

From 1847
Benicia General Plan
Into the 21st Century

BENICIA GENERAL PLAN

DRAFT ENVIRONMENTAL IMPACT REPORT

STATE CLEARINGHOUSE #97122023
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1. INTRODUCTION

This Draft Environmental Impact Report (EIR) has been prepared to provide an assessment of the potential environmental consequences of adoption and implementation of the proposed Benicia General Plan. This assessment is designed to inform City of Benicia decision-makers, other responsible agencies, and the public-at-large of the nature of the General Plan and its effect on the environment. This Draft EIR has been prepared in accordance with and in fulfillment of California Environmental Quality Act (CEQA) requirements. The City of Benicia is the Lead Agency for the project.

A. PROPOSED ACTION

The proposed project, the Benicia General Plan, is a comprehensive update of the City's General Plan, which is the principal policy document for guiding future conservation and development of the City. The Plan has a long-term horizon, addressing an approximately 15- to 20-year time frame, yet it brings a deliberate, overall direction to the day-to-day decisions of the City Council, its commissions, and City staff. The project is described in more detail in Chapter 3.

The General Plan includes newly proposed goals, policies and programs which have been designed to implement the community's vision for the City. The policies and programs would be used by the City to guide day-to-day decision-making so there is continuing progress toward the attainment of goals of the Plan.

B. EIR SCOPE, ISSUES AND CONCERNS

The scope of this Draft EIR was established by the City of Benicia through the General Plan update process. Issues addressed in this EIR are the following:

1. Land Use
2. Population, Employment and Housing
3. Community Services
4. Open Space and Recreation
5. Transportation
6. Visual Quality and Urban Design

7. Cultural Resources
8. Geologic and Seismic Hazards
9. Hydrology and Water Quality
10. Biological Resources
11. Air Quality
12. Noise
13. Hazardous Materials

This EIR is a “program level” EIR that assesses the impacts of the general development patterns that would occur under the proposed General Plan. It is therefore, of necessity, relatively general in its impact assessments. The City will conduct more specific analysis of environmental impacts for individual development projects that are proposed after General Plan adoption.

C. REPORT ORGANIZATION

This Draft EIR is organized into the following chapters:

- ◆ *Chapter 1: Introduction* provides an introduction and overview describing both the intended use of the document and the review and certification process.
- ◆ *Chapter 2: Report Summary* summarizes environmental consequences that would result from the proposed project, describes recommended mitigation measures, and indicates the level of significance of impacts before and after mitigation.
- ◆ *Chapter 3: Project Description* describes the proposed General Plan in detail, including a summary of the chapters of the General Plan and a listing of proposed land use designation changes.
- ◆ *Chapter 4: Setting, Impacts and Mitigation Measures* provides an analysis of the potential environmental impacts of the proposed project, and presents recommended mitigation measures to reduce their significance.
- ◆ *Chapter 5: Alternatives to the Proposed Project* considers three major alternatives to the proposed project, including the CEQA-required “No Project Alternative.” Additionally, two sets of alternative policies and programs that could be considered by the City of Benicia are also analyzed in this chapter.
- ◆ *Chapter 6: Report Preparation* identifies the data sources and preparers of the Draft EIR.

D. ENVIRONMENTAL REVIEW PROCESS

This Draft EIR will be available for review by the public and interested parties, agencies and organizations for a review period of at least 45 days, as required by law. A public hearing on the EIR will be held during the review period. The public is invited to attend the hearing to offer oral comments on this Draft EIR.

Comments on the Draft EIR may also be submitted in writing to:

John Bunch, Planning Director
City of Benicia
Planning Department
250 East "L" Street
Benicia, California 94510

Following the close of the public comment period, a Final Environmental Impact Report (FEIR) will be prepared to respond to all substantive comments regarding this Draft EIR. The FEIR will include with it a Mitigation Monitoring Program for all mitigation measures listed in the EIR as necessary to reduce significant impacts to less than significant levels. The FEIR will also be made available for public review prior to consideration of its certification by the City of Benicia City Council.

Once the City Council certifies the FEIR, the Council will also consider adoption of the Benicia General Plan itself. If the Plan is adopted, the Council may require mitigation measures specified in this EIR as amendments to the proposed General Plan. Alternatively, the Council could require other mitigation measures deemed to be effective measures for the identified impacts, or it could find that the mitigation measures cannot be feasibly implemented. For any identified significant impacts for which no mitigation measure is feasible, the Council will be required to make a finding that the measures to mitigate the impact are outside the jurisdiction of the City, or that the impacts are considered acceptable because overriding considerations indicate that the project's benefits outweigh the impacts in question.

2. REPORT SUMMARY

This summary presents an overview of the analysis contained in Chapter 4: Setting, Impacts and Mitigation Measures. CEQA requires that this chapter summarize the following: 1) areas of controversy; 2) significant impacts; 3) unavoidable significant impacts; 4) implementation of mitigation measures; and 5) alternatives to the project.

A. PROJECT UNDER REVIEW

This Draft Environmental Impact Report (EIR) provides an assessment of the potential environmental consequences of the Benicia General Plan. The General Plan is intended to serve as the principal policy document for guiding future conservation and development of the City. The General Plan includes newly proposed goals, policies and programs which have been designed to implement the community's vision for the City. The policies and programs would be used by the City to guide day-to-day decision-making so there is continuing progress toward the attainment of goals of the Plan. Additionally, the General Plan includes a series of proposed land use designation changes which have been proposed to implement the overall goals and vision of the General Plan. The General Plan is further detailed in Chapter 3 of this EIR.

B. AREAS OF CONTROVERSY

There has not been significant controversy regarding the potential environmental impacts of the Benicia General Plan. The community has been extensively involved in the planning process, and has developed the Benicia General Plan to protect environmental quality. The Plan is largely self-mitigating with regard to environmental impacts.

The analysis in this EIR considers several issues of environmental concern in order to ensure the Plan would not result in any significant environmental impacts. These detailed analyses are contained in Chapter 4 of this EIR, and the findings of these analyses are summarized in this chapter.

C. SIGNIFICANT IMPACTS

Under CEQA, a significant impact on the environment is defined as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance.

Implementation of the Benicia General Plan has the potential to generate environmental impacts in a number of areas. Impacts to the following environmental topics could be significant without the implementation of mitigation measures, but would be reduced to a less-than-significant level if the mitigation measures recommended in this report are implemented:

- Land Use
- Community Services
- Transportation and Circulation
- Hydrology and Water Quality
- Air Quality
- Hazardous Materials

Adoption of the Plan would have relatively few impacts. The Plan has been developed to be largely self-mitigating and it actually lowers development potential in some areas of the City. Thus, only a small number of significant impacts are identified in this EIR.

D. MITIGATION MEASURES

This Draft EIR suggests specific mitigation measures that would reduce most impacts identified above to less-than-significant levels, as summarized in the table at the end of this summary. The mitigation measures in this Draft EIR will form the basis of a Mitigation Monitoring Program to be implemented in accordance with State law.

E. UNAVOIDABLE ENVIRONMENTAL IMPACTS

The project is not expected to cause any significant unavoidable environmental impacts under CEQA definitions. All potential impacts can be mitigated to a less-than-significant level with the implementation of the mitigation measures outlined in this EIR.

F. ALTERNATIVES TO THE PROJECT

This Draft EIR analyzes three alternatives to proposed General Plan, as follows.

- No Project Alternative
- Land Use Changes Option A
- Land Use Changes Option B

Based on the comparative alternatives analysis contained in this EIR, the proposed General Plan is the environmentally superior alternative. In addition to the Plan alternatives, several alternative policy and programs have been analyzed in the alternative analysis chapter of this EIR.

G. SUMMARY TABLE

Table 1 presents a summary of impacts and mitigation measures identified in this report. It has been organized to correspond with environmental issues discussed in Chapter 4.

The table is arranged in four columns: 1) environmental impacts; 2) significance prior to mitigation; 3) mitigation measures; and 4) significance after mitigation. A series of mitigation measures is noted where more than one mitigation may be required to achieve a less-than-significant impact. For a complete description of potential impacts and suggested mitigation measures, please refer to the specific discussions in Chapter 4. Additionally, this summary does not detail the timing of mitigation measures. Timing of implementation is described further in Chapter 4 and will be further detailed in the Mitigation Monitoring Program.

Table 1 Summary of Impacts and Mitigation Measures

Significant Impact	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
LAND USE			
<i>There are no significant land use impacts</i>			
POPULATION, EMPLOYMENT AND HOUSING			
<i>There are no significant population, employment and housing impacts</i>			
COMMUNITY SERVICES			
SERV-1: New development under the Benicia General Plan could result in an increased demand for police services.	S	SERV-1: The General Plan should be amended to incorporate a policy and/or program intended to maintain police services at an officer-to-population ratio approved by the City Council.	LTS
SERV-2: The General Plan would result in the development and establishment of level of service standards for the City's fire protection services and facilities. Programs 2.11.C, 2.48.A and 4.21.C all call for establishment of similar standards. Assurances are needed that the fire protection standards would be established prior to new development or infill projects so that existing fire protection services are not impaired.	S	SERV-2: Programs 2.11.C, 2.48.A and 4.21.C should be revised to cross-reference each other and to ensure that standards are established prior to any major new development or infill project.	LTS
OPEN SPACE AND RECREATION			
<i>There are no significant open space and recreation impacts</i>			

S = Significant; LTS = Less than Significant

Significant Impact	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
TRANSPORTATION AND CIRCULATION			
CIRC-1: Of the 24 intersections studied, 22 would operate below the proposed General Plan standard of LOS C / D under projected buildout conditions.	S	CIRC-1: The City should add the improvements shown in Figure 12 to the CIP and continue its traffic monitoring program as new development allowed by the General Plan takes place. The improvements should be implemented as they become necessary and the improvement list should be revised as necessary based upon actual traffic patterns which develop, physical constraints, and other considerations such as neighborhood impacts, and community character. Whenever possible, the City should consider alternatives to intersection widening, including signalization, aggressive Travel Demand Management programs, rerouting traffic, prohibiting certain turning movements during peak hours, and coordinating traffic signals.	LTS

S = Significant; LTS = Less than Significant

Significant Impact	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
<p>CIRC-2: Future traffic volumes under the General Plan indicate the need for four lanes on the following arterials in order to maintain a minimum of LOS E:</p> <ol style="list-style-type: none"> (1) Lake Herman Road east of the I-680 NB ramps; (2) East Second Street between Lake Herman Road and the existing four-lane section; (3) East Second Street between I-780 WB ramps and Military East; (4) East Fifth Street between I-780 WB ramps and Military East; (5) Industrial Way between Lake Herman Road (along new extension) and the I-680 ramps; (6) Bayshore Road between I-680 SB ramp and Industrial Way; (7) Military West between West Fifth and West Second; (8) Military East between East Second and East Fifth; (9) West Seventh Street between Chelsea Hills and Military West; and (10) Park Road between Industrial and Bayshore. 	S	<p>CIRC-2: To the extent that the improvements listed above are not in the CIP, the City should consider adding them to the CIP. The City should continue its traffic monitoring program as new development allowed by the General Plan Update takes place. The improvements should be implemented if they are found necessary. The improvement list should be revised as necessary based upon actual traffic patterns which develop, physical constraints, and other considerations such as neighborhood impacts and community character. The City should also consider other alternatives as "spot widening" at congestion points, aggressive Travel Demand Management programs, rerouting traffic, prohibiting certain turning movements during peak hours, and coordinating traffic signals.</p>	LTS
<p>CIRC-3: The intensification of uses in the Downtown and Arsenal areas may require increased transit service.</p>	S	<p>CIRC-3: The City should work with Benicia Transit to incorporate the effects of the General Plan's land use changes into the Short Range Transit Plan, in particular planning for increased service in the Downtown and Arsenal areas.</p>	LTS

VISUAL QUALITY AND URBAN DESIGN

There are no significant visual and urban design impacts

S = Significant; LTS = Less than Significant

Significant Impact	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CULTURAL RESOURCES			
<i>There are no significant cultural resources impacts</i>			
GEOLOGICAL AND SEISMIC HAZARDS			
<i>There are no significant geological and seismic impacts</i>			
HYDROLOGY AND WATER QUALITY			
<i>There are no significant hydrology and water quality impacts</i>			
BIOLOGICAL RESOURCES			
<i>There are no significant biological resource impacts</i>			
AIR QUALITY			
AIR-1: The General Plan does not specifically address buffer zones surrounding sources of odor or toxic air contaminants.	S	AIR-1: Goal 4.28 and Policy 4.28.1 should be modified to specifically address toxic air contaminants.	LTS
NOISE			
<i>There are no significant noise impacts</i>			

S = Significant; LTS = Less than Significant

Significant Impact	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
HAZARDOUS MATERIALS			
HAZ-1: Development within or adjacent to the eleven areas of concern identified by the Corps of Engineers could encounter unexploded ordnance which could result in construction-related hazards.	S	HAZ-1: The General Plan Update should include a policy and/or program to require site investigation of sites with possible unexploded ordnance prior to development of the properties. Should any unexploded ordnance be discovered, the remediation of the property should be required before grading or construction occurs.	LTS

S = Significant; LTS = Less than Significant

S = Significant; LTS = Less than Significant

3. PROJECT DESCRIPTION

The City of Benicia has prepared a draft update to the City's existing General Plan. The update involves substantial reorganization and revisions to elements of the General Plan and a series of General Plan land use designation changes. This chapter further describes the proposed General Plan and the planning process that created it.

A. LOCATION AND PHYSICAL SETTING

Benicia is approximately 35 miles from San Francisco and 57 miles from Sacramento, as shown in Figure 1. It lies on the north shore of the Carquinez Strait, where the combined flow of the Sacramento and San Joaquin rivers have cut a deep gorge through the coast range. The Strait is a crucial link in Northern California's inland waterway, connecting San Pablo Bay to the west with the Sacramento and San Joaquin river delta to the east. Through the Strait, ocean-going ships can reach the Port of Benicia, or can continue on to the Central Valley ports of Sacramento and Stockton. The City is built on a peninsula of land that reaches south from the main body of Solano County and creates a prominent bend in the Carquinez Strait. The Union Pacific rail line and I-680, which both cross the Carquinez Strait, provide easy access to Benicia from the north and south; I-780 (which the City straddles) provides access from the west.

Although part of Solano County, Benicia is also closely linked to Contra Costa County across the Strait. Views from Benicia encompass the Strait, the foothills of northern Contra Costa County, and Mt. Diablo in the distance. Many Benicia residents work and shop in Contra Costa County.

The Planning Area is made up primarily of rolling hills, rising to an elevation of 1,160 feet. On the west boundary, Sulphur Springs Mountain reaches approximately 950 feet. Two major drainages -- Sulphur Springs Creek and Paddy Creek -- run approximately north-south through the northern portion of the study area. They meet just south of Lake Herman Road and then run through the Industrial Park to Suisun Bay. Other minor creeks and watersheds drain the developed parts of the City south of Southampton Ridge.

REGIONAL LOCATION

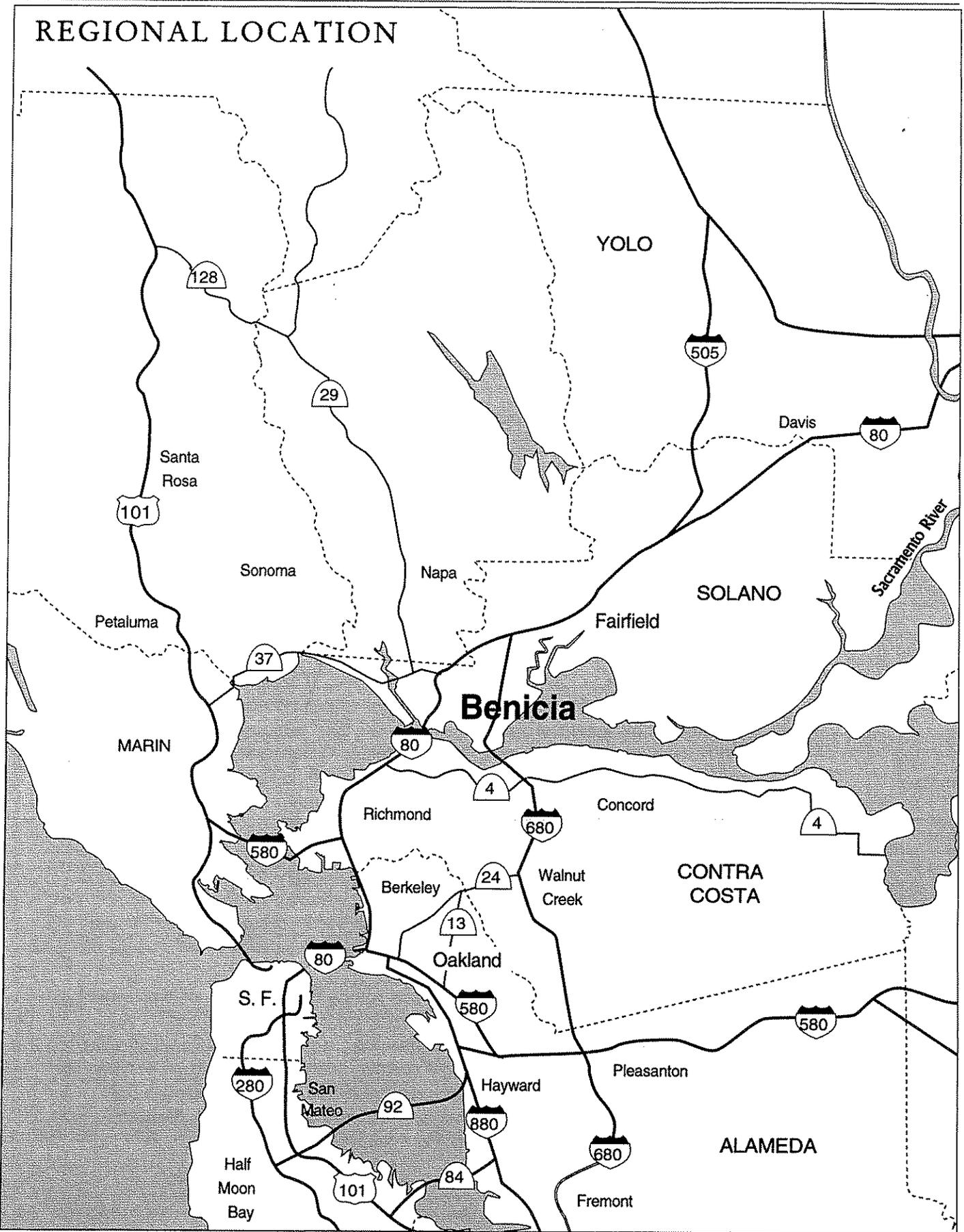


Figure 1

The rolling hills reach almost to the shoreline; very little of Benicia is flat. On the southern margins of the City, the land slopes gently down to the Carquinez Strait. Most of the older residential areas and the Downtown are here. The eastern City limits are bordered by the marshlands of Suisun Bay. Relatively flat areas adjacent to the marshes provide sites for industry. At the southwestern boundary of the Planning Area, another flat, marshy area has been preserved as the Benicia State Recreation Area.

Several key natural features have influenced the pattern of existing development:

- The Carquinez Strait and Suisun Bay provide an extensive, accessible shoreline bracketed on both east and west by marsh preserves. The shoreline is divided between residential, recreational, and industrial uses.
- Low hills above the Downtown interrupt lines of sight to the newer development in the hill areas north of I-780. This interruption creates separate “visual basins”—contributing to the small town feel and scale of Benicia. The topography frames a “water-oriented” area containing the Downtown, central Benicia, and portions of Southamption which lie below the main ridgeline.
- Steep hillsides, high promontories, and canyons north of the main ridgeline facing the Carquinez Strait define three distinct areas: (1) an “upland” area directly behind the main ridgeline, which is largely developed; (2) the “lake” area where the hills slope inward towards Lake Herman; and (3) a “northern” area comprised of the watershed of Sulphur Springs Creek, which until the early 1990s was considered for residential development.
- A pronounced terrace, directly in line with the Benicia-Martinez Bridge, separates the northbound and westbound freeways. This terrace defines two distinct industrial areas: community uses and import-export activities to the southwest, and major industrial uses to the northeast. The northeast industrial area is also contained by the hills below Lake Herman Road to the north, the slopes above East Second Street to the west, and Suisun Bay to the east.

B. WHAT IS THE GENERAL PLAN?

The Benicia General Plan is the principal policy document for guiding future conservation and development of the City. It represents an agreement among the citizens of Benicia on basic community values, ideals, and aspirations to govern a shared environment. The Plan has a long-term horizon, addressing a time-frame of approximately 15- to 20-years, yet it brings a deliberate, overall direction to the

day-to-day decisions of the City Council, its commissions, and City staff.

The General Plan is intended to direct Benicia's growth to achieve beneficial ends. It addresses concerns that Benicia's residents, businesses, and taxpayers have raised about the magnitude and location of growth. The Plan is meant to reflect the community's shared values and determination of what Benicia is and should continue to be.

C. THE GENERAL PLAN PROCESS

In late 1992, the Benicia City Council formed a citizens' task force to review the existing General Plan and report its findings. As a result, in late 1993, a General Plan Task Force Report was issued. The report stated that many of the policies and programs in the General Plan had not been revised since 1979, had already been implemented, or were no longer relevant to current or future conditions.

In June 1994, the City Council adopted a resolution directing that preparations begin for a comprehensive update of the General Plan. Accordingly, the Council formed a 17-member citizens' general Plan Oversight Committee (GPOC) to work with City staff to design the update process. GPOC was charged with facilitating public outreach, monitoring the update process, working with City staff to implement the adopted work program, providing volunteer assistance, and leading or assisting in community workshops and forums.

The GPOC drafted and adopted a working outline for the General Plan in September 1995. The City's consultants and citizens groups prepared 11 background reports on General Plan issues in late 1995. GPOC and consultants also conducted extensive community outreach and data gathering exercises, including two community-wide surveys, six public workshops and visits to all of the City's elementary school classrooms.

In February 1996, GPOC began to use the information generated to develop the Issues, Goals, and Policies (IGPs) report of January 21, 1997. The IGPs report was reviewed by the GPOC, Planning Commission, and City Council at a joint meeting on February 5, 1997, by the Planning Commission on February 13, and by the City Council on March 13. Those reviews assured that the IGPs document contained goals and policies for what are the most significant issues for the community.

Based on the IGPs, the City's consultants prepared a Goals, Policies, and Programs

report (June 6) and a Preferred Alternatives Report (June 30) which incorporated additions and changes made by the GPOC, the consultants, City staff, Planning Commission, and City Council since the IGPs report of January 21, 1997. The Preferred Alternatives Report was reviewed by the City Council on August 6. With the Council's comments in hand, the consultants began drafting the proposed General Plan and this Draft Environmental Impact Report.

D. GENERAL PLAN CHARACTERISTICS

1. THE ROLE OF THE GENERAL PLAN

The overall objectives of the Benicia General Plan are to:

- Express the desires of Benicia residents in regard to the physical, social, economic, cultural, and environmental character of the City;
- Serve as a comprehensive guide for making decisions about land use, economic development, transportation improvements, and protecting natural resources and public health and safety;
- Define a realistic vision of what the City intends to be in 15 to 20 years;
- Chart the course of conservation and development that will determine the future character of Benicia; and
- Serve as the City's "constitution" for land use and community development. That is, provide the legal foundation for all zoning, subdivision, and public facilities ordinances, decisions, and projects -- all of which must be consistent with the General Plan.

2. GENERAL PLAN CHAPTERS

The Benicia General Plan has five chapters plus a Technical Appendix. These components of the General Plan are briefly described below:

- *Chapter 1: Introduction.* This chapter provides an introduction to the General Plan, the General Plan process, and the organization of the General Plan.
- *Chapter 2: Community Development and Sustainability.* The following elements of the General Plan are contained in Chapter 2: Economic Development Element, Residential Land Use Element (the State-mandated Housing Element), Land Use Element, Circulation Element, and a section on Growth Management and urban growth boundaries.

- *Chapter 3: Community Identity.* This chapter covers Historic and Cultural Resources, Urban Design, and the State-mandated Open Space and Conservation Elements.
- *Chapter 4: Community Health and Safety.* This chapter discusses Healthy Communities and provides the State-mandated Safety and Noise elements.
- *Chapter 5: Glossary.* A glossary of terms is provided in this chapter to help the reader understand the Plan and ensure that the terms in the Plan are clearly defined.
- *Technical Appendix.* This section contains background materials on growth management, hazardous materials and housing that was used in preparing the General Plan. The technical appendix is important for a thorough understanding of the General Plan update process, however, it is not proposed for adoption as policy by the City nor is it essential to the day-to-day uses and implementation of the Plan. The information in the technical appendix has also been used as the basis of environmental analysis in this EIR.

3. GOALS, POLICIES, AND PROGRAMS

Chapters 2, 3 and 4 of the General Plan propose a series of goals, policies, and programs, which comprise the heart of the General Plan. Goals are “end-state;” they are the long-range answers as to what the City wants to accomplish to resolve a particular issue. Policies and programs are medium- or short-range. Policies and programs guide day-to-day decision-making so there is continuing progress toward the attainment of the General Plan’s goals.

4. LAND USE CATEGORIES

The General Plan proposes to retain the existing General Plan land use categories, with some revisions. The existing land use categories to be retained are:

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Community Commercial (called “Neighborhood Commercial” in the existing General Plan)
- Waterfront Commercial
- Downtown Commercial

-
- Business and Professional Offices
 - General Commercial
 - General Industrial
 - Limited Industrial
 - Water-Related Industrial
 - Public and Quasi-Public
 - Marsh
 - General Open Space
 - Parks

The General Plan also proposes to add a new major group of land uses called "Mixed Use." The two new classifications added under the Mixed Use group are "Downtown Mixed Use" and "Lower Arsenal Mixed Use." These classifications are further detailed below:

- *Downtown Mixed Use.* This category permits residential retail and office uses and churches as a conditional use. Its purpose is to increase the number and types of spaces available for living above retail and office, to encourage a mix of compatible uses adjacent to the Downtown, and to encourage the upgrading of existing buildings, the preservation and adaptive reuse of historic buildings, and the introduction of new, compatible buildings of mixed use. The Downtown Mixed Use category permits a maximum floor area ratio of 2.0. The proposed General Plan includes the redesignation of 29 acres of land to this new designation.
- *Lower Arsenal Mixed Use.* The mixed use designation created for the Arsenal area permits live/work, office, retail development, churches, limited industrial and general commercial uses, any of which may require a use permit. Its purpose is to increase the number and types of spaces available for living and working, to encourage a mix of compatible uses in designated areas of the Lower Arsenal formerly designated for General Industrial, General Commercial, and Business and Professional Office, and to promote the upgrading of existing buildings, the preservation and adaptive reuse of historic buildings, and the introduction of new, compatible building to house mixed use. The Lower Arsenal Mixed Use category permits a maximum floor area ratio of 2.0. The proposed General Plan includes the redesignation of 44 acres of land to this new designation.

5. LAND USE CHANGES

In addition to the newly proposed goals, policies, and programs and the new General Plan land use designations, the General Plan proposes several revisions to the land use designations of properties shown on the 1993 General Plan land use map. All of these changes are intended to be in keeping with the goals, policies and programs of the General Plan.

The land use changes are listed, numbered, and described below. The paragraph numbers correspond to the numbers on the map of Land Use Changes in Figure 2 and the summary of changes described in Table 2. All acreages are gross except as noted. "Net" means streets are completed and are not included in the acreage figures.

1. The entire former Sky Valley Group site (350 acres on three parcels north of Lake Herman Road): from Low Density Residential, Medium Density Residential, and General Open Space TO General Open Space.
2. Three IT parcels (169 acres) north of Lake Herman Road (and north and northwest of the Water Treatment Plant): from Business and Professional Office TO General Open Space.
3. West Channel Road and California Court: approximately 33 parcels (134 acres) from General Industrial TO Limited Industrial with a 150-foot General Open Space buffer adjacent to proposed residential along the south and west edges of six industrial parcels.
4. Exxon buffer west of East Second (five parcels; 272 acres): from General and Limited Industrial TO Limited Industrial with 150-foot General Open Space buffer adjacent to residential uses. The reservoir site in this area would remain Public/Quasi-Public.
5. Exxon buffer east of East Second (one parcel): a total of 152 acres from General Industrial TO Limited Industrial with 150-foot Open Space buffer along the south edge adjacent to Low Density Residential, General Open Space, and Public/ Quasi-Public. The Corporation Yard would maintain its Public/Quasi-Public designation.

LAND USE CHANGES

LEGEND	
Preferred Urban Growth Boundary	Planning Area Boundary
Sphere of Influence	City Limits
Low Density Residential	General Commercial
Open Space - Marsh	Downtown Commercial
Open Space - General	Community Commercial
Downtown - Mixed Use	Limited-Industrial
Arsenal - Mixed Use	Public/Quasi-Public
* See Text for Specifics	

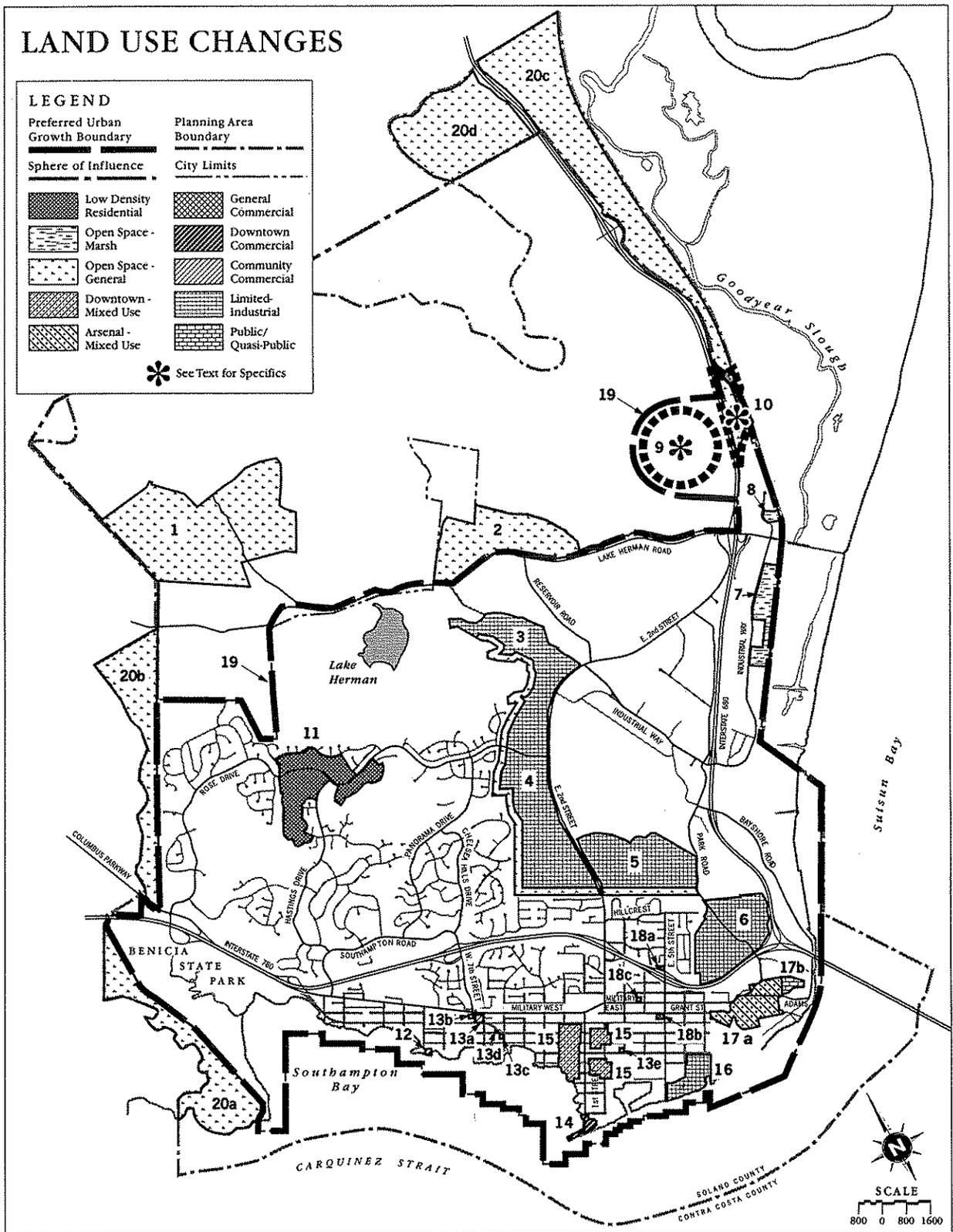


Figure 2

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6. Upper Arsenal north of I-780 (123 acres from approximately the Armory south, to and including Pine Lake): from General Industrial TO Limited Industrial.
 7. Four Fleetside parcels (43.5 acres between Industrial Way and the UPRR): from General Industrial TO Open Space-Marsh.
 8. The third parcel north of Lake Herman Road between Egret Court and UPRR: (4.7 acres) from Limited Industrial TO Open Space-Marsh.
 9. West side I-680, south of the northern "Gateway" to Benicia: undeveloped open space with a small, inactive gravel pit on its northern edge. This area would retain its existing General Plan Open Space Designation, but may be redesignated for alternative urban uses in the future.
 10. East side I-680, south of the northern "Gateway" to Benicia: three parcels (24 acres) between Goodyear Road and I-680. This area would retain its existing General Plan Open Space Designation, but may be redesignated for alternative urban uses in the future.
 11. Parcels generally north of Solar Village, Henderson School, and Jack London Park (and generally along Solano Drive, Rose Drive, Sorrel Court, Alder Court, Lupine Court, Toyon Place, Iris Court, Zinnia Court, Gardenia Court, Fuchsia Drive, Wisteria Court, Orchid Drive, Barton Way, Primrose Lane, Daffodil Drive, Snapdragon Place, Periwinkle Place, Morning Glory Drive, and Lyon Court): 120 net acres from Medium Density Residential TO Low Density Residential.
 12. Cliff's Pleasant View at the south end of West Ninth Street: 0.76 acres from Low Density Residential TO Community Commercial.
 13. Several parcels TO Community Commercial:
 - a. Southwest corner of West Military at West Sixth: 1.54 acres FROM Neighborhood Commercial.
 - b. South of West Military adjacent to and east of Willow Glen Park: 0.47 acres FROM General Commercial.

Table 2. Proposed Land Use Changes by Category and Acres

EXISTING LAND USE	ACRES	PROPOSED LAND USE	ACRES
1. Low Density Residential	208		
Medium Density Residential	12		
Open Space	130	Open Space	350
2. Business/Professional Offices	169	Open Space	169
3. General Industrial	134	Limited Industrial	119
		Open Space	15
4. General Industrial	272	Limited Industrial	245.0
		Open Space	27.0
5. General Industrial	152	Limited industrial	147.5
		Open Space	4.5
6. General Industrial	123	Limited Industrial	123
7. General Industrial	43.5	Open Space/Marsh	43.5
8. Limited Industrial	4.7	Open Space/Marsh	4.7
9. Open Space	undeter- mined	Alternative Uses	undeter- mined
10. Open Space	24	Alternative Uses	24
11. Medium Density Residential	120	Single Family Residential	120
12. Low Density Residential	.79	Community Commercial	.79
13. a. Neighborhood Commercial	1.54	Community Commercial	1.54
b. General Commercial	.47	Community Commercial	.47
c. Neighborhood Commercial	.36	Community Commercial	.36
d. Neighborhood Commercial	.12	Community Commercial	.12
14. Waterfront Commercial	0.5	Downtown Commercial	4.5
Open Space/Parks	4		
15. Commercial (General, Office, Neighborhood)	2.1	Downtown Mixed Use	29.3
Public	1.2		
Residential (Single Family, Multi-family, PUD)	26.0		
16. General Industrial	32	Limited Industrial	32
17. a. Office	11.5	Lower Arsenal Mixed Use	44.0
General Commercial	10.5		
Limited Industrial	22.0		
b. Business/Professional Office	7.0	Public/Semi Public	7.0
18. a. Neighborhood Commercial	.53	General Commercial	.53
b. Neighborhood Commercial	.42		
c. Neighborhood Commercial	.29		
19. (none)	--	Establish Urban Growth Boundary	--
20. a. Vallejo Open Space	154	Open Space	154
b. Vallejo Buffer Zone	180	Open Space	180
c. County (Open Space, Marsh / Agriculture, Extensive)	820	Open Space	820
d. County (Agriculture, Extensive)	230	Open Space	230

- c. Southwest corner of J and West Fifth Street: 0.36 acres FROM Neighborhood Commercial.
 - d. Parcel north side of J Street between West Fifth and West Sixth Streets: 0.12 acres FROM Neighborhood Commercial.
 - e. Parcel north corner of H and East Third Street (east of Fitzgerald Field): 0.43 acres FROM Neighborhood Commercial.
14. Foot of Downtown (both sides of First Street south of B Street): 32 net acres from Waterfront Commercial and Open Space-Parks TO Downtown Commercial.
15. The blocks on either side of Downtown from West Second (both sides) to East Second (both sides) and between E and K Streets: 29.3 net acres from High Density Residential, General Commercial, Neighborhood Commercial, and Business and Professional Office TO Downtown Mixed Use.
16. The "Yuba" area (south of the WWTP and east of East Fifth Street and south of E Street): 32 acres from General Industrial TO Limited Industrial.
- 17a. Those parts of the Lower Arsenal now designated General Industrial (north of Lincoln, Polk, and Tyler Streets), General Commercial, and Business and Professional Office (except the Commandant's House and Clocktower): 44 net acres TO Lower Arsenal Mixed Use.
- 17b. The Commandant's House and Clocktower (7 acres) from Business and Professional Office TO Public/Quasi-Public.
- 18a. Two parcels on the west side of East Fifth immediately north of the I-780 on-ramp: 0.53 acres from Neighborhood Commercial TO General Commercial.
- 18b. Three parcels on the south side of L Street west of East Fifth plus one parcel immediately to the south on East Fifth between K and L Streets: 0.42 acres from Neighborhood Commercial TO General Commercial.

-
- 18c. Two parcels on the north side of Military East and located one parcel west of East Fourth Street: 0.29 acres from Neighborhood Commercial TO General Commercial.
19. An Urban Growth Boundary (UGB) would be established along the City Limit line around the Zocchi property to Lake Herman Road, then follows Lake Herman Road east to Interstate 680. At Interstate 680, the boundary turns north along the freeway and west to encompass a small cluster of hills surrounding a former quarry, then east to cross the freeway at the north end of Goodyear Road and east to the Planning Area Boundary. No urban development (except for urban recreation uses and support facilities) is allowed outside of the UGB.
20. The Planning Area boundary would be expanded beyond the City Limits in four locations:
- a. West of the Benicia State Recreation Area (154 acres);
 - b. West of the City Limits north of Columbus Parkway to Lake Herman Road (180 acres);
 - c. Between I-680 and the UPRR north of Goodyear Road for approximately 2.75 miles (820 acres); and
 - d. An approximately 230-acre area starting at the existing Sphere of Influence boundary at I-680 and running north for approximately 3,000 feet and west for approximately 3,800 feet.

All four of these areas would be designated General Open Space in the General Plan.

4. ENVIRONMENTAL EVALUATION

This chapter consists of thirteen sections that evaluate the environmental impacts of the proposed Benicia General Plan. Each section follows the same format, and consists of the following subsections:

- ◆ The *Existing Setting* section describes current conditions with regard to the environmental factor reviewed.
- ◆ The *Standards of Significance* section tells how an impact is judged to be significant in this EIR. These standards are based on the CEQA guidelines.
- ◆ The *Impact Discussion* gives an overview of potential impacts of Plan adoption and implementation, and tells why impacts were found to be significant or less-than-significant.
- ◆ The *Impacts and Mitigation Measures* section numbers and lists identified impacts, and identifies measures that would mitigate each impact. This section is only included where significant environmental impacts would occur.

Impacts have been assessed relative to both existing conditions and the existing General Plan. Each numbered impact is considered significant prior to mitigation, unless it is specifically identified as less-than-significant. Mitigation measures have been suggested that will reduce significant impacts to less-than-significant levels.

