait. During these periods, upvalley flows can carry the polluted air as far north as Santa Rosa and Sebastopol.

Winds are usually stronger in the Petaluma Valley than the Cotati Valley because the former is directly in line with the Petaluma Gap. Petaluma's climate is similar to areas closer to the coast even though Petaluma is 28 miles from the ocean. Average annual wind speed at the Petaluma Airport is seven mph. The Cotati Valley, being slightly north of the Petaluma Gap, experiences lower wind speeds. The annual average wind speed in Santa Rosa and Sebastopol is five mph.

Air temperatures are very similar in the two valleys. Summer maximum temperatures for this subregion are in the low-to-mid-80's, while winter maximum temperatures are in the high-50's to low-60's. Summer minimum temperatures are around 50 degrees, and winter minimum temperatures are in the high 30's.

Generally, air pollution potential is low in the Petaluma Valley because of its link to the Petaluma Gap and because of its low population density. There are two scenarios that could produce elevated pollutant levels: 1) stagnant conditions in the morning hours created when a weak ocean breeze meets a weak bay breeze, and 2) an eastern or southeastern wind pattern in the afternoon brings in pollution from the Carquinez Strait Region and the Central Valley.

The Cotati Valley has a higher pollution potential than does the Petaluma Valley. The Cotati Valley lacks a gap to the sea, contains a larger population and has natural barriers at its northern and eastern ends. There are also industrial facilities in and around Santa Rosa. Both valleys of this subregion are also threatened by increased motor vehicle traffic and the associated air contaminants. Population and motor vehicle use are increasing significantly, and housing costs and the suburbanization of employment are leading to more and longer commutes traversing the subregion.

EXISTING AMBIENT AIR QUALITY: CRITERIA AIR POLLUTANTS

The California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) currently focus on the following air pollutants as indicators of ambient air quality: ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb). Because these are the most prevalent air pollutants known to be deleterious to human health, they are commonly referred to as "criteria air pollutants." Sources and health effects of the criteria air pollutants are summarized in Table 5.3-1.

TABLE 5.3-1 COMMON SOURCES OF HEALTH EFFECTS FOR CRITERIA AIR POLLUTANTS

Pollutants	Sources	Health Effects
Ozone (O_3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases; reduced lung function; increased cough and chest discomfort
Fine Particulate Matter (PM_{10} and $PM_{2.5}$)	Stationary combustion of solid fuels; construction activities; industrial processes; atmospheric chemical reactions	Reduced lung function; aggravation of respiratory and cardiovascular diseases; increases in mortality rate; reduced lung function growth in children
Nitrogen Dioxide (NO_2)	Motor vehicle exhaust; high temperature stationary combustion; atmospheric reactions	Aggravation of respiratory illness
Carbon Monoxide (CO)	Incomplete combustion of fuels and other carbon-containing substances, such as motor vehicle exhaust; natural events, such as decomposition of organic matter	Aggravation of some heart diseases; reduced tolerance for exercise; impairment of mental function; birth defects; death at high levels of exposure
Sulfur Dioxide (SO_2)	Combination of sulfur-containing fossil fuels; smelting of sulfur-bearing metal ore; industrial processes	Aggravation of respiratory diseases; reduced lung function
Lead (Pb)	Contaminated soil	Behavioral and hearing disabilities in children; nervous system impairment

SOURCE: BAY AREA AIR QUALITY MANAGEMENT DISTRICT (2012)

Ozone (O_3), or smog, is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between reactive organic gases (ROG) and nitrous oxide (NO_X) in the presence of sunlight. Ozone formation is greatest on warm, windless, sunny days. The main sources of NOX and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines), the evaporation of solvents, paints, and fuels, and biogenic sources. Automobiles are the single largest source of ozone precursors in the SFBAAB. Tailpipe emissions of ROG are highest during cold starts, hard acceleration, stop-and-go conditions, and slow speeds. They decline as speeds increase up to about 50 mph, then increase again at high speeds and high engine loads. ROG emissions associated with evaporation of unburned fuel depend on vehicle and ambient temperature cycles. Nitrogen oxide emissions exhibit a different curve; emissions decrease as the vehicle approaches 30 mph and then begin to increase with increasing speeds.

Ozone levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, it can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Chronic exposure to high ozone levels can permanently damage lung tissue. Ozone can also damage plants and trees, and materials such as rubber and fabrics.

Particulate Matter (PM) refers to a wide range of solid or liquid particles in the atmosphere, including smoke, dust, aerosols, and metallic oxides. Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. $PM_{2.5}$ includes a subgroup of finer particles that have an

aerodynamic diameter of 2.5 micrometers or less. Some particulate matter, such as pollen, is naturally occurring. In the SFBAAB most particulate matter is caused by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. PM10 is of concern because it bypasses the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The EPA and the State of California revised their PM standards several years ago to apply only to these fine particles. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health. Motor vehicles are currently responsible for about half of particulates in the SFBAAB. Wood burning in fireplaces and stoves is another large source of fine particulates.

Nitrogen Dioxide (NO_2) is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component of a brown cloud on high pollution days, especially in conjunction with high ozone levels.

Carbon Monoxide (CO) is an odorless, colorless gas. It is formed by the incomplete combustion of fuels. The single largest source of CO in the SFBAAB is motor vehicles. Emissions are highest during cold starts, hard acceleration, stop-and-go driving, and when a vehicle is moving at low speeds. New findings indicate that CO emissions per mile are lowest at about 45 mph for the average light-duty motor vehicle and begin to increase again at higher speeds. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses. Even healthy people exposed to high CO concentrations can experience headaches, dizziness, fatigue, unconsciousness, and even death.

Sulfur Dioxide (SO_2) is a colorless acid gas with a pungent odor. It has potential to damage materials and it can have health effects at high concentrations. It is produced by the combustion of sulfur-containing fuels, such as oil, coal, and diesel. SO^2 can irritate lung tissue and increase the risk of acute and chronic respiratory disease.

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

Ambient Air Quality Standards and Designations

The current Federal and State ambient air quality standards and attainment standards are presented in Table 5.3-2.

TABLE 5.3-2 AMBIENT AIR QUALITY STANDARDS AND DESIGNATIONS

Pollutant	Averaging Time	California		National Standards [a]		
		Standards [b, c]	Attainment Status [d]	Primary [c,e]	Secondary [c,f]	Attainment Status [g]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Serious)	–[h]	Same as Primary Standard	–[h]
	8-hour	0.070 ppm (137 µg/m^3)	–	0.075 ppm (147 µg/m^3)		N
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (339 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	A
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m3)	
	1-hour	0.25 ppm (655 µg/m3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	– h	Same as Primary Standard	U
	24-hour	50 µg/m^3		150 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N	15 µg/m^3	Same as Primary Standard	Nj
	24-hour	–	–	35 µg/m^3		
Lead	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	–
Sulfates	24-hour	25 µg/m^3	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	–			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when	U			

TABLE 5.3-2 AMBIENT AIR QUALITY STANDARDS AND DESIGNATIONS

Pollutant	Averaging Time	California		National Standards [a]		
		Standards [b, c]	Attainment Status [d]	Primary [c,e]	Secondary [c,f]	Attainment Status [g]
		the relative humidity is less than 70%.				

a National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM10 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current Federal policies.

b California standards for ozone, CO (except Lake Tahoe), SO2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

c Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.

Attainment (A): a pollutant is designated attainment if the State standard for that pollutant was not violated at any site in the area during a 3-year period.

Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a State standard for that pollutant in the area.

Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

e National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

f National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

g Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.

Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

h The 1-hour ozone NAAQS was revoked on June 15, 2005 and the annual PM_{10} NAAQS was revoked in 2006.

i ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for this pollutant.

j U.S EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006. EPA issued attainment status designations for the 35 µg/m3standard on December 22, 2008. EPA has designated the Bay Area as nonattainment for the 35 $\mu g/m^3$ $PM_{2.5}$ standard. The EPA designation will be effective 90 days after publication of the regulation in the Federal Register.

SOURCE: BAY AREA AIR QUALITY MANAGEMENT DISTRICT CEQA GUIDELINES (2012)

Monitoring Data

The BAAQMD operates a regional air quality monitoring network that regularly measures the concentrations of the major criteria air pollutants. Air pollutant monitoring data is available at http://www.arb.ca.gov/adam/welcome.html. Air quality conditions in the SFBAAB have improved significantly since the BAAQMD was created in 1955. Ambient concentrations and the number of days on which the region exceeds standards have declined dramatically. Neither Federal nor State ambient air quality standards have been violated in recent decades for nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and vinyl chloride.

The Bay Area Air Quality Management District and CARB maintain two air quality monitoring sites 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), PM^{10}, and $PM^{2.5}$. 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 7-year period is shown in Tables 5.3-3 through 5.3-5**.**

TABLE 5.3-3: AMBIENT AIR QUALITY MONITORING DATA (SANTA ROSA - 5TH STREET)

Pollutant	Cal. Primary Standard	Fed. Primary Standard	Year	Max Concentration	Days (samples) State/Fed Standard Exceeded
Ozone (O_3) (1-hour)	0.09 ppm for 1 hour	NA	2007	0.071	0/NA
			2008	0.076	0/NA
			2009	0.086	0/NA
			2010	0.084	0/NA
			2011	0.073	0/NA
			2012	0.064	0/NA
			2013	0.074	0/NA
Ozone (O_3) (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
			2010	0.068	0/0
			2011	0.054	0/0
			2012	0.052	0/0
			2013	0.065	0/0
Particulate Matter ($PM_{2.5}$)	NA	35 µg/m^3 for 24 hours	2007	32.0	NA/0
			2008	30.8	NA/0
			2009	29.0	NA/0
			2010	26.6	NA/0
			2011	33.2	NA/0
			2012	25.7	NA/0
			2013	28.1	NA/0

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2007-2013.

NOTES:

PPM = PARTS PER MILLION.

UG/M^3 = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

** = THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE*

TABLE 5.3-4: AMBIENT AIR QUALITY MONITORING DATA (SANTA ROSA - HEALDSBURG AIRPORT)

Pollutant	Cal. Primary Standard	Fed. Primary Standard	Year	Max Concentration	Days (samples) State/Fed Standard Exceeded
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
			2010	N/A	NA/NA
			2011	0.073	0/NA
			2012	0.073	0/NA
			2013	0.069	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
			2010	N/A	NA/NA
			2011	0.065	0/0
			2012	0.063	0/0
			2013	0.063	0/0

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2007-2013 (2010 HAS NOT RECORDED DATA).

NOTES:

PPM = PARTS PER MILLION.

MG/M^3 = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

TABLE 5.3-5: AMBIENT AIR QUALITY MONITORING DATA (HEALDSBURG -133 MATHESON ST.)

Pollutant	Cal. Primary Standard	Fed. Primary Standard	Year	Max Concentration	Days (samples) State/Fed Standard Exceeded
Particulate Matter (PM_{10})	50 µg/m^3 for 24 hours	150 µg/m^3 for 24 hours	2007	43.0	0/0
			2008	49.0	0/0
			2009	22.0	*/0
			2010	34.0	0/0
			2011	46.0	0/0
			2012	38.0	*/*
			2013	55.0	*/0

SOURCES: CALIFORNIA AIR RESOURCES BOARD (ADAM) AIR POLLUTION SUMMARIES, 2007-2013.

NOTES:

CLOSEST PM_{10} MONITORING SITE IS WITHIN THE NORTH COAST AIR BASIN

PPM = PARTS PER MILLION.

MG/M^3 = MICRONS PER CUBIC METER.

NA= NOT APPLICABLE

Emissions Inventory

The BAAQMD estimates emissions of criteria air pollutants from approximately 900 source categories. The estimates are based on BAAQMD permit information for stationary sources (e.g., manufacturing industries, refineries, and dry-cleaning operations), plus more generalized estimates for area sources (e.g., space heating, landscaping activities, and use of consumer products) and mobile sources (e.g., trains, ships and planes, as well as on-road and off-road motor vehicles). BAAQMD emissions inventory data is available at http://www.arb.ca.gov/app/emsinv/emssumcat.php. Table 5.3-6 presents the 2012 estimated annual emissions in Sonoma County.

TABLE 5.3-6: 2012 ESTIMATED ANNUAL AVERAGE EMISSIONS (SONOMA COUNTY)								
STATIONARY SOURCES	**TOG**	**ROG**	**CO**	**NOX**	**SOX**	**PM**	**PM_{10}**	**$PM_{2.5}$**
Fuel Combustion	5.64	0.19	3.15	0.75	0.05	0.34	0.25	0.17
Waste Disposal	9.15	0.09	0.00	0.01	0.00	-	-	-
Cleaning and Surface Coatings	2.79	2.22	0.00	0.00	-	-	-	-
Petroleum Production and Marketing	2.08	0.78	-	-	-	-	-	-
Industrial Processes	1.03	0.95	0.03	0.02	0.05	2.16	1.19	0.42
Total Stationary Sources	**20.69**	**4.22**	**3.19**	**0.78**	**0.10**	**2.50**	**1.44**	**0.59**
AREAWIDE SOURCES	**TOG**	**ROG**	**CO**	**NOX**	**SOX**	**PM**	**PM_{10}**	**$PM_{2.5}$**
Solvent Evaporation	5.08	4.36	-	-	-	-	-	-
Miscellaneous Processes	36.96	4.62	20.93	1.28	0.07	19.57	11.14	4.16
Total Areawide Sources	**42.03**	**8.98**	**20.93**	**1.28**	**0.07**	**19.57**	**11.14**	**4.16**
MOBILE SOURCES	**TOG**	**ROG**	**CO**	**NOX**	**SOX**	**PM**	**PM_{10}**	**$PM_{2.5}$**
On-road Motor Vehicles	7.93	7.31	66.76	13.50	0.07	0.95	0.94	0.49
Other Mobile Sources	4.92	4.41	29.34	9.21	0.29	0.50	0.49	0.45
Total Mobile Sources	12.85	11.72	96.10	22.71	0.36	1.45	1.43	0.93
Total for Sonoma County	**75.58**	**24.92**	**120.22**	**24.77**	**0.53**	**23.52**	**14.01**	**5.69**

SOURCE: CALIFORNIA AIR RESOURCES BOARD ALMANAC EMISSION PROJECTION DATA (PUBLISHED IN 2013) 2012 ESTIMATED ANNUAL AVERAGE EMISSIONS HTTP://WWW.ARB.CA.GOV/APP/EMSINV/EMSEIC1_QUERY.PHP (ACCESSED 7/2014)

EXISTING AMBIENT AIR QUALITY: TOXIC AIR CONTAMINANTS

In addition to the criteria air pollutants listed above, another group of pollutants, commonly referred to as toxic air contaminants (TACs) or hazardous air pollutants can result in health effects that can be quite severe. Many TACs are confirmed or suspected carcinogens, or are known or suspected to cause birth defects or neurological damage. Secondly, many TACs can be toxic at very low concentrations. For some chemicals, such as carcinogens, there are no thresholds below which exposure can be considered risk-free.

It is important to understand that TACs are not considered criteria air pollutants and thus are not specifically addressed through the setting of ambient air quality standards. Instead, the EPA and CARB regulate hazardous air pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by the BAAQMD establish the regulatory framework for TACs.

Industrial facilities and mobile sources are significant sources of TACs. The electronics industry, including semiconductor manufacturing, has the potential to contaminate both air and water due to the highly toxic chlorinated solvents commonly used in semiconductor production processes. Sources of TACs go beyond industry. Various common urban facilities also produce TAC emissions, such as gasoline stations (benzene), hospitals (ethylene oxide), and dry cleaners (perchloroethylene). Automobile exhaust also contains TACs such as benzene and 1,3-butadiene. Diesel particulate matter has also been identified as a TAC by the CARB. Diesel PM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. BAAQMD research indicates that mobile-source emissions

of diesel PM, benzene, and 1,3-butadiene represent a substantial portion of the ambient background risk from TACs in the SFBAAB.

EXISTING AMBIENT AIR QUALITY: ODORS AND DUST

Other air quality issues of concern in the SFBAAB include nuisance impacts of odors and dust. Objectionable odors may be associated with a variety of pollutants. Common sources of odors include wastewater treatment plants, landfills, composting facilities, refineries and chemical plants. Similarly, nuisance dust may be generated by a variety of sources including quarries, agriculture, grading and construction. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to anger and concern over possible health effects among the public. Each year the BAAQMD receives thousands of citizen complaints about objectionable odors. Common odor sources in the Planning Area may include: skunks, livestock and their waste, decomposing dead animals along roadways, stagnant water, etc. Wastewater from Sebastopol travels to Santa Rosa for treatment so wastewater odor issues are not expected. There are not any industrial or commercial users in the Planning Area that are expected to cause nuisance odors, although to some people certain foods/restaurants can cause nuisance odors. Lastly, fresh asphalt can be a temporary odor nuisance for people. Dust emissions can contribute to increased ambient concentrations of PM_{10}, and can also contribute to reduced visibility and soiling of exposed surfaces.

REFERENCES

Bay Area Air Quality Management District. 2010. Bay Area 2010 Clean Air Plan Adopted September 15, 2010.

Bay Area Air Quality Management District. 2012. California Environmental Quality Act Air Quality Guidelines Updated May 2012.

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. 2014. http://www.baaqmd.gov/

C Donald Ahrens. 2006. Meteorology Today: An Introduction to Weather, Climate, & the Environment.

California Air Resources Board. 2014. ARB Databases: Aerometric Data Analysis and Management System (ADAM). http://www.arb.ca.gov/html/databases.htm.

The Weather Channel, LLC. 2014. http://www.weather.com.

5.4 GREENHOUSE GASES AND CLIMATE CHANGE

REGULATORY SETTING

FEDERAL

Federal Climate Change Policy

According to the EPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The Federal government's goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR," "Climate Leaders," and Methane Voluntary Programs. However, as of this writing, there are no adopted Federal plans, policies, regulations, or laws directly regulating GHG emissions.

Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a Federal purchase requirement for renewable energy.

STATE

Assembly Bill 1493

In response to AB 1493, CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing motor vehicle emission standards. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1), require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37 percent lower than during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight (GVW), GHG emissions are reduced approximately 24 percent between 2009 and 2016.

CARB requested a waiver of Federal preemption of California's Greenhouse Gas Emissions Standards. The intent of the waiver is to allow California to enact emissions standards to reduce carbon dioxide and other greenhouse gas emissions from automobiles in accordance with the regulation amendments to the CCRs that fulfill the requirements of AB 1493. The EPA granted a waiver to California to implement its greenhouse gas emissions standards for cars.

California Executive Orders S-3-05 and S-20-06, and Assembly Bill 32

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by 2020 and 3) 80% below 1990 levels by 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs State agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

Assembly Bill 32- Climate Change Scoping Plan

On December 11, 2008 ARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which functions as a roadmap of ARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. The Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2e under a business-as-usual scenario. (This is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.) The Scoping Plan also breaks down the amount of GHG emissions reductions ARB recommends for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e),
- the Low-Carbon Fuel Standard (15.0 MMT CO_2e),
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and
- a renewable portfolio standard for electricity production (21.3 MMT CO_2e).

Assembly Bill 1007

Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005) directed the CEC to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepared the State Alternative Fuels Plan in consultation with State, Federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Governor's Low Carbon Fuel Standard (Executive Order S-01-07)

Executive Order S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel

Standard. The Low Carbon Fuel Standard is incorporated into the State Alternative Fuels Plan and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

Climate Action Program at Caltrans

Caltrans prepared a Climate Action Program in response to new regulatory directives. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO2 from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that "the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards)."

Senate Bill 97

Senate Bill 97 (Chapter 185, 2007) required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. OPR prepared its recommended amendments to the State CEQA Guidelines to provide guidance to public agencies regarding the analysis and mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions in draft CEQA documents. The Amendments became effective on March 18, 2010.

Senate Bill 375

SB 375 requires CARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. The 18 metropolitan planning organizations (MPO) in California will prepare a "sustainable communities strategy" to reduce the amount of greenhouse gas emission in their respective regions and demonstrate the ability for the region to attain CARB's reduction targets. CARB would later determine if each region is on track to meet their reduction targets. In addition, cities would have extra time -- eight years instead of five -- to update housing plans required by the State.