Adoption of the General Plan would have relatively few impacts. The Plan has been developed to be largely self-mitigating and it actually lowers development potential in some areas of the City. Thus, only a small number of significant impacts are identified in this EIR.

All mitigation measures are stated with discretionary language ("should") because they are recommendations, and not conditions of approval for the project, unless they are specifically adopted as conditions by the City. Under CEQA, an EIR is required to identify mitigation measures that could reduce identified impacts to less-than-significant levels. However, the City is not required to adopt these mitigation measures, even after the EIR is certified. The City could also require alternative mitigation measures that are equally effective, or it could find that the

identified measures are infeasible and allow the project without mitigation under a finding of overriding consideration. If the City adopts the suggested mitigation measures as conditions of approval, then their language will be changed from the discretionary "should" to the mandatory "shall."

4.1 LAND USE

This section presents information on the existing land use in the City of Benicia and describes the effects the proposed General Plan would have on these land uses.

A. EXISTING SETTING

1. EXISTING LAND USE

The City of Benicia covers a total of 14 square miles, including about 1.2 square miles of open water and 12.8 square miles of land. The land area also includes some areas of seasonal or permanent wetlands. Approximately 53 percent of the land within the City was developed as of 1995. This land includes residential, commercial, and industrial development, as described below:

- *Residential.* Over 1,577 acres of land is developed with residential uses in the City of Benicia. Much of the low density residential land is within the Southhampton area. Higher density residential uses can also be found in the Southhampton area, north and east of the City Cemetery and near the Marina. Additionally, there are some residential uses within predominant commercial areas since the City of Benicia has historically allowed housing on the upper floors of buildings in most commercial zones. Specifically, this type of housing can be found along the waterfront and in the Downtown.
- *Commercial.* A major commercial concentration in the City is the Downtown. There are about 19 acres of developed commercial uses around the First Street Corridor. In addition to Downtown commercial uses, the City has the Southhampton Shopping center, the Columbus Parkway commercial area, and about three acres of land developed for Neighborhood Commercial uses in small commercial clusters. The remaining developed commercial acreage is used for office and waterfront commercial uses. In the entire City, about nine acres are developed for commercial office uses and four acres are developed with waterfront commercial. In general, the City has a limited supply of existing commercial uses and few large commercial uses.

Table 3. Existing Land Use Plan Map Categories within the City of Benicia

LAND USE CATEGORY	ACRES	PERCENT OF TOTAL
Residential	1,733	21 %
Commercial	381	5 %
Industrial	2,578	32 %
Parks/Open Space	2,046	25 %
Public/Quasi-public	230	3 %
Transportation	1,195	15 %
Total Land Area	8,163	100 %

Industrial. The Benicia Industrial Park (BIP) is the site of most of Benicia's large employers. A wide variety of businesses are located within the BIP, including automobile import/export, petroleum refining, biotechnology, wholesale distribution, manufacturing, and industrial services and supplies. Also in the BIP is the Port of Benicia, which specializes in the shipment of automobiles, petroleum products, and agricultural commodities.

2. EXISTING GENERAL PLAN LAND USE DESIGNATIONS

Currently, the General Plan has 15 land use categories grouped under five major headings: Residential, Commercial, Industrial, Public/Quasi-public, and Open Space. Table 3 shows the current acres of land associated with each of these categories, plus a sixth category of "transportation" which includes streets, highways, and railroads.

3. EXISTING REGIONAL PLANS AND POLICIES

Since Benicia is located on the Carquinez Strait and Suisun Bay, its shoreline areas are under the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), which has issued several plans that pertain to the area. Relevant plans promulgated by BCDC are described below:

The *San Francisco Bay Plan* was originally prepared by BCDC in 1969 in fulfillment of its original charge from the State legislature under the McAteer-Petris Act and has been amended several times since. The *Bay Plan's* objectives are to "protect the Bay as a great natural resource for the benefit of present and future generations" and to "develop the Bay and its shoreline to their highest potential with a minimum of Bay filling." The *Bay Plan* indicates that the Suisun Marsh near Benicia is an area of "High Value Waterbird Habitat" that should be maintained as "Managed Wetland." It also indicates that Benicia's Port and urbanized shoreline are locations of "Ports" and "Waterfront Industry." It directs readers to the

Benicia Waterfront Special Area Plan and the *Seaport Plan* for more information on these areas.

- The *Benicia Waterfront Special Area Plan* was adopted in 1977 by BCDC and the Benicia City Council. It divides Benicia's waterfront into three areas: the Historical Business District, the Marina District and the Port District. For each of these areas, it designates permitted uses and design and development guidelines. These uses and guidelines are consistent with the types of uses that have been developed in the three areas to date.
- The *Suisun Marsh Protection Plan* (1976) was prepared by BCDC in response to the Nejedly-Bagley-Z'berg Suisun Marsh Preservation Act of 1974. It mandates preservation of about 89,000 acres of tidal marsh, adjacent grasslands and waterways in Suisun Marsh in which any development must receive BCDC approval, and also designates an additional 22,500 acres of significant buffer lands as a secondary management area in which local governments have sole jurisdiction. The portions of the Marsh itself designated by the *Protection Plan* within the Benicia Planning Area are in and immediately adjacent to the Bay. Parts of the secondary management area in the Benicia Planning Area extend from Suisun Bay across Interstate 680.
- The *San Francisco Bay Area Seaport Plan*, published in 1996, is a cooperative planning effort between BCDC and the Metropolitan Transportation Commission (MTC) that serves as the basis for BCDC's *Bay Plan* port policies. It includes a description of the Port of Benicia and policies related to its retention as one of the Bay Area's six port facilities.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would create a significant land use impact if it would:

- Result in adjacent incompatible land uses.
- Result in conflicts with established recreational, educational, religious or scientific uses in the City.
- Conflict with legally-binding regional plans or policies.

C. IMPACT DISCUSSION

The General Plan proposes to retain the existing General Plan land use categories, with some revisions, and proposes to add a new major group of land uses called "Mixed Use." The two new classifications added under the Mixed Use group are "Downtown Mixed Use" and "Lower Arsenal Mixed Use." These classifications are further detailed in Chapter 3:

In addition, the industrial classifications and definitions are proposed to be revised

somewhat from the definitions in the existing General Plan in order to refine the uses allowed under the classifications and clarify the intent of the designations. New floor area ratios are being proposed for the three industrial classifications in order to better reflect both existing development patterns and future City desires as follows:

- *General Industrial.* The floor area ratio of this designation is proposed to be reduced from 1.0 to 0.7.
- *Limited Industrial.* The floor area ratio of this designation is proposed to be reduced from 0.8 to 0.6.
- *Water-Related Industrial.* The floor area ratio of this designation is proposed to be reduced from 1.0 to 0.7.

The remaining 12 definitions of the proposed land use plan have been paraphrased and condensed, but are essentially the same as those in the existing General Plan.

The General Plan also proposes a series of land use designation changes, as detailed in Chapter 3: Project Description. The net effect of these land use designation changes is summarized in Table 4. In general, these land use designation changes result in a lowering of development potential, a removal of some of the undeveloped industrial designated land in the City, a shifting of land to the two new mixed-use land use designations, and the protection of additional open space.

In addition to the land use designation changes proposed within the City limits (Table 4), there are several land use designation changes proposed outside the City limits, but within the sphere of influence. These proposed changes result in the redesignation of over 600 acres to Open Space General from various more intensive land use designations.

None of the land use designation changes would result in incompatible land uses or result in conflicts with established land uses. With regards to land use compatibility, the land use designation changes would result in the beneficial effect of decreasing the likelihood that incompatibility would occur.

For example, along West Channel Road and California Court, a 150-foot General Open Space buffer would be established between the industrial land use properties and the bordering residential properties. An open space buffer would also be established along the Exxon property in the vicinity of East Second Street.

The General Plan would also direct the City to establish and maintain a land buffer between industrial/commercial uses and existing and future residential uses for reasons of health, safety, and quality of life (Policy 2.2.2) and to use topography, landscaping, and distance as a buffer between Industrial Park uses and residential neighborhoods (Program 2.2.C).

Table 4. Proposed Land Use Plan Map Categories within the Benicia City Limits*

LAND USE CATEGORY	EXISTING ACRES	PROPOSED CHANGE	PROPOSED ACRES	PERCENT OF TOTAL
Residential	1,733	-27	1,706	21 %
Commercial	381	-26	355	4 %
Industrial	2,578	-117	2,461	30 %
Parks/Open Space	2,046	+94	2,140	26 %
Public/Quasi-public	230	+0	230	3 %
Mixed Use	0	+73	73	1 %
Alternative	0	+24	24	0 %
Transportation	1,195	0	1,195	15 %
Total Land Area	8,163	8,163	8,163	100 %

* : Additional changes would occur outside the City Limits in the Northern Area.

Policy 2.57.1 of the General Plan would allow churches to locate in industrial areas as conditional uses, which is consistent with existing City policy. Program 2.57.A would require the City to establish specific regulations for churches in non-residential zones. Locating churches in industrial zones creates the potential for land use incompatibilities since uses and activities associated with churches, such as religious classes and child care activities, could be incompatible with surrounding industrial activities. Compatibility of these uses could depend on the hours of operation of church activities compared to that of the industrial activities. This is not considered a significant impact since it is not a change from existing policy.

The encouragement of mixed uses proposed by the General Plan would also have the potential to create land use incompatibilities. However, this issue is adequately addressed by the General Plan since it directs to City to only allow mixed land uses when adequate buffers are established (Policy 2.2.3). Thus no impact is expected.

The proposed General Plan is consistent with bayshore and port development policies promulgated by BCDC in the *San Francisco Bay Plan*, the *Benicia Waterfront Special Area Plan*, the *Suisun Marsh Protection Plan* and the *San Francisco Bay Area Seaport Plan*. Specifically:

- The Waterfront Industrial and Waterfront Commercial designations, which run along much of the land at the Port of Benicia and the Marina, would not be changed under the proposed General Plan.

- The proposed General Plan makes reference to the Benicia Waterfront Path, which provides public access along the waterfront through much of Benicia's non-industrial waterfront area.
- Goals 2.6, 2.7 and 2.8, and their related policies and programs, are oriented at maintaining the Port of Benicia as a vital port area and providing adequate access to it.
- The "Marsh Open Space" land use designation would protect identified resources in BCDC's primary management area, and Policy 3.54.4 requires the maintenance and enhancement of major wildlife movement corridors between the northeastern hills and Suisun Bay marshlands.

Moreover, any new development in Benicia's waterfront area falling under the jurisdiction of BCDC would be reviewed by BCDC to ensure that it is consistent with BCDC policies.

In summary, no significant impacts related to land use are expected if the proposed General Plan is adopted.

4.2 POPULATION, EMPLOYMENT & HOUSING

This section presents information on the existing and projected population, employment and housing within the City of Benicia and describes the effects of the proposed General Plan on these factors.

A. EXISTING SETTING

1. POPULATION

Benicia grew very slowly for most of its first century; in 1940 the City's population was still less than 2,500. The 1940s and World War II brought a period of explosive growth, with the population tripling by 1950. During the 1950s the City's population declined, but by 1970 it had recovered to the 1950 level. The beginning of the Southampton development in the early 1970s brought another period of rapid growth. Both the 1970s and the 1980s saw numerical population increases that were greater than the total 1970 population. Although the rate of residential development slowed after 1990, the City still added nearly 2,250 people between 1990 and 1995, for an estimated population of 26,700.

Future growth is expected to be slower. Benicia is expected to only add approximately 1,900 people by 2015. These projections, which are shown in Table 5, are based on economic forecasts and consideration of applicable planning documents, including Benicia's existing General Plan.

2. EMPLOYMENT

ABAG estimates that there were about 11,500 jobs in Benicia in 1995. According to ABAG, approximately 1 percent of these jobs were agriculture and mining jobs, 28 percent were manufacturing and wholesale jobs, 14 percent were retail jobs, 18 percent were service jobs, and 39 percent were "other" jobs, which include jobs in government and construction.

Table 5. Benicia's Share of Solano County Households and Populations

YEAR	HOUSEHOLDS			POPULATION		
	BENICIA	SOLANO COUNTY	% OF COUNTY	BENICIA	SOLANO COUNTY	% OF COUNTY
1980	5,772	80,426	7.2%	15,696	235,203	6.7%
1985	7,690	91,200	8.4%	21,100	270,800	7.8%
1990	9,208	113,052	8.1%	24,453	339,471	7.2%
1995	9,870	121,730	8.1%	26,700	370,700	7.2%
2000	10,030	128,490	7.8%	27,700	397,900	7.0%
2005	10,160	139,110	7.3%	28,400	436,800	6.5%
2010	10,350	152,260	6.8%	28,800	474,600	6.1%
2015	10,450	166,000	6.3%	28,600	507,700	5.6%

Note: These figures include the population in Benicia's Sphere of Influence

Source: ABAG, Projections 96; ABAG, Projections 98.

By 2015, ABAG predicts that there will be 14,320 jobs in Benicia. It is estimated that 1 percent of these jobs will be agriculture and mining jobs, 41 percent will be manufacturing and wholesale jobs, 15 percent will be retail jobs, 20 percent will be service jobs, and 25 percent will be "other" jobs. The biggest changes are anticipated to be an increase in manufacturing and wholesale jobs and a decrease in "other" jobs.

The Benicia Industrial Park (BIP) is the site of most of the largest employers in Benicia. There are approximately 600 companies within the BIP, which combined employ in excess of 6,000 workers. There are a wide variety of businesses located within the BIP, including automobile import/export, petroleum refining, biotechnology, wholesale distribution, manufacturing, and industrial services and supplies.

3. HOUSEHOLDS AND HOUSING

Benicia had 9,880 households in 1995 according to Department of Finance estimates. Benicia's share of county households is higher than its share of county population because average household size in Benicia is smaller than for the rest of the county. Even though household size has increased recently, Benicia is expected to continue to have generally smaller households than its neighbors.

In 1995, the City's households were accommodated by the City's 10,260 housing units. The majority of housing units, 74 percent, were single-family residences. Multi-family dwelling units were 22 percent. Mobile homes and "other" units made up the remaining 4 percent.

Benicia's existing housing units are primarily owner-occupied. The 1990 Census showed 70 percent of Benicia units were owner-occupied, which is higher than the national home ownership rate of 64 percent, and California's rate of 56 percent. Based on the 70 percent ownership rate identified in the 1990 Census, it is estimated that 6,929 units were owner-occupied in 1995 and 2,951 were renter-occupied.

In 1995, the rental vacancy rate was only 3.7 percent, less than the 4.5 percent rate normally needed to provide adequate choice in the housing market. In 1995, Benicia would have needed 85 additional units to achieve ABAG's targeted 4.5 percent vacancy rate.

4. HOUSING AFFORDABILITY

Housing in the San Francisco Bay Area is generally expensive, although Benicia is more affordable than most Bay Area cities. Contrary to the situation in many Bay Area cities, median-income households in the Benicia area could afford to buy the median-priced house in Benicia in 1995. Affordability, however, remains a problem for those whose incomes fall far below the area median, including some low-wage workers, single parents, and elderly.

Affordability is most problematic for those with the lowest incomes. Of the 309 single-family residences sold between April 1994 and November 1995, only 1 percent were affordable to very low-income households of four persons; 18 percent were affordable to low-income households. Those earning Benicia's median income for four persons could afford 54 percent of the homes sold, and those four-person households earning Benicia's moderate income could afford 82 percent of the homes sold. Condominiums were more affordable than single-family residences. Of the 61 condos sold between September 1994 and November 1995, 26 percent were affordable to Benicia's very low-income households of four persons, 84 percent were affordable to Benicia's low-income households, 93 percent were affordable to Benicia's median income households, and all were affordable to Benicia's moderate income households.

A rental survey conducted in October and November 1995 revealed average rents for all available units in Benicia ranged from \$593 for one-bedroom units to \$765 for two-bedroom units, to \$1,094 for three-bedroom units. Apartments generally had lower rents than condominiums and houses, averaging \$573 for one-bedroom, \$664 for two-bedrooms, and \$783 for three-bedrooms. Rents for houses were typically higher, averaging \$636 for one-bedroom, \$988 for two-bedrooms, and \$1,165 for three-bedrooms.

The 1995 rental survey showed that 26 percent of Benicia's 91 available rental units were affordable to very low-income households of four persons, and 80 percent were affordable to low-income households. Very low-income households had limited options; they could primarily afford only smaller units (studios and one-bedrooms). Apartments were much more affordable to them than

condominiums or houses. Low-income households had more choice. They could afford most of the two-bedroom units, and they could afford condominiums as well as apartments. Low-income households needing a unit larger than two bedrooms, however, would find their choices limited. Those earning median and moderate incomes could afford most units in each category of size and type.

5. PROJECTED HOUSING NEEDS

State law (Government Code Section 65584) requires each regional council of governments to estimate the future housing needs for its region and to allocate a "fair share" of the regional need to each locality. The Association of Bay Area Governments (ABAG) last prepared "fair share" housing estimates by income groups for cities in the Bay Area and presented them in its 1989 Housing Needs Determinations. The needs enumerated in the 1989 report were intended to apply to housing elements adopted for the 1990 to 1995 period. State funding has not been available for ABAG to provide fair share allocations for the 1995 to 2000 period, so the State Legislature has extended the effective period for existing housing elements to 1997. It is not known when (or if) ABAG will be able to provide a new fair share allocation.

6. JOBS / HOUSING BALANCE

ABAG estimates that there were 13,500 employed residents and 11,500 jobs in Benicia in 1995. This equals about 0.85 jobs for every employed Benicia resident which means that there are not enough jobs for employed residents. By 2015, this ratio is expected to improve to 0.90 jobs for every employed resident. Benicia has a very high percentage of employed residents (about 75 percent) who commute out of the City for work. About 66 percent of all jobs in Benicia are filled by residents of other Bay Area counties.

B. STANDARDS OF SIGNIFICANCE

Demographic changes, such as increased population or employment, do not in-and-of-themselves, represent an environmental impact. It is the activities of new people and jobs that could cause environmental impacts, not simply the presence of the people or jobs. Thus, the proposed General Plan would cause a significant impact related to population and housing if it would:

- Create population growth rates which would outpace the ability of the City to provide required services.
- Create employment growth rates which would outpace the ability of the City to provide required services.
- Have an adverse effect on the jobs-to-housing ratio which could indirectly increase traffic, air quality emissions and noise.

C. IMPACT DISCUSSION

Development that could occur under the General Plan would probably result in a smaller population increase than anticipated under current development policies. This is primarily because the General Plan proposes to change property from residential land uses to General Open Space in the Sky Valley area.

A detailed review of land available for residential development was conducted by the City in November 1995. The City compiled a list of all infill parcels that could potentially be developed for residential use, including vacant residential parcels and vacant commercial parcels that permit residential use above the ground floor. Based on this analysis, the total number of units that can be anticipated through future development allowed under the General Plan is 1,258 units.

As previously discussed, ABAG last prepared "fair share" housing estimates by income groups for cities in the Bay Area and presented them in its 1989 Housing Needs Determinations. State funding has not been available for ABAG to provide fair share allocations for the 1995 to 2000 period. In the absence of these projections, the City of Benicia developed its own preliminary estimates of fair share housing needs. Based upon these projections, it is estimated that new residential development under the General Plan could accommodate needed housing growth through 2005. After this horizon, the City of Benicia may not be able to provide its "fair share" of the region's housing needs.

The possible failure of the City to meet fair share housing goals is a less than significant impact since regional fair share housing goals only provide guidelines for housing provision, and since Housing Element law only requires a city to meet identified housing need for a five-year period. Effects analyzed under CEQA must be related to a physical change in the environment [Guidelines Sec. 15358 (b)]. Not providing housing within the City's jurisdictional boundaries would not adversely affect the physical environment. Additionally, if Benicia were to allow further residential development in the northern area of the City it could result in other significant impacts to the natural environment, as further described in Chapter 5 of this EIR.

Growth in employment and industry under the General Plan would be similar to growth currently anticipated under the existing General Plan. Proposed land use designation changes which may affect job growth include the redesignation of the three IT parcels north of Lake Herman Road from Professional Office to General Open Space. The General Plan also proposes several land use designation changes from General Industrial to Limited Industrial, including properties along West Channel Road and California Court, the Exxon property west of East Second, an area in the Upper Arsenal north of I-780, and the "Yuba" area south of the WWTP and east of East Fourth Street and south of E Street. Various commercial designations are also proposed to be changed to slightly different commercial designations. Overall, these land use changes are not anticipated to have significant measurable effects to employment and business growth since they seek only to

more accurately reflect existing market conditions and realistic growth assumptions.

The proposed reduction in residential development proposed by the General Plan, along with a relative sustainment of commercial and industrial growth, should provide more employment opportunities for Benicia's existing and future residents. This means that development under the proposed General Plan should bring the City's jobs-to-housing ratio more in balance. The City's jobs-housing ratio is projected by ABAG to be about 1.0 by 2020. This would be a beneficial effect of the General Plan, although the jobs-housing ratio only represents a gross numerical balance and does not necessarily mean that jobs will match the needs of Benicia's employed residents.

4.3 COMMUNITY SERVICES

This section presents information on the existing community services in the City of Benicia, including police, fire, schools, sewer service, and water service, and describes the effects of the proposed General Plan on these services. Additional background information on police and fire services can be found in the Public Safety Background Report. This section is organized according to topic, with the existing setting, impacts and mitigation measures presented together for each of the community services.

A. POLICE

1. EXISTING SETTING

The City of Benicia Police Department provides police services to City residents. It currently has an authorized staff of 50, with 36 sworn officers, including 18 patrol officers, three detectives, and six sergeants.

In 1996, the Department had 1.19 officers per 1,000 residents. This ratio is down from 1.25 officers per 1,000 residents in 1991. Ideally, the Department would like to increase to ratio to 1.5 officers per 1,000 residents.

Despite the less than optimal officer-per-resident ratios, the Department maintains acceptable response times. Average response times are as follows:

- Priority 1 calls (in which a crime is in progress or injury has occurred): 5 minutes, 10 seconds.
- Priority 2 calls (reports on felonies and other major crimes): 9 minutes.
- Priority 3 calls (all other responses): 21 minutes.

The Department would like to see Priority 1 calls answered in a maximum of five minutes, rather than the current 5 minute average.

2. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact to police services if it would:

- Significantly diminish the City's ability to provide police protection to any areas of the City.
- Result in development that would not be located or designed to receive adequate police protection.

3. IMPACT DISCUSSION

According to the Association of Bay Area Governments (ABAG), the 1995 population in the City of Benicia Sphere of Influence was 26,700. ABAG projects that the population of the Sphere of Influence will grow to 28,600 by the year 2015. This population growth is not representative of the City's buildout. This projection is an estimate of likely population growth based on the City's development potential as defined by the current zoning, General Plan, and local development policies, in conjunction with economic and demographic demand coming from both regional and subregional areas.¹

ABAG projections have been used in this analysis to conservatively estimate the amount of growth anticipated under the General Plan. This EIR assumes that the population would grow similar to the ABAG projections through the year 2015.

If the population were to grow at the rate ABAG currently estimates, this growth would result in the addition of approximately 1,900 persons. Using the City's ideal goal of 1.5 police officers per 1,000 residents, this additional 1,900 people would require an increase in police staffing and associated resources (including support staff and equipment) by approximately three officers. Additionally, the City would have to add an additional four officers to bring the overall ratio of officers to population to the goal of 1.5 police officers per 1,000 residents, since the City is not currently meeting this goal. The proposed General Plan does not include policies or programs to ensure that this growth of the Police Department would occur with the expected population growth.

4. IMPACTS AND MITIGATION MEASURES

Impact SERV-1: New development under the Benicia General Plan could result in an increased demand for police services.

Mitigation Measure SERV-1: The General Plan should be amended to incorporate a policy and/or program intended to maintain police services at an officer-to-population ratio approved by the City Council.

¹ Association of Bay Area Governments. *Projections 98*.

B. FIRE

1. EXISTING SETTING

The Benicia Fire Department provides fire suppression, fire prevention, advanced life support (ALS) medical services, disaster preparedness, and weed abatement services throughout the City. The City is served by two fire stations, with a total of two engines and one rescue squad staffed twenty-four hours per day.

Station One is currently located in temporary quarters at 150 Military West while a new station is under construction. This station responds to approximately 1,500 calls per year. The station houses one engine and one rescue squad; additional assigned equipment includes a reserve engine, ladder truck, brush fire truck, and staff vehicles.

Station Two is located at 601 Hastings Drive and is typically staffed with three fire suppression personnel. Equipment housed at the station includes: one engine, two brush fire trucks, two utility vehicles, and one reserve rescue unit. Personnel at the station respond to approximately 500 calls per year.

In 1996, the Fire Department employed 30 fire suppression personnel, typically with eight persons on duty at any particular time. The Department also supports three chief officers, one Emergency Medical Services Coordinator, one Fire Prevention Specialist, one part-time Citizen Assistance Officer, one full-time clerical, and one part-time clerical.

The Fire Department's average response time is four to five minutes. The current level of response provides the City with an Insurance Standards Office (ISO) rating of three within a range of one to ten, with one as the highest rating. The Department estimates that about 70 percent of its activity is related to emergency medical services.

The City's jurisdiction includes extensive open space areas with primarily grassland vegetative cover. Residential and industrial uses occur in various parts of the City in proximity to these open space areas, posing potential fire safety problems. The vegetation in much of the City's open space areas is characteristic of greenbelt areas rather than the mixed vegetative cover found in true wildland areas. In order to address the specific requirements for fire prevention in these open space areas, the Department administers a vegetation control program for public and private open space lands. In addition to the vegetation removal program enforced by the Department, the City requires 20-foot wide fire access roads in open space areas to ensure adequate accessibility for fire suppression in large open space areas. The Fire Department currently has no map of significant fire hazards.

2. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact to fire services if it would:

- Significantly diminish the City's ability to provide fire protection to any areas of the City.
- Result in development that would not be located or designed to receive adequate fire protection.

3. IMPACT DISCUSSION

New development, whether residential, commercial or industrial, would result in an increased demand for fire protection and ALS services. The need for staff, facilities, and equipment would increase in order to serve new development or to serve increased densities in currently developed areas, without affecting the current level of service for existing residents and businesses in Benicia. Previous assessments by the Fire Department have indicated that the existing station facilities would be unable to accommodate additional staff or equipment; the new Station One will be able to accommodate additional staff but no new equipment. Therefore, any increase in demand for fire services could require expansion of existing stations or construction of an additional new station.

Goals, policies and programs are specifically included in the General Plan to provide for improved infrastructure and public services, including fire protection services (Policy 2.11.3, Policy 2.48.1, and Program 4.21.E.). These measures, if implemented, would mitigate any potential impact on increased demand for fire protection services.

However, in order to ensure that new developments would have an acceptable level of service for fire protection and adequate facilities and that the existing level of service for fire protection is not affected or impaired, the City would need to establish fire protection standards and level of service standards for fire personnel and facilities for both new developments and the existing community. These standards would provide criteria for determining if the policies and programs in the General Plan are effectively implemented. There are three programs included in the General Plan that address the need to establish adequate public services standards (Programs 2.11.C, 2.48.A, and 4.21.C). These standards would need to be internally consistent, as well as consistent with accepted standards, such as the Insurance Standards Office and the most recent Uniform Fire Code. In addition, the standards would need to be developed and approved prior to any major new development or infill project so that need for additional fire protection personnel, facilities, equipment or other considerations can be incorporated into project planning.

Development under the General Plan would not only result in the potential for increased demand for fire protection services, but also could increase the water demand needed for fire suppression and protection. Policies included in the General Plan would address this impact, including Policy 2.58.3 which directs the City to approve development plans only when a dependable and adequate water supply to serve the development is assured.

Goal 4.21 of the General Plan states "Reduce fire hazards," and a number of policies and programs are incorporated in the Update to support Goal 4.21, including Program 4.21.A, Program 4.21.B, Policy 4.21.2, and Program 4.21.F. These policies and programs would result in addressing City-wide fire hazard issues and would in general reduce long term fire hazards and improve fire protection services throughout the City.

The General Plan could theoretically result in increased fire hazards by promoting development at the grassland/urban interface. The City currently contains areas with potential fire safety problems due to the proximity of urban development to open space grassland cover. The General Plan would continue this practice of developing at the urban/grassland interface. However, the General Plan would include a number of policies and programs to minimize fire hazards associated with development and the urban/grassland interface, including Policy 4.21.3, which directs the City to promote the use of fire-resistant landscaping in public and private developments. Additionally, Policy 4.21.1 directs the City to promote the creation and maintenance of natural and artificially constructed firebreaks between development and the open space area through the use of fire resistive landscaping, weed abatement, discing, and other methods. Moreover, the number of development areas with grassland interfaces would be reduced under the proposed General Plan, so no impact would occur.

The General Plan also includes several policies and programs to minimize potential emergency access problems, including Policy 2.51.3, Program 2.66.B, and Program 4.21.E. The policies and programs would ensure that emergency access is maintained and that pedestrian and vehicular safety are preserved.

4. IMPACTS AND MITIGATION MEASURES

Impact SERV-2: The General Plan would result in the development and establishment of level of service standards for the City's fire protection services and facilities. Programs 2.11.C, 2.48.A and 4.21.C all call for establishment of similar standards. Assurances are needed that the fire protection standards would be established prior to new development or infill projects so that existing fire protection services are not impaired.

Mitigation Measure SERV-2: Programs 2.11.C, 2.48.A and 4.21.C should be revised to cross-reference each other and to ensure that standards are established prior to any major new development or infill project.

C. SCHOOLS

1. EXISTING SETTING

Benicia is served by both public and private schools. The Benicia Unified School District (BUSD) maintains five elementary schools, a middle school, a high school, and a continuation high school. For the 1997-98 school year, fall district-wide enrollment was 5,376. Enrollment figures and capacities for each school facility are shown in Table 6.

Increasingly, school districts rely on development permit fees to generate funds for new school facilities. The State currently limits development permit fees for schools to \$1.84 per square foot for residential projects and \$0.30 per square foot for commercial and industrial projects. The District calculates that this fee funds about one-third of the costs of the new school facilities needed to serve new development areas which might be approved as part of the General Plan.

2. STANDARDS OF SIGNIFICANCE

The proposed Benicia General Plan would have a significant impact to schools if it would:

- Result in the student capacity of a school district to be exceeded, or result in the need for construction of new school facilities.

3. IMPACT DISCUSSION

The number of new students expected to enroll in public schools, and the need for additional school facilities, is closely related to the amount of new housing constructed. The student generation rates used by the City and BUSD assume 0.10 elementary school students for a multi-family housing unit and 0.30 elementary school students for a single family housing unit. For middle school, the rates are 0.045 for a multi-family unit and 0.14 for a single family unit. For high school, the rates are 0.055 for a multi-family unit and 0.16 for a single family unit.

The District has some existing space to accommodate existing infill potential but cannot accommodate significant new development.

The proposed General Plan includes goals, policies and programs to ensure that adequate school facilities to serve new residential development are provided. Policy 2.55.1 directs the City to approve new residential projects only if adequate

Table 6. School Enrollment and Capacity, 1997-1998

SCHOOL	GRADE LEVEL	ENROLLMENT	CAPACITY
Semple Elementary	K-5	448	516
Mills Elementary	K-5	374	474
Mary Farmer Elementary	K-5	450	515
Henderson Elementary	K-5	657	671
Turner Elementary	K-5	478	518
Benicia Middle School	6-8	1,312	1,351
Benicia High School	9-12	1,586	2,089
Liberty High School	9-12	76	86
St. Dominic's (Private)	K-8	346	346

school facilities are available or will be available when needed. Additionally, Policy 2.55.2 directs the City to ensure that new development pays appropriate fees to offset any increased burden on school facilities. The effect of these policies is that developers will have to ensure that adequate school facilities will exist, by contributing funds, land, or both.

With these policies, no impacts to school facilities are expected with the adoption of the Benicia General Plan.

D. SEWER SERVICE

1. EXISTING SETTING

Benicia's sewer system dates from the time when sanitary sewers and storm drains flowed together into the Carquinez Strait. Separation of sanitary from storm water flows was completed and interceptors were constructed to carry wastewater to the Wastewater Treatment Plant (WWTP) at the lower end of East Fifth Street.

The current reliable capacity of the WWTP is 1.2 million gallons per day (mgd) for average day dry weather flows (ADWF) and 8.3 mgd for peak hour wet weather flow (PHWWF). Comparatively, the 1996 influent flows to the WWTP were 2.37 mgd ADWF and approximately 10 mgd PHWWF. As can be seen by this data, the current influent wastewater flows exceed the rated capacity of the existing WWTP for both average day dry weather flow and peak hour wet weather flow conditions. Consequently, this has caused the City to occasionally exceed the NPDES permit limitations for the WWTP.

The rated capacity is based on the ability of the WWTP to treat wastewater flows to reliably meet NPDES permit limitations for discharge of treated wastewater to the Carquinez Strait. This includes some standby capacity to allow treatment processes to be taken out of service for routine operations and maintenance. The existing facilities are currently operating with all standby units in service and in excess of recommended design criteria.

The City is currently working on the WWTP Improvement Project (Phase 1), which is nearing completion of final design. This project will alleviate the current overloading condition by restoring a reliable treatment capacity of 3.18 mgd ADWF, which is anticipated to meet the City's demands through 2015.

In 2005, the existing RBCs (rotating biological contactors - a secondary treatment process for removal of pollutants) will be approaching the end of their useful life. Phase 2 improvements will consist of either replacing the RBCs over a period of time as they fail or expanding the activated sludge process. These additional improvements are expected to maintain the reliable 3.18 mgd ADWF needed to accommodate growth through 2015.

2. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact to sewage service if it would:

- Create a demand for wastewater treatment service that exceeds the City's existing wastewater treatment capacity.
- Place a demand on the City's sewer collection system that exceeds its existing capacity.

3. IMPACT DISCUSSION

The City has projected wastewater flows for the anticipated population growth through 2015. These projections have been based on ABAG's *Projections '96*, which include more development than would be anticipated under the proposed General Plan.

Improvements that are planned for implementation through the Wastewater Treatment Plant Improvement Project are expected to adequately meet the City's demand for sewer services through the forecast year of 2015. Additionally, the proposed General Plan includes goals, policies, and programs to ensure adequate wastewater treatment capacity to serve all development allowed under the General Plan. Specifically, Goal 2.59 directs the City to ensure adequate wastewater treatment capacity to serve future development, and Policies 2.59.1, 2.59.2, 2.59.3 and 2.59.4 include specific guidance for meeting this goal.

For the above reasons, no significant impacts with regard to sewer service are anticipated with implementation of the General Plan.

E. WATER SERVICE

1. EXISTING SETTING

WATER SUPPLY

Benicia has a long history of local shortages of fresh water. When the Benicia Water Company was established in 1880 to bring water from a dam on Sulphur Springs Creek in Sky Valley to Benicia, the sulfur content in the water was found to be objectionable. Sulphur Springs Creek water, which is contained by Lake Herman, can be treated for satisfactory domestic use. Nevertheless, this source still contains a high level of dissolved minerals which, if used directly in industrial wash processes, causes machinery to foul. Lake Herman has a storage capacity of 1,780 acre-feet.

Benicia's potable water is currently supplied by the California State Water Project (SWP) through the North Bay Aqueduct and the City of Vallejo. The City's maximum entitlement from the State Water Project for 1997 is 14,350 acre feet. This amount increases each year to a maximum of 17,200 acre feet in the year 2004. After 2004, the allocation gradually decreases to reach 14,200 acre feet in 2018. This decreased allocation is as a result of a 1985 agreement between the State, Benicia, Fairfield and Vallejo to reduce future entitlements to provide water for the cities of Rio Vista and Dixon.

The City's existing water supply is subject to State cutbacks in years of below-normal rainfall or Bay-Delta Estuary water quality and endangered species protection requirements. For example, in 1991 Benicia's allocation from the State was cut back 70 percent. During times of short water supply, the City is prepared to use water from Lake Herman, which is considered a back-up water supply. Additionally, in 1990 the City Council established and adopted, by ordinance, an Emergency Water Conservation Plan (which has since been amended). The plan includes five stages of action for rationing water depending upon the seriousness and anticipated duration of the water shortage. The City also has two agreements (1962 and 1992) with the City of Vallejo for water and has been aggressively pursuing alternative sources of water and water source protection. These efforts are discussed in more detail in the City's 1996 Water System Master Plan.

In 1995, total water usage in the City was 10,845 acre feet with residents and businesses accounting for about half this usage and Exxon accounting for the other half. The City will be entitled to 18,300 acre feet of water in 2015 - 17,200 acre feet of State Water Project allocation and 1,100 acre feet from the City of Vallejo pursuant to the 1962 agreement. Baseline demand forecasts included in the City's 1996 Water System Master Plan estimate the need for 13,688 acre feet in 2015. This baseline demand assumes no additional conservation above 1995 levels, 100 percent planned buildout phased as anticipated. Exxon's raw water demand curve is also assumed to remain relatively flat at levels extrapolated from historical use data, and not to reach its maximum contracted yearly delivery level of 12,322

acre feet.

WATER DISTRIBUTION

The raw water is brought from the Cordelia area along Highway I-680 to the City's Water Treatment Plant. Since the 1989 expansion of capacity, the Water Treatment Plant is capable of producing a steady supply of 12 million gallons per day (mgd). Based on the City's baseline maximum day demand projections through buildout included in the City's 1996 Water System Master Plan, expansion of the Water Treatment Plant will not be required until approximately 2009, at which time the City expects to expand the capacity to 18 mgd.

2. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact to water supply and distribution if it would:

- Create a demand for water service that exceeds the City's existing water supply capacity.
- Place a demand on the City's water distribution system that exceeds its existing capacity.
- Result in the wasteful use of water.

3. IMPACT DISCUSSION

Based on the City's State Water allocation and its 1962 agreement with the City of Vallejo, the City will be entitled to 18,300 acre feet of water in 2015. The City's 1996 Water System Master Plan estimates a need for 13,688 acre feet in 2015, leaving a surplus of approximately 4,600 feet. By comparison, using projections it is estimated that development under the General Plan would result in less water demand than the 13,688 acre feet in 2015 currently projected by the City. In addition, the City has adopted the Emergency Water Conservation Plan, which would result in the implementation of progressively restrictive water conservation measures depending upon the seriousness and anticipated duration of possible water shortages. With these considerations, no significant shortage in water supply is anticipated as a result of the General Plan.

The General Plan includes goals, policies and programs to ensure an adequate water supply for current and future residents and businesses. Included in this guidance is a policy to only approve development plans when a dependable and adequate water supply to serve the development is assured (Policy 2.58.3) and to continue to pursue and secure adequate water sources (Policy 2.58.4). Additionally, there are several policies and programs aimed to pursue and promote water conservation. With these policies and programs in place, no significant impacts with regard to water supply are anticipated.

4.4 OPEN SPACE & RECREATION

This section summarizes information on the open space and recreation resources of the City and provides an evaluation of the effects the proposed General Plan would have on these resources.

A. EXISTING SETTING

This section provides a general description of the existing open space and recreation resources within Benicia. Further detail on these resources is contained in the Natural Resources Background Report.

1. REGIONAL AND SUBREGIONAL OPEN SPACE

There are currently seven open space resources within the City of Benicia, as described in more detail below.

TRI-CITY AND COUNTY OPEN SPACE

Benicia is part of the Tri-City and County Cooperative Planning Group. The Group and its individual agencies have adopted a cooperative Plan that covers 10,000 acres of open space in unincorporated Solano County between Benicia, Fairfield and Vallejo. Plans for this area include a regional park plan that tentatively identifies a 35-mile system of primary trails that would connect six potential recreational use development areas (totaling 960 acres) to each other and to areas outside of the Cooperative Planning Area. Near Benicia, a 10-mile north-south ridge trail would connect Lynch Canyon to Lake Herman Recreation Area. Another trail would connect the Lake Herman Recreational Area to King Ranch on the eastern side of the Cooperative Planning Area adjacent to Lopes Road.

SOUTHAMPTON OPEN SPACE

The undeveloped open space areas within the Southampton subdivision offer physical separation between houses and visual relief from development. Portions of this open space have trails running through them, and are used for hiking, jogging and walking. Some parts of the Southampton Open Space are "residual" open space areas that occur in areas that were too steep for development. These steeply sloping areas are too steep for recreational use, and they are not connected

to larger open space areas, so they provide little habitat value.