LOCAL

Sonoma County Climate Action Plan 2020

In 2005, the ten local governments within Sonoma County pledged to reduce GHG emissions to 25 percent below 1990 levels by 2015. The Regional Climate Protection Authority (RCPA) was created in 2009 to help each jurisdiction reach its goal. The RCPA includes representatives from each of the nine cities in Sonoma County and the Board of Supervisors.

Climate Action 2020 is a collaborative effort led by the RCPA and including all nine cities and the County of Sonoma and several partner entities to take further actions to reduce GHG emissions community-wide and respond to the threats of climate change. RCPA will work with each jurisdiction to develop a

Community Climate Action Plan that will provide a comprehensive assessment of GHGs emission sources as well possible measures that jurisdictions can take to reduce GHG emissions and/or adapt to climate change to ensure their communities remain vibrant and resilient.

Cities for Climate Protection Program

The City of Sebastopol passed Resolution 5229 in January 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.

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*.

Sebastopol Mandatory Photovoltaic System Requirements

As of July 21, 2013 the City of Sebastopol established a Mandatory Solar Photovoltaic Requirements Ordinance to promote the reduction of Green House Gas Emissions.

Municipal Code section 15.72 requires a photovoltaic system on all new commercial or residential buildings, and alterations, additions and remodels to existing buildings. Any addition to an existing commercial building that increases the square footage by 1800 square feet or greater and all commercial remodels, alterations or repairs that are made involving demolition, remodel or repair of more than 50% of the structure.

Any addition to an existing residential building that increases the square footage by 75% or greater and all residential remodels, alterations or repairs that are made involving demolition, remodel or repair of more than 75% of the structure.

Minimum system size may be calculated by either of two methods, prescriptive or performance.

Prescriptive Method. The minimum system size utilizing the prescriptive method is two watts per square foot of building size. Watts are calculated by using the nameplate rating of the photovoltaic system. There are no considerations for performance such as tilt, orientation shading or tariffs.

Performance Method. The system sizing requirement for the performance model shall be calculated using modeling software or other methods approved by the official. The total building load is calculated in kilowatt hours. The photovoltaic system annual output is calculated by factoring in system orientation, tilt, shading, local weather conditions and equipment efficiency. On an annual basis the photovoltaic system must offset 75% of the building's total load.

Solar Sebastopol

Solar Sebastopol was the City of Sebastopol's pioneering effort to encourage Sebastopol residences and businesses to switch to solar energy, a much more environmentally sustainable, renewable source of

electricity. The program was designed to make solar a simple, affordable, and compelling choice for Sebastopol property owners, while demonstrating to other municipalities how to take their local energy future into their own hands. The program has grown to what is now called Solar Sonoma County, which is led by the Solar Action Alliance.

The Solar Action Alliance is an organization that supports solar and energy efficiency-related policy issues, educates and trains community members in the field, advocates for a rapidly growing industry, and acts as a clearinghouse for clean energy activity in Sonoma County.

ENVIRONMENTAL SETTING

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_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), 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_2in the world.

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_2 were being emitted.

Effects of Global Climate Change

The effects of increasing global temperature are far reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs 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 21st 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 time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (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 seasons, and increase pathogen growth rates.

***FORESTS AND LANDSCAPES*.** Global warming is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the 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.

ENERGY CONSUMPTION

The consumption of nonrenewable energy (primarily gasoline and diesel fuel) associated with the operation of passenger, public transit, and commercial vehicles results in GHG emissions that ultimately result in global climate change. Alternative fuels such as natural gas, ethanol, and electricity (unless derived from solar, wind, nuclear, or other energy sources that do not produce carbon emissions) also result in GHG emissions and contribute to global climate change.

Electricity Consumption

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Approximately 71 percent of the electrical power needed to meet California's demand is produced in the state. Approximately 29 percent of its electricity demand is imported from the Pacific Northwest and the Southwest (California Energy Commission, 2012)[1]. In 2010, California's in-state generated electricity was derived from natural gas (53.4 percent), large hydroelectric resources (14.6 percent), coal (1.7 percent), nuclear sources (15.7 percent), and renewable resources that include geothermal, biomass, small hydroelectric resources, wind, and solar (14.6 percent) (California Energy Commission, 2012).

According to the California Energy Commission (CEC), total statewide electricity consumption increased from 166,979 gigawatt-hours (GWh) in 1980 to 228,038 GWh in 1990, which is an estimated annual growth rate of 3.66 percent. The statewide electricity consumption in 1997 was 246,225 GWh, reflecting an annual growth rate of 1.14 percent between 1990 and 1997 (California Energy Commission Energy Almanac, 2012). Statewide consumption was 274,985 GWh in 2010, an annual growth rate of 0.9 percent between 1997 and 2010.

Oil

The primary energy source for the United States is oil, which is refined to produce fuels like gasoline, diesel, and jet fuel. Oil is a finite, nonrenewable energy source. World consumption of petroleum products has grown steadily in the last several decades. As of 2009, world consumption of oil had reached 96 million barrels per day. The United States, with approximately five percent of the world's population, accounts for approximately 19 percent of world oil consumption, or approximately 18.6 million barrels per day (The World Factbook 2009, Washington, DC: Central Intelligence Agency, 2009). The transportation sector relies heavily on oil. In California, petroleum based fuels currently provide approximately 96 percent of the state's transportation energy needs (California Energy Commission, 2012).

1 California Energy Commission (2012). Energy Almanac. Retrieved August 2012, from http://energyalmanac.ca.gov/overview/index.html

Natural Gas

Natural gas supplies are derived from underground sources and brought to the surface at gas wells. Once it is extracted, gas is purified and the odorant that allows gas leaks to be detected is added to the normally odorless gas. Natural gas suppliers, such as PG&E, then send the gas into transmission pipelines, which are usually buried underground. Compressors propel the gas through the pipeline system, which delivers it to homes and businesses.

The state produces approximately 12 percent of its natural gas, while obtaining 22 percent from Canada and 65 percent from the Rockies and the Southwest (California Energy Commission, 2012). In 2006, California produced 325.6 billion cubic feet of natural gas (California Energy Commission, 2012).

GHG MEASUREMENT

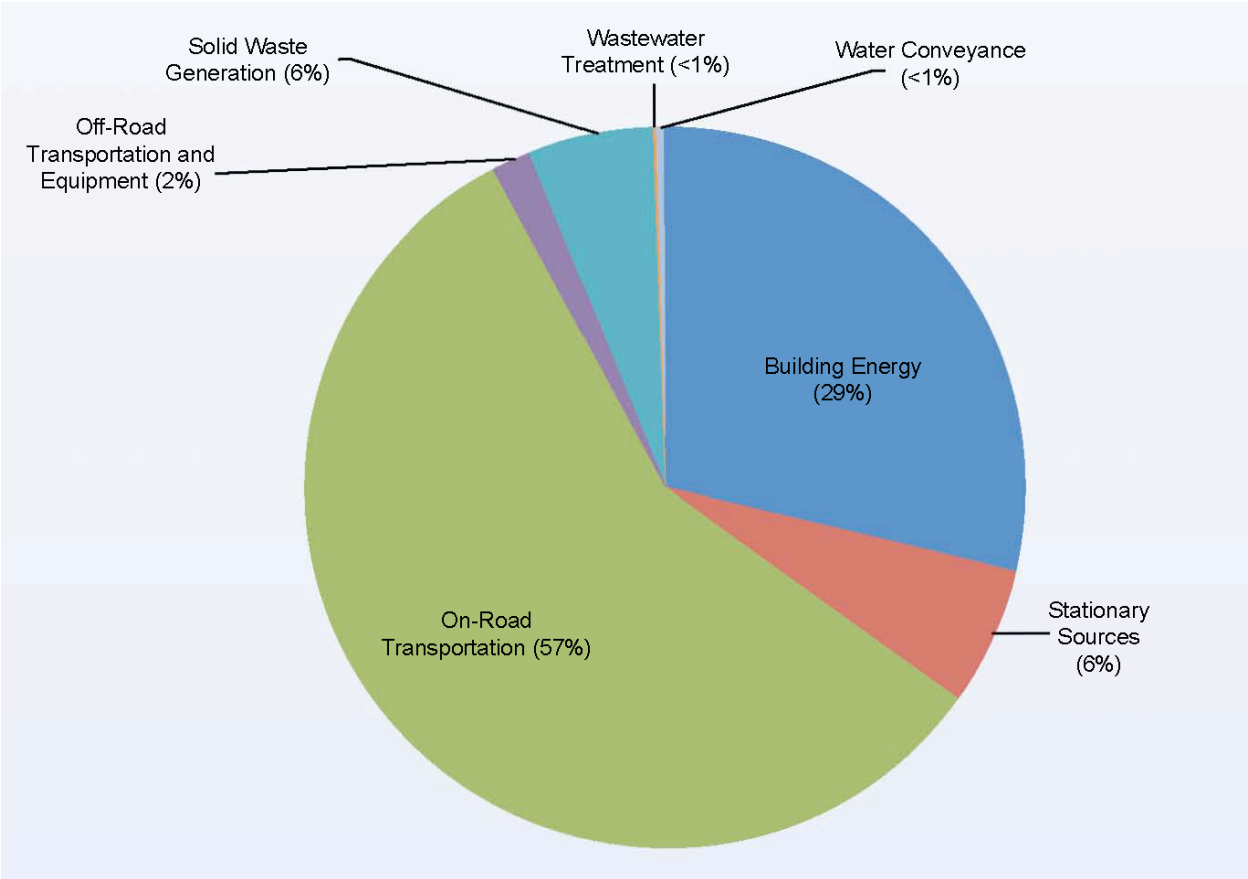
Carbon dioxide equivalents (CO_2e) provide a universal standard of measurement against which the impacts of releasing, or avoiding the release of, different GHGs can be evaluated. Every greenhouse gas has a Global Warming Potential (GWP), a measurement of the impact that particular gas has on radiative forcing; that is, the amount of heat/energy that is retained in the Earth's atmosphere through the addition of this gas to the atmosphere. The GWP of a given gas describes its effect on climate change relative to a similar amount of carbon dioxide (the GWP of CO_2 is 1.0 by definition).

The GWP of a gas depends on two factors, the ability of the gas to absorb energy, and the lifetime of the gas in the atmosphere. GWPs can be expressed on an instantaneous basis, which reflects only the relative ability of the gas to absorb energy, or with an explicit time factor built-in. The residence time of CO_2 in the atmosphere is generally believed to be in excess of 100 years, and some of the other GHGs have even longer residence times. Thus, most analyses use a timeframe in the range of 25 – 100 years in determining the warming potential of GHGs that are emitted into the atmosphere today.

Of the five principal GHGs, only CO_2 and CH_4 are emitted during the combustion of fuels. On a per-carbon basis, CH_4 has a GWP that is 25 times greater than the GWP of CO_2 on an instantaneous basis. However, the average residence time of CH_4 in the atmosphere is only about one-tenth as long as the average residence time of CO_2, and its clearance involves conversion to CO_2, so when a time factor is added the relative GWP of CH_4 goes down to values in the range of 7.5–12.5 on a per-carbon basis, depending on the length of the timeframe being used in the analysis. GWPs are often reported on a per-weight basis, rather than a per-carbon basis. The instantaneous GWP of methane on a weight basis is 69 relative to the same weight of CO_2, and with a time factor built-in it falls to a range of about 20–35.

LOCAL GHG EMISSIONS

GHG emissions by sector in Sebastopol are reported as a percentage of community-wide GHG emissions in the Draft GHG Emissions Inventory prepared in support of the Climate Action 2020 Plan. As shown in the graphic below, transportation sources (on-road) accounted for the largest percentage of local GHG emissions (57%), with building energy emissions accounting for 29% of community-wide GHG emissions. The report estimated community-wide GHG emissions in Sebastopol during 2010 to be approximately 80 million tons of CO2e.



The Regional Climate Protection Authority (RCPA) was created in 2009 to help each jurisdiction reach its GHG reduction goal. The RCPA includes representatives from each of the nine cities in Sonoma County and the Board of Supervisors.

Climate Action 2020 is a collaborative effort led by the RCPA and including all nine cities and the County of Sonoma and several partner entities to take further actions to reduce GHG emissions community-wide and respond to the threats of climate change. RCPA will work with each jurisdiction to develop a Community Climate Action Plan that will provide a comprehensive assessment of GHGs emission sources as well possible measures that jurisdictions can take to reduce GHG emissions and/or adapt to climate change to ensure their communities remain vibrant and resilient. The City of Sebastopol continues to participate in this regional effort. Release of the Public Draft Climate Action 2020 document is scheduled for the fall of 2014, and adoption of the document is tentative scheduled for the spring of 2015.

5.5 AESTHETICS AND VISUAL RESOURCES

This section addresses the aesthetics and visual resources in and around the City of Sebastopol. Further discussion of community character is located in the Land Use and Community Character section of this Background Report (Section 1). The City of Sebastopol and the surrounding areas possess numerous visual resources, many of which are found in the natural areas within the unincorporated areas of Sonoma County. These resources enhance the quality of life for Sebastopol residents, and provide for outdoor recreational, agricultural, scenic vistas, and tourist-generating uses. Landscapes can be defined as a combination of four visual elements: landforms, water, vegetation, and man-made structures. Visual resource quality is an assessment of the uniqueness or desirability of a visual element. This section reviews and summarizes Sebastopol's key visual resources.

METHODOLOGY

This section was prepared based on existing reports and literature for Sebastopol and surrounding areas. Additional sources of information included the California Department of Transportation's (Caltrans) Designated Scenic Route map, Sonoma County Regional Parks trails maps, and the Sonoma County Agriculture and Open Space District's protected lands inventory. Additional site reconnaissance was conducted using the most current ground level and aerial photography available via remote sensing applications such as Google Maps and Google Earth.

KEY TERMS

Scenic Highway Corridor. The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

Scenic Highway/Scenic Route. A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. Until the mid-1980's, General Plans in California were required to include a Scenic Highways Element.

View Corridor. A view corridor is a highway, road, trail, or other linear feature that offers travelers a vista of scenic areas within a city or county.

REGULATORY SETTING

FEDERAL

The United States Forest Service and the United States Department of Agriculture

The USFS was the first Federal agencies to develop and document a comprehensive system for addressing visual resources as part of this agency's land management process. Its handbook, The Visual Management System (USDA-FS, 1974), was followed by the BLM's and FHWA's handbooks in 1978 and 1981, respectively. The USFS has since revised its visual resource management system (Landscape Aesthetics. A Handbook for Scenery Management, USDA-FS, 1995), but the principles have remained the same.

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.

California Environmental Quality Act (CEQA)

The purpose of the Aesthetics section under CEQA is to identify and evaluate key visual resources in a project area, and to determine the degree of visual impact that would be attributable to a proposed project. Further, the analysis should identify key visual resources that warrant consideration in subsequent plans, so as to ensure, where possible, that the integrity of the landscape and built environment is maintained. It is common practice for the aesthetics section of an Environmental Impact Report (EIR) to be based on a policy evaluation and a site inspection of key viewsheds and visual resources. Additionally, a photo reconnaissance is usually prepared to document key resources.

California Government Code: Open Space Lands

This part of the State Government Code defines open space, and requires every city and county to prepare Open Space Plans as a required element of their General Plan. Building permits, subdivision approvals, and zoning ordinance approvals must be consistent with the local Open Space Plan.

California Trails Act

This law requires every city and county to consider trail-oriented recreational uses, and consider such demands in developing specific open space programs in their General Plan. Every city, county, and district must also consider the feasibility of integrating trail routes with appropriate segments of the state trail system.

REGIONAL

Sonoma County General Plan

Because visual resources span a greater breadth than the local city limits, the preservation and enhancement of these resources is not only a local concern, but also one that must be addressed regionally. In the region of Sebastopol visual resources are influenced by Sonoma County. Relevant steps the county is taking to ensure that the area's visual resources and community identity are protected in and around the Sebastopol Planning Area are presented below.

Community Separators: A characteristic which distinguishes Sonoma County from many parts of the San Francisco Bay Area is the continued existence of separate, identifiable cities and communities. Some land areas need to remain open or retain a rural character in order to avoid corridor-style urbanization. Community separators are lands that function as rural open space to separate cities and other communities, to contain urban development, and to provide city and community identity by providing visual relief from continuous urbanization. Community separators enhance the identities of individual cities and communities. As Community separators are rural areas that have open space characteristics, many of these areas are also scenic. The lands within community separators are frequently subject to pressures from development because they are close to developed areas and major roadways. While some development exists along the Highway 12 corridor between Santa Rosa and Sebastopol, scenic views of the Laguna de Santa Rosa, oak studded pastures, and Mt. St. Helena are available. Approximately 1,400 acres between these two communities are designated as community separators by Sonoma County to maintain the visual separation between these cities.

The Sonoma County General Plan has developed goals, objectives, and policies related to community separators, to preserve visual characteristics and community identity. These include:

GOAL OSRC-1: Preserve the visual identities of communities by maintaining open space areas between cities and communities.

Objective OSRC-1.1: Preserve important open space areas in the Community Separators.

Objective OSRC-1.2: Retain a rural character and promote low intensities of development in Community Separators. Avoid their annexation or inclusion in spheres of influence for sewer and water service providers.

Objective OSRC-1.3: Provide opportunities for consideration of additional development in Community Separators in exchange for permanent open space preservation and other overriding, substantial additional public benefits.

Objective OSRC-1.4: Preserve existing specimen trees and tree stands within Community Separators.

Policy OSRC-1a: Avoid amendments to increase residential density in Community Separators, since these densities were established based upon the policies set forth in other elements of this plan as well as the open space, separation and visual considerations identified in this section. The integrity of Community Separators cannot be maintained at densities in excess of one unit per ten acres. However, under no circumstances shall this policy be used to justify an increase in density from that designated on the land use map.

Policy OSRC-1b: Avoid commercial or industrial uses in Community Separators other than those that are permitted by the agricultural or resource land use categories.

Policy OSRC-1c: Notwithstanding conflicting policies or standards, the Board of Supervisors may, through a development agreement, General Plan amendment, or other appropriate mechanism, allow additional or varied development within Community Separators on a case by case basis if, at a minimum, the following criteria are met:

(1) Permanent open space preservation is provided through open space grants to the County and/or third party land trust.

(2) Development is clustered, concentrated or located to maintain the visual quality of the Community Separator.

(3) In addition to providing permanent open space preservation, the development is a public project or a private project which includes other substantial additional public benefits that outweigh the impacts of placing such development within the Community Separator.

(4) The development is accompanied by a visual analysis that demonstrates that the development either is not detrimental to or, in fact, enhances the visual quality of the Community Separator as a whole.

(5) Adequate additional public services and infrastructure are available to serve the development.

(6) The development is compatible with surrounding properties, especially those used for agricultural pursuits.

(7) Where open space grants are offered by way of easement as opposed to fee title, the development proposal includes a landscaping and maintenance plan that retains or enhances the visual integrity of the permanent open space.

In addition to the mandatory criteria set forth above, special consideration will be given to projects that incorporate one or more of the following:

(1) Aggregation of parcels within the Community Separator to achieve a project design that enhances the separator as a whole.

(2) Creative financing mechanisms to maintain and preserve open space or parkland that may be dedicated in fee as part of the proposed development.

(3) Project design features that provide for pedestrian or bicycle links between the communities on either side of the Community Separator and to any parkland that may be dedicated in fee as part of the proposed development.

Policy OSRC-1d: Consider amendments for outdoor recreational or other uses with a low intensity of structures only in those Community Separators along the Highway 101 Corridor.

Policy OSRC-1e: Apply the Scenic Resources combining district consistent with this Element to all lands located within a Community Separator.

Policy OSRC-1f: Unless there are existing design guidelines that have been adopted for the affected area, require that new structures within Community Separators meet the following criteria:

(1) Site and design structures to take maximum advantage of existing topography and vegetation in order to substantially screen them from view from public roads.

(2) Minimize cuts and fills on hills and ridges.