BENICIA-VALLEJO OPEN SPACE BUFFER

The hills and ridges at the western edge of the planning area, sometimes known as the "boundary hills," are a visual and physical separation from Vallejo. The boundary hills open space corridor begins at Dillon Point on Southampton Bay and extend north incorporating Lake Herman Road and containing the upper end of Sky Valley. This area is reserved for open space use through a "Memorandum of Understanding to Preserve the Buffer Zone" entered into with the City of Vallejo in 1979.

LAKE HERMAN REGIONAL PARK

Lake Herman Regional Park is an existing 577-acre lake and open space area located in the northernmost edge of the City. Allowed passive activities in the park include fishing, hiking and picnicking. Boating is prohibited since the lake is a secondary water supply for the City. A trail has recently been completed connecting Lake Herman with nearby Benicia Community Park.

BENICIA STATE PARK

Benicia State Park, consisting of 467 acres on the outskirts of the urban open space area, extends from the shoreline of Southampton Bay along the planning area boundary to the west and to Interstate 780 on the north. It includes the tidal flats of Southampton Bay, as well as some trails and recreational areas.

MARSH AND SHORELINE

Benicia has important marsh and shoreline open space resources all along Carquinez Strait and Suisun Bay. These resources include Southampton Marsh in Benicia State Park, small parks and shoreline access points along the residentially developed areas west of Downtown, the Downtown waterfront and Marina, and marsh areas along the Industrial Park.

NORTHERN AREA

An area in excess of 5,000 acres, between Lake Herman and the Tri-City and County Open Space, is primarily designated as open space, but is largely privately held and faces development pressure. This area was considered in depth during the General Plan process.

2. PARKS AND RECREATION FACILITIES

Benicia has almost 700 acres of existing parks, although the largest part of this acreage is in the Lake Herman Regional Park (577 acres). The Community Park north of Matthew Turner Elementary School accounts for another 50 acres, and

the 21 neighborhood parks make up the remaining 67 acres. Benicia also has several recreation facilities: the Senior Center, City Gym, the Clocktower, James Lemos Pool complex, and the Youth Activities Center. The City also has a joint use agreement with the Benicia Unified School District that provides for the sharing of facilities. Additionally, the City has one public launch ramp, one private launch ramp, two fishing piers, and small waterfront parks at the end of the following streets: West 3rd, 4th, 5th, 8th, 11th, 13th, 14th, John's Place, F, and C.

There is a concentration of parklands around the City Hall complex. More recently constructed areas of the City, such as portions of Southamptton, are also well served by parks. There are fewer parks in the older, outlying residential areas.

The *Parks, Trails and Open Space Master Plan* evaluated the existing park and recreation system to determine future needs for the City. The analysis was conducted for the City as a whole, and for three districts divided along census tract boundaries, as follows:

- District 1 is the Downtown and Old Town area, bounded on the north by Military Street.
- District 2 is the Southamptton subdivision and other northern areas of the City.
- District 3 is the eastern part of the City. It includes a few older residential areas on the east side of East Second Street, but most of it is developed for industrial uses.

Using overall population standards, the study determined that the City has more than adequate regional parkland, but is deficient in community parks and, especially, neighborhood parks. The Master Plan identified a shortfall of 35 acres of neighborhood park land and 18 acres of community park land in 2005. These needs were further defined by district population, distance, facility type, and on-site analysis.

3. TRAILS AND BIKEWAYS

Benicia has a system of bikeways and paved community trails. The *Parks, Trails and Open Space Master Plan* describes and maps the components that make up this system. These resources are described in more detail below.

BICYCLE ROUTES

Bicycle routes share the roadways with other vehicles and do not have a separate lane for bicycles. There are three existing bicycle routes in the Benicia trail system, and the *Master Plan* proposes ten more.

BICYCLE LANES

Bicycle lanes are striped areas on the side of a roadway intended exclusively for bicycle use. Bike lanes are marked with parallel white lines and the words "Bike Lane" placed at various intervals along the way. Signage is also used along the path to help identify existing bicycle lanes. There are three existing bike lanes in Benicia, and the Master Plan proposes four more.

IMPROVED COMMUNITY TRAILS

Improved community trails are graded unpaved paths located in open space areas. There are currently no such trails in Benicia, but the *Master Plan* proposes them in several areas of the City.

PAVED COMMUNITY TRAILS

Paved community trails are located adjacent to, but separated from vehicular traffic by a curb or other buffer. These trails are also routed through open space and may be used by bicyclists and pedestrians. There are six existing paved community trails, with four others proposed in the *Master Plan*.

INTERPRETIVE TRAILS

Interpretive trails are paved and located where there are ecological or historical resources of educational value. Signage is also located along these trails to provide information about significant features along the trail. There are no existing interpretive trails in the system, but a trail is proposed as part of the Lake Herman Regional Park development. The trail is to extend from the Lake Herman Regional Park parking lot, run along the north shore of the lake and connect with the paved community trail along Lake Herman Road.

BAY AND RIDGE TRAILS

The San Francisco Bay Trail is a proposed 400-mile network that will circle San Francisco and San Pablo Bays, passing through all nine Bay Area Counties. Benicia is one of the bay area cities that hosts this network of pathways.

Currently, Benicia's Waterfront Trail is already signed as a part of the Bay Trail. It begins at the Benicia Marina and follows the commercial district on First Street, winds through waterfront neighborhood districts to connect with "I" Street, continues west through Ninth Street Park and forks at Benicia State Park. The southern fork ends at Southampton Bay where it connects with another trail that goes to Glen Cove in Vallejo.

The Bay Trail is to enter Benicia from the south on the Benicia-Martinez Bridge. Caltrans is currently planning to construct a second span to increase capacity on this bridge, and the new span will provide bicycle and pedestrian access. However,

there is no clear plan as to how bicyclists and pedestrians will move from the bridge to the Waterfront Trail. Current Caltrans plans show ramps coming from the bridge onto Park Road in the Arsenal, and Park Road connects to the Waterfront via Jefferson Street, Military East and East Fifth Street. However, it is not clear whether there is room for bike lanes on Park Road.

The Bay Area Ridge Trail is a second regional trail that will circle San Francisco and San Pablo Bays, following the hills and ridges that ring the Bay. In Benicia, this trail follows the same route as the Bay Trail along the Waterfront, and will require the same connection from the Benicia-Martinez Bridge. From Benicia State Park, this trail turns north and runs over the freeway and along Rose Drive. Some portions of the trail also run through the Benicia-Vallejo Open Space Buffer and along the west side of Sulphur Springs Mountain to Blue Rock Springs Park.

STAGING AREAS

The *Parks Master Plan* proposes staging areas to link the City's parks and open space system. These areas are gathering points located adjacent to major trails and accessible to major roads. Major staging areas are to provide a full range of facilities for the trail user including on-site parking. Minor staging areas are to serve short local trails and fewer trail linkages and are located in neighborhood parks. Minor staging areas accommodate the trail user with many of the same facilities as major staging areas with the exception of on-site parking.

Three staging areas in or near Benicia's Planning Area are also proposed in the *Tri-City and County Cooperative Open Space Plan*. They would be at Lopes Road Valley, Orchard and McIntyre Ranch, and would include gravel parking lots, restrooms, picnic tables and a potable water supply.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact with regard to open space and recreation if it would:

- Conflict with an established recreational land use in the area.
- Inhibit the ability to provide recreational opportunities in the future.
- Create a shortage of park and open space facilities for City residents and workers.

C. IMPACT DISCUSSION

Based on the findings of the *Parks, Trail and Open Space Master Plan*, additional sites for neighborhood parks have been identified through the General Plan, particularly in the Southampton area and other areas included in District 2. The

Benicia General Plan identifies the following sites for future park development:

- *Park D-7.* This 3.5-acre neighborhood park is planned for the northeastern portion of the Southampton development. Proposed uses range from a community center, public pool, and tennis courts, to volleyball courts, playgrounds, and croquet courts. This park facility would directly address identified park needs in District 2.
- *Bottle Hill Park.* The site of this 0.5-acre neighborhood park -- to be located in the southeastern portion of the downtown area -- provides panoramic views of the Carquinez Strait from its high point, and offers sheltered, less exposed areas elsewhere. Proposed facilities include a landscaped overlook, a tot lot, and picnic facilities.
- *Hastings Drive Neighborhood Park.* This proposed 10-acre park is located in the Southampton Open Space in the central western portion of the Southampton development. The site contains a small drainage channel and is surrounded by existing homes. The topography in the area means that development of facilities will require terracing. The park will include a multi-purpose playing field, tennis courts, basketball courts, a playground, a grass play area, a picnic area, paths and benches. This park would directly address identified park needs in District 2.
- *Perth Way Neighborhood Park.* Perth Way Neighborhood Park is a proposed 8-acre neighborhood park located in the open space in the eastern portion of the Southampton development. This site is relatively flat, but high in elevation, providing views toward Suisun Bay. Planned facilities include a multi-purpose playing field, tennis court, basketball court, playground, grass play area, picnic area, path, and benches. This park would directly address identified park needs in District 2.
- *St. Catherine's Wood Neighborhood Park.* This 0.5-acre neighborhood park - - to be located directly north of Solano Square at First Street -- will include a playground, an entry plaza, and a seating area.

Development of these sites as parks would be a beneficial effect of the Benicia General Plan.

Additionally, several policies in the General Plan would provide additional access to important open space areas such as the boundary hills, the Northern Area, and the shoreline (Goal 3.41 and associated policies, Goal 3.61 and associated policies, and Goal 3.62 and associated policies). These include the incorporation of plans for the Bay Trail.

The Community Development and Sustainability Chapter of the Proposed General Plan includes several programs to support the recently adopted *Parks, Trails and Open Space Master Plan*, including direction for the City to review the Plan for

additions and updates and to consider adopting as part of the Plan the Carquinez Strait Resource Plan, the Bay Area Ridge Trail Plan, and the Bay Trail Plan (Programs 2.49.A and 2.49.B). Additionally, the General Plan includes goals and related policies and programs to maintain and improve existing City parks (Goal 2.50) and to maintain and improve existing recreation programs (Goal 2.53)

Policies proposed by the Benicia General Plan have also been developed to avoid the further creation of difficult-to-use residual open space areas in new development areas (Policies 3.56.3 and 3.56.4), which was an identified issue in the Natural Resources Background Report.

Land use changes proposed by the General Plan would also serve to greatly minimize the potential for adverse impacts on open space resources. Of particular importance is the elimination of most of the future development potential for lands north of Lake Herman Road, serving to protect an extensive amount of open space lands outside the identified Urban Growth Boundary.

For the above reasons, significant impacts to open space and recreation resources are expected to be avoided with implementation of the proposed General Plan, and only beneficial effects are anticipated.

4.5 TRANSPORTATION & CIRCULATION

This section summarizes the existing transportation and circulation conditions of the City and provides an evaluation of the effects the proposed General Plan would have on these conditions.

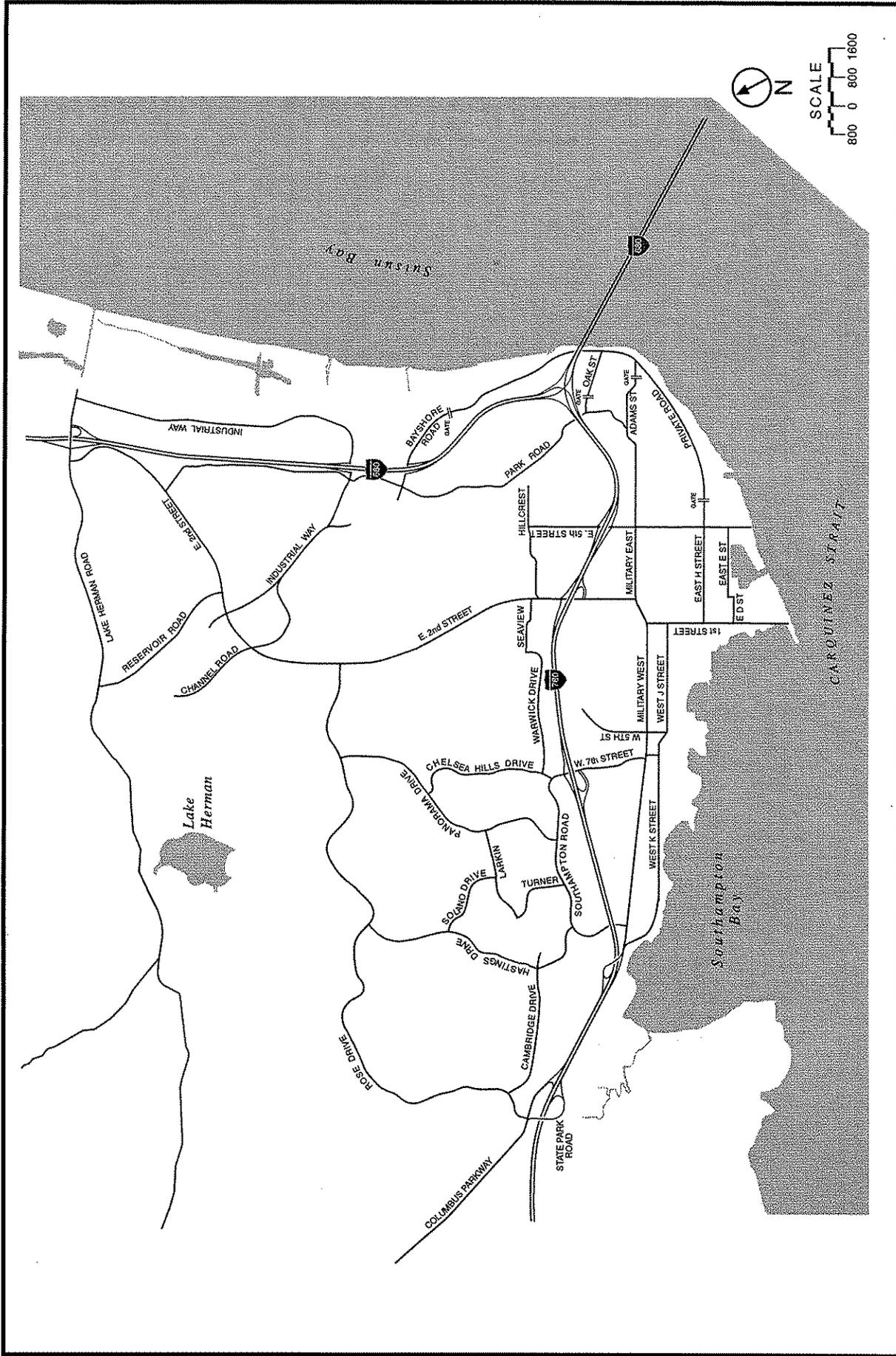
A. EXISTING SETTING

1. ROADWAY NETWORK

Figure 3 illustrates the primary roadway network in Benicia. The City is served by two interstate freeways, I-680 in the north-south direction and I-780 in the east-west direction. I-680 runs along the eastern edge of the City, and crosses the Benicia-Martinez bridge southeast of the City. I-780 bisects the City, connecting I-680 to the east with I-80 to the west in Vallejo. The historic, downtown and waterfront areas of the City lie south of I-780, and the newer residential and industrial development is located north of the freeway.

The primary roadway network includes the following east-west roadways:

- Military (East and West)
- West K Street/West J Street
- East E Street
- East H Street
- Southampton Road
- Rose Drive
- Lake Herman Road
- Columbus Parkway/State Park Road
- Cambridge Drive
- Warwick Drive/Seaview Drive
- Hillcrest Avenue
- Solano Drive/Larkin Drive
- Adams Street
- Oak Street



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Transportation Consultants

**PRIMARY ROADWAY NETWORK
EXISTING CONDITIONS**

FIGURE 3

In the north-south direction, the primary roadway network includes the following roadways:

- Hastings Drive
- Panorama Drive
- W. Seventh Street
- Chelsea Hills Drive
- First Street
- East Second Street
- E Fifth Street
- Park Road
- Industrial Way
- Channel Road
- Turner Drive
- West 5th Street/Sherman Drive
- Bayshore Road
- Reservoir Road

2. EXISTING TRAFFIC CONDITIONS

ANALYSIS METHODOLOGIES

Traffic conditions on Benicia streets are best described by intersection Level of Service (LOS). The Level of Service provides a measure of the delay to drivers at signalized and stop-controlled intersections. For a roadway network like Benicia's, where intersections are relatively closely spaced and congestion between intersections (e.g. un-related to intersection operations) rarely develops, the intersection level of service provides the most accurate description of traffic conditions and delays. The LOS is expressed using a letter A through F, with A representing free-flow and minimal delays, and F representing jammed conditions and long delays. LOS D is generally considered to be the minimum acceptable standard for intersection operation, though a proposed General Plan policy suggests maintaining LOS C wherever possible. The method of calculating LOS differs for signal-controlled versus stop-controlled intersections, as described below.

Signalized intersections are evaluated on an intersection-wide basis, by calculating the volume-to-capacity ratio for all vehicles entering the intersection during a peak traffic hour (such as the evening commute hour or "PM Peak" hour.) For side-street stop-controlled intersections, the level of service for the movements to and from the side street is calculated (the through movement on the main street is uncontrolled, and experiences no delay.) For all-way stop-controlled intersections, the level of service is based on the average delay for all vehicles approaching the intersection. Table 7 describes the different LOS designations A - F, for signalized and stop-controlled intersections.

Table 7. Level of Service Criteria

LEVEL OF SERVICE	SIGNALIZED: Volume to Capacity Ratio	UNSIGNALIZED: Av. Stop Delay per Vehicle (in seconds)
A	0.00 - 0.60	0 - 5.0 seconds
B	0.61 - 0.70	5.1 - 10.0 seconds
C	0.71 - 0.80	10.1 - 20.0 seconds
D	0.81 - 0.90	20.1 - 30.0 seconds
E	0.91 - 1.00	30.1 - 45.0 seconds
F	> 1.00	more than 45 seconds

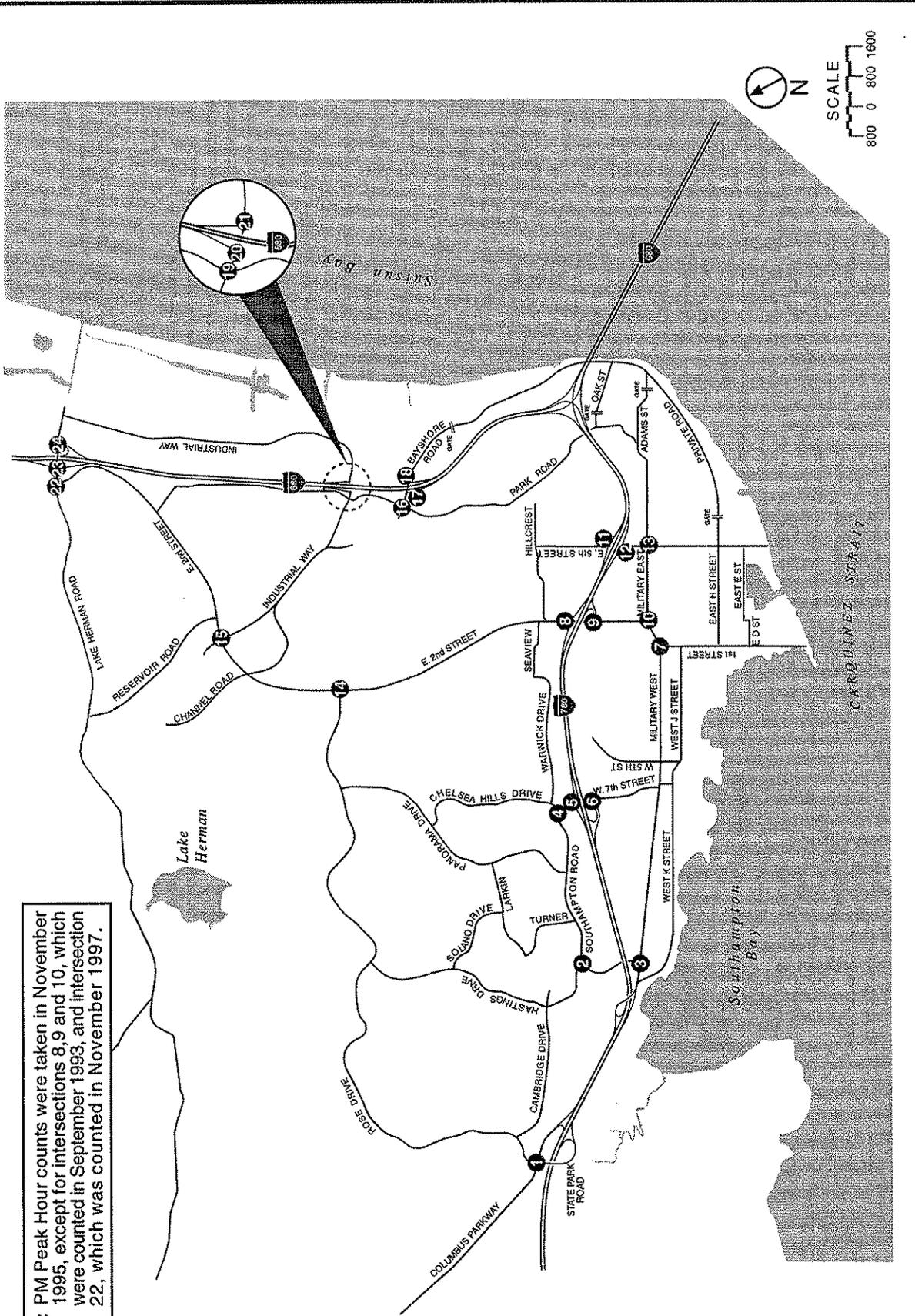
Source: Transportation Research Board, Circular 212, Interim Materials on Highway Capacity and Transportation Research Board, Highway Capacity Manual, 1994.

LOCAL ROADWAYS AND INTERSECTIONS

Figure 4 shows the 24 intersections studied for the General Plan EIR, which are listed below:

1. Columbus Parkway / Rose Drive
2. Southampton / Hastings
3. Southampton / Military West
4. Southampton / Chelsea Hills
5. West Seventh / I-780 Westbound On/Off
6. West Seventh / I-780 EB On/Off
7. First / Military
8. East Second / I-780 Westbound On/Off
9. East Second / I-780 Eastbound On/Off
10. East Second / Military East
11. East Fifth / I-780 Westbound On/Off
12. East Fifth / I-780 EB On/Off
13. East Fifth / Military East
14. East Second / Rose Drive
15. East Second / Industrial

Note: PM Peak Hour counts were taken in November 1995, except for intersections 8, 9 and 10, which were counted in September 1993, and intersection 22, which was counted in November 1997.



STUDY INTERSECTIONS

FIGURE 4

16. Bayshore / Park
17. Bayshore / I-680 Southbound On
18. Bayshore / I-680 Northbound Off
19. Industrial / Park
20. Industrial / I-680 Southbound Off
21. Industrial / I-680 Northbound On
22. Lake Herman / East Second
23. Lake Herman / I-680 Southbound On/Off
24. Lake Herman / I-680 Northbound On/Off

Figure 5 shows the control type and lane configuration at 24 key intersections throughout the City. Figure 6 shows the existing (1995) PM peak hour traffic volumes at the intersections. The PM peak hour is typically the highest-traffic hour of the day, followed by the AM peak hour. In Benicia, the PM peak hour is generally 4:30 to 5:30 p.m. in the northeastern industrial area of the City, and 5:00 to 6:00 p.m. in the downtown and western areas of the City.

Counts at all but intersections 8, 9 and 10 were obtained by Fehr & Peers Associates in November 1995. Intersections 8, 9 and 10 were counted by Fehr & Peers Associates for a traffic study in September 1993, and these counts were considered recent enough to represent existing conditions. Intersection 22 was counted in November 1997 because a road closure was in effect at the time of the 1995 counts. The 1995 counts were conducted for a 3-hour period, between 3:30 p.m. and 6:30 p.m. with the volumes for the PM peak hour shown in Figure 6.

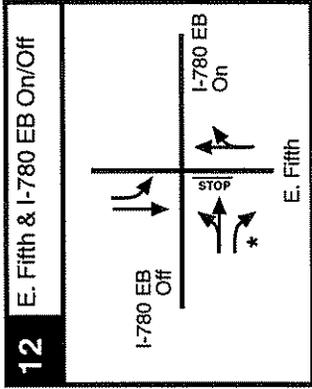
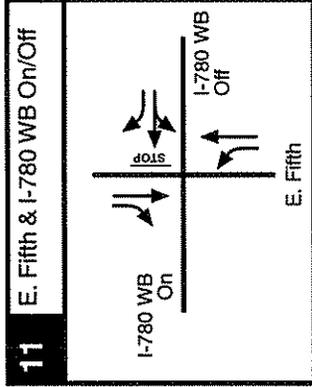
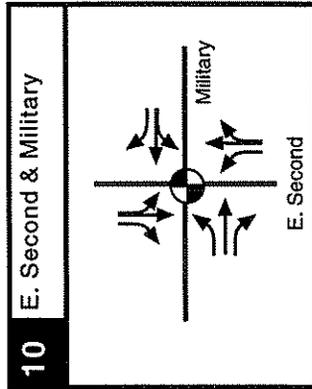
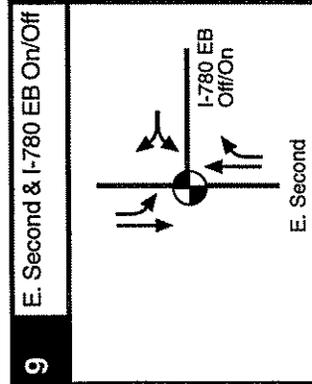
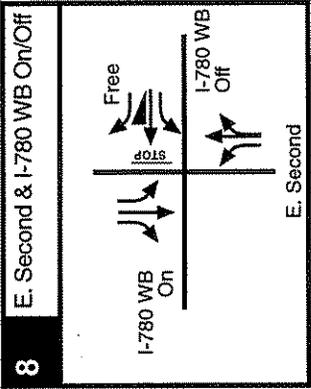
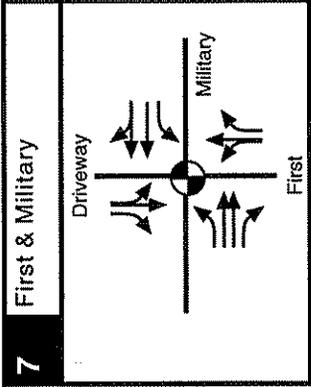
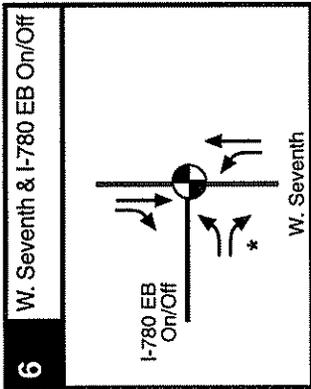
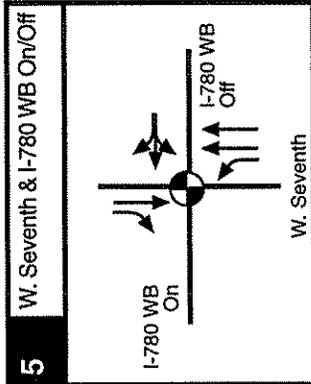
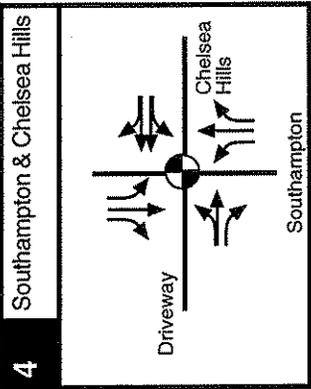
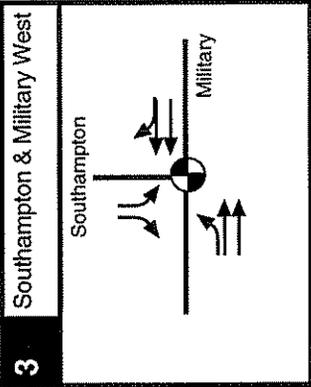
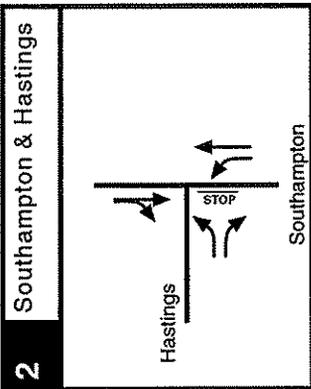
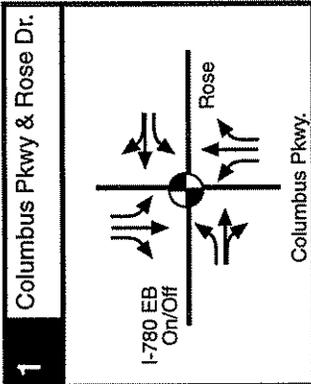
Overall, service levels are fair to good throughout the City, with sixteen of the twenty-four intersections operating at LOS C or better during the PM peak hour. Four intersections operate at LOS D, and four intersections operate at LOS E or F.

The LOS D intersections are:

- Columbus Parkway / Rose Drive (signal);
- East Fifth / Military East (signal);
- East Second / Industrial (stop controlled); and
- Bayshore / Park (stop-controlled).

The LOS E or F intersections are:

- West Seventh / I-780 Westbound Ramps (signal);
- East Second / I-780 Westbound Ramps (stop-controlled);
- East Fifth / I-780 Westbound Ramps, (stop-controlled); and
- East Fifth / I-780 Eastbound Ramps, (stop-controlled).



Key:
 = Stop Sign
 = Signal

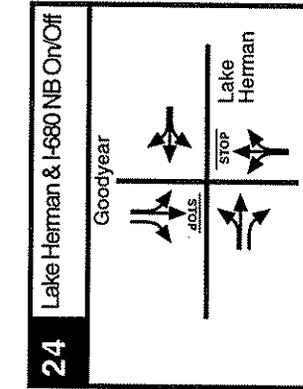
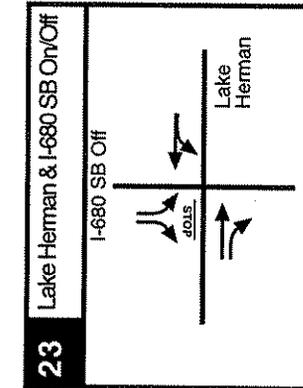
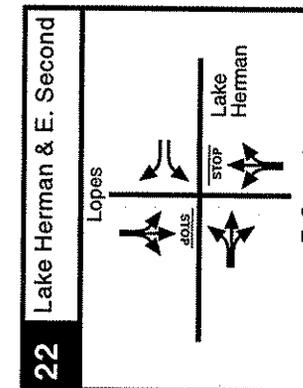
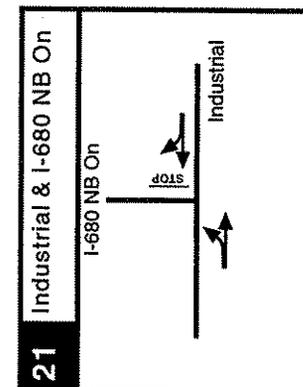
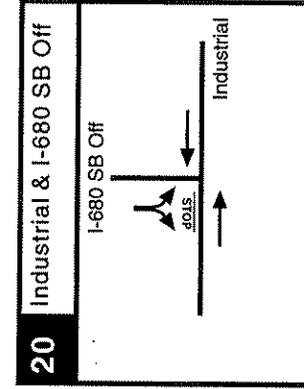
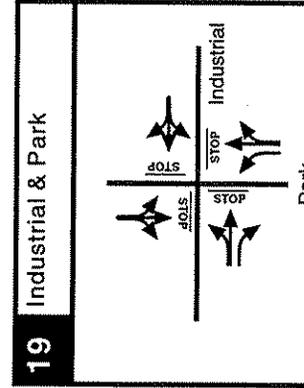
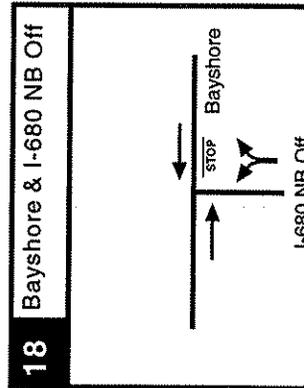
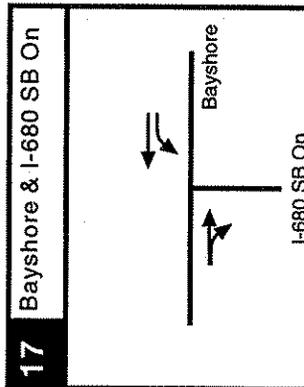
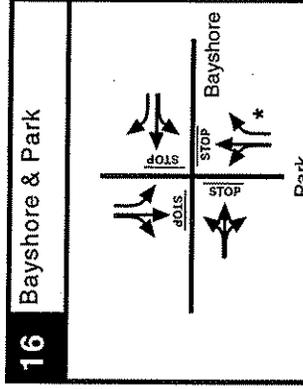
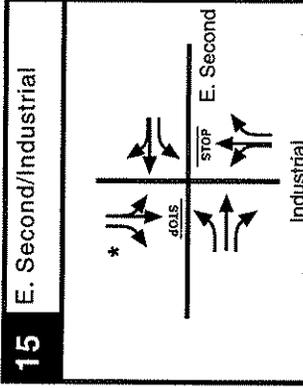
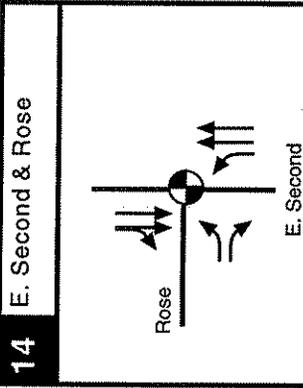
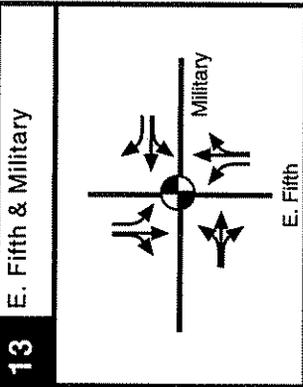
* Not a striped lane, but space available for a right turn queue.



Not to Scale

FIGURE 5a

INTERSECTION LANE GEOMETRY



Key:
 = Stop Sign
 = Signal

* Not a striped lane, but space available for a right turn queue.

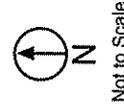
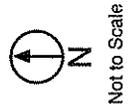
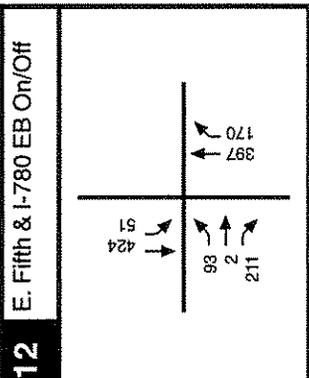
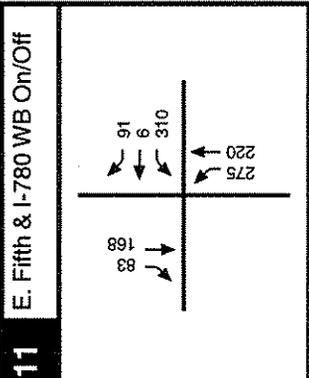
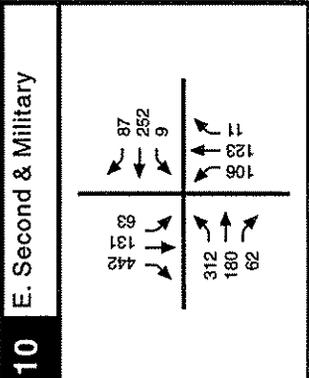
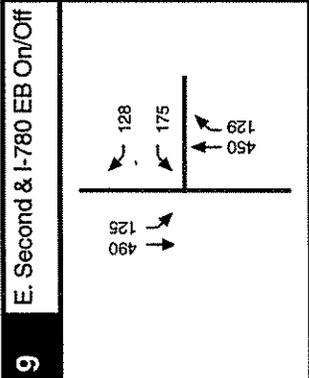
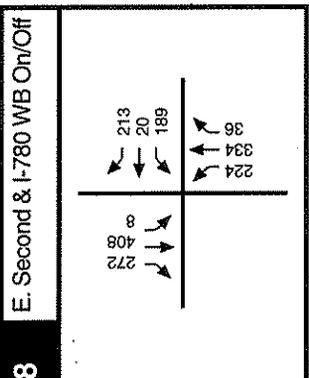
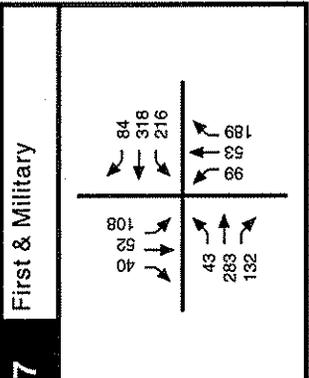
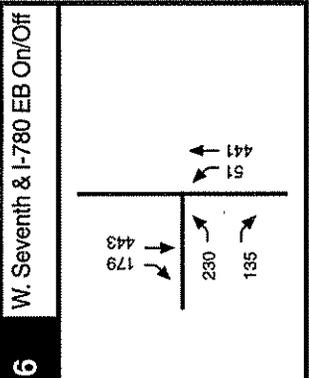
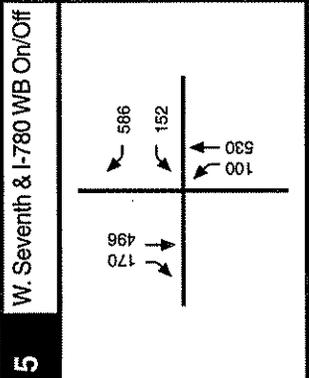
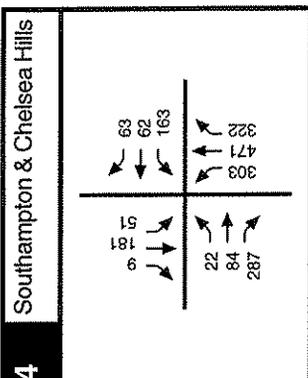
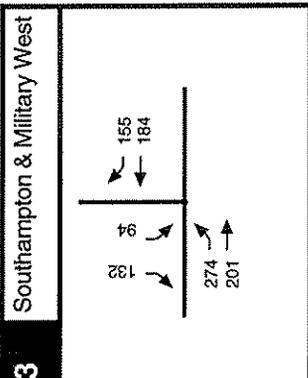
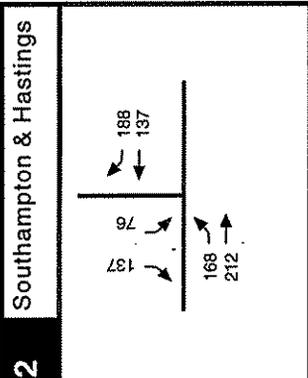
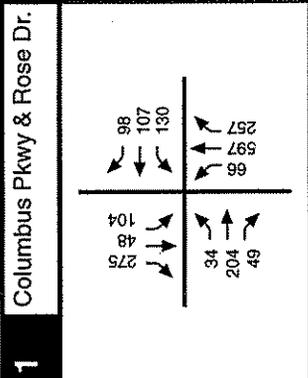


FIGURE 5b

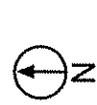
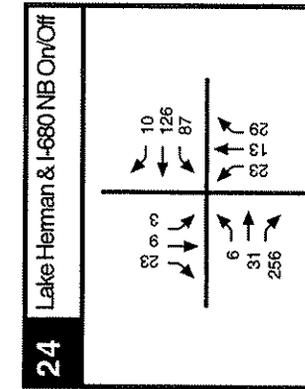
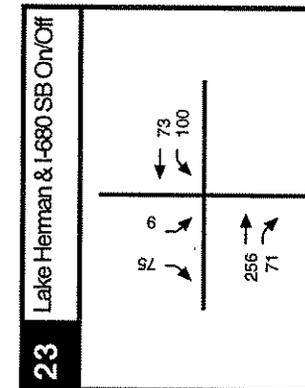
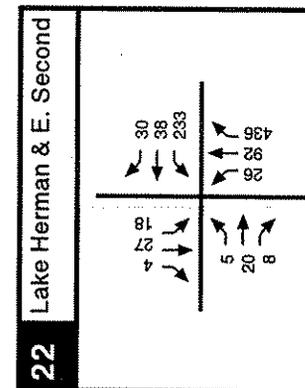
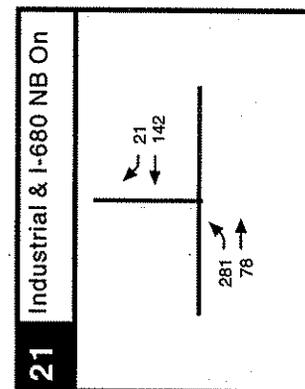
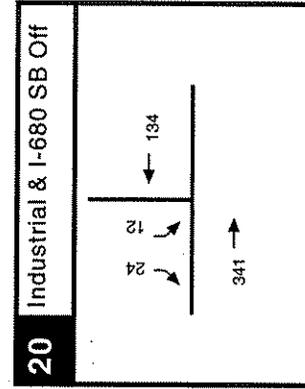
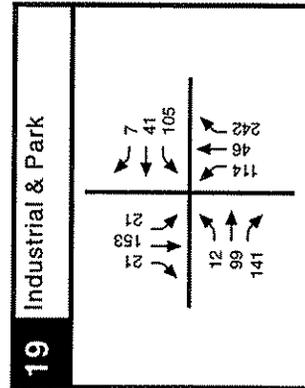
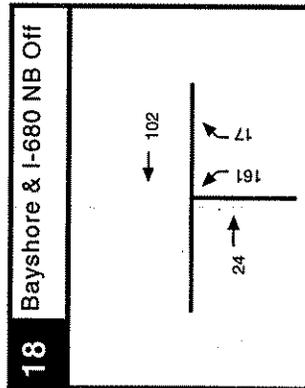
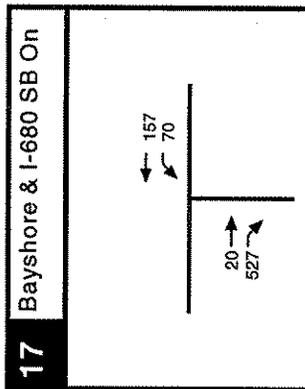
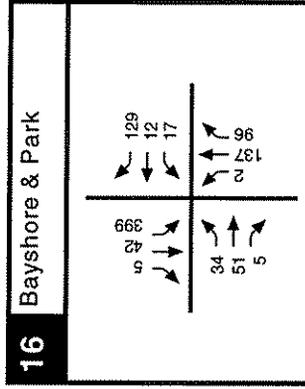
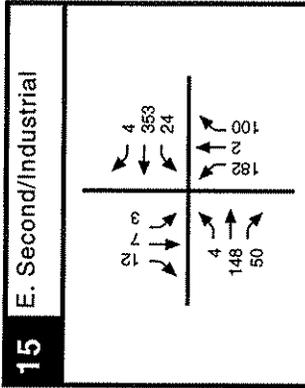
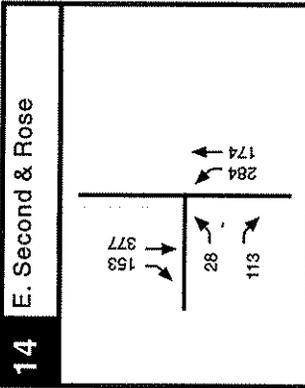
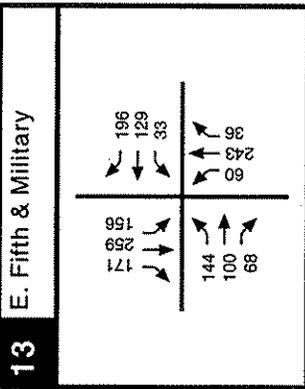
INTERSECTION LANE GEOMETRY



PM Peak Hour is generally 5:00 - 6:00 in the downtown and western areas of the city, and 4:30 - 5:30 in the northeastern part of the city.

FIGURE 6a

PM PEAK HOUR INTERSECTION VOLUMES EXISTING (1995)



Not to Scale

PM Peak Hour is generally 5:00 - 6:00 in the downtown and western areas of the city, and 4:30 - 5:30 in the northeastern part of the city.

PM PEAK HOUR INTERSECTION VOLUMES EXISTING (1995)

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Three of the five stop-controlled intersections identified above have at least one movement with an LOS of D or worse, but an average vehicle delay for all turning movements of C or better. Only two intersections (East Second / I-780 WB Ramps and East Fifth / I-780 WB Ramps) have average vehicle delays of LOS D or worse.

Because of the poor operating conditions at these intersections, the Caltrans peak hour signal warrant was checked to determine if signalization is warranted for any of the stop-controlled intersections currently operating at LOS D or worse. The signal warrant combines volume thresholds for the major and minor streets at a stop-controlled intersection; if the combination of these volumes at a given intersection falls above the threshold, a signal is warranted based on peak hour volumes. It should be emphasized that the decision to install a signal must be based on other considerations as well, such as traffic characteristics throughout the day, pedestrian and bicycle traffic, the traffic-carrying capacity of the major street, and the nature and function of the minor street.

A check of the Caltrans signal warrant criteria for peak hour volumes shows that, of the five stop-controlled intersections which operate at LOS D or worse, two meet the signal warrant: East Second / I-780 Westbound Ramps and East Fifth / I-780 Eastbound Ramps. Both of these intersections are scheduled to be signalized according to the City's current Capital Improvement Program. The East Fifth / I-780 Westbound Ramps intersection approaches but does not meet the warrant; Park / Bayshore and East Second / Industrial do not come close to meeting the warrant.

FREEWAYS

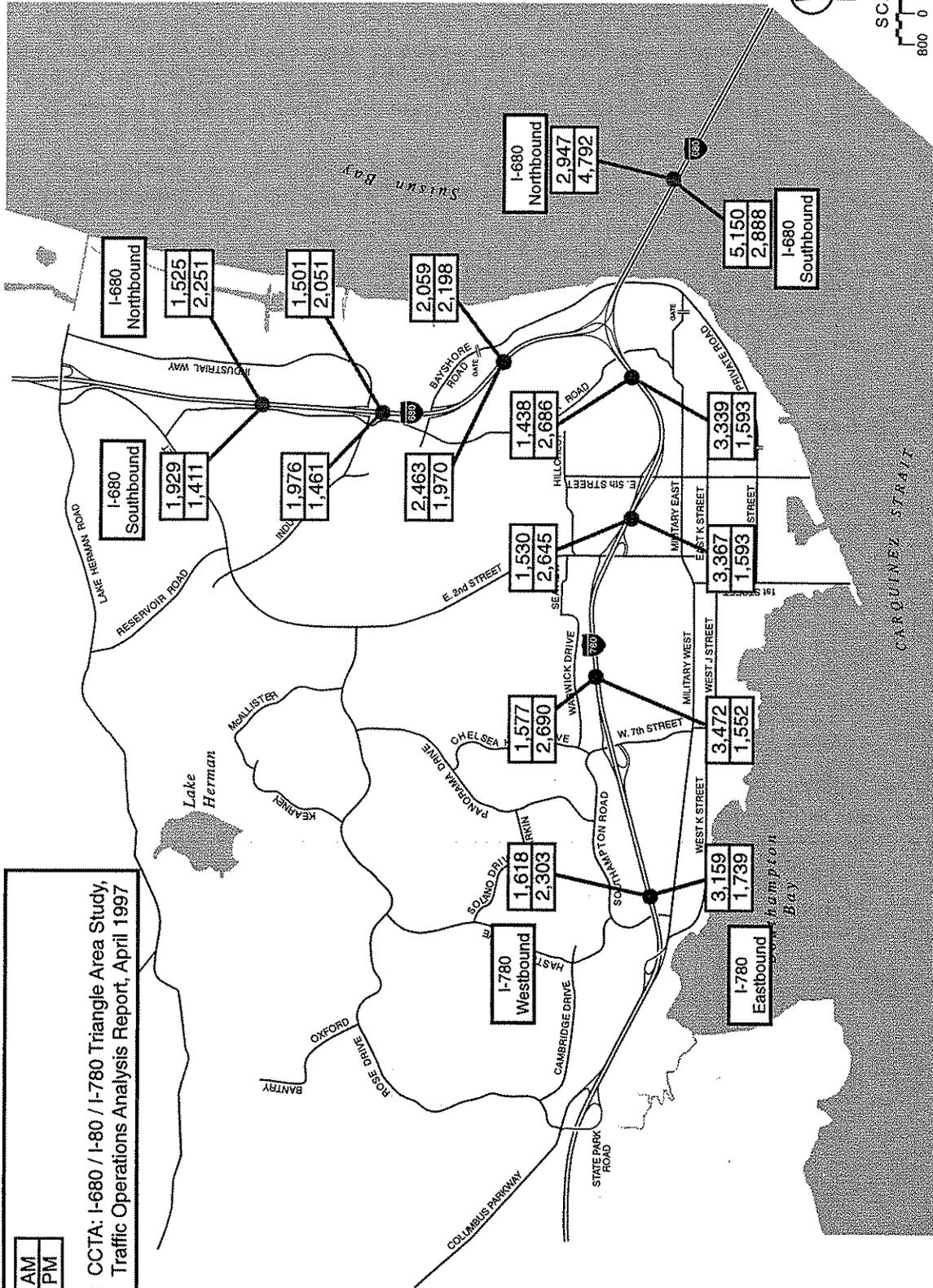
Figure 7 shows 1995 AM and PM peak hour traffic volumes on I-680 and I-780 in the vicinity of Benicia. These volumes are taken from the recent I-680 / I-80 / I-780 Triangle Area Study Traffic Operations Report, prepared by the Contra Costa County Transportation Authority in April 1997. The study reported that most freeway segments in Benicia operate at LOS D or better (vehicle density of 32 passenger cars per mile per lane or less) during both peak hours, with the following exceptions:

- During the AM peak hour, eastbound I-780 operates at LOS E between the East Fifth interchange and the I-680 northbound / southbound split.
- During the PM peak hour, northbound I-680 operates at LOS E between the bridge toll plaza and the I-680 / I-780 split.

These poor service levels reflect the bridge bottleneck which currently controls nearby traffic conditions.

Key: AM
PM

Source: CCTA: I-680 / I-80 / I-780 Triangle Area Study,
Traffic Operations Analysis Report, April 1997



SCALE
800 0 800 1600

**EXISTING FREEWAY PEAK HOUR VOLUMES
(1995)**

FIGURE 7

F Fehr & Peers Associates, Inc.
Transportation Consultants

The Solano County Transportation Authority monitors freeway Level of Service as part of the County's Congestion Management Program. The 1995 Congestion Management Program identifies LOS F conditions at the Benicia Bridge Toll Plaza, Level of Service C/D conditions on I-680 and Level of Service C conditions on I-780.

3. PEDESTRIAN AND BICYCLE FACILITIES

The Benicia Parks, Trails and Open Space Master Plan summarizes the existing and planned future bicycle and pedestrian facilities in Benicia. The following description of the existing Class III (bike routes), Class II (bike lanes) and Class I (multi-use paved trails) facilities is taken from the 1994 Parks, Trails and Open Space Master Plan.

Class III facilities are bike routes, which share the roadway with other vehicles and do not have a separate lane designated. Bike routes in Benicia include the following:

- The Benicia Waterfront Path, with segments on First Street from "A" Street to "E" Street; West Third Street from "H" Street to "I" Street; "E" Street from First Street to West Second Street; "G" Street from West Second Street to West Third Street; "I" Street from West Third Street to West Fourth Street; "I" Street from West Fifth Street to West Ninth Street; "K" Street from West Tenth Street to West Fourteenth Street;
- Rose Drive from Benicia State Park to Palace Court; and
- East Second Street from Military West to Warwick Drive.

Class II facilities are bike lanes which are painted on the side of a roadway and intended exclusively for bicycle use. Bike lanes are marked with parallel white lines and the words "Bike Lane" at various intervals. Signs are also used to identify the designated bike lanes. There are currently three bike lane segments in Benicia, as follows:

- Military West from West Fifteenth Street to West Seventh Street;
- Southampton Road from Military West to West Seventh Street; and
- East Second Street from Warwick Drive to Old Lake Herman Road.

Class I facilities are dedicated paths separated from automobile traffic, for use by bicycles and pedestrians. Existing Class I facilities in Benicia include:

- The Benicia State Park trail;
- Bench Trail - Palace Court to Hastings Drive through the Southampton Open Space;

- Rose Drive via Hastings Court, Solano Park, Henderson Elementary, Jack London Park, and Rose Drive to McAllister Drive;
- Bench Trail - Rose Drive to Channel Road; and
- Benicia Waterfront Path, with segments from Benicia State Park to West Fourteenth Street, from West Tenth Street to West Ninth Street through West Ninth Street Park, from West Fourth Street to West Fifth Street, along the waterfront between West Third Street and "H" Street, and along the waterfront from the end of "E" Street to "G" Street.

4. TRANSIT SERVICE

Three forms of public transit serve Benicia residents: buses, and, indirectly, passenger rail and ferries. The following gives an overview of the services available in Benicia.

BUS TRANSIT

Benicia Transit is an intercity fixed-route service which provides service to the Vallejo ferry terminal, the Lemon/Curtola park and ride stop in Vallejo, and the Pleasant Hill BART station in Contra Costa County.

At the Lemon/Curtola park and ride lot, Benicia Transit riders can transfer to connecting intercity bus service to El Cerrito Del Norte BART, Fairfield/Vacaville and Napa. Vallejo transit operates Bartlink which provides connecting service to El Cerrito Del Norte BART station as well as service to Solano mall and the Suisun Amtrak station.

In addition to its fixed-route transit services, Benicia funds a subsidized dial-a-ride program open to the general public.

Benicia also participates in the intercity "run about" paratransit service running primarily between Vallejo and Benicia. This service operates from 7 a.m. to 7 p.m. Monday through Saturday. The service is demand responsive, and is handicapped accessible. It primarily serves destinations in Vallejo and to Benicia and Fairfield-Suisun as well as complementary paratransit service to El Cerrito Del Norte BART and Pleasant Hill BART. This service is available only to ADA-qualified persons.

Since 1991, Caltrans has operated a daily Benicia Bridge shuttle bus between the park 'n ride lot at the I-780/East Second Street interchange and the Martinez Amtrak station.

PASSENGER RAIL SERVICE

Currently there are four through trains per day operating on the Union Pacific (formerly Southern Pacific) rail line in Solano County. Two stop at Suisun City

(California Zephyr). There are also six local trains/day on the tracks (the Capitols), all stop at Suisun City. The Martinez Amtrak station also provides access to the major north-south and east-west Amtrak routes. This regional rail service is supported by a network of connecting feeder bus routes that effectively extend the service areas to Lake Tahoe/Reno, the northern and southern Sacramento/San Joaquin Valley, Santa Rosa/Eureka, and Salinas/Monterey.

There is no commuter rail service operating through Solano County. However, many Benicia residents commute to work via BART trains in Contra Costa, using Benicia Transit to travel to the Pleasant Hill BART station.

FERRY TRANSIT

Benicia commuters have access to ferry service by using the Benicia Transit service to the Vallejo Ferry Terminal. The ferry operates between the ferry terminal in Vallejo and San Francisco.

5. GOODS MOVEMENT

Three transportation modes provide for freight and goods movement in Benicia. These are truck, rail, and waterborne transport.

TRUCK FREIGHT

Trucks are used for freight transport primarily in Benicia's industrial area along the northern I-680 corridor, and in the port area adjacent to the Bridge. Freeway signs direct Benicia Industrial Park traffic to use I-680 exits. No truck routes are signed on local arterials. However, seven-ton weight limits are posted on Hillcrest, East Fifth Street south of Military, and Military east of East Fifth Street.

RAIL FREIGHT

Freight rail facilities in Benicia center on the main Union Pacific Railroad line from Sacramento which once terminated at the foot of First Street, but now crosses the Carquinez Strait on a bridge paralleling the George Miller Jr. Memorial Bridge to Martinez and the East Bay. Rail spur lines serve Benicia's industrial park area to the north and the port area along the southern waterfront. Rail service along the waterfront now terminates before reaching East Fifth Street.

In 1995, Union Pacific operated an average of 12 freight trains per day through the county; however, the daily pattern varied significantly. This segment of tracks connects the Bay area to Union Pacific's Roseville freight yard, which receives and dispatches trains to and from Portland/Klamath Falls to the north and Salt Lake/Denver/ Kansas City/Chicago to the east. Most freight trains are through trains, but some stop at Suisun to pick up or set out cars for local industries such as Anheuser Busch; others are destined for points on the connecting California

Northern Railroad. The spur line through the Benicia Industrial Park and the Arsenal area is used most frequently by auto carriers and Exxon. Daily switching services operate between Sacramento and Dixon, and between Ozol (west of Martinez) and Suisun.

WATERBORNE FREIGHT

Benicia has a natural deep water channel readily adjacent to the shore along the Carquinez Strait. This channel permits container ships, fuel tankers and freighters with fairly deep draft (up to about 35 feet) to dock at Benicia's port facilities between the George Miller Memorial Bridge and East Fifth Street.

The Port of Benicia, which is operated under a City lease to Benicia Industries (a private company), has a 2,400 foot deep-water pier which provides berthing for three ships. The Port has approximately 750 acres of open storage area and received 215 ship calls in 1993, primarily automobiles and coke. According to the *San Francisco Bay Area Seaport Plan*, the Port is expected to have a throughput capability of 374,000 metric tonnes for neo-bulk cargo and 600,000 metric tonnes for bulk cargo by 2020.

6. FUTURE CONDITIONS

ROADWAY NETWORK CHANGES

The primary roadway network change that will affect regional circulation through Benicia in the future is the second bridge span of the Benicia-Martinez Bridge planned by Caltrans. The project, which is scheduled to start construction in the spring of 1998, will result in five travel lanes in both the northbound and southbound directions, plus a dedicated bicycle lane. The toll plaza will be relocated to the south side of the new bridge, but will continue to collect tolls from northbound traffic.

Local arterial improvements contained in the City's current Capital Improvement Program (CIP) include the following:

- Widen East Second between I-780 and Military to four lanes;
- Widen southeast half of East Second between Wanger and Lake Herman Road;
- Widen East Fifth between I-780 and Military to four lanes;
- Widen Military between West Second and West Fifth to four lanes;
- Widen Adams between Grant and Washington to forty feet;
- Widen Seventh Street between I-780 and Military to 3 and 4 lanes;
- Construct new connector between Park and East Second;
- Extend Bayshore Road between Park and Industrial; and
- Widen Park Road between Bayshore and Industrial to four lanes.

In addition, CIP intersection improvements include:

- Columbus / Rose improvements;
- West K / Military / I-780 Ramps signal;
- East Second / I-780 EB Ramps improvements;
- East Second / I-780 WB Ramps signal;
- East Fifth / Military East improvements;
- East Fifth / I-780 EB Ramp signal;
- East Fifth / I-780 WB Ramp signal;
- Bayshore / I-680 Off-ramp signal;
- Bayshore / Park signal;
- Park / Industrial signal;
- Industrial / I-680 Off-ramp signal; and
- East Second / Industrial signal and interconnect.

LOCAL ROADWAY AND INTERSECTION CONDITIONS

Future traffic volumes under the existing General Plan were projected for the 24 study intersections for the year 2015. The traffic growth was derived from the City's 1992 Citywide Traffic Improvement Funding Report, which contained existing and future land uses for the City in over 100 geographical zones. The land uses in this study are considered to be consistent with the existing General Plan. For this EIR, the traffic generated by residential, commercial and industrial uses was included, while public uses were not. Public uses (schools, churches, parks, etc.) generate relatively low traffic volumes in the PM peak hour and would not significantly affect the comparison of future traffic volumes for the existing General Plan and the General Plan.

The trip generation analysis indicates that City uses currently generate 36,533 p.m. peak hour trips, and that development under the existing General Plan would add 29,782 p.m. peak hour trips, for a total of 66,315 trips in 2015. The land use and trip generation tables are included in the technical appendix.

The additional trips associated with development under the Existing General Plan were added to the roadway network using distribution percentages obtained from the Metropolitan Transportation Commission's regional traffic model. The model indicates that Benicia area traffic is distributed as shown in Table 8. In summary, the model indicates that 51 percent of Benicia trips stay within Benicia, and of the 49% which travel to or from an external destination, the north / south / west distribution is approximately 19 percent/37 percent/44 percent (average of residential and non-residential distributions).

The traffic which travels to or from Benicia (or "external" to Benicia) was assigned to the roadway network using a TRAFFIX network model, with paths manually assigned based on least-distance routing. The TRAFFIX model combines the

Table 8. Traffic Distribution

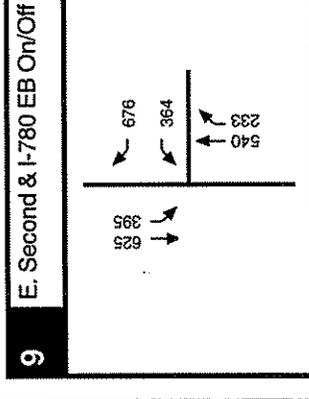
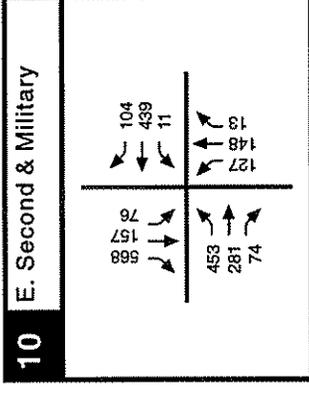
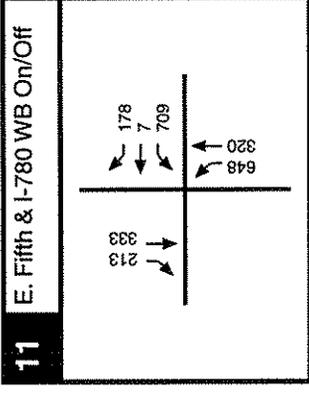
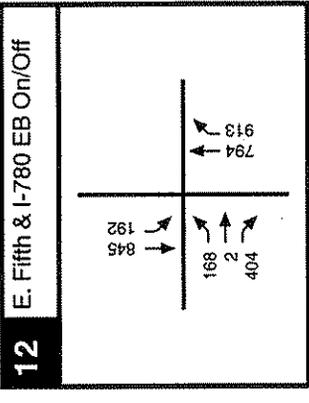
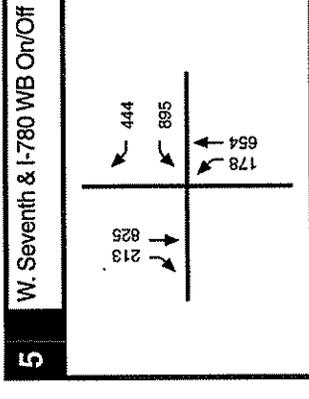
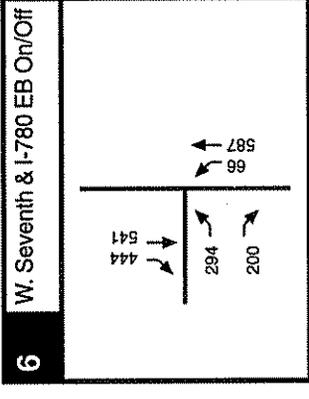
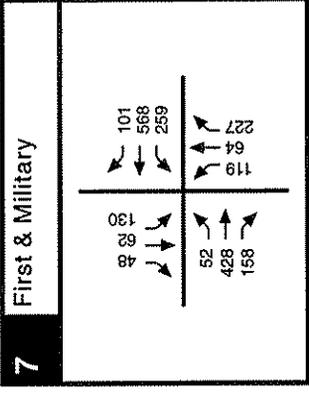
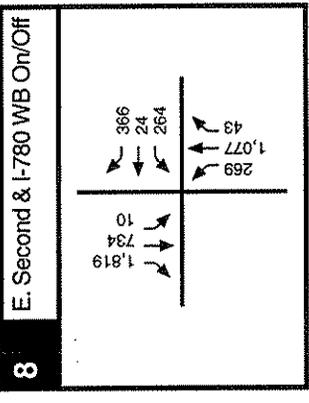
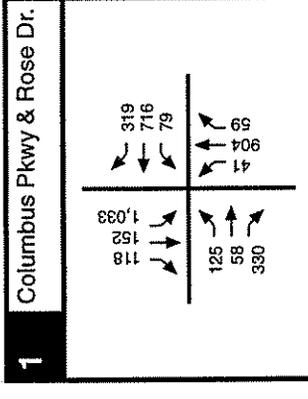
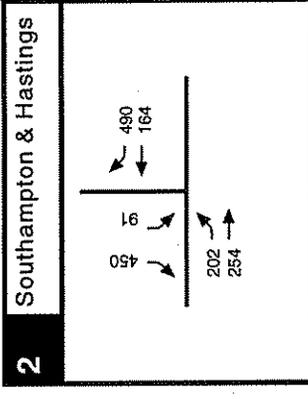
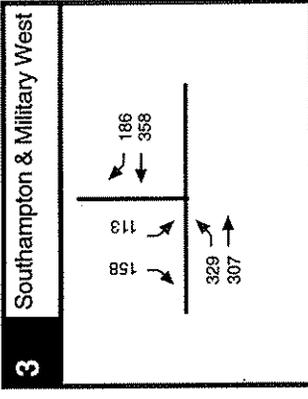
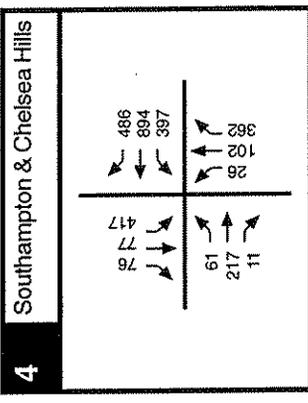
DESCRIPTION	PERCENT OF TOTAL
Benicia trips that stay in Benicia	51 %
Benicia trips which travel to/from an external destination	
to/from the north, residential	14 %
to/from the north, non-residential	24 %
to/from the south, residential	37 %
to/from the south, non-residential	37 %
to/from the west, residential	49 %
to/from the west, non-residential	39 %

Traffic Improvement Funding Program's 100-plus zones into 14 "super zones" to simplify the trip distribution process. The technical appendix contains a zone map. Internal trips, which stay within Benicia, were represented by factoring up existing intersection volumes by a Citywide growth rate which was obtained by dividing the total future trip generation (66,315) by the existing trip generation (36,533), then multiplying the resulting 81 percent growth by 51 percent to reflect internal trip growth, and dividing it by two to account for the two "trip ends" to every trip. The resulting factor, 20 percent, was applied to the existing traffic volumes at all intersections.

The roadway network assumed for this case is the existing network, plus the three roadway extensions proposed in the General Plan: Industrial Way extended to Lake Herman Road, Bayshore Road extended to Industrial Way, and a new east-west connector between East Second and Park Street. Including these extensions in the Existing General Plan analysis allows a direct comparison of the traffic impacts of the Existing General Plan to those of the General Plan.

The resulting intersection volumes are shown in Figure 8. Table 9 shows the corresponding service levels, along with existing service levels for comparison. The service levels reflect the existing intersection configurations, i.e., without any of the planned Capital Improvement Program projects. This allows a direct comparison of intersection operations between the existing and future cases. (The need for future improvements is presented in the impact and mitigation measure discussion for the General Plan.)

Under Existing General Plan conditions, the number of intersections operating at LOS D or worse would increase from eight to 21. The only study intersections operating at LOS C or better would be Southampton / Military West, West

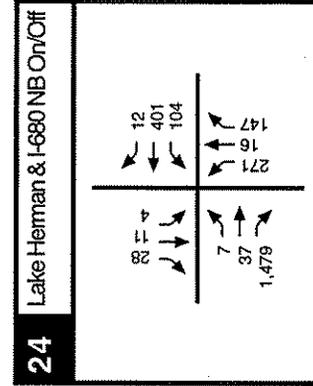
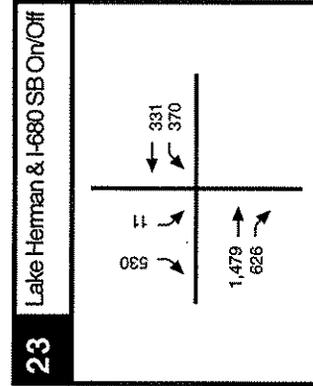
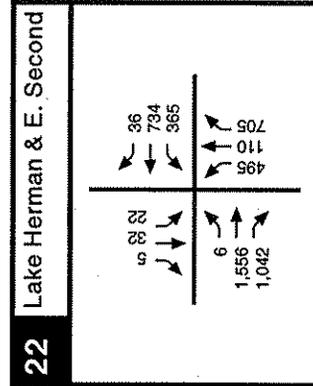
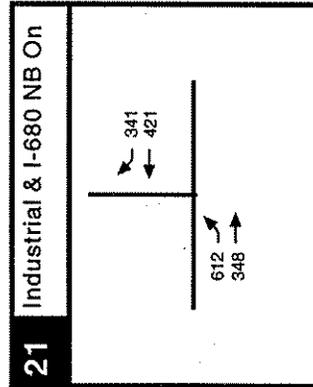
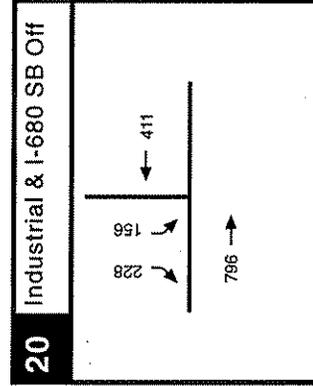
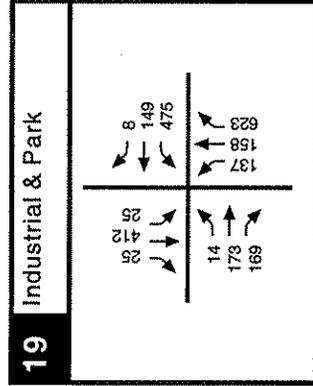
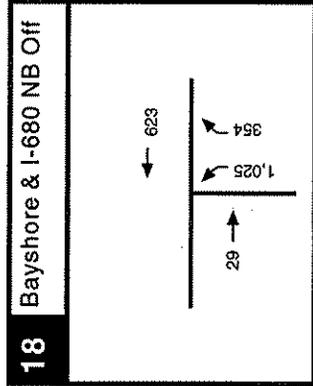
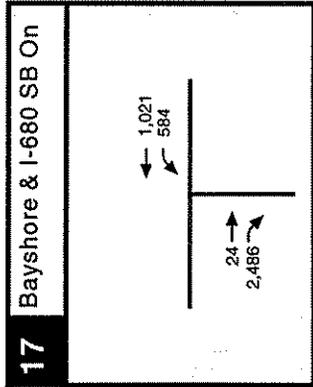
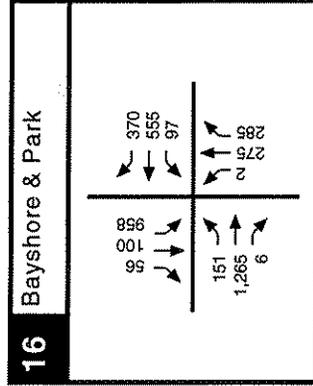
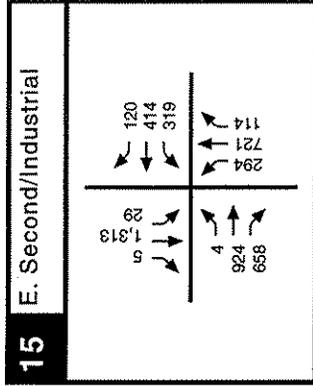
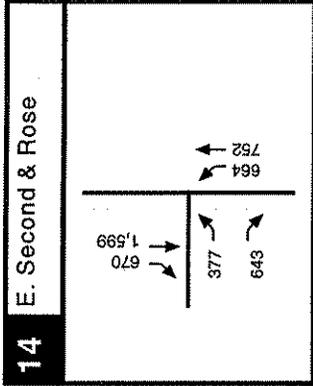
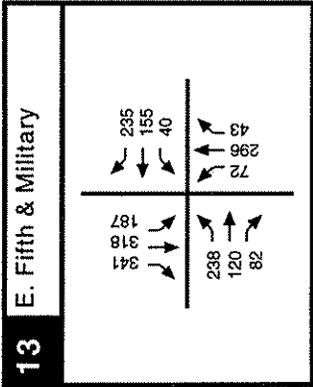


Not to Scale

PM Peak Hour is generally 5:00 - 6:00 in the downtown and western areas of the city, and 4:30 - 5:30 in the northeastern part of the city.

**PM PEAK HOUR INTERSECTION VOLUMES
EXISTING GENERAL PLAN**

FIGURE 8a



Not to Scale

PM Peak Hour is generally 5:00 - 6:00 in the downtown and western areas of the city, and 4:30 - 5:30 in the northeastern part of the city.

FIGURE 8b

**PM PEAK HOUR INTERSECTION VOLUMES
EXISTING GENERAL PLAN**

Table 9. Intersection LOS: Existing vs. Future Conditions with Existing General Plan (2015)

DESCRIPTION	CONTROL TYPE	EXISTING			FUTURE		
		v/c	delay	LOS	v/c	delay	LOS
1. Columbus Parkway/Rose Drive	Signal	0.82		D	2.15		F
2. Southamptton/Hastings	One-way Stop		15/3	C/A		46/7	F/B
3. Southamptton/Military West	Signal	0.46		A	0.54		A
4. Southamptton/Chelsea Hills	Signal	0.74		C	1.24		F
5. West Seventh/I-780 WB On/Off	Signal	1.01		F	1.44		F
6. West Seventh/I-780 EB On/Off	Signal	0.60		A	0.74		C
7. First/Military	Signal	0.53		A	0.67		B
8. East Second/I-780 WB On/Off	One-way Stop		81/22	F/D		*/*	F/F
9. East Second/I-780 EB On/Off	Signal	0.63		B	1.17		F
10. East Second/Military East	Signal	0.63		B	0.91		E
11. East Fifth/I-780 WB On/Off	One-way Stop		259/66	F/F		*/*	F/F
12. East Fifth/I-780 EB On/Off	One-way Stop		¼	E/A		*/*	F/F
13. East Fifth/Military East	Signal	0.80		D	1.14		F
14. East Second/Rose Drive	Signal	0.58		A	2.16		F
15. East Second/Industrial	Two-way Stop		29/7	D/B		*/*	F/F
16. Bayshore/Park	Four-way Stop		28	D		*	F
17. Bayshore/I-680 SB On	WB Left Yield		5/1	A/A		*/*	F/F
18. Bayshore/I-680 NB Off	One-way Stop		6/3	B/A		*/*	F/F
19. Industrial/Park	Four-way Stop		14	C		*	F
20. Industrial/I-680 SB Off	One-way Stop		5/1	A/A		*/95	F/F
21. Industrial/I-680 NB On	One-way Stop		8/4	B/A		*/*	F/F
22. Lake Herman/East Second	Two-way Stop		16/5	C/A		*/*	F/F
23. Lake Herman/I-680 SB On/Off	One-way Stop		9/1	B/A		*/*	F/F
24. Lake Herman/I-680 NB On/Off	Two-way Stop		5/2	A/A		*/*	F/F

Note: For signalized intersections, the volume to capacity ratio is given. For side street stop-controlled intersections, two delays and service levels are given: the delay for the worst movement, and the average intersection delay. For four-way stops, the average intersection delay is given.

* = very long delays (over two minutes)

Seventh / I-780 Eastbound Ramps, and Military / First.

The LOS D, E and F intersections would require improvements such as signalization (for the stop-controlled intersections), lane additions, and signal cycle and phasing adjustments to improve service levels to D or better. The improvement analysis is presented in the Impacts and Mitigation Measures section, for the General Plan case.

FREEWAY CONDITIONS

Freeway traffic conditions for the year 2010 are shown in Figure 9. The volumes are taken from the I-680 / I-80 / I-780 Triangle Area Traffic Study Traffic Operations Analysis Report (1997). The report does not provide Year 2015 estimates. The future freeway volumes shown in Figure 9 assume that only the new bridge is built, with no other freeway or interchange improvements. In the Benicia area, the study predicts that AM peak hour freeway operations would be poor in the future (LOS D to E), although volumes would remain within the existing lane- capacity for all but one segment (I-780 between Southampton and Columbus Parkway). In the PM peak hour, freeway segments in Benicia are projected to operate well under capacity, with speeds of 50 mph or greater.

PEDESTRIAN AND BICYCLE CIRCULATION

The Existing General Plan contains policies and programs which aim to maximize access to the City's unique waterfront and hill areas; provide a connected pedestrian pathway system to serve both recreational and multi-purpose trips (e.g. between home and school, parks and commercial destinations); develop a regional recreational trail system which would connect the hill area to the waterfront, as well as to and around Lake Herman, Sulphur Springs Mountain, and Blue Rock Springs Park; provide disabled access in accordance with ADA standards; and provide a connected and adequate bicycle route system.

The Benicia Parks, Trails and Open Space Master Plan (July 1997) outlines a comprehensive bikeway and trail system that proposes many facilities not identified in the Existing General Plan. The Plan connects the areas north of Rose Drive to West Seventh and Military West. Bikeways are also extended into the Arsenal area and the Benicia Industrial Park. It is the Master Plan policy for unpaved trails to serve pedestrians, bicyclists and equestrians and for fire break trails to serve hikers and bicyclists.

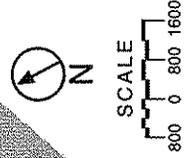
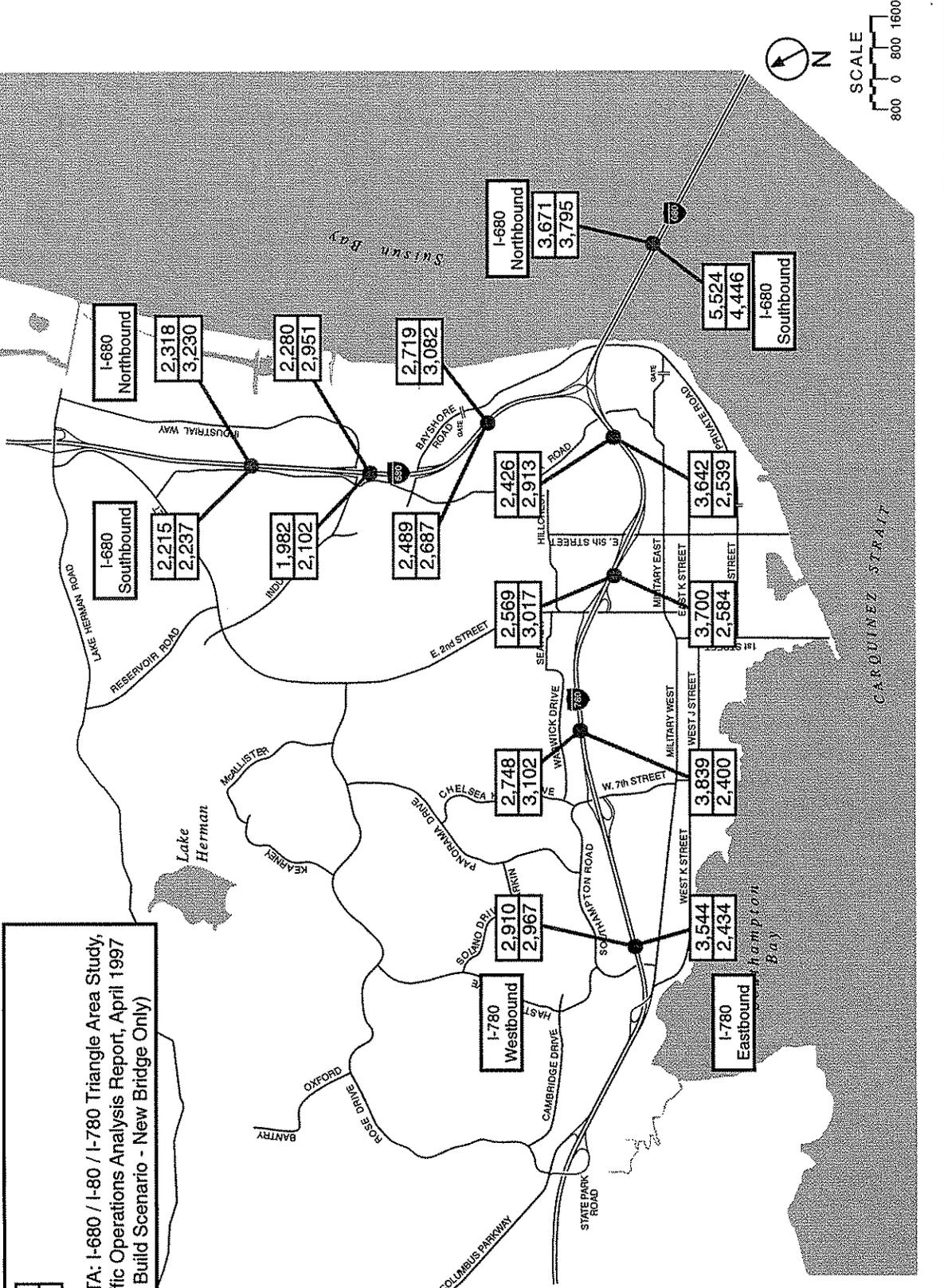
The bicycle and pedestrian system developed for the Benicia Parks, Trails and Open Space Master Plan is not incorporated into the Existing General Plan, because a General Plan update has not been prepared since the Master Plan was completed. This General Plan, discussed in the Impacts section, does incorporate the Master Plan system.