(3) Minimize the removal of trees and other mature vegetation; avoid removal of specimen trees, tree groupings, and windbreaks.

(4) Where existing topography and vegetation would not screen structures from view from public roads, install landscaping consisting of native vegetation in natural groupings that fits with the character of the area in order to substantially screen structures from view. Screening with native, fire retardant plants may be required.

(5) Design structures to use building materials and color schemes that blend with the natural landscape and vegetation.

(6) To the extent feasible, cluster structures on each parcel within existing built areas, and near existing natural features such as tree groupings.

(7) Utilities are underground where economically practical.

(8) On hills and ridges, avoid structures that project above the silhouette of the hill or ridge against the sky as viewed from public roads, and substantially screen driveways from view where practical.

Policy OSRC-1g: Use the following standards in addition to those of Policy OSRC-1f for subdivisions in Community Separators:

(1) Establish building envelopes for structures and consider use of height limitations if necessary to further mitigate visual impacts.

(2) Use clustering to reduce visual impact where consistent with the Land Use Element.

(3) Locate building sites and roadways to preserve significant existing tree stands and significant oak trees.

(4) To the extent allowed by law, require dedication of a permanent scenic or agricultural easement at the time of subdivision.

Policy OSRC-1h: Place a new measure on the ballot to extend the Sonoma County Agricultural Preservation and Open Space District for another twenty years for the continuing purpose of acquiring and administering open space lands, including an appropriate method of financing.

Policy OSRC-1i: Consider voluntary transfer of development rights (TDR) and purchase of development rights (PDR) programs and make Community Separators eligible with owner consent.

Policy OSRC-1j: Until the expiration or Ordinance No. 5003R (2016), require that revisions of or amendments to the boundaries or land use designations and densities of the Rosa/Sebastopol, Community Separators comply with the provisions of that ordinance.

Policy OSRC-1k: Until the expiration of Ordinance No. 5145R (2018), the General Plan land use regulations for the lands within the Petaluma/Novato Community Separator shall not be changed so as to increase either the allowed intensity or density of development by changing the land use designations in Figure LU-2h of the Land Use Element without the prior approval of the voters of Sonoma County.

Scenic Landscape Unit Designation: In the Sebastopol Planning Area, the Sonoma County General Plan has identified the Laguna de Santa Rosa area as a scenic landscape unit (a unit of land that is of special importance to Sonoma County). This area consists primarily of scenic lowlands and floodplain around the Laguna de Santa Rosa marsh, swamp and riparian forest. It also includes hills between Forestville, Sebastopol and Meacham Hill. It defines the eastern boundary of the City of Sebastopol, and associated rural residential development. The Sonoma County General Plan has developed goals, objectives, and policies related to scenic landscape units, to preserve the visual resources in and around the Laguna De Santa Rosa. These include:

GOAL OSRC-2: Retain the largely open, scenic character of important Scenic Landscape Units.

Objective OSRC-2.1: Retain a rural, scenic character in Scenic Landscape Units with very low intensities of development. Avoid their inclusion within spheres of influence for public service providers.

Objective OSRC-2.2: Protect the ridges and crests of prominent hills in Scenic Landscape Units from the silhouetting of structures against the skyline.

Objective OSRC-2.3: Protect hills and ridges in Scenic Landscape Units from cuts and fills.

Policy OSRC-2a: Avoid amendments to increase residential density in Scenic Landscape Units in excess of one unit per ten acres. The land use plan may designate a lower density or larger minimum lot size.

Policy OSRC-2b: Avoid commercial or industrial uses in Scenic Landscape Units other than those that are permitted by the agricultural or resource land use categories.

Policy OSRC-2c: Apply the Scenic Resources combining district consistent with this element to all lands located within Scenic Landscape Units.

Policy OSRC-2d: Unless there are existing design guidelines that have been adopted for the affected area, require that new structures within Scenic Landscape Units meet the following criteria:

(1) Site and design structures to take maximum advantage of existing topography and vegetation in order to substantially screen them from view from public roads.

(2) Minimize cuts and fills on hills and ridges.

(3) Minimize the removal of trees and other mature vegetation. Avoid removal of specimen trees, tree groupings, and windbreaks.

(4) Where existing topography and vegetation would not screen structures from view from public roads, install landscaping consisting of native vegetation in natural groupings that fits with the character of the area in order to substantially screen structures from view. Screening with native, fire retardant plants may be required.

(5) Design structures to use building materials and color schemes that blend with the natural landscape and vegetation.

(6) On hills and ridges, avoid structures that project above the silhouette of the hill or ridge against the sky as viewed from public roads and substantially screen driveways from view where practical.

(7) To the extent feasible, cluster structures on each parcel within existing built areas and near existing natural features such as tree groupings.

Policy OSRC-2e: Use the following standards in addition to those of Policy OSRC-2d for subdivisions in Scenic Landscape Units:

(1) Establish building envelopes for structures and consider use of height limitations if necessary to further mitigate visual impacts.

(2) Use clustering to reduce visual impact where consistent with the Land Use Element.

(3) Locate building sites and roadways to preserve significant existing tree stands and significant oak trees.

Policy OSRC-2f: Identify critical scenic areas within designated Scenic Landscape Units. To the extent allowed by law, consider requiring dedication of a permanent scenic or agricultural easement at the time of subdivision for properties within these critical scenic areas.

Policy OSRC-2g: Consider voluntary transfer of development rights (TDR) and purchase of development rights (PDR) programs and make Scenic Landscape Units eligible with owner consent.

Policy OSRC-2h: For development on parcels located both within Scenic Landscape Units and adjacent to Scenic Corridors, apply the more restrictive siting and setback policies to preserve visual quality.

Scenic Corridors: Residents and visitors of Sonoma County are able to view a high variety of landscapes from rural roadways and scenic corridors throughout the County. Motorists can travel from urban centers into scenic areas such as: orchard and forest covered hills, oak woodlands, rolling pasturelands, scenic valleys, and planted vineyards. Preserving these landscapes is important to the character of the County. The Sonoma County General Plan has developed goals, objectives, and policies related to the preservation and enhancement of scenic corridors. These include:

GOAL OSRC-3: Identify and preserve roadside landscapes that have a high visual quality as they contribute to the living environment of local residents and to the County's tourism economy.

Objective OSRC-3.1: Designate the Scenic Corridors on Figures OSRC-5a through OSRC-5i along roadways that cross highly scenic areas, provide visual links to major recreation areas, give access to historic areas, or serve as scenic entranceways to cities.

Objective OSRC-3.2: Provide guidelines so future land uses, development and roadway construction are compatible with the preservation of scenic values along designated Scenic Corridors.

Policy OSRC-3a: Apply the Scenic Resources combining district to those portions of properties within Scenic Corridor setbacks.

Policy OSRC-3b: For development on parcels located both within Scenic Landscape Units and adjacent to Scenic Corridors, apply the more restrictive siting and setback policies to preserve visual quality.

Policy OSRC-3c: Establish a rural Scenic Corridor setback of 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the road unless a different setback is provided in the Land Use Policies for the Planning Areas.

Policy OSRC-3d: Establish a building setback of 20 feet along the Highway 101 Scenic Corridor in Urban Service Areas to be reserved for landscaping. Where a sound barrier or other sound mitigating structure must be located along a Scenic Corridor, ensure that the landscaped area is visible from the highway. Cooperate with State agencies to achieve compatible goals with regard to visual quality along Scenic Corridors.

Policy OSRC-3e: In conjunction with Section 2.5 “Policy for Urban Design”, incorporate design criteria for Scenic Corridors in urban areas.

Policy OSRC-3f: Refer building permits within the setback along historic Bohemian Highway between Occidental and Freestone and along Bodega Highway between Bodega and Freestone to the Sonoma County Landmarks Commission for review and recommendations.

Policy OSRC-3g: Avoid freeway oriented billboards along designated Scenic Corridors. Establish design criteria for consideration of new freestanding outdoor advertising structures or signs along designated Scenic Corridors to retain visual quality. Consider amortization of existing signs subject to the limitations of State law as a condition of approval for discretionary permits.

Policy OSRC-3i: Recognize Highway 116 from Highway 1 to the southern edge of Sebastopol as an official State Scenic Highway. The unique scenic qualities of this portion of Highway 116 shall be protected as generally outlined in the 116 Scenic Highway Corridor Study, September 1988. Consider requesting official State Scenic Highway designations for Highways 1 and 37. Upon the request of local residents, the County may pursue similar State status for other Scenic Corridors.

LOCAL

City of Sebastopol General Plan

The existing City of Sebastopol General Plan identifies the following policies related to visual resources:

Chapter V Community Identity

Section I: Citywide Design Guidelines

Goal 1 Build on and strengthen Sebastopol's unique identity and sense of place.

Goal 2 Preserve the character of existing residential neighborhoods.

Goal 3 Ensure that new residential development demonstrates quality, excellence of design, and sensitivity to the character of the surrounding neighborhood.

Goal 4 Maintain Sebastopol's identity as a small, compact town.

P.1 Design Guidelines: Ensure that new development is constructed in a manner consistent with the City's Design Guidelines.

Program 1.1: Develop urban design guidelines for the Laguna, Atascadero Creek and entryways to the City.

P.2 Compatibility of Development with Surroundings: Ensure that new residential development is sensitive to the surrounding architecture, topography, landscaping, and to the character, scale, and ambiance of the surrounding neighborhood.

Program 2.1: Continue to maintain the Design Review Board.

Program 2.2: Include the following design guidelines for infill development in the Zoning Ordinance and in the *Design Review Guidelines*:

- require that massing (the relationship between the size and bulk of building); the placement of doors and windows; and the use of colors, materials and detailing be compatible with the existing neighborhood; and
- require landscape plans which complement neighboring lots; buffer adjoining land uses; and soften the variation in size, setback or architectural character of buildings.

P.3 Site Constraints: Ensure that new residential developments are sensitive to site constraints, such as hillsides and scenic views.

P.6 Discourage sameness and repetitive designs.

Program 6.1: Revise the Zoning Ordinance to include the following requirements:

- do not locate new residential construction with identical or similar facades on opposing or adjacent lots;

- require Design Review Board approval of site plans, subdivisions, and structures for residential developments two units and larger.

P.7 Property Maintenance and Nuisance: Ensure that properties are well-maintained and nuisances are bated.

P.8 Landscaping: Encourage attractive native and drought-tolerant landscaping in residential and commercial developments.

Program 8.1: Maintain and periodically update minimum landscape standards.

Program 8.2: Maintain a list of drought-tolerant plants for public distribution.

P.9 Strip Development: Discourage further strip development along South Main Street, Gravenstein Highway South, and Healdsburg Avenue.

Program 9.1: Include standards for the number and location of driveway cuts for arterial streets in the Zoning Ordinance.

Program 9.2: Establish criteria regarding noise, lighting, signage, traffic generation, landscaping and safety for automobile-dependent businesses in the Zoning Ordinance.

P.10 Undergrounding Power Lines: Continue to require undergrounding of power lines.

P.11 Entryways: Clearly define the points of entry to the City through use of distinctive signs, street lighting, landscaping and street trees.

Program 11.1: Maintain all the following entry points to the City, distinctive signs which are placed in a landscaped area, the City limits: at Bodega Avenue; Gravenstein Highway South; Sebastopol Avenue; High School Road; and Gravenstein Highway North.

Goal 5 Improve the appearance and effectiveness of parking facilities.

P.12 Parking Location: Locate parking facilities wherever possible to the rear of the development, so that the building façade is contiguous with the street frontage and parking areas are hidden from the street. Parking lots adjacent to streets are sufficiently screened from adjacent streets by ample landscaping, earthen berms, or a combination of the two, as determined through the Design Review Board process.

P.13 Parking Lot Standards: Reduce the visibility of parking facilities and the amount of land required for this purpose.

Program 13.1: Consider revising the Zoning Ordinance to establish the following standards for parking facilities:

- install landscaped islands within parking areas and establish a standard for shade tree planting;
- require an appropriately-scaled landscaped perimeter around parking areas.

Goal 6 Use lighting to create a sense of security and enhance architecture.

P.16 Enhancing Architecture: Ensure that on-site lighting complements and reinforces the architecture.

P.17 Prevent Glare: Prevent on-site lighting from casting glare onto adjacent parcels and streets.

P.19 Lighting Design Guidelines: Establish and use lighting design guidelines in the Design Review process.

Program 19.1: Adopt the following design guidelines for the review of exterior lighting fixtures:

- Design night lighting of buildings to be indirect with no source of light visible. Prohibit the full lighting of building facades and roofs.
- Keynote special features such as towers and decorative cornices.
- Designate color of light. Favor warm-toned lighting.

P.20 Open Space and Landscaping: Increase the amount of public open space and landscaping.

Program 20.1: Identify sections of Zimpher and Calder Creeks which could be feasibly uncovered and restored to their natural state. Pursue funding sources wherever feasible.

P.31 Visual Connection to the Laguna: Encourage visual connection and identification with the Laguna de Santa Rosa.

Section II: The Downtown Plan Element

D. Goals, Policies and Programs

P.29 Architectural and Landscape Design: Require attractive architectural and landscape design for new commercial developments as well as for expansion to existing commercial uses.

Program 29.3: Continue to review landscape plans to ensure that they provide an appealing and attractive environment Downtown. Introduce water elements where appropriate in landscaping and site plans. Provide large landscaped areas between sidewalks and existing parking. Provide incentives to developers to encourage open space. Apply design standards to screen and shade parking areas.

Program 29.5: Bring water elements and riparian vegetation into the Downtown area.

P.37 Funding Building Rehabilitation: Continue Redevelopment Agency funding for building rehabilitation.

Goal 13 Preserve archaeological and historic resources.

P.39 Historic Buildings, Sites and Districts: Identify, recognize and protect sites, buildings, structures and districts with significant cultural, aesthetic and social characteristics which are part of Sebastopol's heritage.

Program 39.1: Adopt a cultural resources management ordinance to identify, recognize, protect and preserve sites, buildings, structures, districts and objects that reflect significant elements of Sebastopol's cultural, social, economic, political, aesthetic, architectural or natural heritage.

Section III: Historic Resources, Scenic Views and Public Art

Goal 14 Preserve and enhance scenic views of the Laguna de Santa Rosa, Atascadero Creek, the hills to the west of Sebastopol and other natural resources within the Sebastopol Planning and Referral Area.

P.40 Preserve scenic views of the natural landscape.

Program 40.1: Utilize the Map 2: Scenic View Corridors as a guide to protecting and enhancing scenic views in the development review process.

Program 40.2: Analyze proposed structures within 1250 feet of the Laguna de Santa Rosa for their effect on the views of and from the Laguna de Santa Rosa.

Program 40.3: Analyze proposed structures within 1250 feet of the Laguna de Santa Rosa for their potential effect on the Laguna skyline. Do not permit massive, uninterrupted penetrations of the tree line by roofs or other building structures.

Program 40.4: Discourage additional building construction in the area of the Laguna Youth Park and adjacent sewer ponds 200 feet from the center line of Morris Street.

Program 40.5: Prohibit building construction on the Barlow field parcel.

Program 40.6: Revise the Zoning Ordinance to regulate the design and location of antenna towers and satellite dishes.

Program 40.7: Continue to require developers to underground utility lines.

P.41 Discourage Structures Near Laguna Channel: Discourage public agencies from developing building structures within 800 feet of the center line of the Laguna channel.

P.42 Discourage Public Buildings Near the Laguna: Discourage public agencies from developing building structures within 800 feet of the Laguna.

P.43 Color Schemes and Forms for Structures: Encourage new and renovated developments within 1250 feet of the Laguna to use color schemes and forms sympathetic to the visual character of the Laguna and the region.

P.44 Encourage Clustering of Structures: Encourage the clustering of structures to develop open space that physically and visually relates to the Laguna.

Goal 15 Support Public Art and Sculpture.

P.45 Public Art and Sculpture: Promote public art and sculpture that reflects the cultural life of the community.

Program 45.1: Adopt a Percent-for-Art Program.

Program 45.3: Consider implementing an ongoing sculpture exhibit in the Downtown Plaza.

ENVIRONMENTAL SETTING

The City of Sebastopol is located on the western edge of the Santa Rosa plain, northwest of Petaluma, and west of the City of Santa Rosa. The Valley is bordered by the Sonoma Mountains to the east, and a series of rolling hills to the west. To the southwest of the City of Sebastopol are the Estero Lowlands (aka Petaluma Gap), which opens to the Pacific Ocean and Bodega Bay.

Sebastopol and the surrounding areas possesses numerous visual resources, many of which are found in the natural areas within the unincorporated areas around the City, however, they are visible from both unincorporated and incorporated areas. These resources not only enhance the quality of life for residents of Sebastopol, but are a significant attraction that brings tourists to the region. Landscapes can be defined as a combination of differing visual elements: landforms, water, vegetation, and or man-made structures.

Community Identity

Every community has an identity that 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, and identify with certain visual aspects within the community. A community's identity is largely defined by the visual elements that are present, including natural amenities both near and far, and the design of man-made amenities.

The City of Sebastopol is largely defined by its unique small town atmosphere that combines a vibrant blend of cultural amenities with the rural openness surrounding the City. Residents and visitors alike, have long appreciated areas around Sebastopol for the scenic beauty of its rolling hillsides and open spaces. In recent years many restaurants, shops, artist galleries, and live music venues have opened, securing the town's position as West County's arts and culture core. The vast open space areas surrounding the City function as a community separator to provide clear distinction between neighboring communities, and add important open space elements and vistas to the community experience.

Open Space and Visual Resource Areas

There are a variety of open space and visual resources around the City of Sebastopol. They include: agricultural land, grassland, chaparral, woodlands, riverine, wetlands, and public art. Below is a brief description of each of these open space types in and around Sebastopol.

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. Important farmland soils are located throughout Sonoma County, but are concentrated primarily in the Sonoma Valley, and west of Sebastopol. The City of Sebastopol has a long agricultural history. The apple industry brought steady rural prosperity to the town, but as apples struggled to be profitable in the region, wine grapes and grazing became prominent in the area. Today the visual effects of the agricultural industry are present of many hillsides and pasturelands, with rolling hills of grapevines, and open grasslands are devoid of once prominent oak groves. While the visual effects of agriculture as a resource is up to individual

preference, many people find enhanced agricultural landscapes to be a visually pleasing environment, and Sonoma County places a high importance to this specific type of visual resource amenity.

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. Grasslands found near Sebastopol are open habitats, providing opportunities for expansive views, and wildflower displays.

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 grazing, 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. Much of the Santa Rosa Plain was previously covered by oak woodlands. However, a large majority of these trees have been removed, to make way for agricultural and urban uses. Retention of the existing oak woodland vegetation is considered critical to the scenic value of areas around the City of Sebastopol.

Urban Forests are ecosystems of trees and other vegetation in and around communities that may consist of street and yard trees, vegetation within parks and along public rights of way and water systems. Urban forests provide communities with environmental, economic and social benefits, provide habitat for wildlife, create tranquility, and aesthetic value for a community. Sebastopol has acknowledged the importance of trees to the local community and adopted a Tree Protection Ordinance. In March of 1992, the City Council adopted the Tree Ordinance, Chapter 8.12 of the Municipal Code, to ensure that the community's trees would be protected and managed, so as to ensure these multiple civic benefits. The ordinance establishes protection for significant trees on private property, while allowing a process for removal of trees that are diseased, dangerous, or causing property damage. The City's Tree Ordinance states that all trees, other than those species identified on the Escaped Exotic List, (Table 5.5-1) with a diameter at breast height (DBH) of 20 inches or more on properties that house a single-family land use are protected. For all other properties, species identified on the Protected Native Tree List, (Table 5.5-2) with a DBH of 10 inches or greater are protected. In addition, all other trees larger than 20 inch DBH, which are not listed as Escaped Exotics are also protected. Tables 5.5-1 and 5.5-2 display tree varieties that are considered by Sebastopol to be protected native, and exotic (not protected) tree types.

TABLE 5.5-1: ESCAPED EXOTIC TREE LIST		
Common Name	**Scientific Name**	**DBH**
Acacias and Wattles, all species	Acacia sp.	-
Tree of Heaven	Ailanthus altissima	-
Plume Albizia	Albizia lophantha, A. distachya	-
Eucalyptus, all species	Eucalyptus sp.	-
Tamarisk and Salt Cedar, all species	Tamarix sp.	-
Poplars, all species	Populus sp.	-
Monterey Pine	Pinus radiata	-

TABLE 5.5-2: PROTECTED NATIVE TREE LIST			
Common Name	**Scientific Name**	**DBH Single-Family**	**DBH Other Use**
Big leaf Maple	Acer macrophyllum	20''	10''
Box Elder	Acer negundo ssp Callfornica	20''	10''
Buckeye	Aesculus californica	20''	10''
White Alder	Alnus rhombifolia	20''	10''
Madrone	Arbutus menziesii	20''	10''
Hawthorne	Crataegus douglasii	20''	10''
Oregon Ash	Fraxinus latifolia	20''	10''
Douglas Fir	Pseudotsuga menziesii	20''	10''
Coast Live Oak*	Quercus agrifolia*	20''	10''
Oregon Oak*	Quercus garryana*	20''	10''
Black Oak*	Quercus kelloggii*	20''	10''
Valley Oak*	Quercus lobata*	20''	10''
California Bay	Umbellularia californica	20''	10''
Sandbar Willow	Salix hindsiana	20''	10''
Yellow Willow	Salix lasiolepis	20''	10''
Red Willow	Salix laevigata	20''	10''
Coast Redwood	Sequoia sempervirens	20''	10''
Tanbark Oak	Lithocarpus densiflora	20''	10''
California Black Walnut	Juglans hindsii	20''	10''

*Any naturally occurring hybrid of Quercus species listed above

The Sebastopol Public Works Department maintains an extensive inventory of street trees on City streets. Trees can improve air quality, provide shade, assist in 'calming' traffic, and reduce the 'urban heat island' effect, and provide a visual resource that acts to enhance community identity.

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 sources, such as a spring or lake, and flows downward.

Retention of the riparian vegetation near the Laguna De Santa Rosa is critical to the scenic value of areas around the City of Sebastopol. The Laguna is called the "river that flows both ways." During heavy rains, the Laguna flows south carrying floodwaters away from the Russian River, reducing its flood levels. After rains subside and the tides fall, the Laguna reverses its flow, returning the floodwater north, back into the Russian River and eventually to the Pacific Ocean. Additionally, water enters the Laguna from a collection of creeks, tributaries, springs, seeps and sub-surface flows. Because of this diverse water supply, the Laguna, through primarily a marsh, has characteristics of a stream, creek, seasonal wetland, open water, and other aquatic habitats in various locations, making it a truly unique ecosystem and community resource.

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. Sebastopol has developed the unique wetland resource of the Laguna de Santa Rosa Wetlands Preserve, comprising approximately 75 acres of open space and trails. The Laguna de Santa Rosa is the second largest freshwater marsh in Northern California and the largest in Sonoma County. The Laguna is considered a premier wildlife and bird watching area that is home to many species of flora and fauna, including several listed species. Much of the wetland preserve has been reclaimed from a former wastewater treatment plant, a City dump, and an industrial waste (from apple processing) disposal field. The Preserve has served as a model for Laguna Preservation throughout the Laguna watershed, which extends from Rohnert Park to the Russian River. There is a walking trail that adjoins the Laguna channel, looping around the City's former wastewater ponds. From late spring to early fall, a floating pedestrian bridge is in place that crosses the channel and connects to a longer trail that loops around Meadowlark Field.

Public art refers to works of art in any medium, which are outside and accessible to all. Public art usually holds implications of site specificity, community involvement and collaboration. Cities gain value through public art installations through cultural, social, economic, and aesthetic value. Public art is a distinguishing part of a community's history and evolving culture; it adds meaning to cities and uniqueness to communities. Public art humanizes the built environment and can invigorate public spaces. Sebastopol has a rich artistic spirit and appreciation for arts and culture. Public art displays can be viewed in the City at a number of public sites where the work of the 'Sculpture Jam' group of artists is displayed, and along Florence Avenue, which is a residential art enclave displaying public art. The City of Sebastopol also has a Public Arts Committee that works to keep aesthetically pleasing and locally produced art circulating throughout the community. Sebastopol has one of the most active arts organizations in Sonoma County, in the Sebastopol Center for the Arts, with a variety of arts programs, classes, and exhibits.

Scenic Highways

The Santa Rosa Plain 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, one of which (Highway 116) stretches 28 miles from Highway 1 to the city limits of Sebastopol.

Officially Designated State 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 north 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.

Sonoma County Scenic Corridors

Sonoma County has also designated various highways and roadways throughout the unincorporated County as Scenic Corridors (see Figure 5.5-1). Below is a list of designated scenic corridors by Sonoma County that are located in the vicinity of Sebastopol.

Sonoma County Designated Scenic Corridors

- State Route 116 (Gravenstein Highway)
- Occidental Road
- California State Route 12
- Bodega Highway

Sonoma County Designated Scenic Landscape Units

Within the Sebastopol Planning Area, Sonoma County has designated Laguna de Santa Rosa as a scenic landscape unit (a unit of land that is of special importance to Sonoma County). This area consists primarily of the scenic lowlands and floodplain around the Laguna de Santa Rosa marsh, swamp and riparian forest. It also includes hills between Forestville, Sebastopol, and Meacham Hill. The Laguna defines the eastern boundary of Sebastopol and associated rural residential development. Sonoma County has also designated expansive amounts of land as Scenic Landscape Units to the northwest Sebastopol along Occidental Road, and west of the City along Bodega Highway, as shown in Figure 5.5-1.

Sonoma County Agricultural Preservation and Open Space District

The Sonoma County Agricultural Preservation and Open Space District is a Special District formed by a vote of the citizens in 1990. The District was created for the acquisition and preservation of agricultural and open space lands, to ensure future generations are provided with valuable natural environments, scenic areas, and recreational opportunities.

The District protects land through land conservation agreements, (a voluntary legal agreement that a landowner makes to restrict the amount and type of development that may take place on his or her property) and through the direct purchasing of land. Each agreement is tailored to protecting the unique resources of the particular property and remains with the land forever. Conservation Agreements are an important tool used by the District to preserve agricultural land, open space, and recreational land uses. Protected lands in and around the Planning Area include:

Balletto Ranch borders the Laguna de Santa Rosa and contains many scattered valley oaks. This diverse waterfront property acts as a buffer between Sebastopol and Santa Rosa. Rolling hills of lush vineyard cover the upland portion of the site, and creeks feed into the meandering Laguna across its southern

face. The ranch also provides a stunning vista from Occidental Road to the north with its vineyards, valley oaks, winding waterways and wildlife. A portion of land on this property has been donated to the District to provide public access.

Carinalli Ranch is located west of Sebastopol along Highway 12. The Ranch forms an important open space buffer between Santa Rosa and Sebastopol, along the Laguna de Santa Rosa uplands.

Dutton Ranch is well known in the farming community in Sonoma County. The ranch cultivated crops such as Gravenstein apples and varietal grapevines dominate the rolling countryside of this ranch west of Sebastopol. Travelers along Highway 116 will enjoy the scenic views that this productive ranch provides. The ranch is protected with a District easement.

Laguna Farms Spray Fields has an agreement between the City of Santa Rosa and the District, which permanently protects this richly diverse landscape that is visible from the Highway 12 scenic corridor. The broad landscape of water and wetlands is home to hundreds of plants, birds, fish and invertebrates. A master plan is in process to develop trails through the Laguna to allow visitors access to this enjoyable landscape.

Laguna Uplands Preserve is behind Palm Drive Hospital.. Students use this site as an outdoor classroom to learn about nature through the District's "In Our Own Back Yard" educational program. Located on the western edge of the Laguna de Santa Rosa, the property is characterized by moderately sloping hillsides, with scenic views across the Laguna looking toward Taylor Mountain and Santa Rosa. Owned by the Laguna de Santa Rosa Foundation, its conservation values are protected permanently by a conservation easement.

Laguna SkateGarden Park is where skateboarders and gardeners enjoy this unique combination skate park and community garden. The City of Sebastopol has built a build a state-of-the-art skate park on this site, surrounded by a community garden with demonstration areas for sustainable gardening practices. This park site was acquired through the Matching Grant Program, and attracts young people throughout western Sonoma County to skateboard, to learn about organic gardening, and to help grow local produce. Artists from the Sebastopol Center for the Arts have participated in the design process, adding to the creative mix and the unique character of this community park.

West County Trail is a path that runs between Sebastopol and Forestville, and provides a walking and biking view corridor along an abandoned railway line east of Highway 116. The relatively flat terrain, and paved trail makes for easy access, and it provides stunning views of the farms, vineyards, and open land in the greater Sebastopol area. Maintained by Sonoma County Regional Parks, the District retains an easement to protect the conservation values along the trail. The area is noted to be especially scenic in fall and spring. For horseback riders, an unpaved equestrian trail runs parallel to the paved trail. The District was able to acquire a trailhead just off First Street in Forestville and most recently assisted Regional Parks, through its Matching Grant Program, in developing an additional trailhead off of Ross Station Road.

Sebastopol Railroad Forest is situated on the east side of Sebastopol on land formerly owned by the Southern Pacific Railroad. The Sebastopol Railroad Forest is characterized by wetlands and significant wildlife. Bicyclists and hikers along the adjacent trail will enjoy the area's natural resources and rural beauty that is protected by a conservation easement.

Table 5.5-3 displays open space and conservation land in the vicinity of Sebastopol that is currently under a protection agreement.

TABLE 5.5-3: PROTECTED LANDS NEAR SEBASTOPOL			
Name	**Land Conservation Type**	**Date Protected**	**Acres**
Sebastopol Railroad Forrest	Natural areas/Recreation	July 1993	10
Laguna SkateGarden Park	Recreation	April 2008	1.1
Dutton Ranch	Farms/Greenbelts	September 1995	69
West County Trail	Recreation	May 1995	16.6
Balletto Ranch	Greenbelts/Recreation/Farms/Natural Areas	April 2002	256
Carinalli Ranch	Greenbelts/Farms/Ranches	June 1995	245
Laguna Farms	Greenbelts	September 2001	1400
Laguna Uplands Preserve	Natural Areas	May 1996	8
Total			2,002.7

REFERENCES

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

California Department of Transportation. 2013. State Scenic Highway Program. http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm

City of Sebastopol. 1994. City of Sebastopol General Plan 1994. Chapter V Community Identity.

City of Sebastopol. 2014. Laguna Wetland Preserve. Available At: http://ci.sebastopol.ca.us/page/laguna-wetlands-preserve

City of Sebastopol 2002 amended 2014. City of Sebastopol Municipal Code. CHAPTER 8.12 Tree Protection.

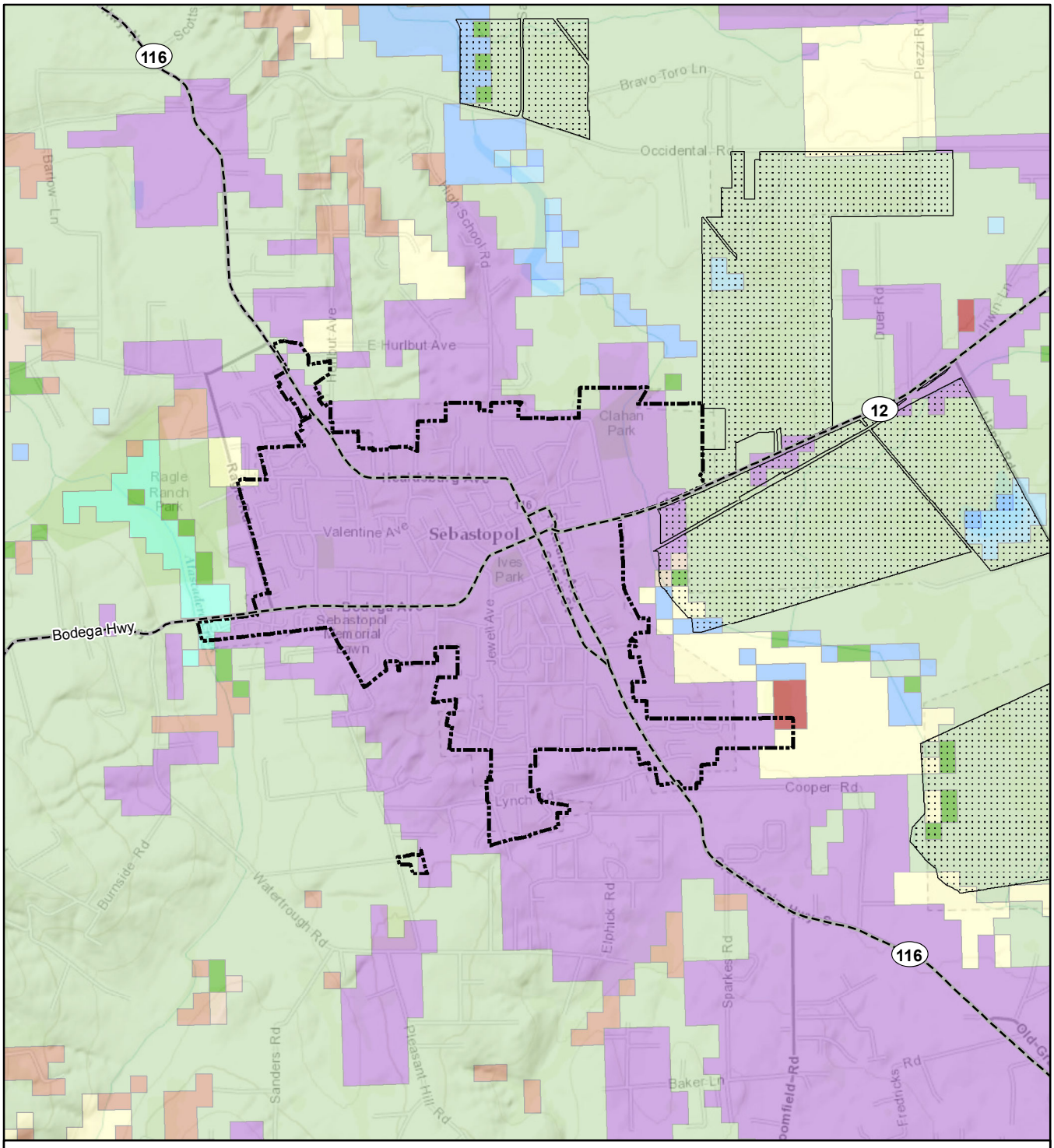
City of Sebastopol. 2004. Laguna Vista Project Scenic Open Space Report. 2004. Prepared by Wetland Research Associates Inc. Ralph Alexander & Associates, and Basin Research Associates. Available At: http://ci.sebastopol.ca.us/sites/default/files/rmansour/laguna_vista_scenic_open_space_report_july_2004_0.pdf

Sonoma County. 2014. Sonoma County Regional Parks. Available At: http://parks.sonomacounty.ca.gov/Get_Outdoors/Parks/West_County_Regional_Trail.aspx

Sonoma County 2014. Sonoma County Agriculture and Open Space District. Available At: http://www.sonomaopenspace.org/Content/?p=10054/preview.html

Sonoma County. 2006. Sonoma County GP 2020 Draft EIR. Prepared by Nichols Berman.

Sonoma County 2008. Sonoma County General Plan 2020. Available At: http://www.sonoma-county.org/PRMD/gp2020/index.htm



Wildlife-Habitat Relationship

- Agriculture
- Annual Grassland
- Eucalyptus
- Freshwater Emergent Wetland
- Montane Hardwood
- Montane Riparian
- Urban
- Valley Foothill Riparian
- Water
- Wet Meadow

City Boundaries

- Sebastopol
- Santa Rosa

SEBASTOPOL GENERAL PLAN UPDATE

Figure 5.2-1: Land Cover Types

N

0 1,500 3,000
Feet

1:36,000

Data sources: Data sources: USGS National Hydrography Dataset; CalWater 2.1.1, National Resources Conservation Service, IWMC; Sonoma County GIS. Map date: June 26, 2014. (Sebas_Landcover_140626)

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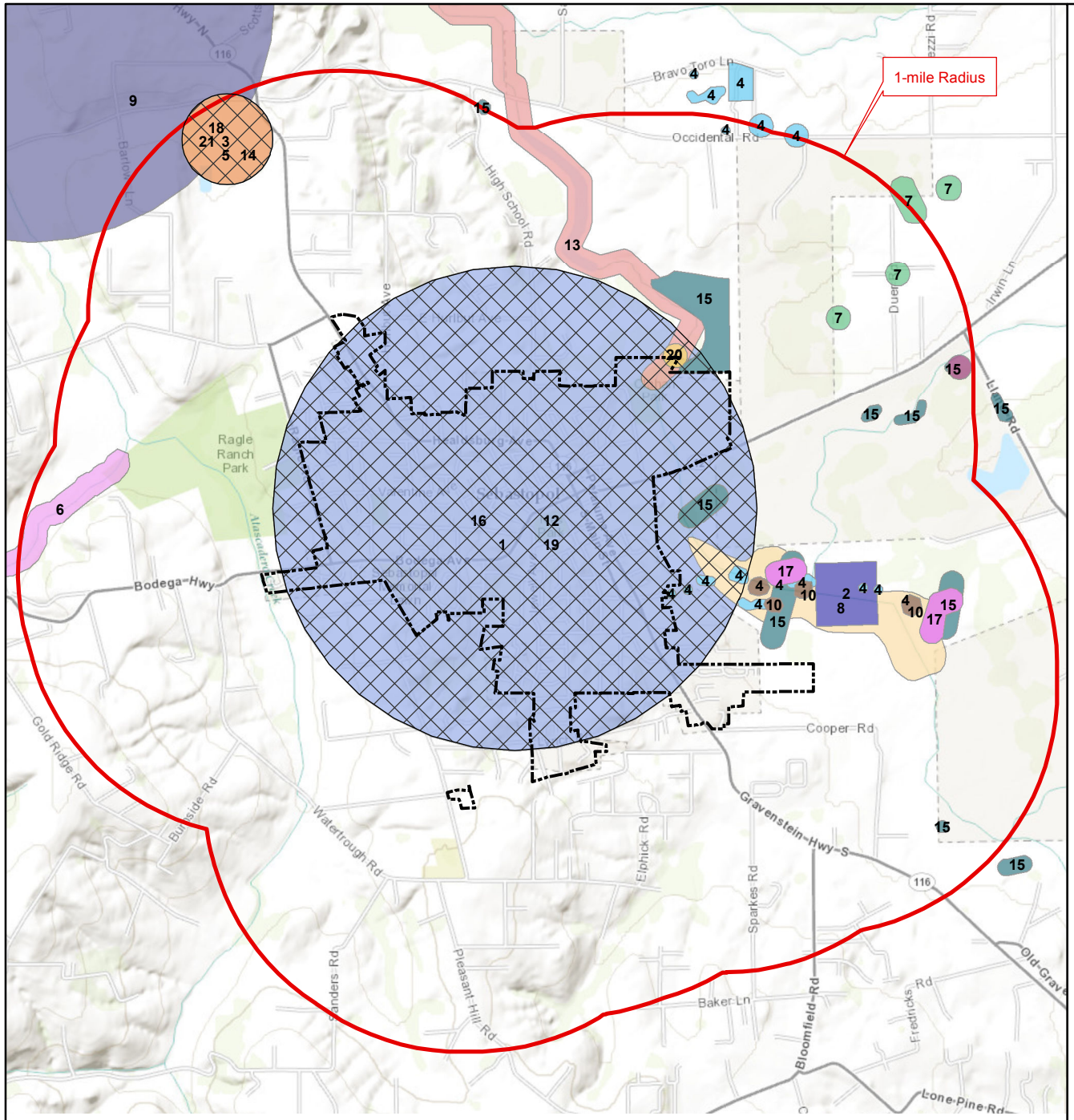

Data sources: Data sources: CDFG California Natural Diversity Database, June 3, 2014;
ArcGIS Online World Topo Map Basemap. Map date: June 26, 2014. (Sebas_CNDDB_01mi_140626_lscp)