The Solano County-wide Bikeway Plan, January 1995, prepared by the Solano County Transportation Authority, is an advisory document on the development

Key:

AM
PM

Source: CCTA: I-680 / I-80 / I-780 Triangle Area Study, Traffic Operations Analysis Report, April 1997 (No Build Scenario - New Bridge Only)



Fehr & Peers Associates, Inc.
Transportation Consultants

FUTURE FREEWAY PEAK HOUR VOLUMES (2010)

FIGURE 9

of bicycle facilities for commuting, shopping, and recreational trips for the next 20 years. Proposals for new bicycle facilities in the Benicia area include an extension of a Class I bikeway from the State Park to Glen Cove Marina, construction of Class II bikeways on Benicia Road, Lopes Road and Park Road, and construction of a Class I bikeway along Sulphur Springs Creek to Sulphur Mountain. The Plan also recommends establishment of a trail system for mountain bikes.

TRANSIT SERVICE

The existing General Plan contains policies and programs which require the City to provide bus and subsidized taxi service, maintain the performance standards included in the Solano County Congestion Management Program, coordinate transit service and trip reduction efforts with other agencies and jurisdictions, and continue to implement the City's Trip Reduction Ordinance. Effective January 1996, state law invalidated the employer-based trip reduction mandates in the City's Trip Reduction Ordinance, and the City Council rescinded the entire ordinance in February, 1996.

The City has a Short Range Transit Plan for Benicia Transit and its related paratransit services (i.e. subsidized dial-a-ride taxi service and Run About service). The Short Range Transit Plan describes how the City will operate its transit services during the next ten years. The City is required to develop and adopt the Plan to maintain its eligibility for state and federal funds that are used to operate these services.

In 1995, the Solano County Transportation Authority sponsored preparation of the Solano Intercity Transit Concept Plan. This plan studies the projected demand for intercity transit over the next 20 years. It proposes to increase county-wide ridership from the current level of approximately 3,600 riders per day. The concept included operation of trunk-line transit service on freeways connecting Benicia, Dixon, Vacaville, Fairfield, and Vallejo/Vallejo Ferry with Sacramento, Napa and BART stations in El Cerrito, Pleasant Hill and Walnut Creek.

The Regional Transportation Plan proposes to expand passenger rail service between Sacramento and San Jose (via Solano County) to six trains daily by the year 2013. Caltrans has budgeted the addition of a fourth train this year.

Union Pacific and BART have proposed operating commuter train service between Dixon and Oakland on a demonstration basis, four trains daily (two eastbound and two westbound). This demonstration service has not occurred due to the shortage of transportation funds at the state and federal level. The California Legislature is considering legislation to form a Joint Powers Agency composed of representatives from each county along the Capitol Corridor to manage future development of passenger rail service in coordination with BART.

In 1995, the Solano Transportation Authority sponsored preparation of the Solano Rail Facilities Plan which developed a concept for implementing passenger rail service with stations at Dixon, Vacaville, Fairfield/Suisun, and Benicia. By 2015, 18 trains would serve Benicia daily. Projected daily station boardings in Benicia are 300 to the Bay Area and 100 to Sacramento.

In 1992, the Metropolitan Transportation Commission adopted the Regional Ferry Plan, which included an evaluation of passenger ferry service between Benicia and Martinez. The study estimated a likely patronage level of 50 to 150 trips a day with half-hour service in peak periods and hourly service during other times. Annual operating costs were estimated at \$160,000. Assuming a one-dollar fare, the required subsidy would be about \$4 per passenger. The Regional Ferry Plan did not recommend implementation of this service, since ridership levels were projected to be low and since the passenger subsidy was significantly higher than for current ferry service on other routes.

GOODS MOVEMENT

The existing General Plan contains policies to designate and sign truck routes, to limit truck traffic to arterial streets, to encourage industrial traffic to use the Industrial Park interchanges, and facilitate goods movement to and through the port and arsenal area by investigating alternate routes from the freeway to the port. There are no policies in the existing General Plan for rail freight or port facilities.

The Metropolitan Transportation Commission and the San Francisco Bay Conservation and Development Commission have an interest in the Port of Benicia as described in their Regional Seaport Plan. The Plan is focused on protecting Port facilities from incompatible uses, improving intermodal facilities between ships, trucks and freight trains, and improving access roads to the Port.

There is a mainline Union Pacific railroad line, formerly owned by Southern Pacific, which runs through Benicia from the Carquinez Strait bridge north towards Sacramento. It consists of two tracks in the City. Caltrans and Union Pacific have negotiated an agreement for complete rebuilding of both tracks with continuous welded rail, and replacement of the signal system with bi-directional signals and centralized traffic control (CTC) to allow operation on either track at upgraded speeds (generally 79 mph). Improvements also would include high speed crossovers in several locations (including one north of Pierce Lane) to permit trains to change tracks as necessary. The agreement will allow increased passenger rail service without interfering with freight trains.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant transportation impact if it would:

- Result in a violation of General Plan Policy 2.72.1, which requires

maintenance of LOS C on all City roads, street segments, and intersections. The proposed General Plan allows exceptions to the policy where measures required to achieve LOS C are unacceptable because of right-of-way needs, impact on neighboring properties, aesthetics, or community character. These conditions for exception are considered in the mitigation analysis which follows.

- Create a projected future over-capacity freeway condition where current long-range planning studies show an under-capacity condition.
- Create a demand for public transit which would not be accommodated by current long-range transit plans.
- Generate pedestrian and bicycle travel demand which would not be accommodated by current pedestrian facility and bicycle route development plans.
- Result in changes in demand for goods movement which cannot be accommodated by feasible roadway improvements, signing/routing changes, or other freight traffic management measures.

C. IMPACT DISCUSSION

The General Plan consists of a number of changes to land use designations, which are described in more detail in Chapter 3: Project Description. For the traffic impact analysis, the vehicular circulation system is assumed to be that shown in the General Plan Circulation System, which is shown in Figure 10. The system contains the following new or extended roadways: (1) the new Benicia Bridge span; (2) an Industrial Way extension from East Second Street to Lake Herman Road; (3) an east-west connector between Park Road and East Second Street; (4) an extension of Bayshore Road to connect to Industrial Way; (5) an extension of Bayshore Road as a public roadway through the port area; and (6) the connection of Oak Street and Adams Street to provide public access to Bayshore Road.

The General Plan impacts are assessed relative to Existing General Plan projections, which are summarized previously in the chapter in Section A6.

1. GENERAL PLAN POLICIES

The proposed Circulation Element includes goals supporting pedestrian and bicycle facilities (Goals 2.66 and 2.67), provision of disabled access throughout the City (Goal 2.68), provision of adequate transit service (Goal 2.69), development of commuter rail service and a new Benicia rail station (Goal 2.70), establishment of direct ferry service to Benicia (Goal 2.71), provision of a balanced street system serving autos, pedestrians, bicycles and transit (Goal 2.72), encouragement of the use of alternatives to the single-occupant vehicle (Goal 2.73), alleviation of traffic congestion near school sites (Goal 2.74), provision of adequate parking while encouraging alternatives to the auto (Goal 2.75), management of traffic during major events (Goal 2.76), provision of safe and direct access to the Industrial Park

(Goal 2.77), improvement of access to the Old Arsenal area (Goal 2.78), maintenance of sufficient freeway capacity for use by Benicia residents and employees (Goal 2.79), and support for an active community deliberation process related to existing and future Caltrans proposals.

The Circulation Element's goals, policies and programs aim to balance the needs of automobile users, transit users, bicyclists and pedestrians, and goods movement vehicles, recognizing that all transportation modes must be supported and none can be neglected. Balancing the needs and requirements of such diverse systems automatically leads to the appearance of internally inconsistent goals and policies. For example, policy 2.72.1 calls for maintenance of LOS C on City streets and intersections, but policy 2.72.2 calls for finding alternatives to roadway widenings and intersection expansions. In fact, many of the Circulation Element's policies and programs attempt to encourage the use of non-auto modes and discourage expanding the street system to fit large amounts of new traffic. While these policies appear to contradict the City's stated LOS C policy, they actually provide the balance for unchecked roadway expansion, which would be undesirable and infeasible. The Circulation Element's inclusion of these differing policies is thus acceptable, as a method of ensuring consideration of automobile and non-automobile modes in the City's future development.

2. INTERSECTIONS

The General Plan calls for conversion of northern land zoned for residential and business park uses to an open space designation. The Update also increases the intensity in certain downtown development sites. The resulting PM peak hour trip generation changes, relative to Existing General Plan conditions, are shown in the technical appendix. City-wide, the revised land use designations would decrease p.m. peak hour trip generation by approximately 440 trips. However, the downtown and Arsenal areas would experience traffic growth relative to the existing General Plan (+5,009 trips), while the industrial and northern area would see less traffic relative to the Existing General Plan (-5,446 trips).

These trip changes were loaded into the fourteen zones used in the TRAFFIX trip assignment model. As for the Existing General Plan analysis, the trips were distributed to the roadway network using the internal / external and north / south / west distributions obtained from the MTC Regional Traffic Model, as described previously in section A5. The 49 percent of trips which travel to or from a point external to the City were distributed to the network using least distance routing. The remaining 51 percent (internal Benicia trips) were added to the study intersections in the form of a City-wide growth factor. The growth factor is essentially the same as the factor for the Existing General Plan analysis, 20 percent, because the total trip generation does not change significantly with the General Plan.

Figure 11 shows the future intersection volumes resulting from the General Plan. Table 10 lists the service levels for existing, Existing General Plan, and General

Plan conditions. As shown in this table, development under the General Plan would improve operations at five intersections, but would not restore any of the twenty-one intersections which operate at LOS D or worse under Existing General Plan conditions to LOS C or better. In addition, one intersection which operates acceptably under Existing General Plan conditions would fall to LOS F under General Plan conditions: West Seventh / I-780 EB Ramps.

Proposed General Plan Policy 2.72.1 state that the City will strive to maintain intersection operation at LOS C or better, except where improvements would be infeasible. Thus, the analysis of required improvements attempts to provide LOS C or better at the twenty four intersections. However, the improvement analysis provides only LOS D at sixteen of the twenty-two intersections requiring mitigation, for two reasons. First, the improvements developed are considered the maximum feasible for widening at the individual locations (many of the intersections would require double left turn lanes and three or four through lanes just to achieve LOS D). Secondly, the LOS analysis methodology used in this EIR, the Transportation Research Board's Circular 212 method, is known to be conservative; the improvements developed in this EIR will likely yield LOS C or better operation when implemented. This can be demonstrated through the use of a more detailed "operations" method such as the Highway Capacity Manual signalized analysis method. Such analysis would be performed as individual intersections come closer to needing signalization.

Figure 12 shows the intersection improvements which would be required to improve all intersections to LOS C or D. Table 11 shows the projected level of service at the study intersections with the improvements. Of the twenty-two intersections which require mitigation, fourteen would require the installation of a signal, and all twenty-two would require lane additions on some or all approaches. Some of the lane recommendations may not be feasible due to physical constraints; however, more detailed operational studies of these intersections can be performed as the need for the improvements draws near, and alternative solutions may be identified (i.e. signal cycle length or phasing changes, adding capacity at a different intersection approach, coordinating timing at adjacent signals, etc.).

It should be emphasized that this analysis provides an estimate of conditions with reasonably foreseeable development allowed with the General Plan, to the year 2015 - almost twenty years from today. As such, it constitutes long-range planning information, which will need to be supplemented by ongoing traffic counts and studies by the City to ensure that the appropriate improvements are developed and implemented when needed.

3. ROADWAY SEGMENTS

The General Plan provides the following definitions for arterial and collector roadways:

- A major arterial is two to four lanes in width and connects collectors,

minor arterials and other major arterials to the Freeways

- A minor arterial is two to four lanes in width and connects collectors to major arterials
- A collector street is two lanes in width and connects local streets to minor and major arterials.

The Circulation System arterial roadways were reviewed to determine where widening would be required to maintain a minimum of LOS E based on projected future volumes. Table 12 shows the maximum daily volumes (or "capacities") for this Level of Service for 2-lane, 4-lane and 6-lane arterials, which were used as guidelines in this analysis. These capacities are not part of the General Plan's arterial classification, but are used in the EIR only to assess needed ultimate widths. The daily volume on a roadway is generally ten times the p.m. peak hour volume; thus, the p.m. peak hour volumes projected for the General Plan were multiplied by ten to allow comparison to the capacities in Table 13. The appendix contains the link volumes which were used for this analysis.

The arterial analysis showed that the following roadway segments would require widening to four lanes under General Plan conditions to maintain a minimum of LOS E:

- (1) Lake Herman Road east of the I-680 NB ramps;
- (2) East Second Street between Lake Herman Road and the existing four-lane section;
- (3) East Second Street between I-780 WB ramps and Military East;
- (4) East Fifth Street between I-780 WB ramps and Military East;
- (5) Industrial Way between Lake Herman Road (along new extension) and the I-680 ramps;
- (6) Bayshore Road between I-680 SB ramp and Industrial Way;
- (7) Military West between West Fifth and West Second;
- (8) Military East between East Second and East Fifth;
- (9) West Seventh Street between Chelsea Hills and Military West; and
- (10) Park Road between Industrial and Bayshore.

Several of these segments are already included in the City's Capital Improvement Program; specifically, items 2 (southeast half only), 3, 4, 7, 9 (between Military West and I-780 only) and 10.

4. FREEWAYS

As previously described, the land uses in the General Plan result in a small drop in total trip generation, relative to the uses in the Existing General Plan. Although a substantial trip reduction occurs in the northern industrial area and a similar trip increase occurs in the downtown / arsenal area, most freeway segments in Benicia would see a volume drop due to the roughly balanced regional trip distribution: 24 percent to the north, 37 percent to the south, and 39 percent to the west (for non-residential trips). Figure 13 illustrates the effect of the trip changes on the

local freeway system.

As discussed in the setting discussion of this section, current projections to the year 2010 indicate that all freeway segments in Benicia would remain well under their ultimate capacity during the PM peak hour, with travel speeds at 50 mph or greater. The small decrease in freeway trips with the General Plan would marginally improve the conditions already forecast.

5. PEDESTRIAN AND BICYCLE FACILITIES

Figure 14 shows the General Plan Bicycle and Multi-Use Trail System. The Update incorporates the recommendations contained in the Benicia Parks, Trails and Open Space Master Plan. It also shows the Bay Trail routing through Benicia. The additional bike routes will provide a connected bicycle circulation system on Benicia's arterial-collector system, through and between the northern residential, northeastern industrial, downtown and waterfront areas.

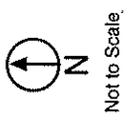
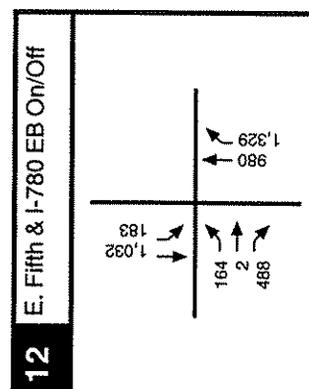
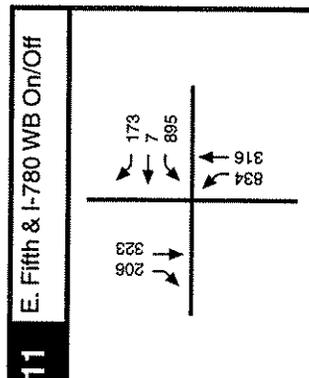
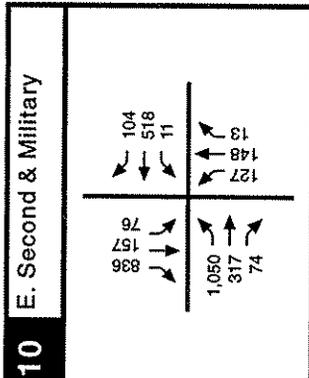
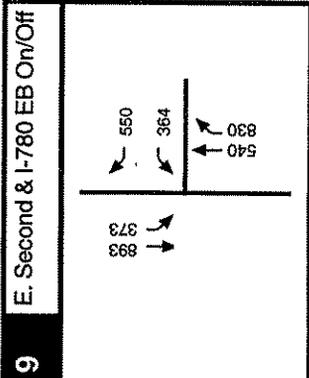
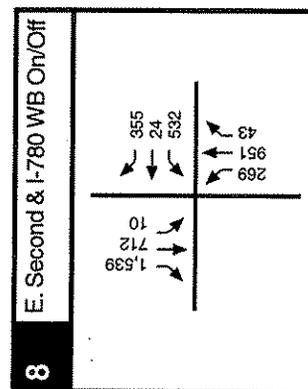
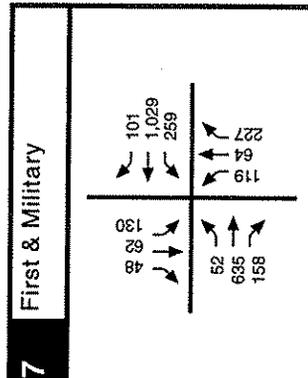
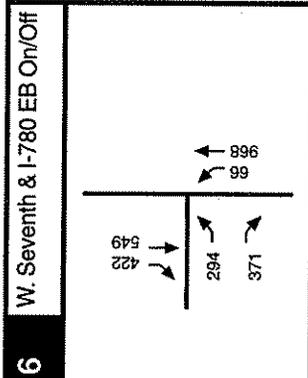
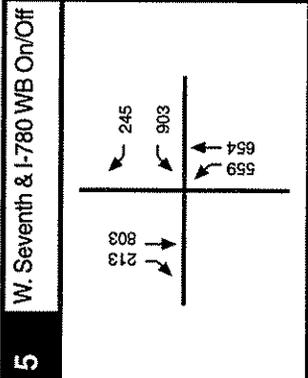
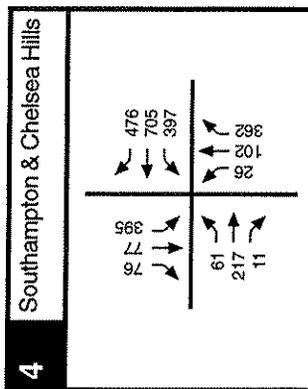
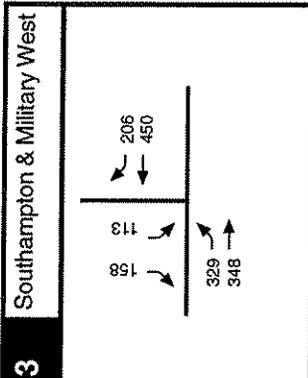
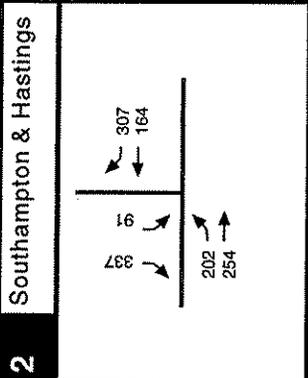
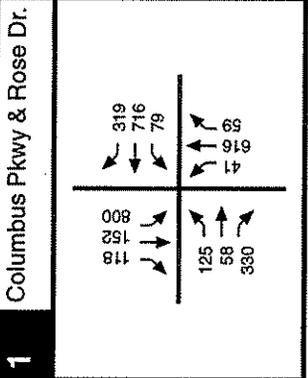
6. TRANSIT

The trip generation analysis for the General Plan indicates that a net increase of 5,009 p.m. peak hour trips will be generated in the downtown and arsenal areas, relative to existing General Plan conditions, and a net decrease of 5,446 trips will be generated in the northern and industrial areas, relative to the existing General Plan. Relative to the total future trip generation under the existing General Plan (66,315 trips), these changes constitute a 7.5 percent increase and an 8 percent decrease, respectively. Relative to the existing Citywide trip generation (36,533 PM peak hour trips) the total future trip generation with the General Plan (65,879 trips) represents an 82 percent increase.

Because a portion of the trip growth could be served by transit, these changes in General Plan projections should be incorporated into Benicia Transit's Short Range Transit Plan, which is updated periodically and plans for capital and operations improvements over a ten-year horizon.

7. GOODS MOVEMENT

No impact is identified related to goods movement under the General Plan. The General Plan contains several elements which will reduce the day-to-day impacts of goods movement operations on City streets and on the City's citizens. The General Plan would reduce the maximum level of industrial development relative to that allowed under the Existing General Plan, through reduced maximum floor area ratios and re-classification of certain areas from General Industrial to Limited Industrial. The effect of the reduced maximum floor area ratios may be minimal, because the maximums were and still are higher than what is typically developed. The re-classifications from General Industrial to Limited Industrial would be expected to result in a corresponding drop in rail, truck and waterborne freight transport, relative to the existing General Plan.

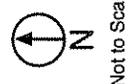
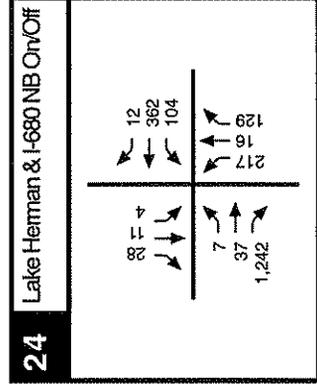
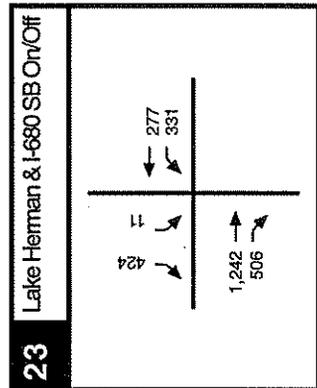
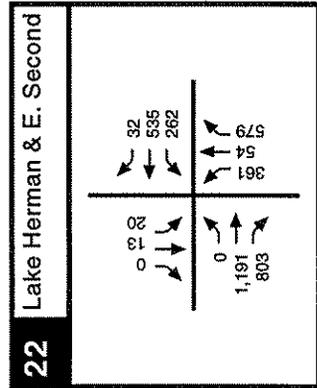
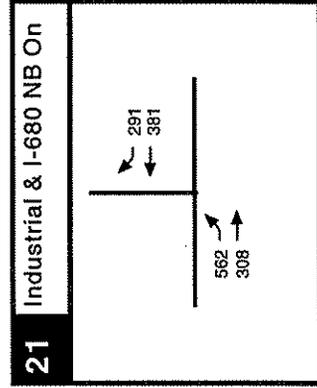
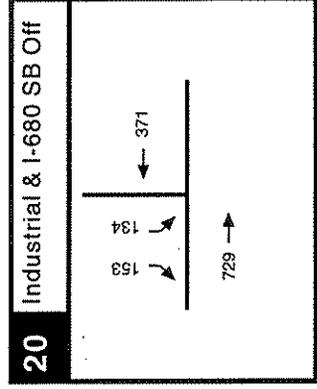
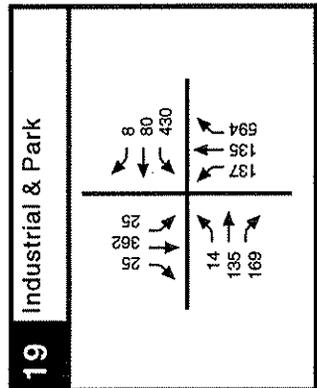
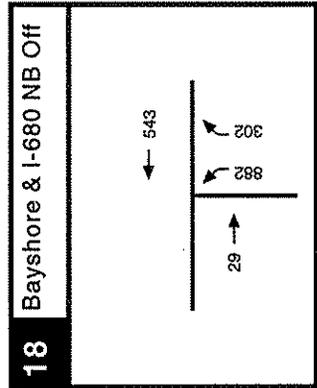
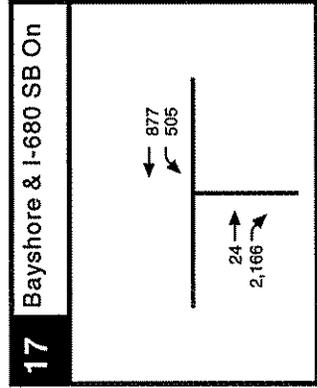
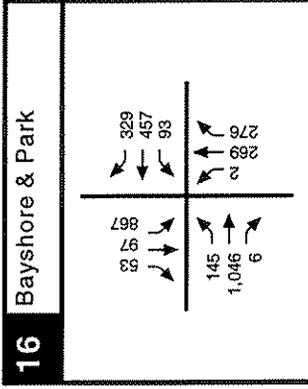
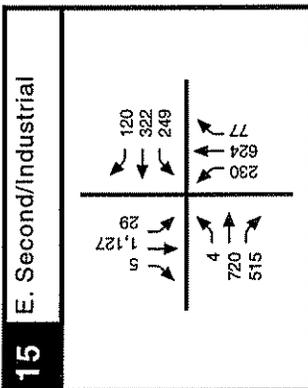
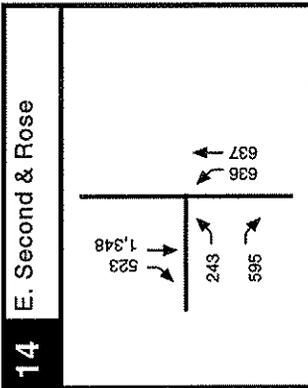
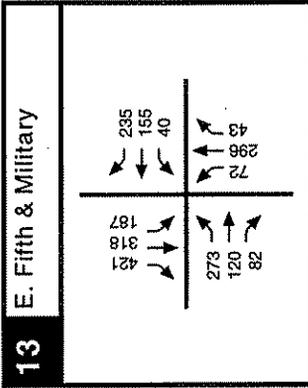


Not to Scale.

PM Peak Hour is generally 5:00 - 6:00 in the downtown and western areas of the city, and 4:30 - 5:30 in the northeastern part of the city.

FIGURE 11a

**PM PEAK HOUR INTERSECTION VOLUMES
GENERAL PLAN UPDATE**



PM Peak Hour is generally 5:00 - 6:00 in the downtown and western areas of the city, and 4:30 - 5:30 in the northeastern part of the city.

FIGURE 11b

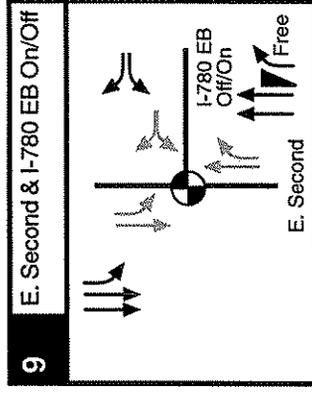
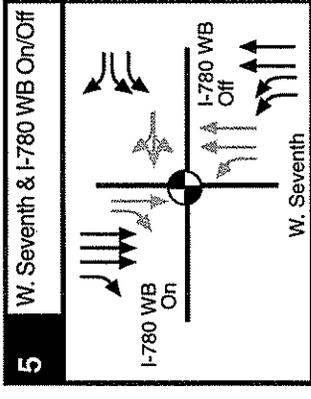
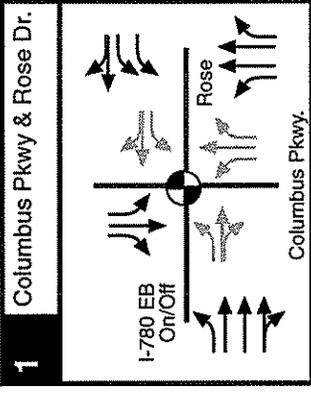
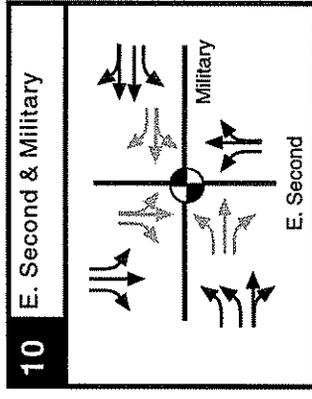
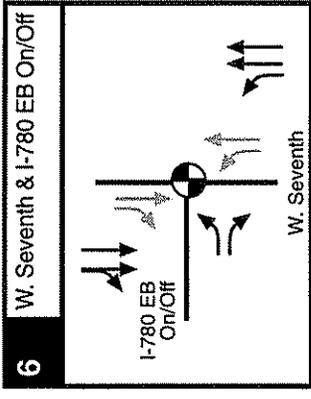
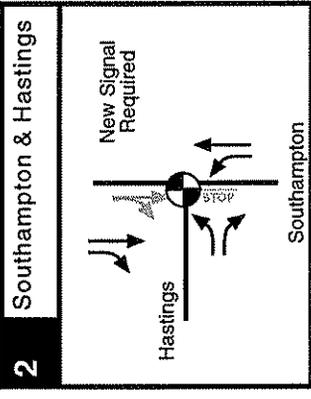
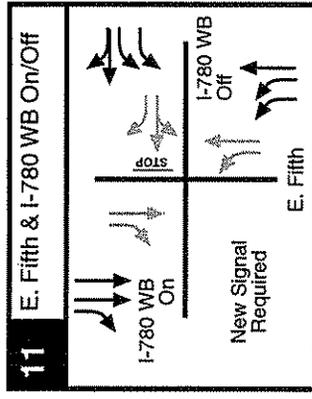
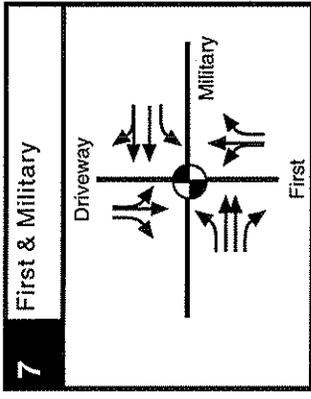
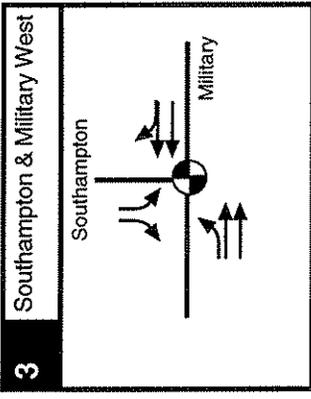
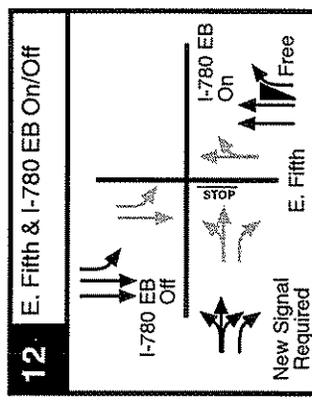
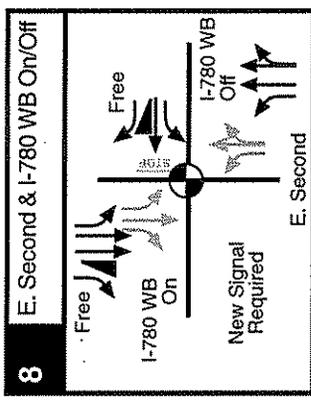
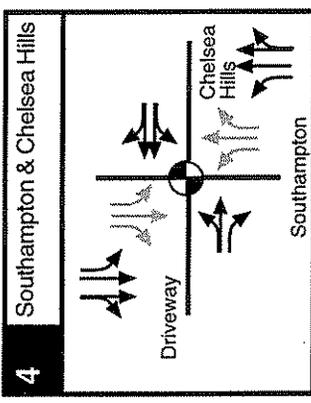
**PM PEAK HOUR INTERSECTION VOLUMES
GENERAL PLAN UPDATE**

Table 10. Intersection LOS: Future Conditions with Existing General Plan vs General Plan (2015)

DESCRIPTION	CONTROL TYPE	EXISTING GP			GP UPDATE		
		v/c	delay	LOS	v/c	delay	LOS
1. Columbus Parkway/Rose Drive	Signal	2.15		F	1.75		F
2. Southamptton/Hastings	One-way Stop		46/7	F/B		28/4	D/A
3. Southamptton/Military West	Signal	0.54		A	0.58		A
4. Southamptton/Chelsea Hills	Signal	1.24		F	1.09		F
5. West Seventh/I-780 WB On/Off	Signal	1.44		F	1.72		F
6. West Seventh/I-780 EB On/Off	Signal	0.74		C	1.07		F
7. First/Military	Signal	0.67		B	0.76		C
8. East Second/I-780 WB On/Off	One-way Stop		*/*	F/F		*/*	F/F
9. East Second/I-780 EB On/Off	Signal	1.17		F	1.28		F
10. East Second/Military East	Signal	0.91		E	1.57		F
11. East Fifth/I-780 WB On/Off	One-way Stop		*/*	F/F		*/*	F/F
12. East Fifth/I-780 EB On/Off	One-way Stop		*/*	F/F		*/*	F/F
13. East Fifth/Military East	Signal	1.14		F	1.23		F
14. East Second/Rose Drive	Signal	2.16		F	1.91		F
15. East Second/Industrial	Two-way Stop		*/*	F/F		*/*	F/F
16. Bayshore/Park	Four-way Stop		*	F		*	F
17. Bayshore/I-680 SB On	WB Left Yield		*/*	F/F		*/*	F/F
18. Bayshore/I-680 NB Off	One-way Stop		*/*	F/F		*/*	F/F
19. Industrial/Park	Four-way Stop		*	F		*	F
20. Industrial/I-680 SB Off	One-way Stop		*/95	F/F		*/28	F/D
21. Industrial/I-680 NB On	One-way Stop		*/*	F/F		*/*	F/F
22. Lake Herman/East Second	Two-way Stop		*/*	F/F		*/*	F/F
23. Lake Herman/I-680 SB On/Off	One-way Stop		*/*	F/F		*/*	F/F
24. Lake Herman/I-680 NB On/Off	Two-way Stop		*/*	F/F		*/*	F/F

Note: For signalized intersections, the volume to capacity ratio is given. For side street stop-controlled intersections, two delays and service levels are given: the delay for the worst movement, and the average intersection delay. For four-way stops, the average intersection delay is given.

* = very long delays (over two minutes)



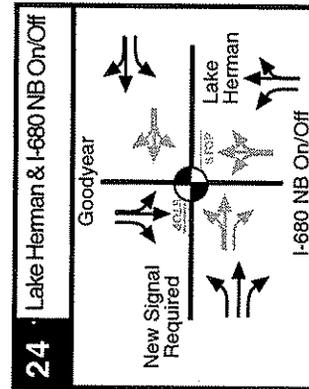
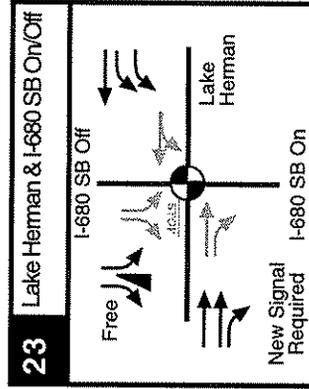
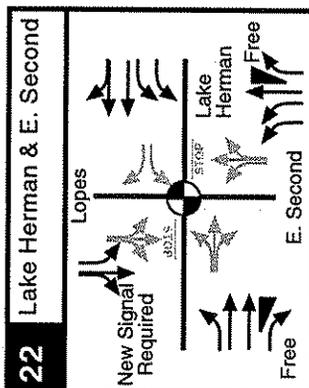
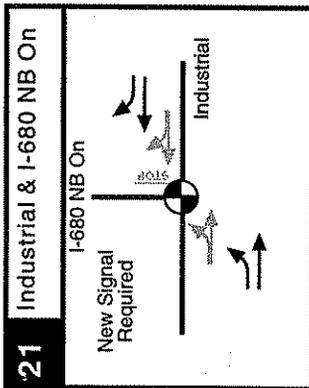
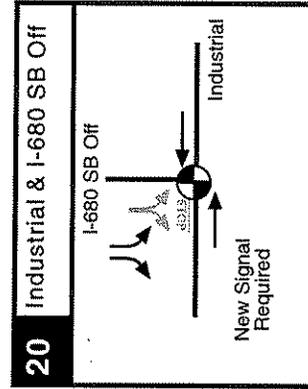
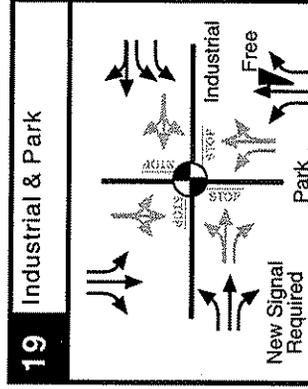
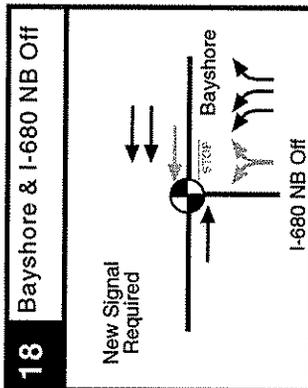
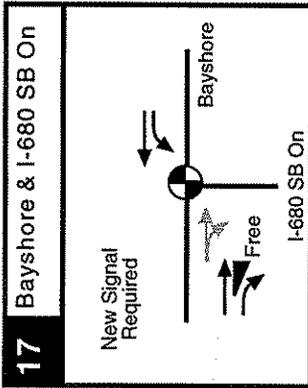
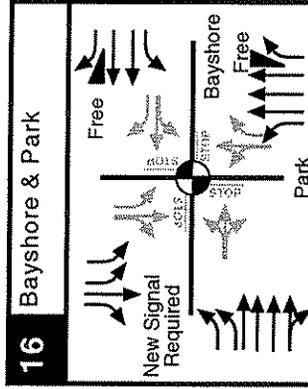
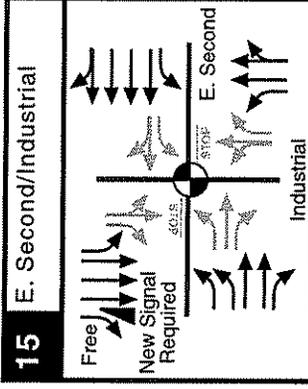
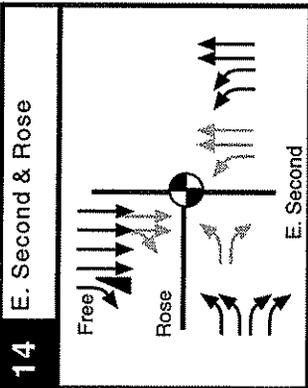
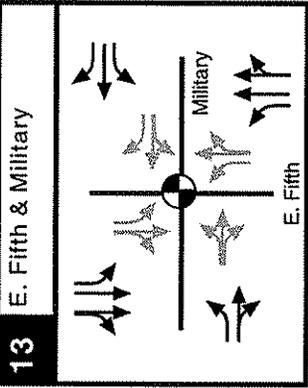
Key:
 = Stop Sign
 = Signal
 = Pre-Mitigation
 = Post-Mitigation

N
 Not to Scale.

FIGURE 12a

INTERSECTION IMPROVEMENTS

Fehr & Peers Associates, Inc.
 Transportation Consultants



Key:
 = Stop Sign
 = Signal
 = Pre-Mitigation
 = Post-Mitigation

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 Not to Scale

FIGURE 12b

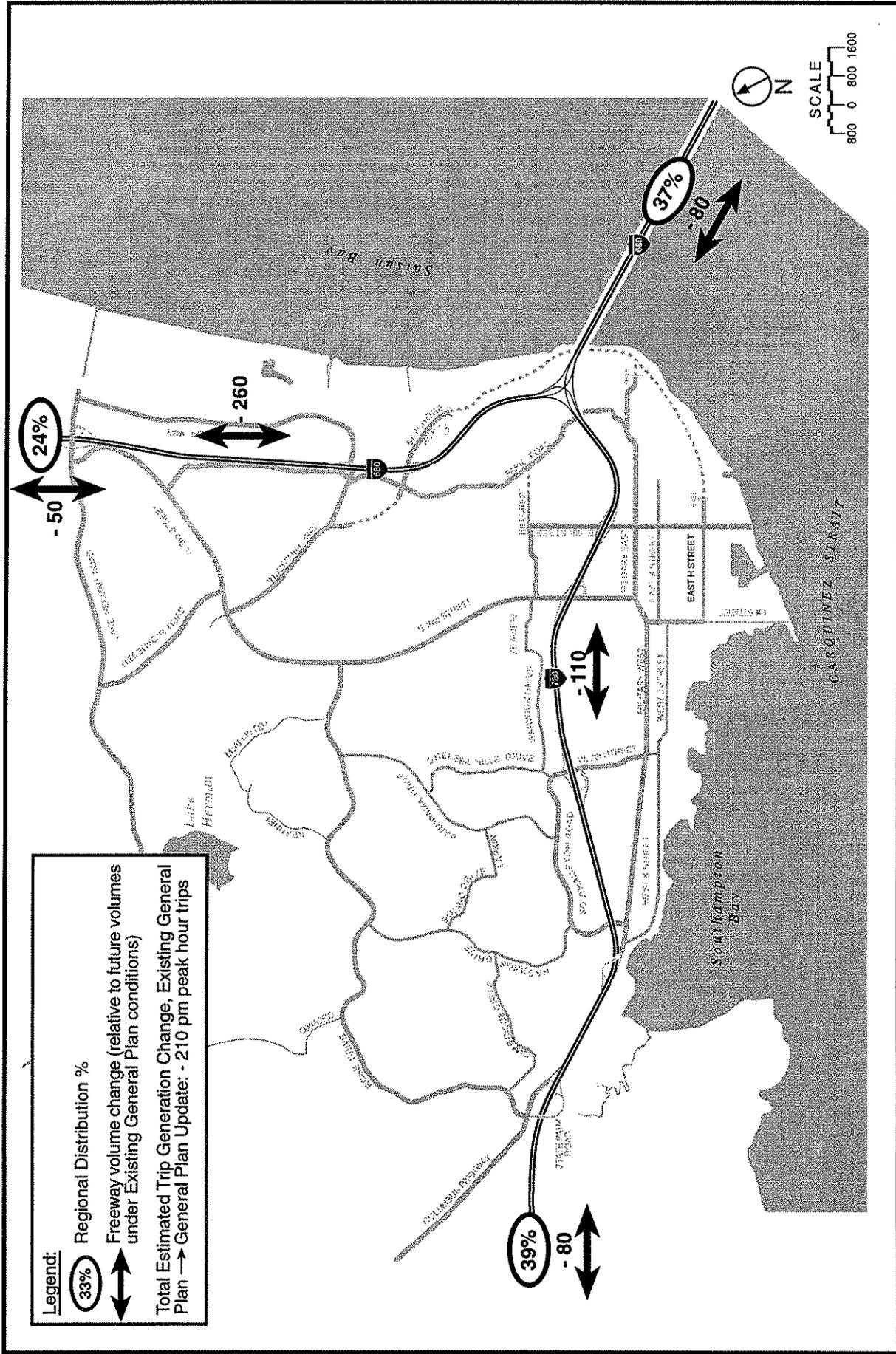
INTERSECTION IMPROVEMENTS

Table 11. Intersection LOS: Future Conditions with and without Intersection Improvements

DESCRIPTION	EXISTING CONTROL TYPE	GP UPDATE (w/o improvements)			GP UPDATE (with improvements)		
		v/c	delay	LOS	v/c	delay	LOS
1. Columbus Parkway/Rose Drive	Signal	1.75		F	0.89		D
2. Southampton/Hastings	One-way Stop		28/4	D/A	0.71		C
3. Southampton/Military West	Signal	0.58		A	0.58		A
4. Southampton/Chelsea Hills	Signal	1.09		F	0.82		D
5. West Seventh/I-780 WB On/Off	Signal	1.72		F	0.84		D
6. West Seventh/I-780 EB On/Off	Signal	1.07		F	0.76		C
7. First/Military	Signal	0.76		C	0.76		C
8. East Second/I-780 WB On/Off	One-way Stop		*/*	F/F	0.84		D
9. East Second/I-780 EB On/Off	Signal	1.28		F	0.87		D
10. East Second/Military East	Signal	1.57		F	0.83		D
11. East Fifth/I-780 WB On/Off	One-way Stop		*/*	F/F	0.89		D
12. East Fifth/I-780 EB On/Off	One-way Stop		*/*	F/F	0.89		D
13. East Fifth/Military East	Signal	1.23		F	0.88		D
14. East Second/Rose Drive	Signal	1.91		F	0.89		D
15. East Second/Industrial	Two-way Stop		*/*	F/F	0.87		D
16. Bayshore/Park	Four-way Stop		*	F	0.89		D
17. Bayshore/I-680 SB On	WB Left Yield		*/*	F/F	0.79		C
18. Bayshore/I-680 NB Off	One-way Stop		*/*	F/F	0.80		D
19. Industrial/Park	Four-way Stop		*	F	0.87		D
20. Industrial/I-680 SB Off	One-way Stop		*/28	F/D	0.82		D
21. Industrial/I-680 NB On	One-way Stop		*/*	F/F	0.69		B
22. Lake Herman/East Second	Two-way Stop		*/*	F/F	0.87		D
23. Lake Herman/I-680 SB On/Off	One-way Stop		*/*	F/F	0.87		C
24. Lake Herman/I-680 NB On/Off	Two-way Stop		*/*	F/F	0.65		B

Note: For signalized intersections, the volume to capacity ratio is given. For side street stop-controlled intersections, two delays and service levels are given: the delay for the worst movement, and the average intersection delay. For four-way stops, the average intersection delay is given. Mitigation improvements are shown in Figure 12.

* = very long delays (over two minutes)



**ESTIMATED FREEWAY IMPACT
 GENERAL PLAN UPDATE**

FIGURE 13

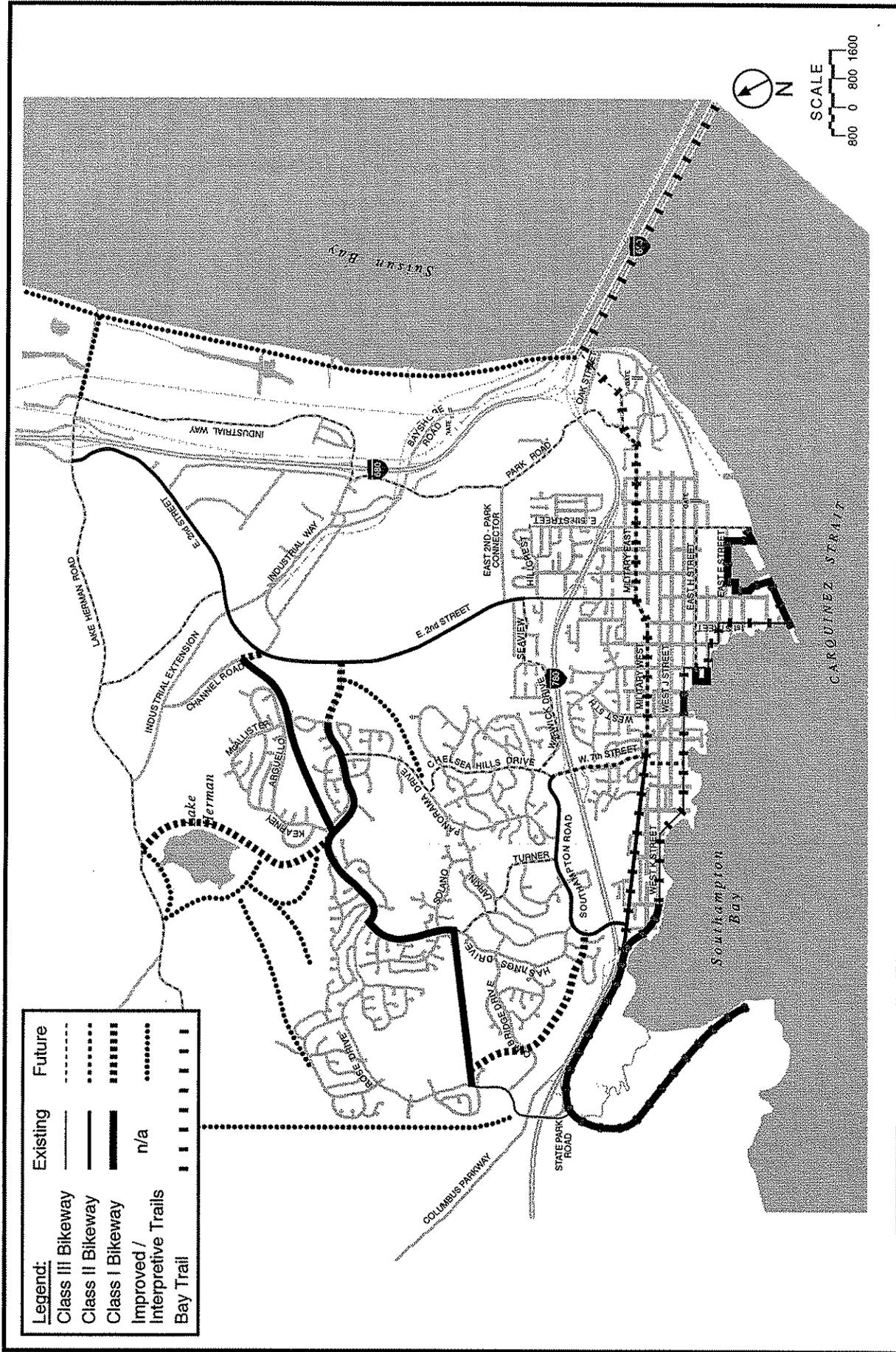
Table 12. Level of Service Criteria for Roadway Segments

LEVEL OF SERVICE	Maximum Daily Trips to Achieve LOS		
	2-Lane Urban Arterial	4-Lane Urban Arterial	6-Lane Urban Arterial
A	13,700	29,800	45,400
B	15,000	31,900	48,100
C	15,600	33,000	49,700
D	16,500	34,900	52,400
E	17,400	36,700	55,200

Source: Florida Department of Transportation, January 1989.

In addition, the General Plan circulation system includes a future public roadway connection through the port/arsenal area, which would more effectively accommodate truck trips in and between the northern industrial area and the southern port/arsenal area. The connection would help minimize the impact of truck trips on residential and general commercial streets. The General Plan also contains programs to monitor truck traffic and truck-related citizen and business complaints, in order to manage truck impacts on an ongoing, responsive basis.

The General Plan contains several policies and programs which promote safe and convenient facilities for walking and bicycling trips, for both recreational and commuting/shopping trips. In particular, Policies 2.66.2, 2.66.4, 2.66.5, 2.67.1, 2.67.2, 2.68.1 and 2.68.2 support the provision of connected bicycle and pedestrian facilities throughout the City. These policies and programs are consistent with the land use patterns contained within the General Plan, and would ensure that pedestrian and bicycle modes of travel are accommodated as development under the General Plan occurs.



**BICYCLE AND MULTI-USE TRAIL
 CIRCULATION SYSTEM**

FIGURE 14

D. IMPACTS AND MITIGATION MEASURES

Impact CIRC-1: Of the 24 intersections studied, 22 would operate below the proposed General Plan standard of LOS C under projected buildout conditions.

Mitigation Measure CIRC-1: The City should add the improvements shown in Figure 12 to the CIP and continue its traffic monitoring program as new development allowed by the General Plan takes place. The improvements should be implemented as they become necessary and the improvement list should be revised as necessary based upon actual traffic patterns which develop, physical constraints, and other considerations such as neighborhood impacts, and community character. Whenever possible, the City should consider alternatives to intersection widening, including signalization, aggressive Travel Demand Management programs, rerouting traffic, prohibiting certain turning movements during peak hours, and coordinating traffic signals.

Impact CIRC-2: Future traffic volumes under the General Plan indicate the need for four lanes on the following arterials in order to maintain a minimum of LOS E:

- (1) Lake Herman Road east of the I-680 NB ramps;
- (2) East Second Street between Lake Herman Road and the existing four-lane section;
- (3) East Second Street between I-780 WB ramps and Military East;
- (4) East Fifth Street between I-780 WB ramps and Military East;
- (5) Industrial Way between Lake Herman Road (along new extension) and the I-680 ramps;
- (6) Bayshore Road between I-680 SB ramp and Industrial Way;
- (7) Military West between West Fifth and West Second;
- (8) Military East between East Second and East Fifth;
- (9) West Seventh Street between Chelsea Hills and Military West; and
- (10) Park Road between Industrial and Bayshore.

Mitigation Measure CIRC-2: To the extent that the improvements listed above are not in the CIP, the City should consider adding them to the CIP. The City should continue its traffic monitoring program as new development allowed by the General Plan Update takes place. The improvements should be implemented if they are found necessary. The improvement list should be revised as necessary based upon actual traffic patterns which develop, physical constraints, and other considerations such as neighborhood impacts and community character. The City should also consider other alternatives to widening such as "spot widening" at congestion points, aggressive Travel Demand Management programs,

rerouting traffic, prohibiting certain turning movements during peak hours, and coordinating traffic signals.

Mitigation Measures CIRC-1 and CIRC-2 could result in widenings of intersections and roadway segments. Such construction projects could have negative visual impacts, since they would result in larger areas of paved roadway and, in many areas, smaller areas of landscaping or open space next to roads. Both mitigation measures provide alternatives to widenings as well, and the General Plan (page 141) recognizes the liabilities that can result from over-sizing roads and intersections. Provided that the General Plan guidance is followed and alternatives are implemented where possible, then only minimal visual impacts should result.

Impact CIRC-3: The intensification of uses in the Downtown and Arsenal areas may require increased transit service.

Mitigation Measure CIRC-3: The City should work with Benicia Transit to incorporate the effects of the General Plan's land use changes into the Short Range Transit Plan, in particular planning for increased service in the Downtown and Arsenal areas.

4.6 VISUAL QUALITY & URBAN DESIGN

This section summarizes information on the visual and urban design resources of the City and provides an evaluation of the effects the proposed General Plan would have on these resources.

A. EXISTING SETTING

This section provides a general description of the existing visual and urban design resources within Benicia. These resources are graphically represented in Figure 15. Further detail on these resources is contained in the Urban Design Background Report.

1. NATURAL FEATURES

Benicia is a place of immense natural variety and drama. The water of the Carquinez Strait and the land meet in places with rocks, and in other places with the soft swaying of tule marshes cradling a rich variety of life. The soft rolling hills rise dramatically from the water's edge of the narrowing of the Carquinez Strait.

2. SCENIC VIEWS

Relative to most communities, Benicia is rich with attractive views and vistas. As a result, vistas are one of the most significant elements defining the City's community character. Vistas are composed primarily of views of the water, of the hills, and of the community from within and from external locations. In addition, there are a variety of streetscape views, such as those along First Street, that warrant preservation and/or enhancement. Such streetscapes provide a more intimate and enclosing sense than the grand views of the hills, water, and City. The Arsenal also features a number of attractive views from streets and buildings, which are identified for preservation through the *Arsenal Historic Conservation Plan*.

3. SCENIC STREETS AND GATEWAYS

There are three principal scenic routes in the City of Benicia:

- I-780 between Glen Cove Road and the former Pine Lake basin;

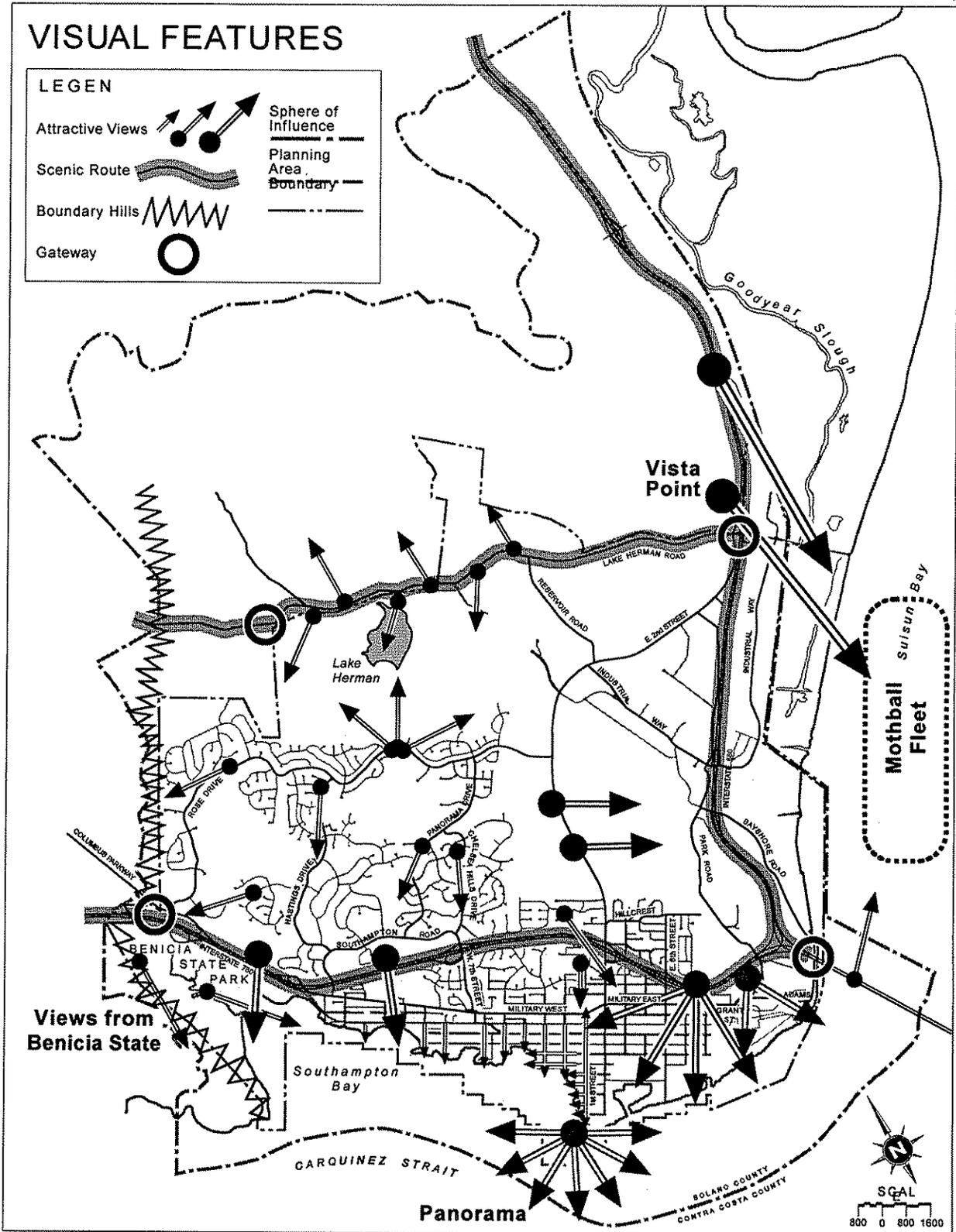


Figure 15

- I-680 between Morrow Lane and the Benicia Bridge; and
- Lake Herman Road.

Along these scenic routes are four natural gateways, as identified in the General Plan. Topography and road configuration leading up to each gateway tends to block views into the community. Only after passing through the gateways are various parts of the community revealed. Undeveloped hillsides and landscaped slopes leading up to the gateways add a rural setting and help give Benicia a separate identity from neighboring communities.

Another key feature of the gateways is the Boundary Hills. These north-south trending hills extend from Dillon Point on the Carquinez Strait to well north of Lake Herman Road. The Boundary Hills, viewed from I-780 and from Lake Herman Road, form the basis of the visual and physical separation from Vallejo and are essential to maintaining Benicia's separate identity.

4. PUBLIC REALM AND STREETSCAPES

Streets, plazas, squares, and formal open spaces such as City Park are the living rooms of the community. As such, they are the places where random personal contacts can reinforce social, political, and commercial relationships. The details of the public realm determine a person's capacity to feel secure and comfortable and to be connected or alone as they choose. Benicia's public realm has a few prototypical streetscapes: the Downtown area, Southampton, and the industrial areas, as described in more detail below:

- *Downtown.* The old portion of Benicia, generally south of Military but with a few similar blocks north of Military, is characteristic of nineteenth century and early twentieth century American neighborhoods with gridded street patterns. The area is dominated by east/west streets with east/west alleys. These streets typically have vertical curbs, parallel parking with substantial reliance upon street parking, and parkway planter strips with trees between the sidewalk and curb. Building fronts are dominated by porches and vertical massing of windows and structures. Uses are integrated with some streets having office, retail and housing on the same block.
- *Southampton.* Southampton is a typical late twentieth century streetscape with a curvilinear, hierarchal street pattern. Streets have relatively narrow sidewalks, very few street trees, and no separation between sidewalks and traffic. Vehicles are parked at curbside much less frequently than in downtown neighborhoods because of the lower density and greater percentage of available garage spaces and driveways. The building forms are dominated by garage doors and large lawns. Uses are almost solely residential except for schools and a few community facilities. Utilities have

been constructed underground, and the area displays a general sense of lack of activity and interaction.

- *Industrial Areas.* The older industrial areas are characterized by large scale, horizontal buildings. The pavement systems are, in some areas, random and chaotic with little consideration for pedestrian movements, safety, or comfort. In addition, landscaping and screening of uses is inadequate and overhead utilities are unattractive. The newer areas have a wider variety of building sizes and construction systems and uses. There is more clarity of entry and better screening of storage areas.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact to visual and design factors if it would:

- Have a substantial, demonstrable negative aesthetic effect on existing defining features.
- Substantially obstruct significant public views and view corridors.
- Result in development that is not harmonious with the surrounding setting.

C. IMPACT DISCUSSION

Specific guidance for the design of buildings and public places is provided in the Community Identity Chapter of the proposed Benicia General Plan. The Update proposes several new sets of goals, policies and programs aimed at protecting visual resources within the City of Benicia and encouraging quality design, as discussed in more detail below:

- *Small town atmosphere.* The Update proposes a series of policies to maintain and reinforce Benicia's small-town character, including retaining the City's pedestrian facilities and scale (Policy 3.16.2), maintaining the appearance and character of the historic Downtown (Policy 3.16.3), and maintaining gathering spaces for social events (Policy 3.16.4).
- *Place-making; Place definition.* A series of policies is proposed to enhance the visual and functional quality of the community (Policies 3.17.1, 3.17.2, 3.17.3, 3.17.4, and 3.17.5).
- *Barriers.* The Update proposes a series of policies designed to ensure that the I-780 corridor does not continue to be a barrier between Southamptton and Benicia south of I-780 (Policies 3.18.1, 3.18.2, and 3.18.3).
- *Natural Features.* The General Plan directs the City to preserve natural features such as streams, marshes, mature trees, and rock outcroppings (Goal 3.19 and Policy 3.19.1).

- *Vistas.* Several goals, policies, and programs are proposed to protect vistas and views (Goals 3.20 and 3.21 and associated programs and policies).
- *Gateways.* The Update proposes two policies to enhance gateways to provide a sense of entry at the edges of the City (Policies 3.22.1 and 3.22.2)
- *Scenic Roads and Highways.* A series of policies are proposed to protect and enhance scenic roads and highways within the City (Policies 3.23.1, 3.23.3, 3.23.4, 3.23.5, 3.23.6, 3.23.7, 3.24.1, 3.24.2, 3.24.3, and 3.24.4).
- *Streets.* Several goals, policies and programs are proposed to improve the City's streetscape and to preserve and extend the grid pattern of Benicia streets (Goals 3.25, 3.26, 3.27, and 3.28 and associated policies and programs).
- *Building type and design.* A series of goals and policies are aimed at promoting architectural consistency with variety (Goal 3.29 and associated policies), attempting to capture more development on less land (Goal 3.30 and associated policies), increasing the amount of mixed use development in appropriate places (Goal 3.31 and associated policies), and insisting on quality development within the City (Goal 3.33 and associated policies).
- *Neighborhoods.* The General Plan also proposes a series of goals and policies to enhance neighborhood cohesiveness, including specific goals and policies for the East Side (Goal 3.35 and associated policies), the Industrial Park (Goal 3.36 and associated policies), the Downtown (Goals 3.37, 3.38 and 3.39 and associated policies), and the Waterfront (Goal 3.40 and associated policies).

The implementation of the proposed goals, policies and programs of the General Plan are not anticipated to have any significant negative visual or design impacts, principally because they encourage well-designed development.

Development under the General Plan has the potential to affect existing visual and design resources which may result in the loss of desirable components of the visual environment. However, the City of Benicia will continue to require design review on significant development projects. Additionally, the protection afforded by the Downtown and Arsenal Historic Districts will ensure that development within these districts does not negatively affect the historic qualities of the districts.

Land use changes proposed by the General Plan would also serve to greatly minimize the potential for adverse impacts to visual resources. Of particular importance is the elimination of most of the future development potential for lands north of Lake Herman Road, which would protect an extensive amount of open space lands outside the identified Urban Growth Boundary. This land use change would serve to provide a natural and visual buffer between the City of Benicia and

land to the north. Additionally, several properties are proposed to be redesignated from General Industrial to Limited Industrial, which is expected to increase the visual quality of developments in these areas.

For these reasons, no significant negative impacts to visual resources or urban design are expected with implementation of the proposed General Plan.

4.7 CULTURAL RESOURCES

This section summarizes information on the cultural resources in Benicia and provides an evaluation of the effects the proposed General Plan would have on these sensitive resources.

A. EXISTING SETTING

This section provides a general description of the existing cultural resources within Benicia. Further detail on the historic and archeological resources within the City is contained in the Historical and Archeological Background Report.

1. ARCHEOLOGICAL RESOURCES

The Vallejo-Benicia area was originally settled by the Southern Patwin group of Native Americans. The Southern Patwin, with a pre-contact population of approximately 3,300, inhabited the areas west of the Sacramento River and north of the Carquinez Strait. Because of European diseases, military raids, abusive treatment at the Missions, declining birth rates and other causes, the Southern Patwin were extinct by the beginning of the twentieth century.

The Patwin were a hunting and gathering society that depended mostly on acorns and fish for sustenance. Their settlements occurred next to water supplies. The nearest Patwin village sites that archaeologists have definitely located are on the Napa River and near the present City of Fairfield. There are mortar sites at the Benicia State Recreation Area. Although early explorers reported seeing "many villages" on the north shore of the Carquinez Strait and mapped a village at the head of Southampton Bay, it remains undocumented whether this region was regularly inhabited, how it was utilized, and who used it.

In 1986, a detailed archaeological study was conducted on the 350-acre Sky Valley Residential Development site adjacent to Sulphur Springs Creek and upstream from Lake Herman. No prehistoric cultural resources were detected in this study or from subsequent studies in the 5,000-acre Sky Valley Benicia Specific Plan Area or within a one mile radius. No other specific surveys of the Benicia area are known to have been conducted.

While a number of potential archaeological sites may exist in Benicia, the one known resource is an underwater archeological site at the Mathew Turner Shipyard State Park. The site is of the remains of the Stromboul, a former whaling ship that was originally designed and built on the East Coast to ship ice from New England to India.

Six other archaeological sites may also exist within Benicia's City limits. One is a Native American site, possibly a campground, rumored to be located in the vicinity of Lake Herman Road and the Suisun Bay marsh. Another is rumor that a campground for the WPA once existed in the vicinity of Lake Herman Road and the Suisun Bay marsh. The other four potential sites are located in the Arsenal and Downtown. In the Arsenal, a limestone quarry may have been used as a dump after its usefulness as a quarry was over. Another site in the Arsenal is a lavatory behind the Camel Barn. In the Downtown, Native American artifacts have been found in the general areas of "G" Street and the waterfront, where the fifth and sixth possible archaeological sites may occur.

2. HISTORIC RESOURCES

The City has two identified historic districts: one encompasses the Downtown commercial and residential area centered along First Street, and the other falls within the boundaries of the former Benicia Arsenal. In 1990 and 1993 the City prepared and adopted conservation plans for the Downtown and Arsenal historic overlay districts respectively. The resources in these districts are briefly described below.

DOWNTOWN HISTORIC DISTRICT

Boundaries for the Downtown Historic Conservation District were drawn to include blocks with the highest concentration of historic buildings established during the initial development of Benicia's central business district from the waterfront at the foot of First Street to Military West and "L" Street, including the residential areas associated with this business district. The Downtown Historic District has two sub-areas: the Central Area and the Eastern Residential Area. These two areas are discontinuous because most of the development surrounding the Eastern Residential area is recent and, although mixed in some blocks, is quite different in character from the older areas. The period of significance for both areas in the Downtown Historic District is from 1847 to 1940. This period begins with the plotting of the City by Jasper O'Farrell and ends at a time fifty years before the downtown study was conducted in 1990.

Downtown Benicia has three broad categories or types of buildings: commercial, institutional (including civic and religious structures), and residential. The commercial buildings are clustered along First Street for the most part. Older institutional buildings are found generally on or within a block of First Street,

while later, i.e., 20th century examples, are more widely dispersed. Residential buildings are represented principally on the east-west streets, although some are located on First Street as well.

In addition to the resources within the district boundaries, the City of Benicia has identified individual landmarks in the vicinity of the Downtown which fall outside the logical boundaries of the district. Nevertheless they have strong associations with the growth and development of downtown. These include the Wingfield house, which is the former residence of Bishop Wingfield on grounds occupied by St. Augustine's College and St. Dominic's Church on "I" Street near East Fifth Street. These structures were identified within the Downtown Historic Conservation Plan because of their proximity to the Downtown, even though they are not included within the district boundary. They are designated as individual landmarks in accordance with the procedures outlined under the Historic District Overlay Zoning. Since these structures are individually designated, they are subject to the City's design guidelines.

ARSENAL DISTRICT

The Arsenal Historic Conservation District includes 345 acres of land originally donated by the town's founders for use as a military reservation. This original land grant includes all of the surviving pre-World War II structures, as well as the former Administration Building (No. 92), which is the only architecturally significant landmark structure in the Arsenal dating from the World War II era. The period of significance for the Arsenal Historic District begins in 1849, when the Benicia Barracks were established, and runs through 1964, when the Benicia Arsenal was deactivated. The most recent building of significance is the 1942 Administration Building.

The two broad categories or types of historic buildings in the Arsenal Historic District are the military/industrial buildings that comprise most of the district's historic structures and the residential buildings where military personnel were formerly quartered. The latter are concentrated in the middle zone of the district between the Jefferson Street embankment and the freeway. The military/industrial buildings are scattered over the site, located principally in the areas south of Adams Street and north of the freeway.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact with regard to cultural resources if it would:

- Disrupt or adversely affect a prehistoric or historic archaeological site or property of historic or cultural significance.

Result in the disruption of context or actual destruction of historic resources.

C. IMPACT DISCUSSION

The proposed General Plan provides a framework for orderly growth in the planning area, and includes provisions for the conservation of cultural resources, including protection and enhancement of sensitive archaeological sites and historic assets within the City. Incorporation of the additional goals and policies contained in the General Plan would provide an added level of protection and clarify the intent of the City to protect sensitive cultural resources, both documented and undocumented.

1. ARCHAEOLOGICAL RESOURCES

In order to protect archaeological sites and resources, the General Plan proposes a series of policies and programs. These include Policy 3.1.1, which is aimed to ensure that State and federal laws pertaining to pilfering of archaeological sites are enforced and Policy 3.1.2, which directs the City to ensure the protection and preservation of known artifacts.

Under the General Plan, the City would also take several measures (Programs 3.1.C, 3.1.D, and 3.1.E) in cooperation with the State Historic Preservation Office and the California Archaeological Inventory before issuing any permits for development or beginning any project within areas potentially containing archaeological resources. If development is proposed in an area where actual or probable sites of archaeological remains are present, the City would require that the proposed project be analyzed by a qualified archaeologist (Program 3.1.F) and that adequate mitigation is implemented (Programs 3.1.G and 3.1.H).

These new policies and programs are only anticipated to have beneficial effects, and no significant impacts to archeological resources are anticipated with the implementation of the General Plan.

2. HISTORIC RESOURCES

The Community Identity chapter of the proposed General Plan contains numerous policies directed at the preservation of historic resources. The policies and programs include direction to the City to continue to maintain a list of historic and architectural resources within the City (Policy 3.2.1) and several policies and programs aimed at the protection of these resources (Policies 3.5.1, 3.5.2, 3.5.4, 3.5.5, 3.4.6, 3.5.7, 3.5.8, 3.5.9, 3.5.10, 3.5.11, 3.5.12, 3.5.13, and associated programs). The proposed policies of the General Plan also include direction for the City to restore City-owned historic structures in danger of deterioration (Policy 3.5.3).

The General Plan also contains a section of policies aimed at ensuring that new development will be compatible with existing historic neighborhoods. These policies (3.6.1 and 3.6.2) would encourage consistent and sensitive development near historic properties and promote compatibility with historic character when adapting buildings for mixed use.

These new policies and programs are only anticipated to have beneficial effects, and no significant impacts to historic resources are anticipated with the implementation of the General Plan.

4.8 GEOLOGIC & SEISMIC HAZARDS

This section summarizes information on geologic and seismic hazards in the City and provides an evaluation of the effects the proposed General Plan with regard to these potential hazards. More detail on the existing geologic setting within the City of Benicia is contained in the Natural Resources Background Report.

A. EXISTING SETTING

1. REGIONAL GEOLOGIC SETTING

The City of Benicia is in an area of low hills located along the northern shore of the Carquinez Strait, along the eastern margin of the Coast Ranges Geomorphic Province.

Bedrock in the Benicia area consists predominantly of sandstone and mudstone of the Mesozoic-age Great Valley Sequence. Older sedimentary and volcanic rocks of the Mesozoic-age Franciscan Assemblage crop out only in the vicinity of Sulphur Springs Mountain. The Great Valley Sequence and Franciscan Assemblage are overlain by a diverse sequence of sedimentary and volcanic rocks of Cenozoic age.

Within the region, many valleys have been partially filled with unconsolidated sedimentary deposits of marine and non-marine clay, silt, sand, and gravel. These Quaternary-age deposits include Bay Mud along the shores of the Carquinez Strait and Suisun Bay, alluvium in the larger valleys, colluvium and landslide deposits in the hillside areas, and graded areas of cut and artificial fill in developed regions.

Several periods of tectonic deformation have occurred in the Coast Ranges Province during Cenozoic and Mesozoic time. That deformation produced numerous faults, most of which are no longer active. Presently, fault rupture occurs most frequently along northwest-trending strike-slip faults associated with the San Andreas fault system.

2. SEISMIC SETTING

Seismicity in the Benicia area is related to activity on the San Andreas system of

active faults. The principal active faults in the vicinity are the Concord and Green Valley faults. The Green Valley fault, northeast of Benicia, is the only known active fault within the Benicia Planning Area. Several other major active faults, including the Hayward, Rodgers Creek, and San Andreas, occur within 50 miles of Benicia. These faults are shown on Figure 16. These faults have the potential to generate moderate to severe ground shaking in Benicia.

In addition to strike-slip faults, blind thrust faults also present a hazard in certain areas of California. The boundary between the Coast Ranges and the Central Valley of California is marked by the presence of blind thrust faults. The Montezuma Hills, approximately 15 to 20 miles east of Benicia, may represent surface deformation resulting from movement at depth along a blind thrust fault.

These faults have the potential to generate strong ground shaking in Benicia. The Association of Bay Area Governments has published maps showing generalized ground motion amplification expected from earthquakes in the Bay Area. The map for the City of Benicia is represented in Figure 17.

The Working Group on California Earthquake Probabilities has estimated a 67 percent or higher chance of a large earthquake (Richter scale magnitude 7 or greater) occurring in the San Francisco Bay region by the year 2020. An earthquake of this magnitude could result in strong to violent ground shaking within the City of Benicia, which could result in impacts to existing structures and the City's population. The estimated effects of an earthquake of this intensity on the Concord-Green Valley fault is shown in Figure 18.

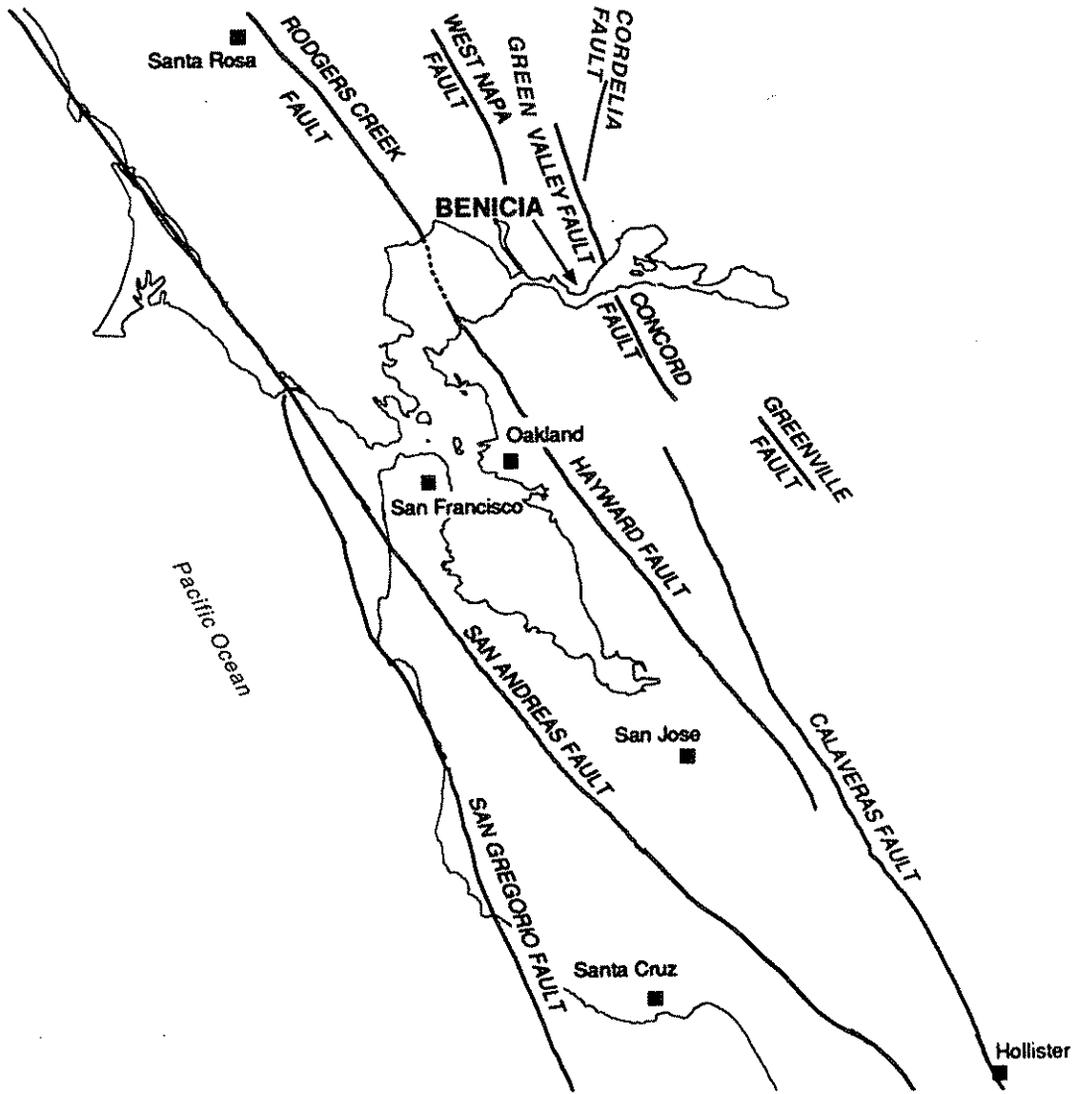
3. EXISTING GEOLOGIC AND SEISMIC HAZARDS

SEISMIC HAZARDS

The most significant seismic hazards within the City are ground shaking, fault rupture, and liquefaction, as discussed in more detail below.