SEBASTOPOL GENERAL PLAN UPDATE

Figure 5.2-2: CNDDB
1-Mile Radius Search

Map Label: Common Name: Occurrence Count

- 1: Baker's goldfields: 1
- 2: Baker's navarretia: 1
- 3: brownish beaked-rush: 1
- 4: Burke's goldfields: 2
- 5: California beaked-rush: 1
- 6: California freshwater shrimp: 1
- 7: California tiger salamander: 3
- 8: Coastal and Valley Freshwater Marsh: 1
- 9: golden larkspur: 1
- 10: Northern Hardpan Vernal Pool: 1
- 11: Northern Vernal Pool: 1
- 12: oval-leaved viburnum: 1
- 13: Peruvian dodder: 1
- 14: round-headed beaked-rush: 1
- 15: Sebastopol meadowfoam: 7
- 16: Sonoma spineflower: 1
- 17: Sonoma sunshine: 2
- 18: swamp harebell: 1
- 19: thin-lobed horkelia: 1
- 20: western pond turtle: 1
- 21: white seaside tarplant: 1

Area of Multiple Species Occurrence

N

0 0.25 0.5
Miles

1:40,000

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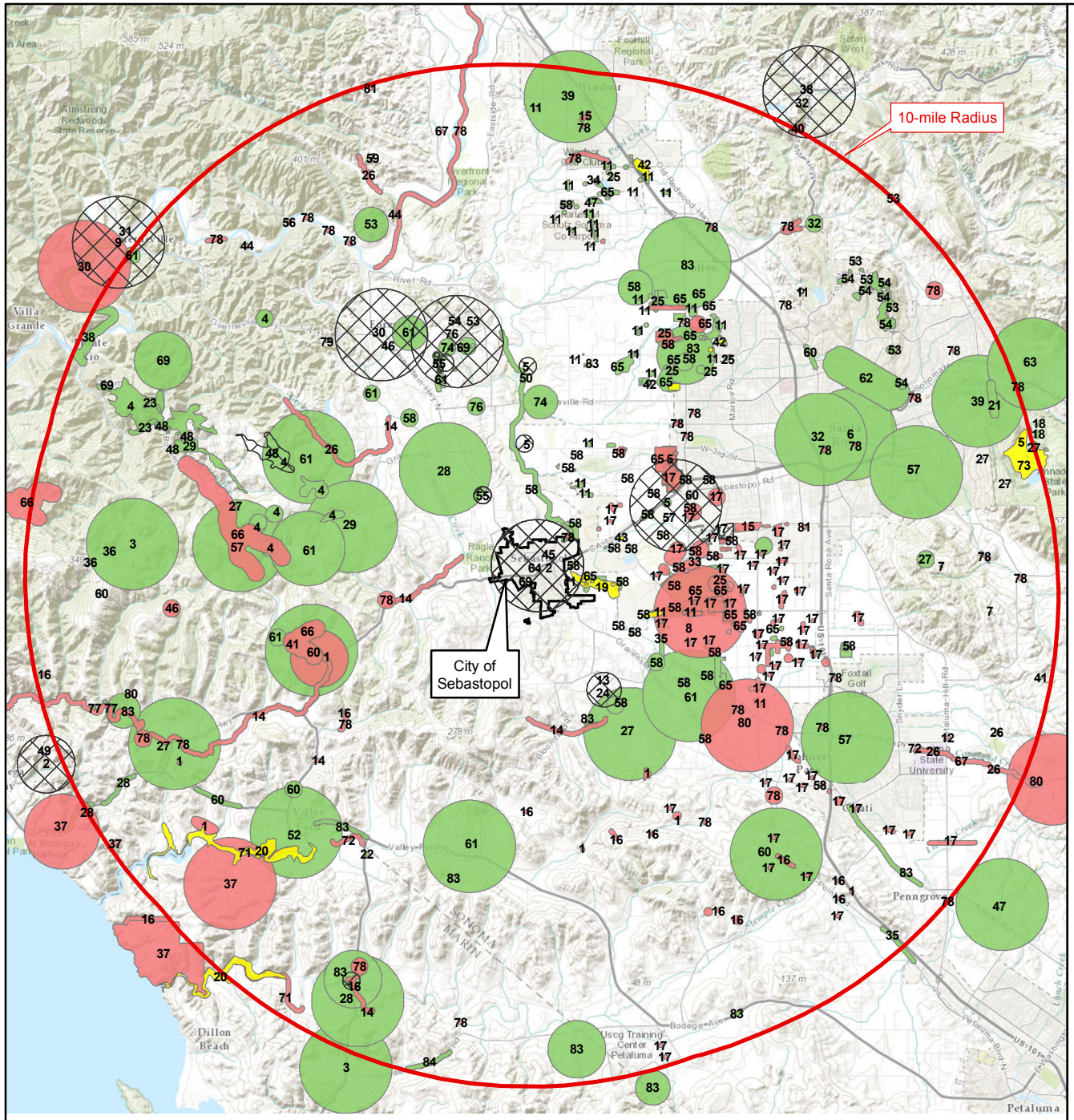

Data sources: Data sources: CDFG California Natural Diversity Database, June 3, 2014;
ArcGIS Online World Topo Map Basemap. Map date: June 30, 2014. (Sebas_CNDDB_10mi_140630_lscp)

SEBASTOPOL GENERAL PLAN UPDATE

Figure 5.2-3: CNDDB 10-Mile Radius Search

- Plants
- Animals
- Terrestrial Communities
- Multiple Species Occurrence

Label	Common Name	Count
1	American badger	9
2	Baker's goldfields	2
3	Baker's larkspur	2
4	Baker's manzanita	8
5	Baker's navarretia	12
6	bent-flowered fiddleneck	1
7	big-scale balsamroot	2
8	Blennosperma vernal pool andrenid bee	2
9	bristly sedge	1
10	brownish beaked-rush	2
11	Burke's goldfields	23
12	burrowing owl	1
13	California beaked-rush	3
14	California freshwater shrimp	6
15	California linderiella	5
16	California red-legged frog	12
17	California tiger salamander	77
18	Calistoga ceanothus	1
19	Coastal and Valley Freshwater Marsh	1
20	Coastal Brackish Marsh	2
21	coastal triquetrella	1
22	Contra Costa goldfields	1
23	Crystal Springs lessingia	2
24	Cunningham Marsh cinquefoil	1
25	dwarf downingia	9
26	foothill yellow-legged frog	5
27	fragrant fritillary	9
28	golden larkspur	4
29	Greene's narrow-leaved daisy	2
30	hoary bat	2
31	holly-leaved ceanothus	1
32	Jepson's leptosiphon	3
33	legenere	1
34	many-flowered navarretia	1
35	marsh microseris	2
36	Methuselah's beard lichen	2
37	Myrtle's silverspot butterfly	4
38	Napa false indigo	2
39	narrow-anthered brodiaea	2
40	Navarro roach	1
41	North Coast semaphore grass	2
42	Northern Hardpan Vernal Pool	6

Label	Common Name	Count
43	Northern Vernal Pool	2
44	osprey	2
45	oval-leaved viburnum	1
46	pallid bat	3
47	pappose tarplant	2
48	Pennell's bird's-beak	4
49	perennial goldfields	1
50	Peruvian dodder	1
51	Pitkin Marsh paintbrush	2
52	Point Reyes checkerbloom	1
53	Rincon Ridge ceanothus	5
54	Rincon Ridge manzanita	5
55	round-headed beaked-rush	2
56	Russian River tule perch	1
57	saline clover	5
58	Sebastopol meadowfoam	39
59	serpentine daisy	1
60	showy rancheria clover	8
61	Sonoma alopecurus	11
62	Sonoma canescent manzanita	3
63	Sonoma ceanothus	1
64	Sonoma spineflower	1
65	Sonoma sunshine	16
66	Sonoma tree vole	3
67	steelhead - central California coast DPS	2
68	swamp harebell	2
69	thin-lobed horkelia	5
70	Thurber's reed grass	1
71	tidewater goby	2
72	tricolored blackbird	2
73	Valley Needlegrass Grassland	1
74	Vine Hill ceanothus	3
75	Vine Hill clarkia	3
76	Vine Hill manzanita	2
77	western leatherwood	1
78	western pond turtle	40
79	western red bat	1
80	western yellow-billed cuckoo	3
81	white-tailed kite	2
82	white beaked-rush	1
83	white seaside tarplant	18
84	wooly-headed gilia	2

N

0 1 2
Miles

1:210,000

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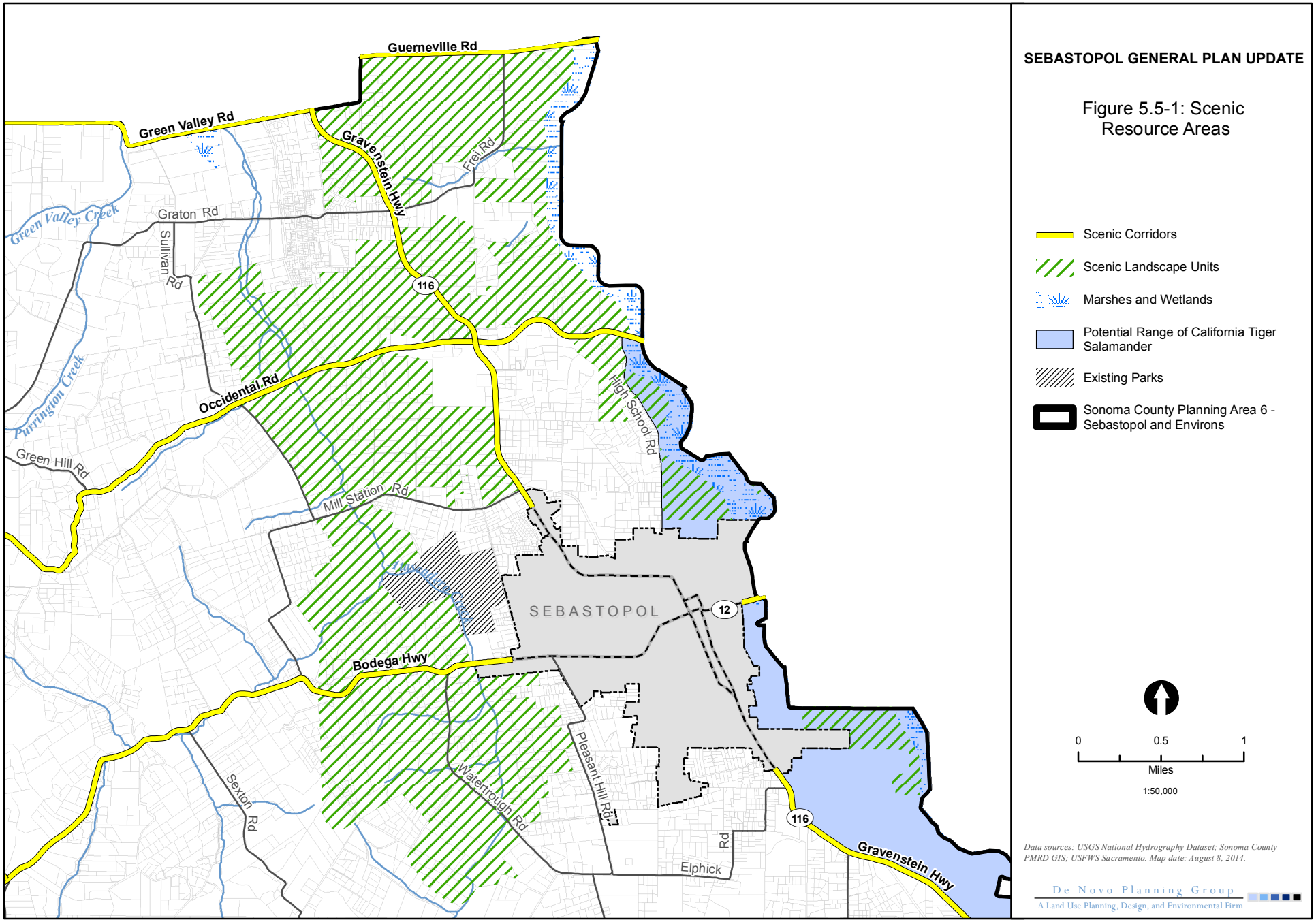
SEBASTOPOL GENERAL PLAN UPDATE
Figure 5.5-1: Scenic Resource Areas
Scenic Corridors
Scenic Landscape Units
Marshes and Wetlands
Potential Range of California Tiger Salamander
Existing Parks
Sonoma County Planning Area 6 - Sebastopol and Environs
0
0.5
1
Miles
1:50,000
Data sources: USGS National Hydrography Dataset; Sonoma County PMRD GIS; USFWS Sacramento. Map date: August 8, 2014.
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Guerneville Rd
Green Valley Rd
Gravenstein Hwy
Frei Rd
Graton Rd
Sullivan Rd
Green Valley Creek
116
Occidental Rd
Purrington Creek
Green Hill Rd
High School Rd
Mill Station Rd
SEBASTOPOL
12
Bodega Hwy
Pleasant Hill Rd
Watertrough Rd
Sexton Rd
Elphick Rd
116
Gravenstein Hwy

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6. COMMUNITY HEALTH AND WELLNESS

This section addresses community health and wellness in the City of Sebastopol. This section provides an overview of existing health conditions in Sebastopol 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 Sebastopol 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 greater detail in Section 2. Parks and recreational facilities are discussed in Section 3.3. Hazardous materials and applicable hazards regulations are addressed in Section 4.1. Air quality and air quality regulations as well as water quality and water quality regulations, are addressed in Section 5.

6.1 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 20th 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 19th 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.

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

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 2010 and 2012, the number of California residents who are obese (as measured by body mass index, or BMI) has increased from 24 percent to 25 percent.[1] Additionally, between 2005 and 2010, the percentage of California residents diagnosed with diabetes increased from 7.4 percent to 8.9 percent.[2]

Based on current obesity trends, for the first time in American history, children are not predicted to live as long as their parents.[3] 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

[1] Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System, Prevalence and Trends Data: California 2012. Available at http http://www.cdc.gov/obesity/data/adult.html Acessed July 10,2014.

[2] Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Data Trends: California 2012. Available at http://apps.nccd.cdc.gov/DDTSTRS/Index.aspx?stateId=6&state=California&cat=prevalence&Data=data&view=TO&trend=prevalence&id=1. Acessed July 12, 2014.

[3] 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.[4]

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 roughly 40,000 Americans each year. In 2012 alone, 4,743 pedestrians were killed in auto related accidents.[5] Vehicle collision data for the City is provided in Section 2 of this Background Report.

Addressing public health and wellness in the Sebastopol 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 Sebastopol residents. Though the creation of a healthy general plan, Sebastopol can focus on opportunities to affect changes in the overall health and wellbeing of the community.

6.2 HEALTH AND WELLNESS IN SEBASTOPOL

LEADING CAUSES OF DEATH

The California Department of Public Health provides detailed statistics on deaths throughout California. Table 6.2-1 shows total deaths by age in the City of Sebastopol for the years 2000, 2005, 2010, and 2012. Table 6.2-2 shows the percentage of deaths by age for Sebastopol and California in 2012, while Table 6.2-3 shows the causes of death, by percentage, in 2012 for Sebastopol and California.

[4] Frank, L.; Kavage, S; Litman, T. (2006). Promoting Public Health through Smart Growth. Prepared for *Smart Growth BC*: page 6.

[5] National Highway Traffic Safety Administration, Fatality Analysis Reporting System, National Statistics. (2012). Accessed July 7, 2014. Accessible at: http://www-fars.nhtsa.dot.gov/Main/index.aspx.

Table 6.2-1 Deaths by Age in Sebastopol

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	252	103	149	2	1	1	3	2	3	16	14	36	73	101
2005	295	133	162	2	-	-	4	2	5	16	37	41	87	101
2010	220	97	123	3	-	-	1	4	4	15	27	31	52	83
2012	222	116	106	-	-	-	2	1	3	7	27	41	53	88

SOURCE: CALIFORNIA DEPARTMENT OF HEALTH, DEATH PROFILES BY ZIP CODE (95472). DATA FILES FROM 2000, 2005, 2009, AND 2012. AVAILABLE AT: WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX. ACCESSED JULY 9, 2014. NOTE: DATA IS ONLY AVAILABLE BY ZIP CODE, AND ZIP CODE 95472, INCLUDES THE CITY, AND PORTIONS OF THE COUNTY TO THE WEST.

As shown in Table 6.2-1, there have been very few deaths in Sebastopol of persons under 44 years of age during the sample years shown. From 2000 to 2012, approximately one-third of total deaths in Sebastopol were of persons over 85 years old. For all sample years, approximately 65 percent of total deaths in Sebastopol were of persons 75 years and older.

Table 6.2-2 Percentage of Deaths by Age (2012)

Age	Sebastopol	California
<1	0%	0.93%
1-4	0%	0.17%
5-14	0%	0.20%
15-24	0.90%	1.21%
25-34	0.45%	1.76%
35-44	1.35%	2.73%
45-54	3.15%	7.10%
55-64	12.16%	12.90%
65-74	18.47%	15.92%
75-84	23.87%	23.58%
85+	39.64%	33.51%

SOURCE: CALIFORNIA DEPARTMENT OF HEALTH, DEATH PROFILES BY ZIP CODE (95472). DATA FILES FROM 2012. AVAILABLE AT: WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX. ACCESSED JULY 9, 2014.

As shown in Table 6.2-2, the percentages of deaths by age in Sebastopol are generally similar to statewide statistics in California. One area worth noting, is death rates in Sebastopol are lower than state averages in all age brackets under 64 years of age, but surpass the state average in all age brackets from 65 years of age and over.

Table 6.2-3 shows the causes of death by percentage in the City of Sebastopol, and the entire State of California in 2012, as reported by the California Department of Health.

Table 6.2-3 Causes of Death by Percentage (2012)

Cause	Sebastopol	California
Heart Disease	24.3%	24.4%
Cancer	29.7%	23.7%
Stroke	7.2%	5.5%
Lower Respiratory Disease	5.9%	5.3%
Injury (Unintentional)	2.7%	4.4%
Pneumonia or Influenza	0.9%	2.4%
Diabetes	1.8%	3.2%
Alzheimer's	2.7%	4.8%
Liver Disease or Cirrhosis	1.4%	1.9%
Suicide	0.9%	1.6%
Hypertension	1.8%	1.9%
Homicide	0%	0.8%
Other	20.3%	19.7%
Unknown	0%	0.01%

SOURCE: CALIFORNIA DEPARTMENT OF HEALTH, DEATH PROFILES BY ZIP CODE (95472). DATA FILES FROM 2012. AVAILABLE AT: WWW.CDPH.CA.GOV/DATA/STATISTICS/PAGES/DEATHPROFILESBYZIPCODE.ASPX. ACCESSED JULY 8, 2014.

Table 6.2-3 shows that the leading cause of death in Sebastopol in 2012 was cancer, which was the second leading cause of death Statewide. However, the percentage of deaths in Sebastopol in 2012 caused by cancer were approximately 6 percent higher than the statewide percentage. The second leading cause of death in Sebastopol in 2012 was heart disease, which accounted for approximately 24 percent of all deaths. 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 plan by a health care professional. Generally, Sebastopol death rates are higher than statewide averages for cancer, stroke, and lower respiratory disease, but lower than statewide averages for all other ailments.

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[6] and reduced consumption of foods high in calories, sugar, and fat.[7] As shown above, heart disease and cancer are the two most prevalent causes of death in Sebastopol, and cancer caused deaths within the City 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

[6] 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.

[7] 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.

picture of the health and health care needs of California's large and diverse population. Data regarding obesity and overweight status is available from CHIS for Sonoma County and the entire State. While data specific to the City of Sebastopol 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 Sebastopol. Adult obesity and overweight trends are shown in Table 6.2-4 and teen obesity and overweight trends are shown in Table 6.2-5.

Table 6.2-4 Obesity and Overweight Trends- Adults

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%
2012/Sonoma County	32.8%	21.5%
2001/California	35.5%	19.3%
2009/California	35.0%	24.4%
2012/California	35.0%	24.8%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2001, 2009, AND 2012 ADULT SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: WWW.CHIS.UCLA.EDU/ ACCESSED JULY 8, 2014.

As shown in table 6.2-4 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 show approximately a 1.5 percent increase in Sonoma County from 2001 to 2009, and a decrease of 4 percent from 2009 to 2012. Obesity rates among adults in Sonoma County are roughly 3 percent lower than the statewide average, however, adult obesity rates in Sonoma County increased by over 7 percent between 2001 and 2009, which exceeds the Statewide adult obesity increase of approximately 5 percent during the same time period.

Table 6.2-5 Obesity and Overweight Trends- Teens

Year/Region	At Risk of Overweight (85th-95th percentile)	Overweight/Obese (highest 5th percentile)
2003/Sonoma County	18.3%	6.3%
2009/Sonoma County	18.9%	10.3%
2012/Sonoma County	23.6%	6.2%
2003/California	16.6%	12.4%
2009/California	16.7%	12.0%
2012/California	16.6%	15.8%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2003, 2009, AND 2012. TEEN SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: WWW.CHIS.UCLA.EDU/ ACCESSED JULY 8, 2014.

As shown in table 6.2-5 above, teens considered at-risk of being overweight, or those in the 85th-95th BMI percentiles, occur in slightly higher rates in Sonoma County from 2001 to 2009 when compared to the rest of the State. In 2012 this margin was increased when roughly 5 percent more Sonoma County teens entered this category.

The percentage of teens who are overweight or obese (the highest 5th BMI percentile) in Sonoma County are lower than the statewide average. Between 2003 and 2009 teen overweight/obesity levels in Sonoma County increased by four percent, while Statewide levels decreased slightly. This trend was reversed when Sonoma County teen obesity decreased by 4 percent from 2009 to 2012. It is worth noting that the possible increase in teens in the 85th-95th percentile in 2012, could be attributed to the decrease in teens in the overweight and obese category observed from 2009 to 2012.

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 2012 California Health Interview Survey includes data regarding activity levels for children and teens in Sonoma County. As shown in table 6.2.6 below, over 35 percent of Sonoma County children ages 5-11 were physically active every day of the week for at least one hour, which is slightly higher than the Statewide average for children. Roughly 2.6 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 8.4 percent.

The data shows that exercise and activity levels decrease from childhood ages to teen ages. Only 13.3 percent of teens in the County were active for at least one hour, seven days a week, compared to 35.1 percent of children. Furthermore, Sonoma County teens are falling short of teens statewide in terms of activity five or more days per week. Approximately 30 percent of California teens are physically active for at least one hour five or more days a week, compared to 23.7 Sonoma County teens. Also, a large percentage of Sonoma County teens reported little to no physical activity. Roughly 18.2 percent of teens in the County reported zero days per week of more than one hour of physical activity, which is roughly double the Statewide average of 9.3 percent.

TABLE 6.2-6 NUMBER OF DAYS PER WEEK PHYSICALLY ACTIVE AT LEAST ONE HOUR (2012)

Days per Week	Sonoma County Children (5-11)	California Children (5-11)	Sonoma County Teens	California Teens
0	2.6%	8.4%	18.2%	9.3%
1	12.8%	4.8%	10.3%	8.9%
2	2.7%	10.7%	13.4%	13.4%
3	15.0%	14.6%	20.3%	15.2%
4	4.8%	10.9%	14.1%	13.2%
5	23.8%	13.9%	8.1%	15.0%
6	3.3%	4.2%	2.3%	8.9%
7	35.1%	32.6%	13.3%	16.1%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2012 CHILDREN AND TEEN SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: WWW.CHIS.UCLA.EDU/ ACCESSED JULY 8, 2014.

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 Sonoma County teens reported visiting a park or other open space area in the past month (from the time the 2012 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.[8] 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

[8] California Department of Education. Physical Fitness Testing Results, Accessed on July 7, 2014. Accessible at: http://www.cde.ca.gov/ta/tg/pf/pftresults.asp.

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 Sebastopol Union Elementary District, and Analy High School in the West Sonoma County High School District for the 2008-09 academic year are shown in Table 6.2-7, and results from the 2012-13 academic year are shown in Table 6.2-8.

Table 6.2-7 Student Physical Fitness Testing (PFT) Results (2008-2009)

# of Physical Areas Meeting the HFZ	Sebastopol Union Elementary District		Analy High School	California		
	Gr. 5	Gr. 7	Gr. 9	Gr. 5	Gr. 7	Gr. 9
6 of 6 fitness criteria	72.2%	20.8%	62.5%	29.2%	34.2%	37.9%
5 of 6 fitness criteria	21.1%	49.5%	28.2%	26.7%	26.5%	26.9%
4 of 6 fitness criteria	4.4%	14.9%	5.8%	19.3%	17.8%	15.9%
3 of 6 fitness criteria	2.2%	9.9%	2.0%	12.8%	11.5%	9.7%
2 of 6 fitness criteria	0%	1.0%	1.2%	7.5%	6.4%	5.0%
1 of 6 fitness criteria	0%	1.0%	0.3%	3.5%	2.7%	2.3%
0 of 6 fitness criteria	0%	3.0%	0%	1.0%	1.0%	2.2%

Source: California Department of Education, Physical Fitness Testing Results. Available at: www.cde.ca.gov/ta/tg/pf/pftresults.asp. Accessed July 8, 2014.

Table 6.2-8 Student Physical Fitness Testing (PFT) Results (2012-13)

# of Physical Areas Meeting the HFZ	Sebastopol Union Elementary District		Analy High School	California		
	Gr. 5	Gr. 7	Gr. 9	Gr. 5	Gr. 7	Gr. 9
6 of 6 fitness criteria	50.7%	11.4%	63.1%	25.5%	32.4%	36.5%
5 of 6 fitness criteria	17.8%	43.0%	21.9%	23.1%	22.9%	23.0%
4 of 6 fitness criteria	17.8%	22.8%	9.6%	19.8%	19.0%	18.7%
3 of 6 fitness criteria	12.3%	11.4%	4.0%	15.2%	13.8%	12.1%
2 of 6 fitness criteria	1.4%	10.1%	0.5%	10.2%	7.9%	6.2%
1 of 6 fitness criteria	0.0%	1.3%	0.5%	5.0%	3.2%	2.5%
0 of 6 fitness criteria	2.1%	0.0%	0.3%	1.2%	0.8%	0.9%

Source: California Department of Education, Physical Fitness Testing Results. Available at: www.cde.ca.gov/ta/tg/pf/pftresults.asp. Accessed July 8, 2014.

As shown in the two tables above, the PFT results for 5th and 7th graders in the Sebastopol Union Elementary District decreased between 2008-09 and 2012-13, while Statewide numbers also showed a decrease, but by a smaller margin, particularly among students scoring 6 out of 6 for fitness criteria. During the 2012-13 academic year, 50.7 percent of 5th graders at Sebastopol Union Elementary District scored 6 out of the 6 criteria, which is a decline from the 2008-09 school year by roughly 22 percent, but still above and the State average of 25.5 percent.

Seventh graders in the Sebastopol Union Elementary District also saw declines in those meeting 6 out of the 6 fitness criteria, from roughly 21 percent in 2008-09, to 11.4 percent in 2012-13. As of 2013, 7th grade students in Sebastopol trail California 7th graders at 11.4 percent versus the California average of 32.4 percent.

The data also indicates that although the levels of fitness of Sebastopol 5th and 7th graders had declined between 2008-09 and 2012-13, the 9th graders attending Analy High School in the West Sonoma County High School District have remained fairly constant over time, and outperform state averages by a considerable margin. As of 2013, 9th grade students at Analy High School outperform California 9th graders at 63.1 percent versus the California average of 36.5 percent in the 6 out of the 6 fitness criteria.

ASTHMA AND HEART DISEASE

Local air quality conditions can be a strong indicator of asthma rates within a community. Table 6.2-9 includes data from CHIS for asthma rates, symptoms and hospitalizations for Sonoma County 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 5.3 of this report.

TABLE 6.2-9 ASTHMA RATES AND HOSPITALIZATIONS (2012)

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	18.4%	12.4%	84.4%
Marin County	11.2%	17.0%	98.2%
Napa County	18.4%	3.0%	75.4%
California	14.1%	13.7%	89.8%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2012 ASTHMA SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: WWW.CHIS.UCLA.EDU/ ACCESSED JULY 8, 2014

As shown in Table 6.2-9 above, roughly 18 percent of Sonoma County residents have been diagnosed with asthma at some point in their lives, and of those who have been diagnosed, over 84 percent have had asthma symptoms in the past 12 months (from the time the 2012 CHIS survey was conducted). The percentage of people diagnosed with asthma in Sonoma County is approximately 4 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 Napa County, but much lower than Marin County. While Sonoma County's rates of hospitalization for asthma were similar to the Statewide averages, they were over 9 percent higher than the hospitalization rate in Napa County.

ALCOHOL, DRUG AND TOBACCO USE

In 2012, 12.7 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, 51.1 percent reported smoking no cigarettes in the past 30 days (from time the 2012 CHIS survey was conducted). This represents an increase from 2009 when 94.3 percent of teens who had reported ever smoking said they had not smoked in the past 30 days.

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[9]:

- 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.
- 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 2011-12 Sonoma County Healthy Kids Survey Update[10] reported that 38 percent of Sonoma County 11th graders; 22 percnet of 9th graders, and 7 percent of 7th graders reported they are Currently using alcohol (Current use is defined as any use within the past 30 days). Approximately 27 percent of County 11th graders; 13 percent of 9th graders, and 3 percent of 7th graders reported binge drinking at least once during the past month, compared to the lower Statewide teen rate of approximately 10 percent[11] (Binge drinking is defined as having 5 or more drinks in a row, within a couple of hours). CHIS data reported the binge drinking rates are significantly lower than the Sonoma County Healthy Kids Survey estimates for teen binge drinking rates in Sonoma County, at 6.4 percent. This discrepancy may be due to the fact that teens did not accurately report drinking rates during the 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.[12] In Sebastopol, there is one retail license for alcohol sales per 113 persons. This is a density greater than the Countywide rate of 1 per 266 persons, and higher than other small cities within the County including: Cloverdale, and Cotati, however the statistic for Sebastopol does not reflect its

[9] 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 July 7, 2014.
[10] Sonoma County Healthy Kids Update. 2011-2012. Available At: http://www.scoe.org/files/chks-1112.pdf. Accessed July 10, 2014.
[11] U.S Department of Health and Human Services. Adolecent Behavioral Health September 2009. Available At: http://www.samhsa.gov/data/StatesInBrief/2k9/OASTeenReportCA.pdf Acessed July 10, 2014.
[12] Community Health Needs Assessment 2011-2014. Babs Kavanaugh, BK Consulting Services. No date.

substantially-higher effective population, considering persons in unincorporated Sebastopol. Table 6.2-10 summarizes retail liquor licenses per capita in Sebastopol, Cloverdale, Cotati, and Sonoma County.

TABLE 6.2-10: RETAIL LIQUOR LICENSES PER CAPITA (2013)

	Retail Licenses	Density per Capita
Sebastopol	67	1 / 113
Cloverdale	36	1 / 242
Cotati	44	1 / 168
Sonoma County	1,860	1 / 266

SOURCE: DEPARTMENT OF ALCOHOLIC BEVERAGE CONTROL, ALCOHOLIC BEVERAGE LICENSES, JUNE, 2013. AVAILABLE AT: HTTP://WWW.ABC.CA.GOV/DATPORT/SUBANNSTATREP.PDF. ACCESSED JULY 8, 2014.

According to CHIS data from 2012, over 20 percent of Sonoma County teens reported using marijuana in the past year, which represents an increase from 2009 when 13 percent of teens reported marijuana use. 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.

6.3 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 3.3) and transportation facilities (Section 2).

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 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.[13]

Within Sebastopol, 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.[14] 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.

[13] Crane, R. (2000). The Influence of Urban Form on Travel: An Interpretive Review. *Journal of Planning Literature*; 15(1), 3-23.
[14] Walkscore assessments and methodology are available at www.walkscore.com. Accessed July 9, 2014.

- 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 6.3-1 shows the Walkscore calculated for various areas within Sebastopol. A map of these locations is shown on Figure 6-1. As described above, a Walkscore above 70 indicates that most daily errands can be accomplished on foot, while a Walkscore below 50 indicates that few amenities are within walking distance.

TABLE 6.3-1 WALKABILITY SCORES IN SEBASTOPOL

City Points of Interest	Street Address	Walk Score
1-Laguna Parkway Skate/Garden Park	6767 Laguna Park Way	98
2-Analy High School	6950 Analy Ave	88
3-Sebastopol Community Center	390 Morris St	86
4-Center For the Arts/ Ives Park	282 S High St	100
5-Sebastopol Senior Center	167 N High St.	100
6-Reach Charter School	7285 Hayden Ave	63
7-Luther Burbank's Gold Ridge Farm	7799 Bodega Ave	62
8-Willard Libby Park	393 Pleasant Hill Ave N	68
Residential Areas	**Intersection**	**Walk Score**
9-City Center (MDR)	West St/Wilton Ave	98
10-South City (MDR&LDR)	Woodland Ave/1st St	46
11-Northwest City (MDR)	Hansen Ln/Michael Pl	65
12-Southeast City (HDR)	Redwood Ave/ Gravenstein Hwy	66

SOURCE: WWW.WALKSCORE.COM. ACCESSED JULY 8, 2014

The results in Table 6.3-1 show that areas of the City that are centrally located and have higher development densities, such as Downtown, and areas of Medium Density Residential development north and east of Downtown, score relatively high on the walkability scale. While areas that are dominated by lower density land uses around the perimeter of the City score lower, and are generally better suited for auto use for travel to area points of interest. 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 daily trips and destinations.

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.[15] 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.

[15] 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.

ACTIVITY-RELATED COMMERCIAL SERVICES

Another proxy measure for physical activity is the availability of activity-related commercial services.[16] Currently, there are 3 private health clubs, gyms, or personal training facilities within the City of Sebastopol. The facilities are located east of downtown off Bodega Highway at Ragle Road, off Morris Road in the northeastern portion of town, and off Highway 116 in the southeastern portion of town. Both locations in the eastern portion of town offer easy accessibility, and a high walk score (both over 70), while the western location has a low walk score of 49. Although the recreation facility located in the western portion of town has a low walk score rating, it is located near medium, and high density residential neighborhoods, and provides more convenient access for residents living in the western portion of the City.

Research also suggests that formal spaces for physical activity, such as gyms and health clubs, may not be enough to increase overall individual physical activity levels, even if it's easily accessible.[17] This demonstrates the importance of providing an environment where residents can easily incorporate physical activity into their everyday routines. This can be accomplished through improvements to the physical environment such as: the addition of bicycle lanes, shared-lane markings (Sharrows) and convenient bicycle parking near shops and restaurants, or improving the pedestrian realm with wider sidewalks and count-down signals. Figure 2-3 depicts existing and proposed bicycle and pedestrian facilities in Sebastopol.

6.4 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.[18] The presence of a grocery store in a neighborhood is linked to higher fruit and vegetable consumption and reduced prevalence of overweight and obesity.[19] Fresh, minimally processed, local food is generally the most nutritionally valuable and the least detrimental to the environment. Access to affordable specialty grocery stores and farmers markets increases the likelihood that people will eat healthy, locally sourced food.

The concentration of food outlets is important, but it is more significant to concentrate on the impacts of the system as a whole. In response to the environmental and health implications of food systems, the popularity of local food is on the rise. The proliferation of the term "food miles" to measure the impact of the food system on the environment reinforces the logic of local production. Locally sourced food attempts to address the negative externalities associated with packaging, preparing, and shipping food, which is higher for fresh food that is grown at long distances; because many foods do not travel a single or logical route, but take many steps along the supply chain from "Field to plate".

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[16] Assessed using http://www.yelp.com. Accessed July 8, 2014.

[17] 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.

[18] Mari Gallagher Research and Consulting Group. (July 2006). "Examining the impact of food deserts on public health in Chicago". Accessed July 8, 2014. Available at: http://www.marigallagher.com/site_media/dynamic/project_files/Chicago_Food_Desert_Report.pdf.

[19] 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.

RETAIL FOOD ENVIRONMENT

Sebastopol's retail food environment for residents includes non-restaurant shopping options that are located within the City. Table 6.4-1 provides some examples of retail food options within the City limits. The examples provided in Table 6.4-1 are in no way intended to represent a comprehensive list of retail food options available in the City.

TABLE 6.4-1 RETAIL FOOD ENVIRONMENT SUMMARY

Retail Food Type	Examples	Quantity
Non-restaurant Food Vendors		
Grocery Stores	Whole Foods, Lucky's, Safeway, Community Market	4
Small and/or Specialty Markets	Pacific Market Fircrest Market	4
Farmer's Markets/Produce Stands	Sebastopol Farmer's Market, Andy's Produce	6
Convenience Stores	Apple Blossom Mini Mart, 7 Eleven, Rotten Robbie	6
Liquor Stores	Sebastopol Liquor, Lucca Liquor, R&B Market	3
Restaurants		
Fast Food Chains	Burger King, Subway, McDonalds, Taco Bell	5
Large Restaurant Chains	Mary's Pizza Shack	1
Coffee Shops	Sebastopol Cookie Company, My Friend Joe, Holy Cow	10
All other food establishments		44

SOURCES: WWW.YELP.COM, WWW.WALKSCORE.COM, WWW.YAHOO.COM ACCESSED JULY 8, 2014.

As shown in Table 6.4-1, there are four grocery stores within Sebastopol: Whole Foods, Lucky's, Safeway, and Community Market , which all provide residents with a full range of grocery options and also provide a wide variety of healthy, organic, and locally produced grocery options. There are specialty markets within Sebastopol, such as Pacific Market and Fircrest Market that offer a variety of options for fresh fish, meat, and poultry, that is organic and locally produced. Sebastopol hosts a year-round weekly certified farmer's market every Sunday from 10:00am-1:30pm in the Downtown Plaza. The weekly farmer's market offers a wide variety of local produce and specialty items including ethnic food options.

With respect to restaurants, the vast majority of dining options in Sebastopol consist of locally owned, non-chain restaurants. Many of the City's restaurants are located within or near downtown Sebastopol. Sebastopol offers a wide array of dining options covering a broad range of food types (Mexican, Japanese, Italian etc.) Innovative business models have also taken shape in the City to serve niche markets who require fresh local produce. Sebastopol Micro Greens offers a mobile service for fresh produce that delivers fresh live micro greens to dining establishments and chefs in Sebastopol, and the greater San Francisco/Bay Area.

In December 2012, Sebastopol passed an emergency moratorium to restrict all future drive-through establishments. This moratorium was extended from 45 days to 10 months in January 2013. Existing regulations already prohibited fast-food drive-through restaurants; the moratorium extended the drive-through prohibition to all business establishments within the City.

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 heroin.[20] 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 6.4-2 below, shows the frequency that fast food was consumed in the past week for Sonoma County residents, compared to residents throughout California (from the time the 2012 CHIS survey was conducted). 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.

TABLE 6.4-2 FAST FOOD EATEN HOW MANY TIMES IN PAST WEEK (2012)

Number of Times	Sonoma County	California
No times	49.5%	34.7%
One Time	25.5%	28.3%
Two Times	12.2%	17.1%
Three Times	5.9%	8.5%
Four or more Times	7.0%	11.5%

SOURCE: CALIFORNIA HEALTH INTERVIEW SURVEY. CHIS 2012 DIET SOURCE FILE. LOS ANGELES, CA: UCLA CENTER FOR HEALTH POLICY RESEARCH. AVAILABLE AT: WWW.CHIS.UCLA.EDU/ ACCESSED JULY 8, 2014.

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.[21] 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.[22] According to CHIS data from 2012, approximately 10 percent of Sonoma County children and teens drink two or more 12oz sodas daily, while California statewide averages 15 percent.

[20] 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.

[21] California Center for Public Health Advocacy, Resources: Soda Consumption. Accessed on July 7, 2014. Accessible at http://www.publichealthadvocacy.org/resources_soda.html.