- *Ground shaking* in Benicia could result from an earthquake on any of the principal active faults in the region. In addition, the intensity of ground shaking can be amplified by local geologic conditions. Areas most susceptible to a significant amplification of ground shaking are underlain by soft sediments such as Bay Mud. In several areas along the waterfront, fill has been placed over Bay Mud as a part of site development. These areas could experience stronger ground shaking than nearby areas underlain by bedrock.
- *Fault rupture* tends to occur along lines of previous faulting and is likely to occur in the future along the Green Valley fault as a result of an earthquake on that fault. The risk of fault rupture in the remaining portions of the Planning Area is very low.

PRINCIPLE ACTIVE FAULTS SAN FRANCISCO BAY REGION



SCALE



Reference: U.S. Geological Survey, 1990

Figure 16

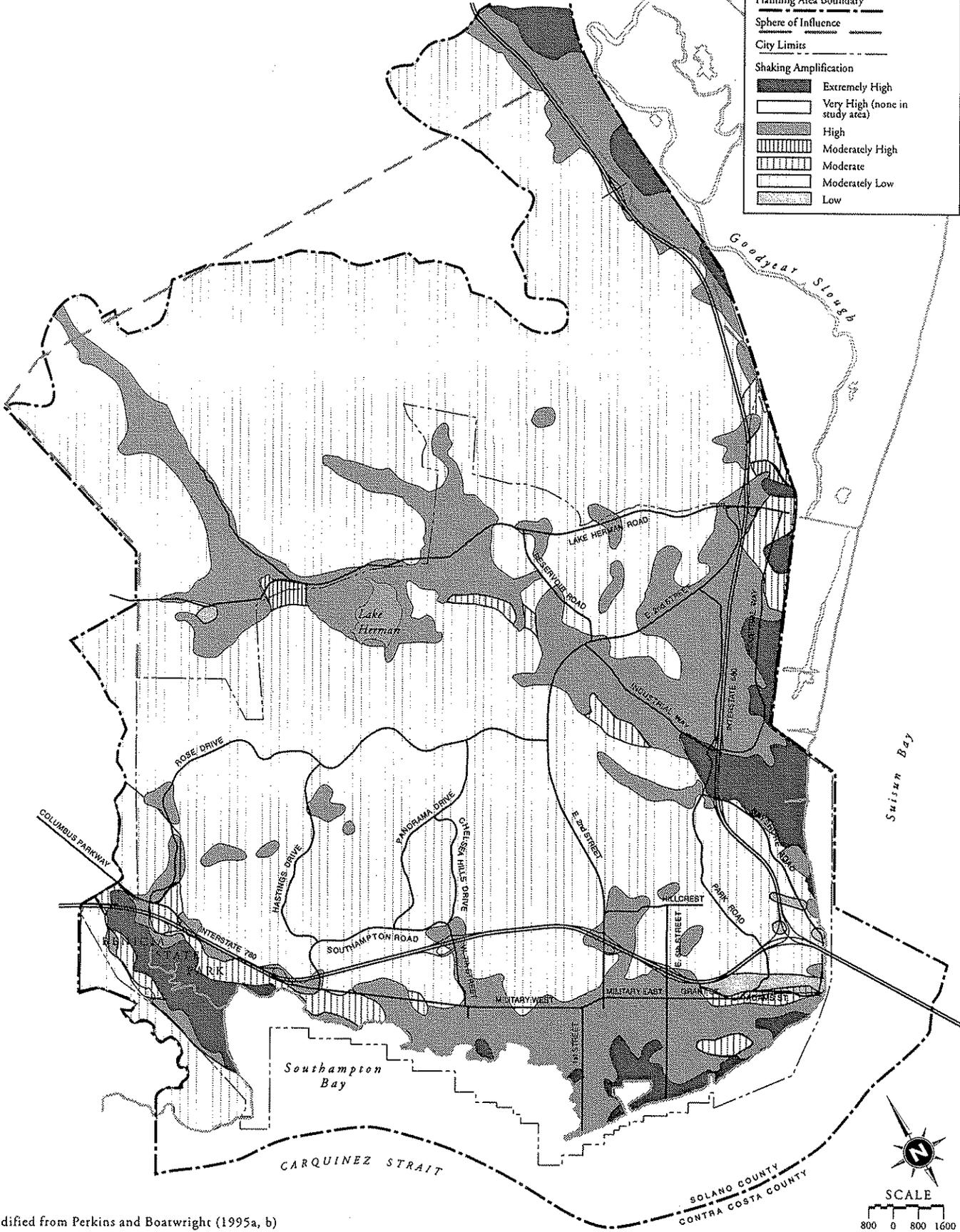
GROUND SHAKING AMPLIFICATION

LEGEND

- Planning Area Boundary
- Sphere of Influence
- City Limits

Shaking Amplification

- Extremely High
- Very High (none in study area)
- High
- Moderately High
- Moderate
- Moderately Low
- Low



Modified from Perkins and Boarwright (1995a, b)

Figure 17

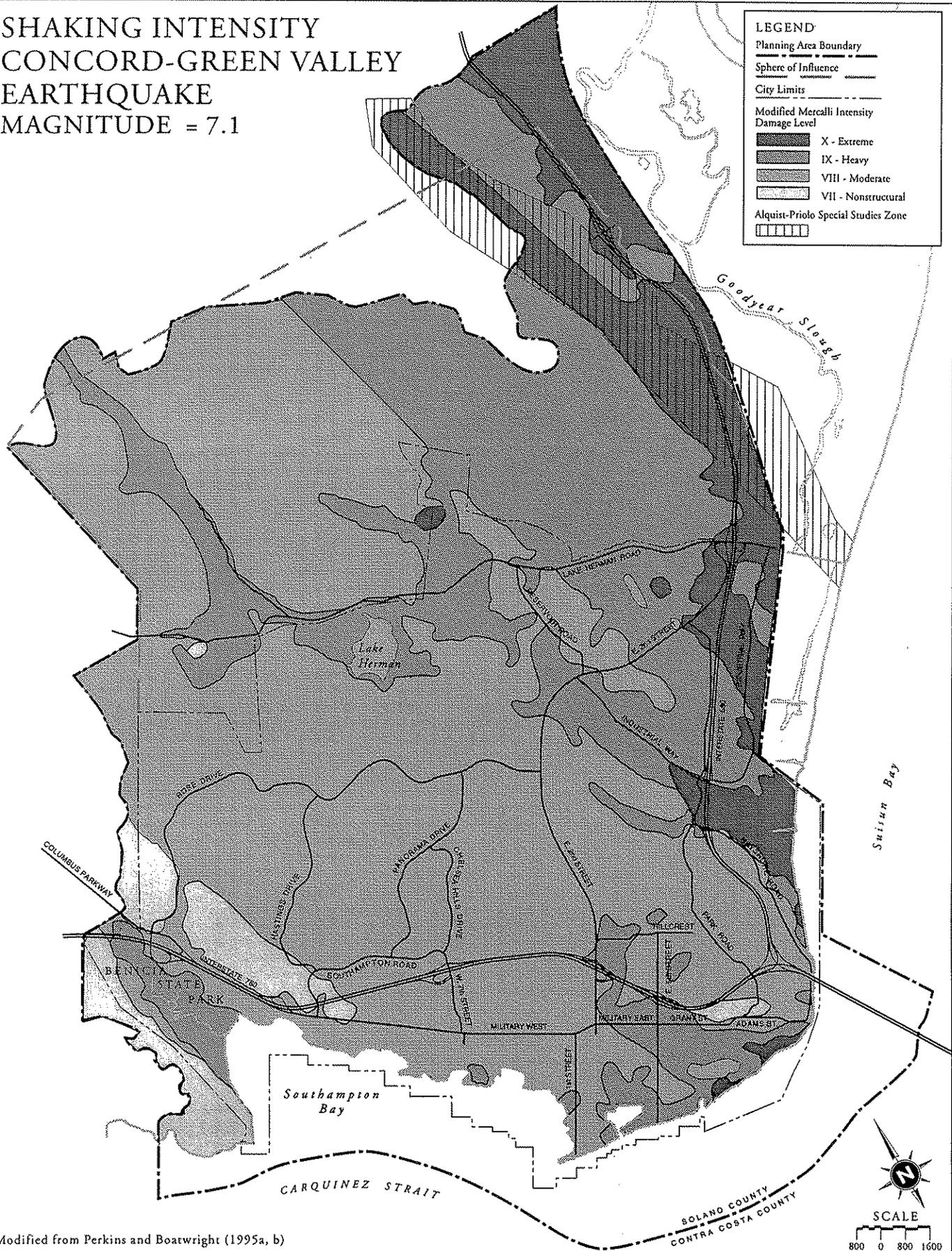
SCALE

800 0 800 1600

SHAKING INTENSITY CONCORD-GREEN VALLEY EARTHQUAKE MAGNITUDE = 7.1

LEGEND

- Planning Area Boundary
- Sphere of Influence
- City Limits
- Modified Mercalli Intensity Damage Level
 - X - Extreme
 - IX - Heavy
 - VIII - Moderate
 - VII - Nonstructural
- Alquist-Priolo Special Studies Zone



Modified from Perkins and Boatwright (1995a, b)

Figure 18

- *Liquefaction* is a phenomenon in which sediments undergo a sudden loss of strength during ground shaking. Within Benicia, the areas most at risk from liquefaction are along the bay margin and in the flat lying valley bottoms, in areas underlain by Bay Mud or Alluvium. The risk of liquefaction is moderate to low within the low-lying, coastal portions of Benicia and very low in upland areas.

Of these, the potential for ground shaking is the most serious and widespread.

SLOPE STABILITY HAZARDS

Following earthquake-related hazards, landslides and slope stability hazards are the second most significant geologic hazards in City. Specific slope stability hazards in the City of Benicia are discussed below.

- *Large landslides* generally involve bedrock and are 50 to 100 feet deep or more. These deep seated landslides are usually slow-moving. In the planning area, several large slides exist, including one on the west side of Sky Valley.
- *Earthflows* generally involve the surface soils and uppermost weathered bedrock, typically ranging in depth from 5 to 35 feet. Earthflows are probably the most common type of landslide in the City. They are typically active during the rainy season and are typically slow moving.
- *Debris flows*, sometimes known as debris avalanches, are rapidly moving mixtures of water, soil, rocks, and debris. They typically occur on steep slopes underlain by sandy bedrock. Within the study area, many of the swales or ravines which occupy the steep hill slopes may be capable of generating debris flows.

OTHER GEOLOGIC HAZARDS

Other geologic hazards present within the City include expansive soil and bedrock, and coastal erosion, as discussed below.

- *Expansive soils* undergo a significant volume change as a result of wetting or drying and can cause damage to improperly designed structures. Expansive soils are common in the area, occurring most frequently in areas underlain by mudstone of the Great Valley Sequence and the Nortonville Shale. Moderately to highly expansive materials can occur within the bedrock formations present in the study area. These materials are most commonly layers of mudstone or volcanic tuff within the Great Valley Sequence and Nortonville Shale.
- *Coastal erosion* is not a significant hazard in Benicia. Generally, the coastline of Benicia is protected from large waves, and the potential for large episodes of coastal erosion is judged to be moderate to small.

B. STANDARDS OF SIGNIFICANCE

The City of Benicia General Plan would result in a significant geological or seismic impact if it would:

- Cause a substantial change in any of the geotechnical conditions within the planning area.
- Bring people or development into areas exposed to unusually high levels of geologic hazard.

C. IMPACT DISCUSSION

With respect to geologic hazards, the General Plan includes a series of policies and programs to minimize harm from geologic hazards.

Geotechnical engineering reports are required by the Uniform Building Code for all major new structures or earth works, and this requirement is reflected through the General Plan (Policy 4.16.1 and Program 4.16.A). The requirement for geotechnical engineering reports has been in place for several decades and is consistent with current City policies. Such reports are the primary method by which onsite geologic or geotechnical hazards are evaluated and subsequently mitigated. Additionally, the City's General Plan includes a program to develop guidelines for site specific geologic and geotechnical reports (Program 4.16.B), which will further aid the City in addressing site-specific geotechnical hazards and verifying that geotechnical reports are complete and comprehensive.

Complex projects such as residential subdivisions within hillside terrain often require special expertise, such as geotechnical engineering or engineering geology. Experience in other cities in the Bay Area has shown that peer review can significantly improve the quality of geologic hazard mitigation and geotechnical engineering on projects and can reduce public exposure to life threatening geologic hazards and property damage. The City is proposing a program that will permit City staff to retain outside consultants with the necessary expertise to review geotechnical engineering reports and project plans on an as-needed basis (Program 4.16.C). This program would improve the quality of geotechnical engineering reports and reduce public exposure to geologic and geotechnical hazards. The program should also reduce the number and severity of post-construction defects and resulting litigation.

The City is also proposing the preparation of a planning-level geologic hazards map for the City, which would provide information to the public and City staff regarding the locations and nature of the various geologic hazards present in the planning area (Program 4.16.E). In addition, a planning area database of geologic information is proposed (Program 4.16.F), which would consist of all available

published maps, the geologic evaluations of various environmental impact reports and planning documents and soils reports for major projects. These are beneficial effects of the General Plan.

The General Plan also proposes several policies and programs to ensure that the Alquist-Priolo Act and the Uniform Building Code are enforced (Policies 4.16.3 and 4.16.4 and associated programs) and that the unreinforced masonry building program is continued and expanded (Program 4.16.K). These proposed policies and programs would reduce public exposure to the risk of structural collapse of these buildings during earthquakes.

The General Plan also includes several changes in land use classification for undeveloped parcels, mainly in the area north of Lake Herman Road. Several parcels formerly considered for development will be reclassified as open space. Portions of these parcels are in geologically hazardous areas subject to landslides or debris flows. Although the hazards will remain, maintaining these areas as open space will generally eliminate the need for mitigation of potential hazards. In addition, public exposure to inadequate hazard mitigation or on-going maintenance will be minimized.

The General Plan is only anticipated to have beneficial effects with regard to geologic and seismic hazards, and no significant impact or geologic hazards are anticipated with its implementation.

4.9 HYDROLOGY & WATER QUALITY

This section summarizes information on Benicia's hydrology and water quality and provides an evaluation of the effects the proposed General Plan would have on these resources. More detail on the existing hydrologic setting is contained in the Natural Resources Background Report, and more detail on existing flooding hazards is presented in the Public Safety Background Report.

A. EXISTING SETTING

1. CARQUINEZ STRAIT AND SUISUN BAY

CHARACTERISTICS

The Carquinez Strait occupies a physical narrows in the San Francisco Bay Estuary linking Suisun Bay to the east with San Pablo Bay to the west. Maximum depths in the channel reach 88 feet. Large scale eddying effects downstream of the Army Point pier and Benicia Point produce shoaling along the majority of the Benicia waterfront. Depths within this shallow zone range from a couple of feet in the mudflats of Southampton Bay to roughly 20 feet within 200 to 1000 feet of the shoreline.

Physical, chemical and biological characteristics of waters in the Carquinez Strait vary according to the magnitude of Delta outflows, tidal currents and other factors such as insolation, turbulent mixing by winds, resuspension of deposited sediments and urban/industrial and agricultural discharges. When Delta outflow is significant, as during the winter of 1995, an entrapment zone forms in the Strait. An entrapment zone is an area of no-net motion. The enhanced mixing that occurs in this zone results in a cycling and concentration of particulate matter that produces more turbid waters.

BAY AND DELTA WATER QUALITY

Water quality in Carquinez Strait, Suisun Bay, the Sacramento-San Joaquin Delta and the Sacramento and San Joaquin rivers is monitored by the California Department of Water Resources (DWR) in accordance with the requirements of

Water Right Decision 1485, issued in August 1978. The water quality monitoring site most representative of conditions in the Carquinez Strait at Benicia is at Martinez. Martinez is one of six sites which are equipped to continuously monitor the major water quality indicators.

The most recent available DWR annual water quality report covered the 1992 water year. While some extreme water quality conditions were documented in 1992 during periods of low Delta outflow, no organic pesticides were measured above minimum reporting limits, and no primary drinking water standards for dissolved trace metals were exceeded at any of the monitoring sites in Carquinez Strait, the lower Delta and Suisun Bay. At the Martinez station, one trace metal, dissolved copper, was detected in concentrations that exceeded freshwater and marine toxicity levels for aquatic life. However, the nearest stations upstream of Martinez in Grizzly Bay at Dolphin and in upper Suisun Bay near Nichols did not report toxic levels of copper during 1992. Copper is most likely related to urban run-off, especially from non-point sources such as roadways.

In addition, data on selenium concentrations in marine organisms indicate its pervasive nature in the aquatic food chain of Suisun Bay, Carquinez Strait, eastern San Pablo Bay and the South Bay. Selenium is a contaminant of concern due to its known biocumulative effects. Selenium concentrations result from agricultural uses well upstream from Benicia in the Central Valley, and, to a lesser extent from the Exxon Benicia Refinery and other industrial dischargers in the Bay Area. Data on selenium discharges from the Exxon refinery for 1992 indicated a 12-month rolling average concentration of 1.89 pounds per day. The limit for this constituent cited in the Waste Discharge Requirements for the refinery is 2.07 pounds per day.

2. SURFACE WATER AND STORMWATER DRAINAGE

CHARACTERISTICS

Regional surface drainage patterns in Benicia are governed by the northwest-southeast orientation of the principal ridgelines and intervening valleys of the Coastal Range. Smaller tributary drainages typically follow a northeast-southwest alignment, while the principal creeks direct flows toward the south-southeast and Carquinez Strait or Suisun Bay.

All of the channels exhibit intermittent flows during the winter rainy season. Some may convey flow only during and shortly after rainstorms, while others can flow much of the wet season. Channel characteristics vary with the steepness of the local topography.

Sulphur Springs Creek and its main tributary, Paddy Creek, form the largest

watershed in the Benicia area. From its outlet at the southern end of Suisun Bay, Sulphur Springs Creek extends to the north-northwest to its headwaters near the summit of Sulphur Springs Mountain. Paddy Creek, which drains a 3 square mile watershed, joins the lower reach of Sulphur Creek just below the Lake Herman outlet.

Lake Herman is a reservoir impounded by an earthfill dam, with a storage capacity of 1,780 acre-feet. The dam and reservoir were constructed on Sulphur Springs Creek in 1905 to provide water storage for the City of Benicia. The dam was raised in 1943 to increase the reservoir storage capacity. Watershed runoff is stored along with excess water from the North Bay Aqueduct, a component of the State Water Project and the City's principal potable water supply. While some flood control storage is occasionally available at the outset of a major rainstorm, the principal role of the reservoir is water storage.

SURFACE WATER QUALITY

Data on the quality of stormwater runoff and other surface waters in the Benicia area is sparse. Water quality data for Sulphur Springs Creek and Lake Herman during the 1980s indicate that creek and lake waters contain less than the maximum concentration levels established by the EPA for fluoride, mercury, nitrate, cadmium and lead. With the exception of sulfate and total dissolved solids (TDS), significant water quality indicator values were lower in Sulphur Springs Creek than in Lake Herman.

Lake Herman, which is the City's back-up water supply, is considered a eutrophic water body by the Regional Water Quality Control Board (RWQCB). Eutrophic waters are characterized by high nutrient loads, excessive algal and aquatic vascular plant growth, low water clarity and reduced oxygen concentrations in bottom waters. However, the City also stores good quality North Bay Aqueduct water in Lake Herman, and the current mixture of water in the lake is considered sufficient to meet water quality standards.

There is no other data available on water quality in other surface waters in Benicia. However, it stands to reason that water quality in other minor creeks and drainages would be similar to that found in other urbanized portions of the Bay Area, since Benicia is subject to the same point and non-point sources as other jurisdictions.

NON-POINT SOURCE POLLUTANTS

Non-point source contamination occurs over diffuse areas in the form of degraded urban and agricultural runoff. Roadways, commercial and industrial sites, and grazed and other agricultural lands may contribute to non-point source pollution in the form of introduced heavy metals, oils and greases, high sediment yields and nutrients.

Non-point source pollutants in stormwaters are regulated by the US EPA under Section 402(p) of the Federal Clean Water Act (PL 92-500, 1972). This statute requires that discharges of stormwater associated with industrial and construction activity be regulated by National Pollutant Discharge Elimination System (NPDES) permits. At the regional level, EPA jurisdictional oversight of stormwater activity is handled by the RWQCB, San Francisco Bay Region, headquartered in Oakland. Municipalities with populations exceeding 100,000 are required to prepare and implement Stormwater Pollution Prevention Program (SWPPPs) within their jurisdictions. Under this criterion, Benicia is not technically required to implement a SWPPP.

However, the City Department of Public Works has recently taken the initiative and prepared a SWPPP for the City. The Benicia SWPPP describes Best Management Practices (BMPs) for stormwater quality protection for implementation by public agencies, industrial and commercial concerns and construction contractors.

POINT SOURCE POLLUTANTS

Point sources of surface water contamination comprise readily identifiable sites of pollutant dispersal. Typically, such sites include waste water treatment facilities, hazardous waste storage areas, landfills, mine sites, and commercial and industrial operations.

Industrial dischargers are permitted by the RWQCB in accordance with the National Pollution Discharge Elimination System (NPDES), which is overseen by the USEPA. Although Benicia has many industries, the wastewater outfall from the Exxon refinery wastewater treatment plant and the City's Wastewater Treatment Plant are the only discharge permits currently in force in Benicia. The refinery has an extensive surface water treatment program, which separates and cleans run-off on the Exxon refinery site. The refinery also has its own wastewater treatment plant for its industrial discharge, which meets special wastewater discharge requirements and goals set by the RWQCB. Both on-site stormwater discharge (to Sulphur Springs Creek) and processed waste water discharge (to Suisun Bay) from the Exxon Refinery wastewater treatment plant are monitored under NPDES permit provisions.

Syar Quarry discharges untreated and partially treated wash water from its shop and equipment maintenance activities into the principal western tributary to Sulphur Springs Creek. The quarry has holding ponds on site, which allow for settling out of some contaminants, but these ponds could not be expected to catch all run-off or to hold large amounts of run-off during storms.

3. GROUNDWATER

CHARACTERISTICS

Groundwater resources in the area are limited due to the areas of steep topography and geologic characteristics. The steep slopes of Sulphur Springs Mountain and the overlying shallow soils produce insufficient quantities of water for municipal development. The highest yielding zones of water are in the alluvium and weathered bedrock in Sky Valley. The lower reaches of the Sulphur Springs Creek Watershed are also generally recognized as adequate for development of domestic and agricultural wells but are not developable as a municipal water supply.

GROUNDWATER QUALITY

Groundwater resources can be negatively affected by contamination from local landfills, underground gasoline storage tanks, hazardous waste disposal sites and mine tailings.

Previous studies have located groundwater contamination in a number of areas in Benicia. However, Benicia's reliance on imported State Water Project water for its municipal water supply means that the groundwater quality problem sites have little impact on drinking water quality. Instead, they have the potential to affect water quality in local creeks and the receiving waters in the Carquinez Strait and Suisun Bay, since groundwater eventually discharges to area creeks from springs and shallow aquifers. Specifically, groundwater contamination upstream from Lake Herman could affect the quality of Lake Herman, the City's water supply. To date, the principal upstream source of potential water supply contamination has been identified as the Hastings Mercury Mine, although direct surface water contamination from the Syar Quarry is also a potentially significant contaminant source.

In addition to the identified industrial sites, there are a number of point sources of groundwater contamination in the Benicia planning area. A comprehensive review of groundwater contaminant sources in 1992 listed 24 sites, ranging from geographically extensive waste disposal sites, such as the IT Panoche waste disposal facility and Solano County landfill, to numerous oil spills and underground gasoline storage tank sites.

4. FLOODING

CURRENT FLOODING CHARACTERISTICS

Flooding that causes damage to lands and property within the City occurs primarily in response to severe rainstorms coincident with near saturated soil conditions and/or high tides. High tides can result in backwater conditions that

exacerbate flooding. The most severe flooding in recent years occurred in February 1986.

The Federal Emergency Management Agency (FEMA), which maps areas prone to flooding, published the initial Flood Insurance Study for the City of Benicia in 1986, and in 1989 the agency completed a revised Flood Insurance Study. Flood hazard zones delineated by FEMA are shown on Figure 19. As shown in the figure, the low-lying areas of the City that are subject to flooding in the 100-year storm event include the lower reaches of the Sulphur Springs Creek Watershed downstream of Lake Herman, the lands flanking the Benicia shoreline east of East 3rd Street, and the wetlands associated with Benicia State Park along Southampton Bay.

EFFECTS OF SEA LEVEL RISE

The Bay Conservation and Development Commission's predictive study of sea level rise and its impacts on San Francisco Bay predicts a rate of sea level rise of between 0.005 and 0.05 ft. per year over the coming tidal epoch. While rising sea level will not be enough to endanger existing developed areas of Benicia, sea level rise will mean that flooding could be exacerbated in low lying areas at times of high tide. If sea level rise continues, existing sea walls and levees will have to be raised, and the maintenance and design of shoreline stabilization works will also be affected.

FLOOD CONTROL IMPROVEMENTS

Flood control improvements in Benicia have been suggested in detail in a 1982 study that focused on the East Third Street and "H" Street storm drain system, and the 1989 Lake Herman/Sulphur Springs Creek Drainage Basin Master Plan. Since the publication of these reports, the City has completed over 40 storm drainage improvement projects. These improvements have significantly reduced the spot flooding which formerly occurred in Benicia. Two large stormwater detention basins were also constructed as part of the Southampton D-Unit subdivisions and they have also helped to minimize flooding problems through downstream areas in the Industrial Park.

B. STANDARDS OF SIGNIFICANCE

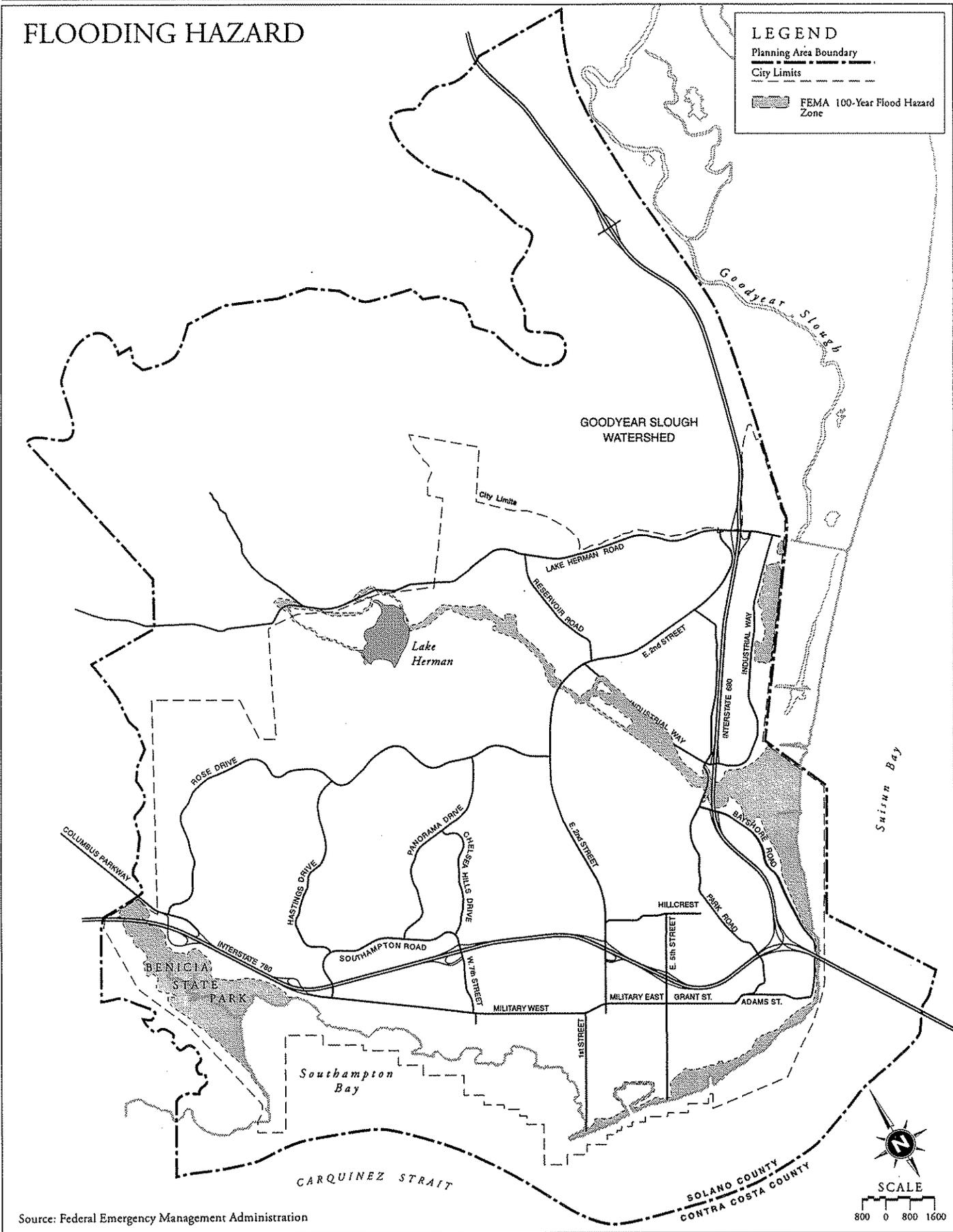
The proposed Benicia General Plan would have a significant impact to water quality and hydrology if it would:

- Alter drainage patterns or stream alignments.
- Degrade water quality.

FLOODING HAZARD

LEGEND

- Planning Area Boundary
- City Limits
- FEMA 100-Year Flood Hazard Zone



Source: Federal Emergency Management Administration

Figure 19

- Increase off-site peak stormwater flow rates in excess of the capacity of downstream stream reaches and/or hydraulic structures such that additional downstream channel instability would result.
- Result in a reduction in local infiltration rates that would in turn cause a substantial increase in the volume of surface runoff leaving development sites, ultimately causing a change in the flow regime in area drainageways.
- Result in hillslope or channel erosion changes, which would directly or indirectly produce excessive soil loss, degradation or loss of riparian, wetland, or aquatic habitat, property loss, or reductions in the capacity of downstream channel reaches and or hydraulic structures via sedimentation.
- Expose people or property to flood hazards.

C. IMPACT DISCUSSION

The Benicia General Plan includes specific goals, policies and programs to address potential impacts to area hydrology, flooding and water quality. Programs and policies in the General Plan specifically include measures to require remediation of hazardous waste sites and protection of the public from these wastes (Goals 4.11 and 4.12 and associated policies and programs). Additional programs and policies addressing storm drainage facilities and flood reduction measures would also ensure that adequate facilities are available and new development would not worsen existing local flood hazards (Goals 4.17, 4.18, and 4.19 and associated policies and programs). Policies and programs aimed at reducing the flood hazard would result in regulation of post-development peak flow rates (to pre-development levels), encouragement of the use of natural channels, and control of watershed erosion, channel degradation and local flood hazards.

Though the policies and programs of the proposed General Plan adequately address existing flooding conditions, there is no consideration for changes in flood level elevations that might occur with sea level rise. Downstream hydraulic control elevations are expected to increase relative to existing design levels as sea level rises. Over the next 50 years, this elevation increase could exceed 0.6 ft. for the 100-yr. high tide. Consequently, storm drain system design and wharf/breakwater projects in the low-lying areas near the waterfront could face reduced effectiveness due to heightened backwater effects and higher levels of storm surge and wave run-up. However, this is not considered a significant impact since the amount of sea level rise relative to existing tides is expected to be low.

Water quality protection programs and policies included in the General Plan would minimize the future increases in non-point source pollutant loading of stormwater from urban sources and construction sites (Goals 3.43 and 3.44 and associated policies and programs). In addition, they would mandate continuation of the

current communication and coordination with regional regulatory agencies (e.g. RWQCB) in cleaning up existing hazardous waste sites. Preparation of an updated Storm Water Management Plan is also proposed by the General Plan.

The Water Resources and Biotic Resources Goals, Policies and Programs sections of the General Plan include policies and programs that would promote protection of surface and groundwater quality and protection and enhancement of wetlands and riparian habitat (Goals 3.43 and 3.44 and associated policies and programs and Goals 3.47, 3.48, 3.49, and 3.51 and associated policies and programs). Application of these policies, in conjunction with the land use changes proposed in the Plan, would also result in a reduction in the cumulative impact of development on water quality in the San Francisco Bay Estuary.

In addition, the land use changes proposed by the General Plan would generally improve the prospects for maintaining or improving the quality of regional stormwater. Of particular importance is the elimination of most of the future development potential for lands north of Lake Herman Road, serving to protect an extensive amount of open space lands outside the identified Urban Growth Boundary. Additionally, land uses proposed by the General Plan within urban areas of the City would not have significant effects on peak flow rates or flooding in area drainageways, nor on stormwater quality. These changes would only alter the intensity of particular land uses. For instance, some lands would be converted from Waterfront Commercial to Downtown Commercial, which would not significantly increase the rate of stormwater runoff or the contaminant loading of stormwater.

In one area, potential land use changes under the proposed General Plan could have an adverse impact on water quality. This area consists of Areas 9 and 10 on Figure 2, which maps proposed land use changes. Although the Open Space designations in the area would not be changed by the General Plan, the Plan indicates that changes could occur in the future. This area has been identified in BCDC's *Suisun Marsh Protection Plan* (1976) as one in which development could affect water quality in the Suisun Marsh, particularly in areas with poor soil conditions for construction. Parts of Areas 9 and 10, particularly the gravel quarry in Area 9, have such soil conditions, so impacts to water quality could occur. However, the General Plan includes policies that require mitigation of construction impacts to water quality. Moreover, additional environmental review would take place before any development could occur in Areas 9 and 10. Hence no significant impact is expected.

In summary, the proposed General Plan would have no significant impacts with regard to hydrology and water quality.

4.10 BIOLOGICAL RESOURCES

This section summarizes information on the biological resources of the City and provides an evaluation of the effects of the proposed General Plan on the sensitive resources.

A. EXISTING SETTING

This section provides a general description of the existing biological resources within the Benicia Sphere of Influence. A summary of the regulatory framework which provides for the protection and conservation of important biological resources and more detail on the resources within the City of Benicia are contained in the Natural Resources Background Report.

1. VEGETATION

Vegetation in the Benicia planning area is dominated by a cover of non-native grassland and suburban landscape, bordered by the important marshlands associated with Southampton Bay to the west and Suisun Bay to the east. Most of the rolling hills to the south of the Rose Drive area have been developed with urban and suburban uses, interspersed with grassland covered slopes and a few remaining undeveloped ravines. The lands to the east of East Second Street and north of I-780 have been highly disturbed by past military development and existing industrial uses, extending to the remaining marshland habitat along the edge of Suisun Bay. Grasslands cover most of the rangeland to the north of East Second Street and the Lake Herman Road area throughout Sky Valley and the northeastern hills. Major creeks, drainages, and the fringe of Lake Herman in the undeveloped northern area support freshwater marsh and riparian vegetation, which varies from stands of emergent cattail to a dense cover of willow forest and scrub. Scattered groves of oaks also occur in the northeastern hills, primarily on the north and east-facing slopes just west of I-680. Small areas of northern coastal scrub, freshwater seeps, remnant native grasslands, and stands of non-native eucalyptus also occur in the northern portion of the planning area.

The various vegetative cover types and natural communities found in the planning area are summarized below. More information on these natural communities in addition to the wildlife usage attributes of habitat areas can be found in the Natural Resources Background Report for the General Plan. Figure 20 provides a graphic summary of the known sensitive resources in the planning area which would be afforded some level of protection through federal, state, and local regulations and guidelines.

NON-NATIVE GRASSLAND

Non-native grasslands occupy most of the planning area, composed of introduced grasses and broadleaf weedy species which quickly recolonize disturbed areas. Intensive grazing, dryland farming, and other disturbance have eliminated most of the native grasslands throughout California over the past 100 years, including the historic rangelands of the Benicia vicinity.

DEVELOPED AREAS

Ornamental landscaping has been planted throughout developed areas and in the vicinity of rural residences in the northern portion of the planning area. Ruderal grassland species occupy vacant lots and heavily disturbed areas, including much of the industrial use areas such as the Exxon Benicia Refinery and portions of the IT Panoche facility north of Lake Herman Road.

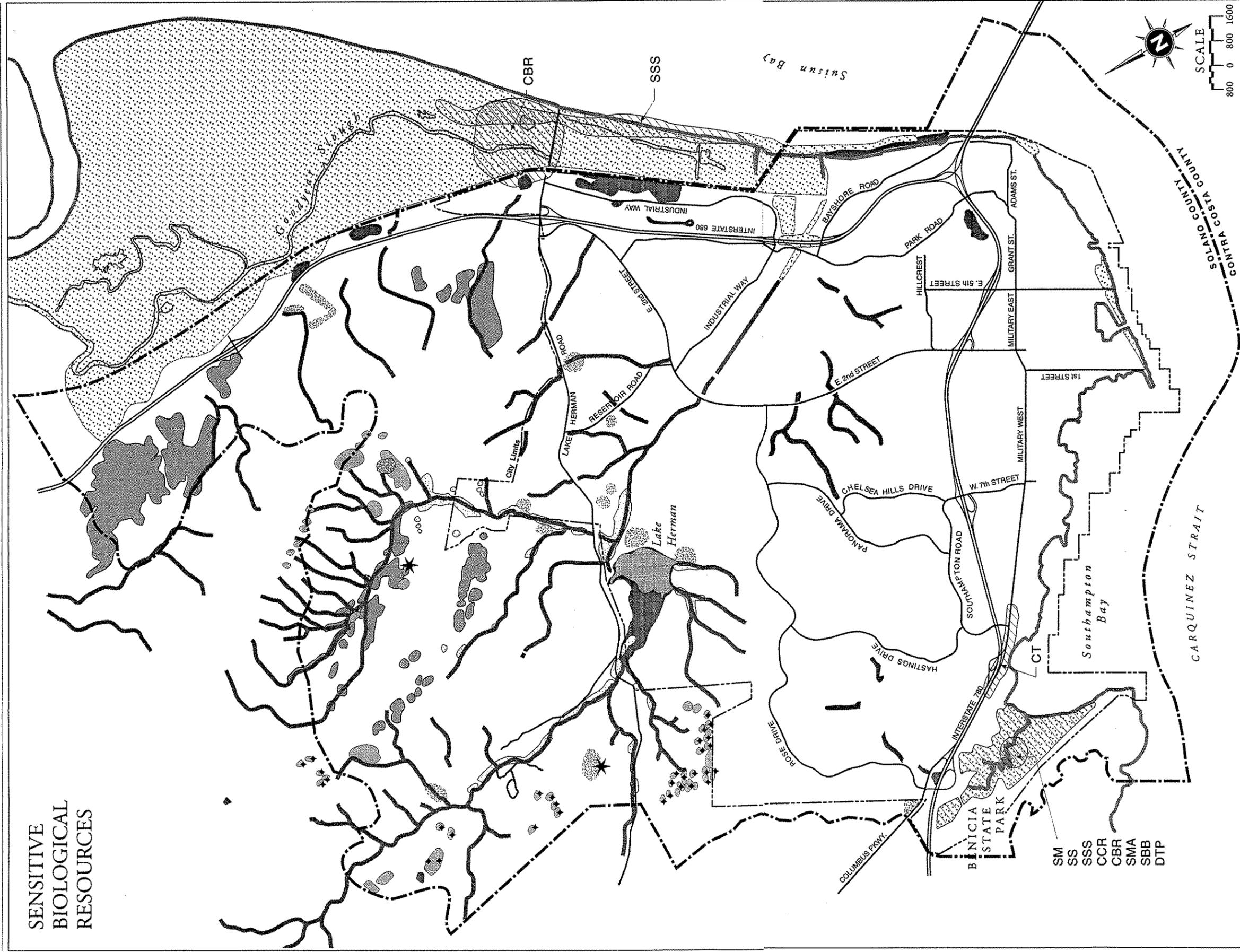
NORTHERN COASTAL SALT MARSH AND COASTAL BRACKISH MARSH

The marshland natural communities occur along the fringe of Carquinez Strait and Suisun Bay where soils are subject to regular inundation by salt and brackish water. Characteristic species are typically segregated by elevation and degree of inundation. Marshland vegetation is generally absent along the developed shoreline of Carquinez Strait from the State Recreation Area at Southampton Bay to just east of the Benicia Bridge, although emergent vegetation occurs near the entrance to the Benicia marina and forms a small stand just east of Tyler Street.