[22] 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.

6.5 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,[23] and are often less expensive than care once someone has become sick.

Most of the major medical service providers near Sebastopol are located outside of the City. There is a Kaiser Permanente Medical Center located in Santa Rosa, as well as the St. Joseph Urgent Care Center in Santa Rosa, and Memorial Hospital in Santa Rosa. Several other hospitals are also located in Rohnert Park, Healdsburg, and Petaluma. Sonoma County offers several community health care clinics for County residents, including the West County Health Center in Sebastopol. Other community clinics in Sonoma County are located in Cloverdale, Guerneville, Healdsburg, Occidental, Petaluma, Santa Rosa, Sonoma, and Windsor.

Because of the recent closure of Sebastopol's Palm Drive Hospital in April 2014, the City no longer has a full service medical facility. Palm drive hospital consisted of a 37 bed general medical, urgent care and surgery center, and emergency room facility. The facility was run as a nonprofit medical service, and served as Sebastopol's largest employer with over 250 employees. For several decades, Palm Drive Hospital endured difficult financial times, including two bankruptcy filings in the last seven years. Palm Drive officials note that the hospital has suffered declines in overnight patients, reduced payments from insurance companies and competition from Sutter, St. Joseph Health and Kaiser Permanente. Currently, hospital officials are continuing negotiations and hope an agreement can be reached in the near future to reopen the hospital in some capacity, to provide some level of health service to area residents. Currently, the nearest 24-hour Emergency Room is located at the Santa Rosa Memorial Hospital in Santa Rosa, while the nearest Urgent Care Center is located at St. Joseph Urgent Care Center in Santa Rosa.

According to 2012 CHIS data, over 68 percent of Sonoma County residents receive their primary medical care from a doctor's office (including HMOs and Kaiser), over 17 percent utilize a community or government clinic, and 11.4 percent have no usual source of medical care. In 2012 CHIS data, showed over 88 percent of Sonoma County residents currently have medical insurance, which closely mirrors the Statewide coverage rate. Of those with medical insurance, approximately 60 percent receive employment-based medical insurance, and over 7 percent maintain privately purchased insurance coverage. It should be noted that the most current data does not take into account the full effects of the Affordable Care Act and current rates of insured individuals in Sonoma County and Sebastopol.

Over 17 percent of County residents reported not visiting a doctor within the past year (from the time the 2012 CHIS survey was conducted), and nearly 23 percent reported visiting a doctor only once in the past year. Approximately 20.2 percent of residents reported visiting an emergency room at least once in the past 12 months. Over 70 percent of teens in Sonoma County reported visiting a doctor for a physical exam or routine checkup within the Last year (from the time 2012 CHIS survey was conducted).

[23] U.S. Department of Health and Human Services Agency for Healthcare Research and Quality, *National Healthcare Disparities Report*, pg. 112, Rockville, Maryland. July 2003.

6.6 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, multiple visioning workshop participants identified community identity and community involvement as key factors that make Sebastopol a great place to live and work.

Based on 2012 CHIS results, over 97 percent of Sonoma County residents reported having no significant psychological distress during the past year, which is similar the statewide rate of 96 percent. However, approximately 17.1 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 2012 survey was conducted), which is above the Statewide rate of 12.1 percent. Of those County residents who sought treatment from a mental health professional, 92.9 percent visited for a mental or emotional problem, while 4.9 percent sought treatment for an alcohol or drug related problem. The 2011-12 Sonoma County Healthy Kids Survey Update reported that 10 percent of Sonoma County 7th graders, and 14 percent of 9th and 11th graders made a plan about how they would attempt suicide in the past year[24] (from the time the 2011-12 survey was conducted). Based on 2012 CHIS data, 27.9 percent of Sonoma County teens reported having Frequent Mental Distress (FMD) during the past month (from the time the 2012 survey was conducted). In a recent study of 5th–12th graders it was found that, based on engagement patterns in community service and/or extracurricular activities, that adolescents who engaged in community service (whether mandated or voluntary) and/or extracurricular activities, had the highest reports of bonding and bridging social capital, intergenerational harmony, and social support, whereas those who did neither had the lowest rates of social capital.[25] In 2012, nearly 52 percent of teens in Sonoma County reported doing some sort of volunteer or community service in the past year (from the time the 2012 CHIS survey was conducted), which is nearly 5 percent lower than the Statewide averages for teen community service, and down from the 2009 Sonoma County teen participation rate of 68 percent.

The Sebastopol community 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 Sebastopol, including: the farmer's market,activities at the Senior Center, Library, Ives Pool, Community Cultural Center events and classes, the Sebastopol Documentary Film Festival, Apple Blossom Festival, Peace-Town concert series at Ives park, and Sebastopol PD midnight sports programs.

[24] Sonoma County Healthy Kids Update. 2011-2012. Available At: http://www.scoe.org/files/chks-1112.pdf. Accessed July 10, 2014.

[25] Flanagan, C. A., Kim, T., Collura, J. and Kopish, M. A. (2014), Community Service and Adolescents' Social Capital. Journal of Research on Adolescence. DOI: 10.1111/jora.12137

6.7 SEBASTOPOL SUPPORTING COMMUNITY HEALTH

Sebastopol has taken many steps to ensure the health and wellness of the community. This section describes some of the steps the City has taken that aid in the development of a healthy community.

Air Quality:

One of the initiatives taken by the City to maintain and improve local air quality is the passage of an ordinance that regulates the type of wood-burning appliances that may be installed and maintained within the City, and that bans the use of non-certified burning appliances after June 2005, and is known as the Woodsmoke ordinance.[26]

Water Quality

Like other water systems in California, Sebastopol is under a State mandate to provide clean and healthy water to its customers. Sebastopol has high-quality water which needs a minimum of treatment. Water is regularly tested, and water quality reports are regularly provided to the community.[27] Additional details regarding the City's water supplies can be found in Sections 5.7 and 3.1.

Parks, Open Space and Street Trees:

One of the elements of a sustainable and healthy City is adequate urban parks, open space, and street trees, which contribute to a local healthy environment. The Sebastopol Public Works Department maintains an extensive inventory of street trees on City streets. Trees provide the City with many benefits including: improved air quality, shade, assist in calming traffic, and reduced urban heat island effects. The City also encourages property owners to plant trees in their front yards to beatify Sebastopol.

Sebastopol has also adopted a comprehensive Tree Protection Ordinance, which may be found in the Municipal Code.[28] The ordinance establishes protection for significant trees on private property, while allowing a process for removal of trees that are diseased, dangerous, or causing property damage.

With development of the skate park/community garden park, Sebastopol will have nearly 29 acres of developed parkland. Principal parks include: Ives Park, Libby Park, Laguna Youth Park, Town Plaza, and the developed Skate Garden and community garden park.

Skategarden Skate Park is a place where skaters and gardeners alike enjoy a unique combination skate park and community garden. The City of Sebastopol has built a state-of-the-art skate park on site, surrounded by a community garden with demonstration areas for sustainable gardening practices. This

[26] Wood Smoke Ordinance Accessed On July 9, 2014. Accessible At:

http://www.ci.sebastopol.ca.us/pdfs/building/WoodsmokeOrdinance.pdf

[27] Water Quality Report. Accessed On July 9, 2014. Accessible At:
http://www.ci.sebastopol.ca.us/pdfs/engineering/2005ConsumerConfReport07-01-06.pdf

[28] Sebastopol Municipal Code. Accessed July 7, 2014. Accessible At:
http://ci.sebastopol.ca.us/sites/default/files/mgourley/pdf_2012_zoning_ordinance_master_updatd_as_of_3_27_2012.pdf

park attracts young people throughout western Sonoma County to skateboard in a safe and fun environment, while also serving as a place to learn about sustainable gardening practices. Artists from the Sebastopol Center for the Arts participated in the design process, adding to the creative and unique character of this park.

Toxic Substances Reduction Program:

While recognizing that use of manufactured substances is part of the modern world, Sebastopol is concerned about health and environmental impacts of toxic substances. In May of 1999, the Sebastopol City Council voted to establish Sebastopol as a Voluntary Toxics Free Zone. Resolution No. 5108 Created a Voluntary Toxics Free Zone to Reduce the Use of Pesticides and other Toxic Chemicals in the City of Sebastopol. [29] With this Resolution, the City has chosen to minimize the use of herbicides and pesticides on City maintained property, and supports reduction programs for pesticide use among residents.

Existing General Plan:

The existing Sebastopol General Plan includes the following goals, policies, and programs that support and promote community health.

Land Use Element

Goal 2 Maintain Sebastopol as a small town.

P.5 City-Centered Growth: Focus future growth within city limits.

P.6 Favor Infill: Encourage development within the city limits; favor infill development over annexation.

Transportation Element

Goal 1 Reduce regional traffic growth.

P.3 Support Regional Alternatives to the Single-Occupant Vehicle: Support regional transportation policies and programs which increase the use of public transit, carpools, bicycles and other alternative modes of transportation and limit the growth of single-occupant vehicle traffic.

Goal 2 Develop a citywide and area wide circulation system that is safe and efficient.

P.7 Continuation of Streets: Facilitate the continuation of streets and bicycle and pedestrian paths through new developments wherever possible.

Program 7.1: Review site plans of developments to facilitate the continuation of streets, bicycle and pedestrian paths to improve local circulation.

Goal 3 Regard the quality of life in Sebastopol and maintaining community identity as more important than accommodating traffic.

P.11 Reduce Pollution: Reduce the air, water, and noise pollution that results from vehicular traffic by reducing the number of trips.

[29] Sebastopol Toxic Substances Reduction Program Resolution 5108. Accessed July 7, 2014. Accessible At http://ci.sebastopol.ca.us/sites/default/files/admin/res5108sustainseb.pdf

Goal 7 and Goal 8 Make it easier and safer for people to walk and travel by bicycle.

P.21 Comprehensive Bicycle Path System: Establish a comprehensive and safe system of bicycle trails connecting all parts of the City.

Program 21.1: Complete the bicycle and pedestrian trail system as indicated in *Map 4: Bicycle and Pedestrian Trails System*.

Program 21.2: Incorporate bicycle and pedestrian facilities into the design and construction of all roadway improvements as feasible.

Program 21.3: Continue to participate in the Countywide Bicycle Advisory Committee.

P. 22 Bicycle Parking: Provide adequate and secure bicycle parking at public transit facilities, park and ride lots, schools, the library, parks, city offices, and commercial areas.

Program 22.1: Require new development to provide secure bicycle parking.

P.23 Provide Continuous Sidewalks: Provide a continuous system of sidewalks throughout the City.

Program 23.1: Require a sidewalk on both sides of all collector and arterial streets and either a sidewalk or a walkway on local streets.

P.25 Pedestrian Paths: Develop a series of continuous pedestrian paths or walkways within Downtown and residential neighborhoods.

Open Space and Conservation Element

Goal 5 Conserve, protect and enhance trees and native vegetation.

P.12 Encourage Planting of Native Trees and Native Vegetation: Encourage the planting of native and drought-resistant trees and vegetation in new developments and in City owned parks, trails and recreational facilities.

P.13 Preserve and Plant Trees: Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction or by other means.

Program 13.1: Continue to implement the Tree Protection Ordinance.

P.14 Preserve and Plant Trees: Require new commercial and industrial development to incorporate trees in landscape plans.

Goal 7 Protect and Improve Air Quality.

P.18 Participate in Regional Planning to Improve Air Quality: Continue to cooperate with the Bay Area Air Quality Management District in implementing the regional Clean Air Plan.

P.19 Enforce Air Quality Standards: Continue to enforce air quality standards in collaboration with the BAAQMD.

Program 19.1: Continue to enforce State and County regulations for wood stoves and fireplaces.

Goal 9 Responsibly manage hazardous wastes to protect the health and safety of residents and the environment.

P.26 The Sonoma County Hazardous Waste Management Plan is incorporated by reference into the Sebastopol General Plan and shall be used to guide decision making regarding the use, handling, storage, transfer, and proper disposal of hazardous waste.

Program 26.1: Development projects shall be required to submit information regarding the use, handling and disposal of hazardous wastes so that decision-makers can incorporate conditions and alter project design in accord with the Hazardous Waste Management Plan.

Program 26.2: Projects that generate or use hazardous waste must be consistent with the Sebastopol General Plan and the Hazardous Waste Management Plan goals and policies.

Goal 10 Provide an attractive and comprehensive system of parks and trails throughout the City that meets the recreational needs of all age groups and capabilities.

P.27 Parkland Standard: Utilize the standard of five acres of parkland per 1,000 residents for acquisition of additional developed parkland pursuant to the provisions of the Quimby Act [Govt. Code § 66477] for all new residential development.

P.32 Additional Facilities for South Portion of City: Encourage the acquisition of additional park facilities in south portion of the City.

P.35 City-School District Cooperation: Encourage city-school district cooperation in developing and maintaining park and recreation facilities.

Program 35.1: Develop joint use neighborhood parks on school sites based on the "school-in-the-park" principle.

Program 35.2: Ensure that neighborhood parks and combined park/school sites serve the entire community and provide a broad range of cultural, recreational, and educational activities.

P.36 Integrated Trails System: Facilitate the development of an integrated trails system that connects regional trails, schools, open space, parks, recreation facilities, and residential areas.

Goal 12 Incorporate open space in all major developments.

P.42 Open Space in Commercial Developments: Require usable open space for residential and Commercial Developments.

Program 42.1: Establish a formula in the Zoning Ordinance for the amount of on-site space to be provided per square foot of building area for commercial, office and industrial developments.

Goal 13 Support and encourage healthy and productive activities for teens.

P.43 Recreation for Teens: Encourage and promote activities, programs, and facilities for teens.

Program 43.1: Establish a teen center.

A new Teen Center and Laguna Youth Park is being designed and built next to the Community Center as a result of a vigorous community volunteer effort, in partnership with the City who has donated the land and has waived fees.

Program 43.2: Work with the Community Center, the Parks and Recreation Commission, the school districts, and local service and business organizations to establish viable programs for teens.

Program 43.3: Establish a committee, comprising a wide cross-section of the local teen population, to encourage teen input and participation in the planning and implementation of programs and activities.

Goal 14 Establish additional facilities and activities for the senior population.

P.45 Additional Senior Facilities and Programs: Facilitate the development of additional facilities and programs for senior citizens.

Program 45.1: Work with organizations involved in providing care to senior citizens to identify their needs and ways that the City can assist this part of the community.

Community Identity Element

Goal 6 Use lighting to create a sense of security and enhance architecture.

P.15 Security: Ensure that on-site lighting contributes to security while not producing excessive glare and glare.

Economic Vitality Element

Goal 1 Broaden the city's employment base.

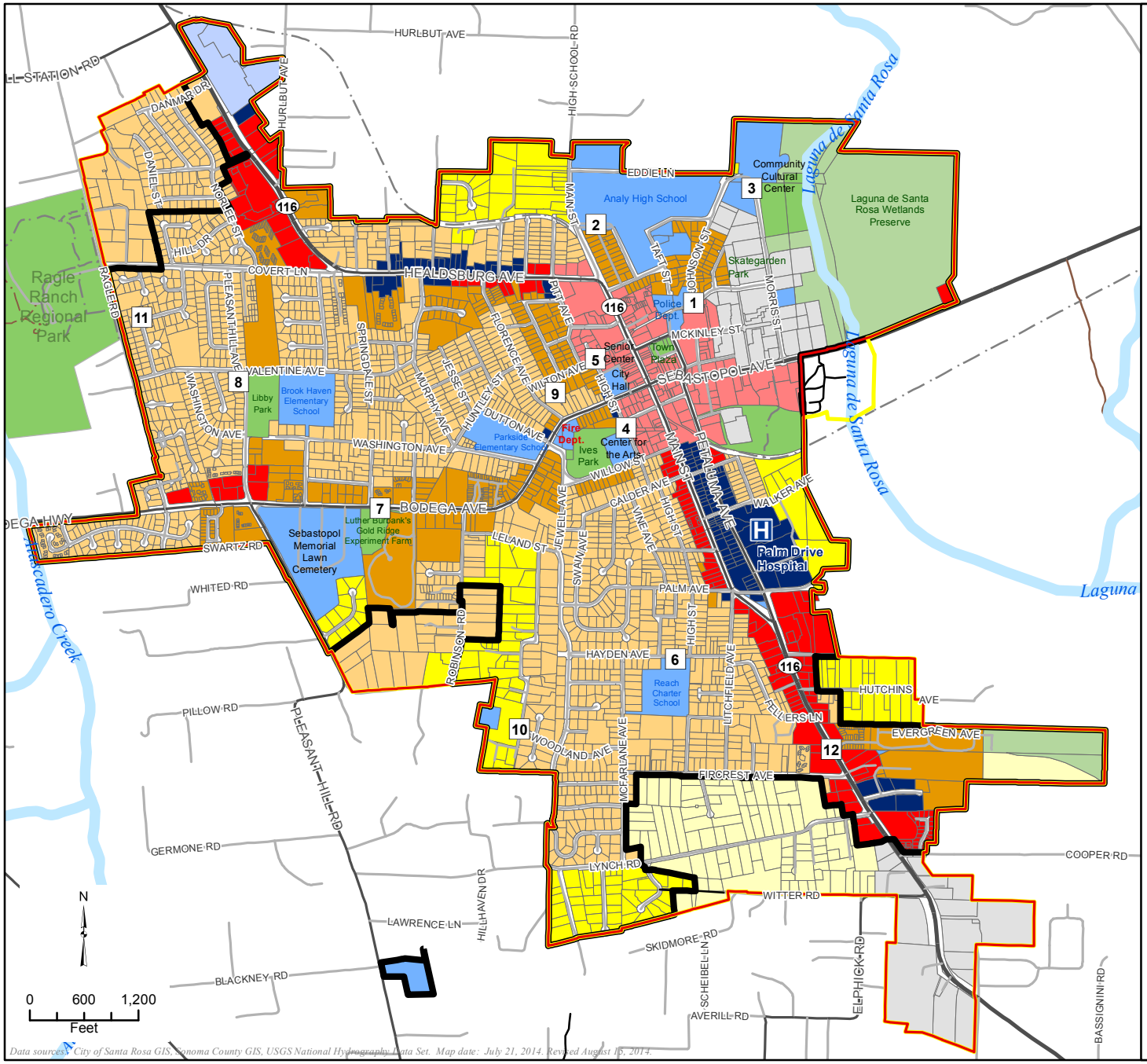
P.1 Well-Paying Jobs: Bring well-paying jobs to the community.

Safety Element

Goal 4 Protect water quality.

P.12 Reduce Agricultural Contamination of Potable Water Supplies: Reduce agricultural contamination of potable water supplies in the Sebastopol aquifer.

Program 12.1: Work with the County Planning Department, the Public Health Officer and Agricultural Commissioner to identify the impacts of farming operations and the use of herbicides, pesticides and fertilizers on the City's domestic water supply.



Data sources: City of Santa Rosa GIS, Sonoma County GIS, USGS National Hydrography Data Set. Map date: July 21, 2014. Revised August 15, 2014.

SEBASTOPOL GENERAL PLAN UPDATE

Figure 6-1: Walkability in Sebastopol

Land Use Designation

- VDR - Very Low Density Residential
- LDR - Low Density Residential
- MDR -Medium Density Residential
- HDR - High Density Residential
- CD- Downton Core
- CG - General Commercial
- LI - Light Industrial
- OLI - Office/Light Industrial
- O - Office
- CF - Community Facility
- OS - Open Space
- PA - Park

Planning Boundaries

- City of Sebastopol
- Urban Growth Boundary
- Sphere of Influence

\# Walk Score Point

City Points of Interest	
1	Laguna Parkway/Skate Garden Park
2	Analy High School
3	Sebastopol Community Center
4	Center for the Arts/Ives Park
5	Sebastopol Senior Center
6	Reach Charter School
7	Luther Burbank's Gold Ridge Farm
8	Willard Libby Park
Residential Areas	
9	City Center
10	South City
11	Northwest City
12	Southeast City

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

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7.0 NOISE

This section provides a discussion of the regulatory setting and a general description of existing noise sources in the City of Sebastopol. The analysis in this section was prepared with assistance from j.c. brennan & associates, Inc.

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50 percent of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event

REGULATORY FRAMEWORK

FEDERAL

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an Leq 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 Ldn 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 Ldn, have generally agreed on the 65 dBA Ldn level as being appropriate for residential uses. At 65 dBA Ldn 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 Ldn or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA Ldn but not exceeding 75 dBA Ldn - 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 Ldn area and 10 dBA of attenuation in a 70 to 75 dBA Ldn area.
- Exceeding 75 dBA Ldn - 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 Ldn 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 Ldn or less, the interior level will be 45 dBA Ldn or less. Thus, structural attenuation is assumed at

20 dBA. However HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 2011). 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, 2003). The guidelines include land use compatibility guidelines for noise exposure.

LOCAL

Existing City Noise Thresholds

The City of Sebastopol General Plan Safety Element establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure. The intent is to provide guidance for determining noise impacts due to, and upon proposed projects. The existing Goals, Policies, and Programs of the City's General Plan Noise Element are provided below:

Goal 10 **Ensure the compatibility of new development with existing and future noise environment.**

Goal 11 **Prevent land uses which increase the existing noise level above established acceptable standards.**

Goal 12 **Reduce noise to acceptable levels where it now exceeds those standards.**

Policies and Implementation Programs to Reduce Noise Level

P.40 Maintain Noise and Land Use Compatibility Standards: Encourage the maintenance of the noise and land use compatibility standards indicated in Table 3 (Table 7-1). The normally acceptable standards for outdoor noise are summarized below (noise measurements in Ldn)

Program 40.1: Review all land use and development proposals for compliance with the Noise and Land Use Compatibility Standards.

Responsibility: Planning Department

Program 40.2: Require a standard of Ldn 45 dB for indoor noise for all new residential development, including hotels and motels.

Responsibility: Planning Department

Program 40.3: Use the 'Normally Acceptable' standards in Table 3 (Table 7-1) to determine the need for noise studies and require new developments to provide noise attenuation features as a condition of approving new projects.

Responsibility: Planning Department

Program 40.4: Require an acoustical study for all new residential projects with a future Ldn noise exposure of 60 dB or greater as shown on Map 7. The study shall describe how the project will comply with the Noise and Land Use Compatibility Standards.

Responsibility: Planning Department

Program 40.5: Require post-construction testing and sign-off by an acoustical engineer for residential and office projects exposed to a Ldn in excess of 65 dB to ensure compliance with applicable exterior and interior standards contained in the Noise and Land Use Compatibility Standards.

Responsibility: Planning and Building Departments

Program 40.6: Continue to implement the Noise Ordinance which limits construction noise.

Responsibility: Planning and Building Departments

Program 40.7: Require acoustical studies and mitigation measures for new development and roadway improvements which affect noise sensitive uses such as schools, hospitals, libraries and convalescent homes.

Responsibility: Planning Department

P.41 Reduce Outdoor Noise in Existing Residential Areas: Reduce outdoor noise in existing residential areas where economically and aesthetically feasible.

Program 41.1: Verify projected noise levels with noise monitors at locations adjacent to residential and other noise sensitive areas where traffic volumes increase by over 50 percent from baseline noise data.

Responsibility: Planning and Public Works Department

Program 41.2: Consider and carefully evaluate the noise impacts of all street, highway and other transportation projects.

Responsibility: Planning and Public Works Department

Program 41.3: Continue to seek State and Federal funding to construct noise barrier where impact of noise can be significantly reduced.

Responsibility: Planning Department

Program 41.4: Establish a standard for new commercial development adjacent to residential areas which does not permit an increase in noise levels in residential areas of more than 3 dB Ldn, or creates noise impacts which would increase noise levels to more than 65 dB Ldn at the boundary of a residential area, whichever is the more restrictive standard.

Responsibility: Planning Department

P.42 Noise Standards Applied to Remodel Projects: Noise standards shall be applied to residential remodel projects, where the remodeling is substantial.

Program 42.1: Review all building permit applications for compliance with the applicable noise standards, and require as necessary, the appropriate noise mitigation features.

Responsibility: Planning and Building Departments

P.43 Protect Existing Noise Environment in Residential Areas.

Program 43.1: Require mitigation for projects that would cause the following criteria to be exceeded or would generate noise which could cause significant adverse community response:

- Cause the Ldn in existing residential areas to increase by 3 dB or more and exceed a Ldn of 55 dB.
- Cause the Ldn in existing residential areas to increase by 3 dB or more if the Ldn currently exceeds 55 dB

(Noise: a 3 dB increase would result in traffic increased by 100 percent over existing levels. It is recognized that there are locations where the outdoor criteria of a Ldn of 55 dB cannot be reasonably and feasibly achieved. These situations will be evaluated on a case-by-case basis to determine the appropriate level of mitigation.)

Program 43.2: Consider development a comprehensive noise ordinance including noise standards for home power tools, animals such as barking dogs, and industrial uses.

Responsibility: Planning Department

P.44 Reduce Noise in Residential Areas: Reduce noise levels in existing residential

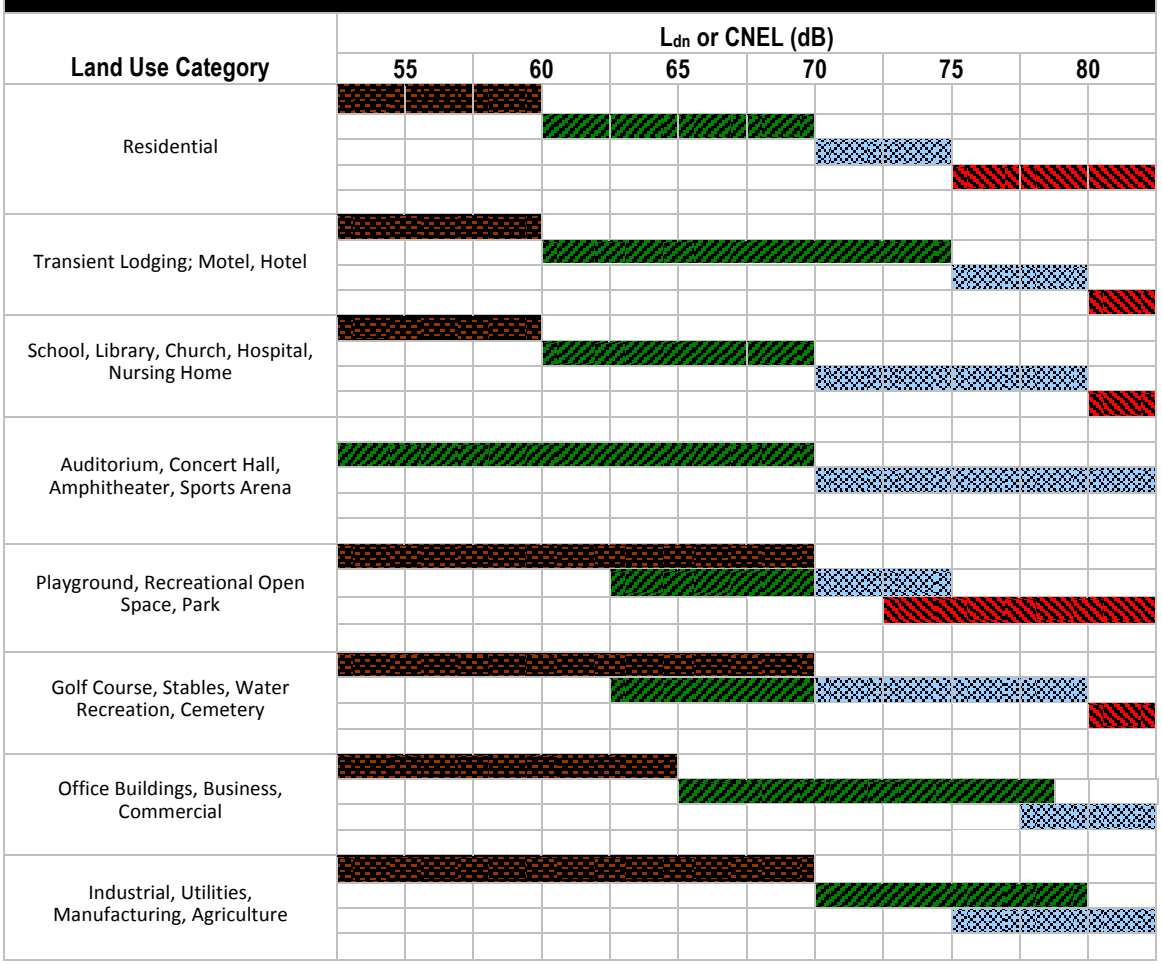
Program 44.1: Restrict truck traffic to designated routes.

Responsibility: Planning and Public Works Department

Program 44.2: Enforce California Vehicle Code § 23130, 23130.5, 27150, 27151, and 38275. These sections pertain to the allowable noise emission of vehicles operated on public streets.

Responsibility: Police Department

TABLE 7-1: CITY OF SEBASTOPOL NOISE AND LAND USE COMPATIBILITY STANDARDS



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

SOURCE: State of California, Governor's Office of Planning and Research, 2003. *General Plan Guidelines*.

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), 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 Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

The day/night average level (Ldn) 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 Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to Ldn, but includes a +3 dB penalty for evening noise. Table 7-2 lists several examples of the noise levels associated with common situations.

TABLE 7-2: TYPICAL NOISE LEVELS		
Common Outdoor Activities	**Noise Level (dBA)**	**Common Indoor Activities**
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. NOVEMBER 2009.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

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

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;

- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop Ldn (24-hour average) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly Leq values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict Ldn values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the General Plan study area. Day/night traffic distributions were based upon continuous hourly noise measurement data and j.c. brennan & associates, Inc. file data for similar roadways. Caltrans vehicle truck counts were obtained for SR 12 and SR 116. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 7-3 shows the results of this analysis.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segments. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 7-3 are generally considered to be conservative estimates of noise exposure along roadways in the City of Sebastopol.

TABLE 7-3: PREDICTED EXISTING TRAFFIC NOISE LEVELS					
Roadway	Segment	Noise Level at Closest Receptors (dB, Ldn)[1]	Distances to Traffic Noise Contours, Ldn (feet)		
			70 dB	65 dB	60 dB
SR 12 / Sebastopol Ave.	East of Main	68.4	39	84	181
Bodega Ave.	West of Main	64.9	23	49	105
Bodega Ave.	West Ragle	65.8	26	56	121
SR 116	North of Covert	66.7	30	65	140
SR 116	Covert to McKinley	67.4	33	72	155
SR 116 South / Main St.	McKinley to Bodega	65.5	25	54	117
SR 116 South / Main St.	Bodega to SR 116 North	65.9	27	58	124
SR 116 North / Petaluma Ave.	Main Street to Sebastopol Ave.	65.1	23	50	109
SR 116 North / Petaluma Ave.	Sebastopol to SR 116 South	64.8	23	49	105
SR 116	Petaluma Ave. to Lynch Rd.	67.7	35	76	163
SR 116	South of Lynch Rd.	67.6	34	74	160

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.

[1] *TRAFFIC NOISE LEVELS ARE PREDICTED AT THE CLOSEST SENSITIVE RECEPTORS*

SOURCE: W-TRANS TRANSPORTATION ENGINEERS, CALTRANS, J.C. BRENNAN & ASSOCIATES, INC., 2014.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

In the City of Sebastopol, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

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
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 7-4.

TABLE 7-4: TYPICAL STATIONARY SOURCE NOISE LEVELS

USE	NOISE LEVEL AT 100 FEET, LEQ [1]	DISTANCE TO NOISE CONTOURS, FEET			
		50 dB LEQ (NO SHIELDING)	45 dB LEQ (NO SHIELDING)	50 dB LEQ (WITH 5 dB SHIELDING)	45 dB LEQ (WITH 5 dB SHIELDING)
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000
Paint Booth Exhaust	61 dB	355	631	200	355
Skate Park	60 dB	316	562	178	316
School Playground / Neighborhood Park	54 dB	158	281	89	158
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

[1] *ANALYSIS ASSUMES A SOURCE-RECEIVER DISTANCE OF APPROXIMATELY 100 FEET, NO SHIELDING, AND FLAT TOPOGRAPHY. ACTUAL NOISE LEVELS WILL VARY DEPENDING ON SITE CONDITIONS AND INTENSITY OF THE USE. THIS INFORMATION IS INTENDED AS A GENERAL RULE ONLY, AND IS NOT SUITABLE FOR FINAL SITE-SPECIFIC NOISE STUDIES.*

SOURCE: J.C. BRENNAN & ASSOCIATES, INC. 2014.

COMMUNITY NOISE SURVEY

A community noise survey was conducted to document ambient noise levels at various locations throughout the City. Short-term noise measurements were conducted at seven locations throughout the City on June 10th and 11th, 2014 during daytime and nighttime periods. In addition, three continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends. The data collected included the hourly average (Leq), median (L50), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 7-5 and Table 7-6. Figure 7-1 shows the locations of the noise monitoring sites.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using a LDL Model CAL200 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

TABLE 7-5: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS

Site	Location	Ldn (dBA)	Measured Hourly Noise Levels, dBA Low-High (Average)					
			Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm – 7:00 am)		
			Leq	L50	Lmax	Leq	L50	Lmax
A	510 Lyding Avenue & Healdsburg Ave., 60 ft to centerline.	64	59-65 (63)	57-64 (62)	73-83 (77)	46-61 (55)	27-57 (39)	66-81 (72)
B	101 Nelson Way & Bodega Ave., 60 ft to centerline.	64	59-64 (63)	55-63 (61)	76-85 (80)	47-60 (55)	26-55 (39)	65-80 (72)
C	554 Petaluma Ave., 45 ft to centerline.	66	59-71 (65)	51-64 (61)	76-101 (83)	47-62 (56)	35-53 (41)	70-82 (74)

SOURCE – J.C. BRENNAN & ASSOCIATES, INC. – 2014

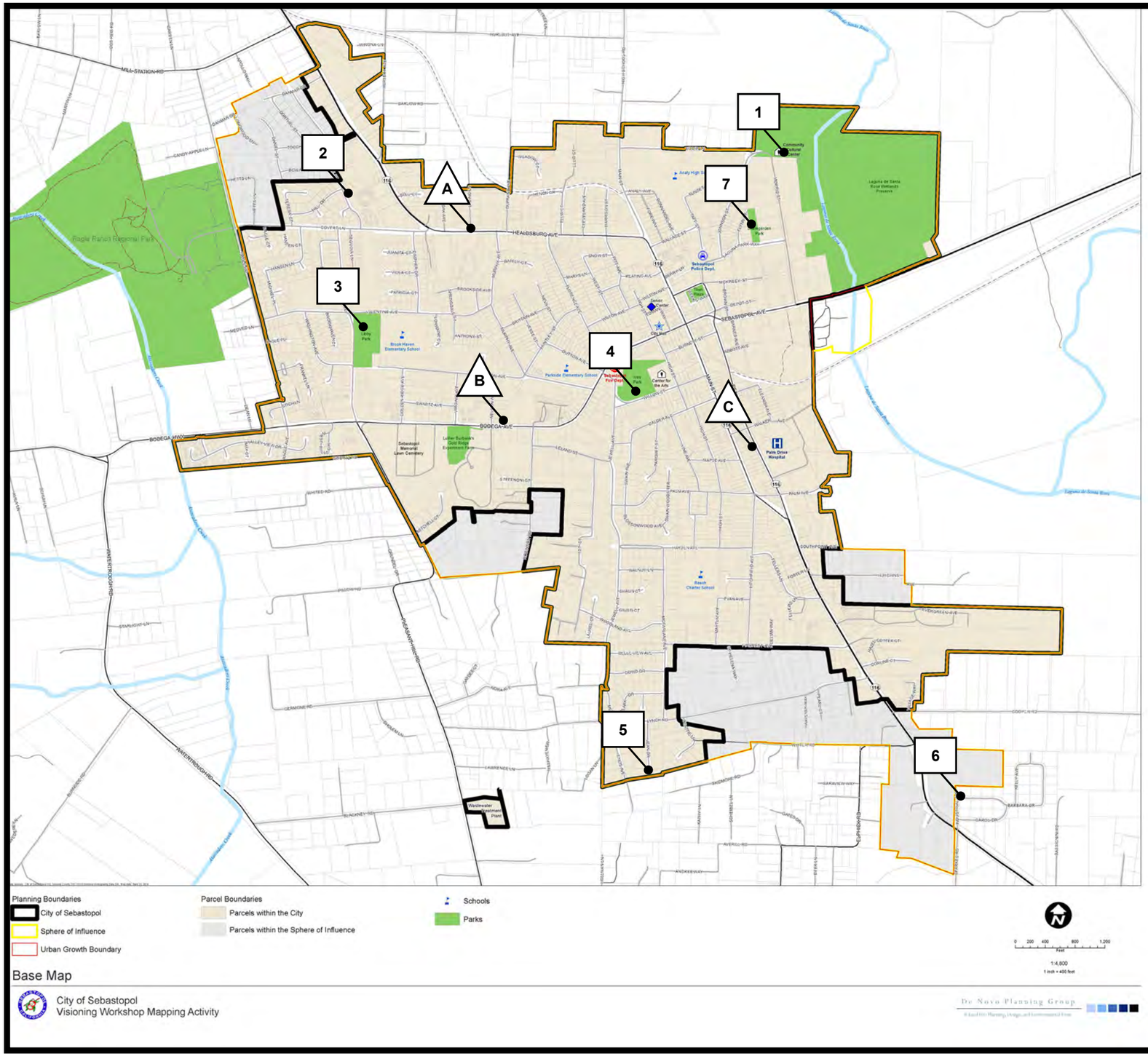
TABLE 7-6: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

Site	Location	Time[1]	Measured Sound Level, dB			Notes
			Leq	L50	Lmax	
1	Community Center at Morris St.	12:20 p.m.	50	50	58	Traffic on Morris St. is primary noise source. Wind steady 10-15 mph from SW.
		11:42 p.m.	43	41	52	Traffic on Morris St. is primary noise source.
2	Behind Lucky's, at Hill Dr.	12:45 p.m.	52	47	67	Fan noise from cooling tower steady, trash pick up 67 dB
		11:10 p.m.	45	44	52	Traffic, Fan noise from cooling tower, steady hum
3	Libby Park at Pleasant Hill Ave.	1:11 p.m.	55	54	64	Traffic 64 dB, kids playing, wind steady 10-15 mph from SW.
		10:59 p.m.	44	37	55	Traffic
4	Ives Park at Willow St.	1:54 p.m.	58	56	69	People recreating at pool, traffic on Willow St.
		10:45 p.m.	40	36	50	Traffic
5	End of Jean Dr. (Cul-de-sac)	2:45 p.m.	50	48	62	Wind in trees, steady 10-15 mph from SW.
		11:30 p.m.	42	36	59	Wind in trees, steady 5-10 mph from SW.
6	Industrial Ave. at Barbara Dr.	2:38 p.m.	58	58	68	Background SR 12 traffic, forklift at Wine Secret 67 dB
		10:15 p.m.	52	50	64	Fan at Wine Secret steady 50-53 dB, Motor/Compressor starts 64 dB
7	Skate Garden Park at 440 Flynn St.	11:55 a.m.	51	51	60	Background Fan Noise 50 dB, Skateboards hit pavement 54 dB, traffic pass by 60 dB

1 - ALL COMMUNITY NOISE MEASUREMENT SITES HAVE A TEST DURATION OF 10:00 MINUTES.

SOURCE - J.C. BRENNAN & ASSOCIATES, INC. 2014.

The results of the community noise survey shown in Table 7-5 and 7-6 indicate that existing transportation (traffic) noise sources were the major contributor of noise observed during daytime hours, especially during vehicle passbys.



Legend

X : Continuous (24-hr) Noise Measurement Site

: Short-Term Noise Measurement Site

Figure 7-1

Noise Measurement Locations

j.c. brennan & associates
consultants in acoustics

Figure Prepared:
June 2014