WILLOW RIPARIAN FOREST AND WILLOW SCRUB

Riparian vegetation occurs along stream courses and the western fringe of Lake Herman, with trees and shrubs forming stands characteristic of riparian forest and willow scrub natural communities. Particularly well-developed corridors of riparian cover occur along Sulphur Springs Creek and Paddy Creek in the Sky Valley area. Additional habitat occurs in scattered locations along intermittent streams throughout the planning area, including Willow Glen Park.

SENSITIVE BIOLOGICAL RESOURCES



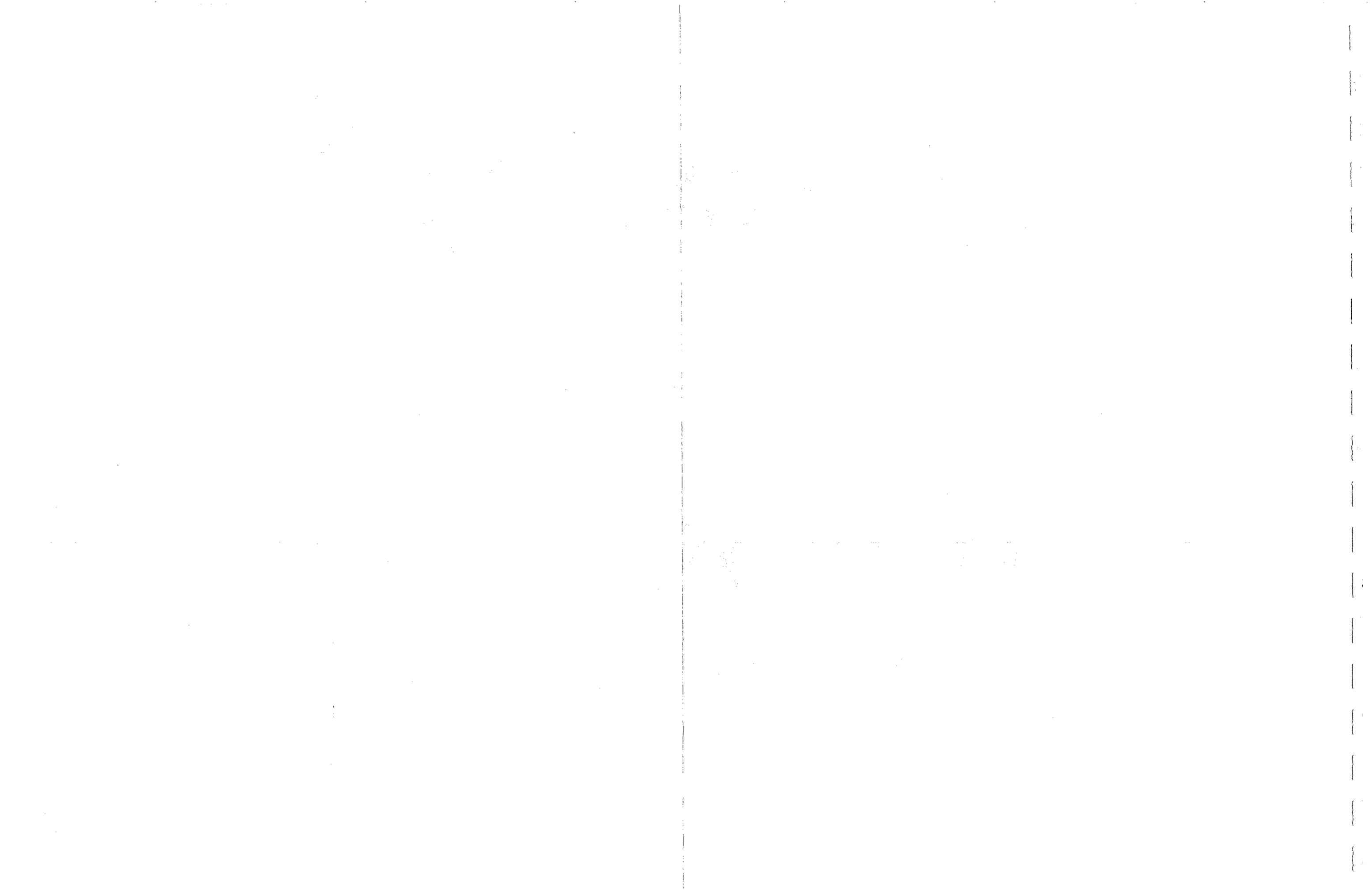
LEGEND

Planning Area Boundary
 City Limits

Sensitive Natural Communities/Unique Vegetation
 Marshland/Northern Coastal Salt Marsh/Coastal Brackish Marsh
 Coast Live Oak Woodland
 Valley Needlegrass Grassland
 Riparian(Willow Riparian Forest/Willow Scrub)
 Golden Violet Population (Callippe Silverspot Host Plant)
 Eucalyptus Grove (Raptor Roosting & Nesting Substrate)
 Wetlands/Other Waters
 Palustrine/Riverine (Streams, Channels, Ponds, Lakes)
 Estuarine (Tidal Marshland, Mudflats)

Special Status Species Occurrences
 + Callippe Silverspot Butterfly Sighting
 * Golden Eagle Nest Location
 General Occurrence Records in Suitable Habitat - Generalized areas where the indicated species have been recorded as occurring
 SM Salt Marsh Harvest Mouse
 SS Suisun Shrew
 SSS Suisun Song Sparrow
 CCR California Clapper Rail
 CBR California Black Rail
 SMA Suisun Marsh Aster
 SBB Soft Bird's-Beak
 DTP Delta Tule Pen
 CT Congdon's Tar Plant (Note: There is a strong likelihood that this area has been mapped by the CNDDDB in an inaccurate location. See text.)

Figure 20



FRESHWATER MARSH

Freshwater marsh is also associated with drainages and the fringe of freshwater bodies, including portions of Lake Herman and several stock ponds. The larger streams in the planning area which are not mapped with riparian habitat in Figure 20 most likely support some type of freshwater marsh cover. Freshwater marsh species also dominate the cover at the numerous freshwater seeps in the planning area.

COAST LIVE OAK WOODLAND

Oak woodland occurs in the northeastern portion of the planning area, and is dominated by coast live oak (*Quercus agrifolia*). The understory layer is generally poorly developed or composed of non-native grassland species, but several shrubs and other tree species occur in the woodland. Over 120 acres of oak woodlands occur within the planning area.

VALLEY NEEDLEGRASS GRASSLAND

Remnant native grasslands still occur in the northern portion of the planning area, forming valley needlegrass grassland. This natural community is characterized by purple needlegrass (*Nassella pulchra*), a perennial bunchgrass. Most of the native grasslands throughout the state have been eliminated, which has led the California Natural Diversity Database (CNDDDB) to now recognize native grasslands as a sensitive resource with a high inventory priority.

NORTHERN COASTAL SCRUB

A few stands of this natural community are scattered in areas of grassland cover in the planning area. Most of these consist of thickets of coyote brush (*Baccharis pilularis* ssp. *consanguinea*), which tends to colonize disturbed areas and therefore has not been mapped in Figure 20. Other species, such as California sage (*Artemisia californica*), poison oak, and toyon, occur in scattered locations on steeper slopes in the northern portion of the planning area.

2. SPECIAL-STATUS SPECIES AND SENSITIVE NATURAL COMMUNITIES

A record search conducted by the CNDDDB, together with other relevant information, indicates that occurrences of several plant and animal species with special-status have been recorded from or are suspected to occur in the southern Solano County area and Benicia vicinity. Several of these have been reported from the planning area, and most of these are associated with tidal marshland habitat. A number of the natural communities in the planning area have a high inventory priority with the CNDDDB due to rarity and threats, and are considered sensitive resources.

PLANT SPECIES

Several plant species with special-status have been reported in the planning area, and based on recorded geographic range and preferred habitat, numerous other species may potentially occur in the Benicia vicinity. These have varied status, and many are considered rare (list 1B) by the California Native Plant Society (CNPS). Table 13 provides information on the name, status, habitat characteristics, distribution, and flowering period of the 15 plant species reported in or having the highest probability of occurrence in the planning area. Of these, four have actually been reported in the planning area. The locations of known or historic populations are shown in Figure 20.

Suisun marsh aster (*Aster chilensis* var. *lentus*), soft bird's beak (*Cordylanthus maritimus* ssp. *palustris*), and Delta tule pea (*Lathyrus jepsonii* ssp. *jepsonii*) are all known from the salt and brackish marsh at Southampton Bay. Suitable habitat for these three species and other marshland species, such as Mason's lilaeopsis (*Lilaeopsis masonii*), also occurs in the marshland along the edge of Suisun Bay along the southeastern edge of the City, but no occurrences have been reported from this portion of the planning area.

An historical occurrence record of Congdon's tarplant (*Hemizonia parrayi* ssp. *congdonii*) was made from 1930 in the Benicia vicinity. Little is known about the habitat conditions or precise location of the population near Benicia, but the CNDDDB has mapped the non-specific occurrence in the vicinity of the I-780 interchange with Military West Street. CNDDDB's mapped location, indicated in Figure 20, appears to be inconsistent with the reported elevational range of the population, and it is possible that the actual occurrence was from the northeastern hills of the planning area, along the alignment of Interstate 680. There is no record that the species has been observed in the Benicia area since 1930, and it is now believed to have been extirpated in Solano County and possibly the Bay Area.

Existing development limits the likelihood of occurrence of any plant species of concern in the remaining grassland habitat south of the Rose Drive area, but suitable upland habitat remains in the northern portion of the planning area. There remains a possibility that populations of one or more species of concern occur on previously unsurveyed properties, particularly in the northeastern hills.

ANIMAL SPECIES

Table 14 provides information on the name, status, preferred habitat, and reported occurrences of the 33 animal species known from or suspected to occur in the planning area. Of these, a total of 13 have actually been reported from the planning area, and sightings and essential habitat for these species are indicated in Figure 20. The federally- or state-listed endangered or threatened species detected within the planning area are restricted to the tidal marshlands and open water habitat. Several other species considered as sensitive by the U.S. Fish and Wildlife

Table 13. Special-Status Plant Taxa Known or Suspected to Occur in the Planning Area

TAXA NAME	STATUS (FED/STATE/ CNPS)	HABITAT CHARAC- TERISTICS	DISTRIBUTION (PRESUMED EXTIRPATED)	FLOWERING PERIOD	OCCUR- RENCE
<i>Aster chilensis</i> var. <i>lentus</i> Suisun marsh aster	*-/1B	Brackish water marshes and swamps	Contra Costa, Napa, Sacramento, Solano	May- October	Known
<i>Castilleja affinis</i> ssp. <i>neglecta</i> Tiburon Indian paintbrush	FE/ST/1B	Valley grassland on serpentine	Marin, Napa, Santa Clara, Solano	April- June	Likely
<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i> Suisun thistle	PE/-/1B	Brackish marsh	Solano	June- August	Possible
<i>Cordylanthus</i> <i>maritimus</i> ssp. <i>palustris</i> Point. Reyes bird's- beak	*-/1B	Coastal salt marsh	Humboldt, Marin, Sonoma, Oregon (Alameda, Santa Clara, San Mateo)	May- October	Known
<i>Cordylanthus mollis</i> ssp. <i>mollis</i> Soft bird's-beak	PE/SR/1B	Coastal salt marsh	Contra Costa, Marin, Napa, Solano	July- Nov.	Possible
<i>Delphinium</i> <i>recurvatum</i> Recurved larkspur	*-/1B	Chenopod scrub and valley grassland	Alameda, Contra Costa, Colusa, Fresno, Kings, Kern, Merced, San Luis Obispo	March- May	Possible
<i>Eriogonum</i> <i>truncatum</i> Mt. Diablo buckwheat	-/-/1A	Oak woodland, chaparral	(Alameda, Contra Costa, Solano)	April- September	Possible
<i>Fritillaria pluriflora</i> Adobe fritillaria	*-/1B	Chaparral, woodland, grassland on adobe soil	Butte, Colusa, Glenn, Lake, Napa, Plumas, Solano, Tehama, Yolo Mendocino, Monterey, San Benito	February-April	Possible
<i>Fritillaria liliacea</i> Fragrant fritillary	*-/1B	Coastal scrub and grassland often	Alameda, Contra Costa, Monterey, San Benito, Santa Clara, San Francisco, San Mateo, Solano, Sonoma	February- April	Possible
<i>Hemizonia parrayi</i> ssp. <i>congdonii</i> Congdon's tarplant	*-/1B	Valley grassland and vernal pools	Monterey, San Luis Obispo (Alameda, Contra Costa, Santa Clara, Santa Cruz, Solano)	June-November	Known (historic record from 1930)

<i>Lasthenia conjugens</i> Contra Costa goldfield	PE/-/1B	Low flats and borders of vernal pools	Napa, Solano, (Alameda, Contra Costa, Mendocino, Santa Barbara, Santa Clara)	April- May	Possible
<i>Lathyrus jepsonii</i> ssp. <i>jepsonii</i> Delta tule pea	*-/1B	Brackish water marshes and swamps	Alameda, Contra Costa, Fresno, Napa, San Benito, Santa Clara, San Joaquin, Solano	May- June	Known
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	*/SR/1B	Brackish water marshes and swamps	Contra Costa, Napa, Sacramento, San Joaquin, Solano	June- August	Possible
<i>Suaeda californica</i> California suaeda	FE/-/1B	Coastal salt marsh, now known from Morro Bay	San Luis Obispo (Alameda, Santa Clara, Sonoma)	July- October	Possible
<i>Trifolium amoenum</i> Showy Indian clover	PE/-/1B	Valley grassland	Sonoma (Alameda, Mendocino, Marin, Napa, Santa Clara, Solano)	April- June	Possible

Federal Status:

- FE = Listed as "endangered" under the Federal Endangered Species Act.
- PE = Petitioned for listing as endangered.
- C = A candidate species under review for federal listing. Candidates include species for which the U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
- * = These species were considered to be category 2 candidate species for federal listing until 28 February 1996 when the U.S. Fish and Wildlife Service revised their status classification system. These species no longer have any candidate designation, but are unofficially classified as species of concern and could be added to the candidate list if information demonstrates they warrant listing.

- 1A = Plants of highest priority; plants presumed extinct in California.
- 1B = Plants of highest priority; plants rare and endangered in California and elsewhere.
- 3 = Plants requiring additional information; a review list.
- 4 = Plants of limited distribution - a watch list.

OCCURRENCE: Indicates likelihood of occurrence in the General Plan Area.

State Status:

- SE = Listed as "endangered" under CESA. Taxa in serious danger of becoming extinct throughout all or significant portion of range due to varying factors.
- SR = Listed as "rare" under CESA. Although not presently threatened with extinction, may become endangered if present environmental factors worsen.

CNPS Status:

Service (USFWS) and/or the California Department of Fish and Game (CDFG) were detected in upland locations, and numerous others are known to occur in the Benicia vicinity but no reports of occurrence have been made within the planning area.

NATURAL COMMUNITIES

Several of the natural communities within the planning area are considered to have a high inventory priority with the CNDDDB. These communities have been designated as sensitive due to rarity and continuing loss as a result of development, flood control improvements, and other factors. Sensitive natural communities in the planning area include coastal salt marsh, brackish marsh, freshwater marsh, willow riparian forest, willow riparian scrub, and valley needlegrass grassland. While coast live oak woodland is not considered as having a high inventory priority with the CNDDDB, it should also be recognized as an important habitat type in the planning area due to its limited occurrence and the high wildlife value the dense cover provides for wildlife.

WETLANDS

Wetlands in the planning area include tidally influenced salt and brackish marshes, freshwater marshes, and riparian habitats. Figure 20 shows the location of wetlands mapped as part of the National Wetland Inventory, which include: intertidal and subtidal estuarine along Carquinez Strait and Suisun Bay; tidal and lower perennial riverine along the lower stretches of Sulphur Springs Creek through the Exxon Benicia Refinery; limnetic lacustrine and emergent, scrub-scrub, and forested palustrine associated with Lake Herman; emergent, scrub-scrub, and forested palustrine along the various streams and larger drainages; and unconsolidated bottom palustrine at the scattered stock ponds in the planning area.

The US Army Corps of Engineers (Corps) and CDFG generally exercise authority over these various wetland habitat types, although a detailed delineation would be required to determine jurisdiction where modifications are proposed. Some of the palustrine wetlands associated with streams and drainages in upland areas may not meet all three technical criteria used by the Corps in determining jurisdiction. Riparian wetland areas are generally defined by the "ordinary high water mark" rather than the band of adjacent riparian vegetation, limiting Corps jurisdiction where dense willow riparian scrub and forest extends a considerable distance from the channel top of bank. Similarly, authority of the CDFG under the Streambed Alteration Agreement process is technically limited to the confines of a channel bank and bed, but the CDFG typically requests that a minimum 100-foot setback be established to protect the wildlife habitat provided by riparian corridors as part of environmental review for specific development plans.

Table 14. Special- Status Animal Taxa Known or Suspected to Occur in the Planning Area

SPECIES	STATUS (FED./ STATE)	PREFERRED HABITAT TYPE	OCCUR- RENCE
<u>Invertebrates:</u>			
Callippe silverspot butterfly	PE/-	Open grasslands with golden violet host species	Known
San Francisco forktail damselfly	-/-	Ponds and streams with emergent vegetation	Possible
Snail (<i>Helminthoglypta</i> spp.)	*/-	Grassland with rocky outcrops and dense cover	Possible
<u>Amphibians/Reptiles/Fish:</u>			
California tiger salamander	C/CSC	Vernal pools, ponds, streams and adjacent grassland	Possible
California red-legged frog	FT/CSC	Ponds and streams	Possible
Delta smelt	FT/ST	Brackish zone of Delta; adjacent freshwater for spawning Open water of Bay and Delta	Likely
Green sturgeon	*/-	Brackish zone of Delta	Likely
Longfin smelt	*/CSC	Sloughs and other slow-moving waters of Delta	Likely
Sacramento splittail	FT/CSC	Pond, rivers, and streams	Likely
Northwestern pond turtle	*/CSC	Open water of Bay and Delta, tributary rivers and	Possible
Winter- run chinook salmon	FE/SE	streams	Likely
<u>Birds:</u>			
Black-shouldered kite	-/CP	Grassland	Known
Burrowing owl	-/CSC	Grassland	Possible
California black rail	*/ST	Salt marsh	Known
California brown pelican	FE/SE	Coastal shoreline and bays	Likely
California clapper rail	FE/SE	Salt marsh	Known
Cooper's hawk	-/CSC	Riparian and grassland	Known
Double-crested cormorant	-/CSC	Bays, rivers and lakes	Known
Golden eagle	-/CSC,CP	Open grassland and savanna	Known
Northern harrier	-/CSC	Grassland	Known
Osprey	-/CSC	Open water and fringe of lakes, rivers, and bays	Possible
Peregrine falcon	FE/SE,CP	Open water and grassland	Possible
Prairie falcon	-/CSC	Grassland	Possible
Salt marsh yellowthroat	*/-	Salt and brackish water marsh	Known
San Pablo song sparrow	*/-	Salt and brackish water marsh	Known
Sharp-shinned hawk	-/CSC	Riparian and grassland	Possible
Suisun song sparrow	*/-	Salt and brackish water marsh	Known
Tricolored blackbird	*/CSC	Marshland	Possible
<u>Mammals:</u>			
American badger	-/CSC	Grassland	Possible
Salt marsh harvest mouse	FE/SE	Salt marsh and adjacent grassland	Known
Salt marsh wandering shrew	*/CSC	Salt marsh	Possible
San Pablo vole	*/-	Salt marsh and adjacent grassland	Possible
Suisun shrew	*/CSC	Salt marsh	Known

Federal Status:

- FE = Listed as "endangered" under the FESA.
- FT = Listed as "threatened" under the FESA.
- C = A candidate species under review for federal listing. Candidates include species for which the U.S. Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
- * = These species were considered to be category 2 candidate species for federal listing until 28 February 1996 when the U.S. Fish and Wildlife Service revised their status classification system. These species no longer have any candidate designation, but are unofficially classified as species of concern and could be added to the candidate list if information demonstrates they warrant listing.

State Status:

- SE = Listed as "endangered" under CESA.
- ST = Listed as "threatened" under CESA.
- CP = California fully protected species; individual may not be possessed or taken at any time.
- CSC = Considered a species of special concern by the CDFG; taxa have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features.

OCCURRENCE:

Indicates likelihood of occurrence in the General Plan Area.

B. STANDARDS OF SIGNIFICANCE

The proposed project would have a significant impact on biological resources if it would:

- Create an impact on a population or essential habitat of a special-status plant or animal species.
- Cause substantial interference with the movement of any resident or migratory fish or wildlife species.
- Result in a substantial reduction in habitat for fish, wildlife or plants.
- Result in the loss or substantial modification to existing wetlands.

C. IMPACT DISCUSSION

Depending on its location, future urban development in the City of Benicia has the potential to affect important biological resources, disturbing or eliminating areas of remaining natural communities, populations of special-status species, and wetlands, and contributing to the disruption of movement corridors and further fragmentation of wildlife habitat.

The proposed General Plan provides a framework for orderly growth in the planning area, and includes provisions for the conservation of natural resources, including protection and enhancement of sensitive biological resources. Incorporation of the additional goals and policies contained in the General Plan would provide protection for and clarify the City's intent to preserve and enhance the sensitive biological resources within the sphere of influence.

The new goals and policies in the Open Space and Conservation of Resources chapter of the General Plan would serve to protect wetlands, habitat for special-status species, native vegetation, wildlife habitat, and movement corridors. Additional biological and wetland assessments would be necessary to conclusively determine whether special-status species, sensitive natural communities, and wetland resources occur on previously unsurveyed land during environmental review of proposed developments, as called for in Policy 3.52.1 and Programs 3.46.A, 3.52.A, and 3.52.C. Where sensitive resources are encountered, adequate mitigation would be required through avoidance, minimization, or replacement, as called for in Policy 3.52.2 and Programs 3.52.B, 3.52.C, 3.53.A, 3.53.B, 3.53.D, 3.54.A, 3.54.B, 3.54.C, and 3.54.D. In general, the goals, policies, and programs in the General Plan would provide for adequate protection and enhancement of sensitive biological resources, and no additional mitigation is necessary.

Land use changes proposed by the General Plan would serve to greatly minimize the potential for adverse impacts on biological resources. Of particular importance is the elimination of most of the future development potential for lands north of Lake Herman Road, serving to protect an extensive amount of open space lands outside the identified Urban Growth Boundary.

An exception to this is the proposed recreational and business uses at Sites 9 and 10 along I-680, north of Lake Herman Road. These locations contain areas of oak woodland habitat, intermittent streams, and possibly seasonal wetland habitat or other sensitive biological resources. Again, proposed General Plan Policies and Programs under Goal 3.52 would require that any proposals for future development in these and other undeveloped areas include detailed surveys and incorporation of appropriate mitigation to protect important biological resources. For these reasons, impacts to biological resources are expected to be avoided on these sites, and no additional mitigation measures are recommended through this EIR.

4.11 AIR QUALITY

This section summarizes information on air quality in the City and provides an evaluation of the effects the proposed General Plan would have on air quality. More detail on the existing air quality setting within the City of Benicia is contained in the Natural Resources Background Report.

A. EXISTING SETTING

1. AIR POLLUTION CLIMATOLOGY

The quality of the air in a region is determined by several factors. Every air basin or sub-air basin has a number of natural characteristics which limit the ability of natural processes to either dilute or transport air pollutants. The amount of pollutants emitted will also determine air quality. The major determinants of transport and dilution are climatic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine. Winds and terrain can combine to transport pollutants from upwind areas, while sunshine can create photochemical pollutants such as ozone.

Benicia's climate is largely determined by its location on the north side of Carquinez Strait. The Carquinez Strait is the only sea-level gap in the central and northern California coastal mountains, which results in relatively strong and persistent winds. Winds are generally greatest during spring and summer and lowest in fall and winter. A strong daily variation in wind occurs in spring and summer, with peak winds occurring in the late afternoon hours and winds gradually decreasing at night. During fall and winter winds are generally more variable both in speed and direction as the area is influenced by storms from the Pacific Ocean.

The occurrence of episodes of high atmospheric stability, known as inversion conditions, severely limits the ability of the atmosphere to disperse pollutants vertically. Inversions can be found during all seasons in the Bay Area, but are particularly prevalent in the summer months when they are present about 90% of the time in both morning and afternoon.

Topography also affects air quality. Benicia is located between the expansive Sacramento and San Joaquin Valleys to the east and San Francisco Bay to the west,

and the large summertime temperature differences between these two areas result in a strong flow of generally westerly winds that dilute and transport air pollutants.

Benicia has a relatively low natural atmospheric potential for pollution given the persistent and strong winds typical of the area. These winds dilute pollutants and transport them away from the area, so that emissions released in Benicia may influence air quality in the Sacramento and San Joaquin valleys. Benicia's location downwind of the greater Bay Area, however, also means that pollutants from other areas are transported to Benicia.

2. AIR QUALITY STANDARDS

Both the US Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air quality standards establish levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. Table 15 identifies the major criteria pollutants, characteristics, health effects and major sources in the Bay Area.

The federal and California state ambient air quality standards are summarized in Table 16 for important pollutants. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM-10.

The US Environmental Protection Agency has recently adopted new standards for ozone and Particulate Matter. The current 1-hour ozone standard has been replaced by a new, lower 8-hour standard. The USEPA has also added a 24-hour and annual standard for Particulate Matter less than 2.5 microns in diameter (PM_{2.5}).

3. CURRENT AIR QUALITY

Benicia is within the Bay Area Air Quality Management District (BAAQMD). The District operates a network of monitoring sites throughout the Bay Area. The BAAQMD maintains a monitoring site in Benicia, but it monitors only one pollutant: sulphur dioxide, which is primarily released by industrial sources. During the five-year period from 1992 to 1996, the Benicia monitoring site did not record any violations of the State or federal standards for sulphur dioxide.

Table 15. Major Criteria Pollutants

POLLUTANT	DESCRIPTION	HEALTH EFFECTS	MAJOR SOURCES
Ozone	Principal component of smog. Not directly emitted into the atmosphere, but is formed by the photochemical reaction of reactive organic gases and nitrogen oxides (known as ozone precursors) in the presence of sunlight. Highest concentrations occur during summertime.	<ul style="list-style-type: none"> ▶ eye irritation ▶ respiratory function impairment 	The major sources for ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	A non-reactive pollutant that is highly toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. Highest concentrations in ambient air occur during late fall and wintertime.	<ul style="list-style-type: none"> ▶ impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin ▶ aggravation of cardiovascular disease ▶ impairment of central nervous system function ▶ fatigue, headache, confusion, dizziness ▶ can be fatal in the case of very high concentrations in enclosed places 	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish brown gas that is a by-product of combustion processes. Contributes to ozone (or smog) formation.	<ul style="list-style-type: none"> ▶ risk of acute and chronic respiratory illness 	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Colorless gas with a strong odor and potential to damage materials.	<ul style="list-style-type: none"> ▶ aggravation of chronic obstruction lung disease ▶ increased risk of acute and chronic respiratory illness 	Diesel vehicle exhaust, oil powered power plants, industrial processes.
Particulate Matter	Soil and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	<ul style="list-style-type: none"> ▶ aggravation of chronic disease and heart/lung disease symptoms 	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 16. Federal and State Ambient Air Quality Standards

POLLUTANT	AVERAGING TIME	FEDERAL PRIMARY STANDARD	STATE STANDARD
Ozone	1-Hour	0.12 PPM	0.09 PPM
	8-Hour	0.08 PPM	--
Carbon Monoxide	8-Hour	9.0 PPM	9.0 PPM
	1-Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	--
	1-Hour	--	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	--
	24-Hour	0.14 PPM	0.05 PPM
	1-Hour	--	0.5 PPM
PM ₁₀	Annual	50 µg/m ³	30 µg/m ³
	24-Hour	150 µg/m ³	50 µg/m ³
PM _{2.5}	Annual	15 µg/m ³	--
	24-Hour	65 µg/m ³	--
Lead	30-Day Avg.	--	1.5 µg/m ³
	Month Avg.	1.5 µg/m ³	--

PPM = Parts per Million

µg/m³ = Micrograms per Cubic Meter

The closest monitoring multi-pollutant monitoring site to Benicia is located in Vallejo, about eight miles west of Benicia. Data from this monitoring site provides a good general characterization of pollutant levels within Benicia. During the five-year period 1992 to 1996, the State and federal standards for carbon monoxide, nitrogen dioxide and sulphur dioxide were met every day at the Vallejo monitoring site. The federal standard for ozone was also met, although the more stringent state standard for ozone was exceeded on six days in one year during this period. Monitoring of PM₁₀ levels began during 1994. The data indicate that the federal standard was met during the period from 1994 to 1996, but one exceedance of the more stringent state PM₁₀ standard was recorded.

4. ATTAINMENT STATUS AND REGIONAL AIR QUALITY PLANS

Under federal regulations, the Bay Area is currently a nonattainment area for carbon monoxide and an attainment area for other pollutants. However, the USEPA has proposed reclassifying the Bay Area from "maintenance area" to nonattainment for ozone based on recent violations of the federal standards at several locations in the air basin. This would reverse the air basin's reclassification to "maintenance area" for ozone in 1995. Reclassification would require an update to the region's federal air quality plan.

Under the California Clean Air Act, Solano County is a nonattainment area for ozone and PM₁₀. The county is either attainment or unclassified for other

pollutants.

The California Clean Air Act requires local air pollution control districts to prepare air quality attainment plans. These plans must provide for district-wide emission reductions of five percent per year averaged over consecutive three-year periods or, if not, provide for adoption of "all feasible measures on an expeditious schedule". The Act also grants air districts explicit statutory authority to adopt indirect source regulations and transportation control measures, including measures to encourage or require the use of ridesharing, flexible work hours or other measures which reduce the number or length of vehicle trips.

The current area-wide plan required by the California Clean Air Act was adopted as the Bay Area '94 Clean Air Plan in October 1994. The Plan proposes the imposition of controls on stationary sources (factories, power plants, industrial sources, etc.) and Transportation Control Measures designed to reduce emissions from automobiles. Since the Plan does not provide for a 5 percent annual reduction in emissions, it proposes the adoption of "all feasible measures on an expeditious schedule."

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact to air quality if it is determined to be inconsistent with the Clean Air Plan (CAP).¹ According to the BAAQMD, all of the following criteria must be satisfied for a local plan to be determined to be consistent with the CAP and not to have a significant air quality impact:²

- The local plan should be consistent with the Clean Air Plan (CAP) population and vehicle miles traveled (VMT) assumptions. The CAP states that VMT should not increase faster than populatio.
- The local plan should demonstrate reasonable efforts to implement the Transportation Control Measures (TCMs) included in the CAP that identify cities and counties as implementing agencies.
- The local plan should establish buffer zones around existing and proposed land uses that would emit odors and/or toxic air contaminants.

C. IMPACT DISCUSSION

BAAQMD CEQA guidelines provide that a local plan will have a significant air quality effect unless all three criteria described above are met. Each of these criteria are discussed below.

¹ Bay Area Air Quality Management District. *Bay Area '94 Clean Air Plan*. 1994.

² Bay Area Air Quality Management District. *BAAQMD CEQA Guidelines: Assessing the Air Quality Impact of Projects and Plans*. 1996.

1. CONSISTENCY WITH CLEAN AIR PLAN POPULATION AND VMT ASSUMPTIONS

The General Plan traffic modeling utilized the same Association of Bay Area Government (ABAG) projections of households and employment that are used in the regional Clean Air Plan. For this reason, the General Plan is consistent with the regional air plan with respect to population and employment. However, demonstrating consistency with the Vehicle Miles Traveled (VMT) standard recommended by the BAAQMD is not possible since the traffic model used for the General Plan analysis does not provide this information. In absence of this information, a rough calculation based on peak hour trip generation for trips beginning or ending in Benicia indicates that VMT would increase at a greater rate than the population.

Despite the fact that the proposed General Plan would not meet BAAQMD's criterion for VMT, the proposed Benicia General Plan is considered to be consistent with the regional air plan for the following reasons:

- The standard that VMT should increase no faster than population is a regional performance standard for the nine-county San Francisco Bay Air Basin. It may not be attainable within an individual city or other portion of the region.
- Part of the reason that VMT is projected to increase faster than population in Benicia is anticipated employment growth. Implementation of the proposed General Plan would improve the jobs/housing balance within Benicia, which would have air quality benefits to the region. These employment projections are consistent with ABAG employment projections used in the regional air quality plan.
- The proposed General Plan would result in reduced VMT compared to the existing General Plan. This is because the proposed General Plan would result in less development, and hence have fewer trips than the existing General Plan.

2. CONSISTENCY WITH CLEAN AIR PLAN TCMs

Table 17 lists General Plan policies that constitute implementation of the Clean Air Plan Transportation Control Measures (TCMs). For each TCM a description is provided and a listing of relevant General Plan strategies given. Because these policies are proposed by the General Plan, it is considered consistent with the Clean Air Plan in this regard.

3. ODORS AND TOXICS

For local plans to have a less than significant impact with respect to odors and/or toxic air contaminants, buffer zones are to be established around existing and proposed land uses that would emit these air pollutants. Buffer zones to avoid odors and toxics impacts are to be reflected in local plan policies, land use maps, and implementing ordinances.

Table 17. Implementation of CAP Transportation Control Measures in the General Plan

TRANSPORTATION CONTROL MEASURE	DESCRIPTION	RELEVANT GENERAL PLAN POLICIES
1. Expand Employee Assistance Program	▶ Provide assistance to regional and local ridesharing organizations.	2.77: A Establish Industrial Park bus service.
9. Improve Bicycle Access and Facilities	<ul style="list-style-type: none"> ▶ Establish and maintain bicycle advisory committees in all none Bay Area Counties ▶ Develop comprehensive bicycle plans. ▶ Encourage employers and developers to provide bicycle access and facilities. ▶ Improve and expand bicycle lane system. 	2.67.A: Plan for public improvements that accommodate and enhance bicycle access. 2.69G: Provide bike racks on buses.
12. Improve Arterial Traffic Management	<ul style="list-style-type: none"> ▶ Continue ongoing local signal timing programs. ▶ Study signal preemption for buses on arterials with high volume of bus traffic. ▶ Expand signal timing programs. ▶ Improve arterials for bus operations and to encourage bicycling. 	2.72K: Coordinate traffic signal timing improvements.
13. Transit Use Incentives	<ul style="list-style-type: none"> ▶ Expand marketing and distribution of transit passes and tickets. ▶ Set up local transportation stores to sell passes, distribute information. 	2.69B: Subsidize transit at a level justified by a cost/benefit study. 2.69K: Link buses to other forms of public transit. 2.72H: Advertise the use of transit, bicycling and walking for commuting, shopping, recreation and school trips. 2.69D: Allow preferential parking for public transit vehicles. 2.69G: Provide attractive transit stops. 2.73C: Advertise benefits of TDM measures.
15. Local Clean Air Plans, Policies and Programs	<ul style="list-style-type: none"> ▶ Incorporate air quality beneficial policies and programs into local planning and development activities, with a particular focus on subdivision, zoning and site design measures that reduce the number and length of single-occupant automobile trips. 	2.73A: Work cooperatively with the business and residential communities to minimize peak period traffic through TSM programs. 2.73D: Consider denser, mixed use development, particularly adjacent to or in Downtown. 2.75D: Update parking requirements wherever possible; reflect parking proximity to transit corridors. 4.15D: Encourage land use strategies that reduce auto use.

PPM = Parts per Million

 $\mu\text{g}/\text{m}^3$ = Micrograms per Cubic Meter

TDM = Transportation Demand Management

TSM = Transportation Systems Management

The proposed Land Use Map includes buffer zones around the Exxon refinery, and proposed Policy 4.28.1 directs the City to establish buffer zones between sensitive land uses and those land uses which involve the significant use, storage, or disposal of hazardous materials or waste. However, the General Plan does not specifically address buffer zones around sources of toxic air contaminants or odors.

D. IMPACTS AND MITIGATION MEASURES

Impact AIR-1: The General Plan does not specifically address buffer zones surrounding sources of odor or toxic air contaminants.

Mitigation Measure AIR-1: Goal 4.28 and Policy 4.28.1 should be modified to specifically address toxic air contaminants.

4.12 NOISE

This section summarizes information on noise in the City and provides an evaluation of the effects of the proposed General Plan on noise. More detail on the existing noise setting within the City of Benicia is contained in the Noise Background Report.

A. EXISTING SETTING

1. BACKGROUND INFORMATION

Noise is often defined as unwanted sound, and thus is a subjective reaction to characteristics of a physical phenomenon. Researchers for many years have grappled with the problem of translating objective measurements of sound into directly correlated measures of public reaction to noise. The descriptors of community noise in current use are the results of these efforts, and represent simplified, practical measurement tools to gauge community response.

Two composite noise descriptors are in common use today: Ldn and CNEL. The Ldn (Day-Night Average Level) is based upon the average hourly sound level over a 24-hour day, with a +10 decibel weighting applied to nighttime (10:00 pm to 7:00 am) values. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were subjectively twice as loud as daytime exposures. The CNEL (Community Noise Equivalent Level), like Ldn, is based upon the weighted average hourly sound level over a 24-hour day, except that an additional +4.77 decibel penalty is applied to evening (7:00 pm to 10:00 pm) values. The CNEL was developed for the California Airport Noise Regulations, and is normally applied to airport/aircraft noise assessment. The Ldn descriptor is a simplification of the CNEL concept, but the two will usually agree, for a given situation, within 1 dB. These descriptors are averages and tend to disguise short-term variations in the noise environment. Because they presume increased evening or nighttime sensitivity, these descriptors are best applied as criteria for land uses where nighttime noise exposures are critical to the acceptability of the noise environment, such as residential developments.

2. NOISE IN THE CITY OF BENICIA

The existing noise environment throughout the majority of Benicia is dominated by traffic on major highways, which include I-680, I-780, and major arterial streets

and roads. Noise contours depicting the existing noise environment attributable to these sources are shown in Figure 21.

Operations along the Union Pacific Transportation Company (UPRR) railroad tracks also generate noise within the City of Benicia. The UPRR track is a mainline track which operates across the Carquinez Strait, and also services some industry within the City of Benicia.

Additionally, industrial and other fixed noise sources are dispersed throughout the City. The major fixed noise sources identified in the Background Document include the Exxon Benicia Refinery Area, Port of Benicia Industrial Area, Suisun Bay Industrial Area, special events, tire and muffler shops, metal fabricating shops, large HVAC systems, commercial developments, loading docks, etc.

Noise related to aircraft operations results from the Travis Air Force Base. Aircraft noise levels are due primarily to operations along the flight tracks associated with runways 3L/21R and 3R/21L. Although the City is located outside of the Travis AFB 60 dB CNEL contour, overflights due primarily to C-5 aircraft produce maximum noise levels ranging between 70 dB and 90 dB within the northeast portions of the City.

As part of the background analysis conducted for the General Plan, a community noise survey was conducted throughout the City away from major noise sources, in areas containing noise-sensitive land uses. Noise levels ranged between 51 dB and 63 dB Ldn.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would result in a significant noise impact if it would:

- Result in an increase in ambient noise levels of 5 dB or more in areas with ambient noise of less than 60 Ldn or CNEL.
- Result in an increase in ambient noise levels of 3 dB or more in areas with ambient noise of 60 to 65 Ldn or CNEL.
- Result in an increase in ambient noise levels of 1.5 dB or more in areas with ambient noise of more than 65 Ldn or CNEL.

These standards of significance are based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels (August 1992). They reflect the fact that changes in noise levels are most significant when they occur in areas that already noisy. Additionally, a significant impact would result if:

EXISTING NOISE EXPOSURE CONTOURS

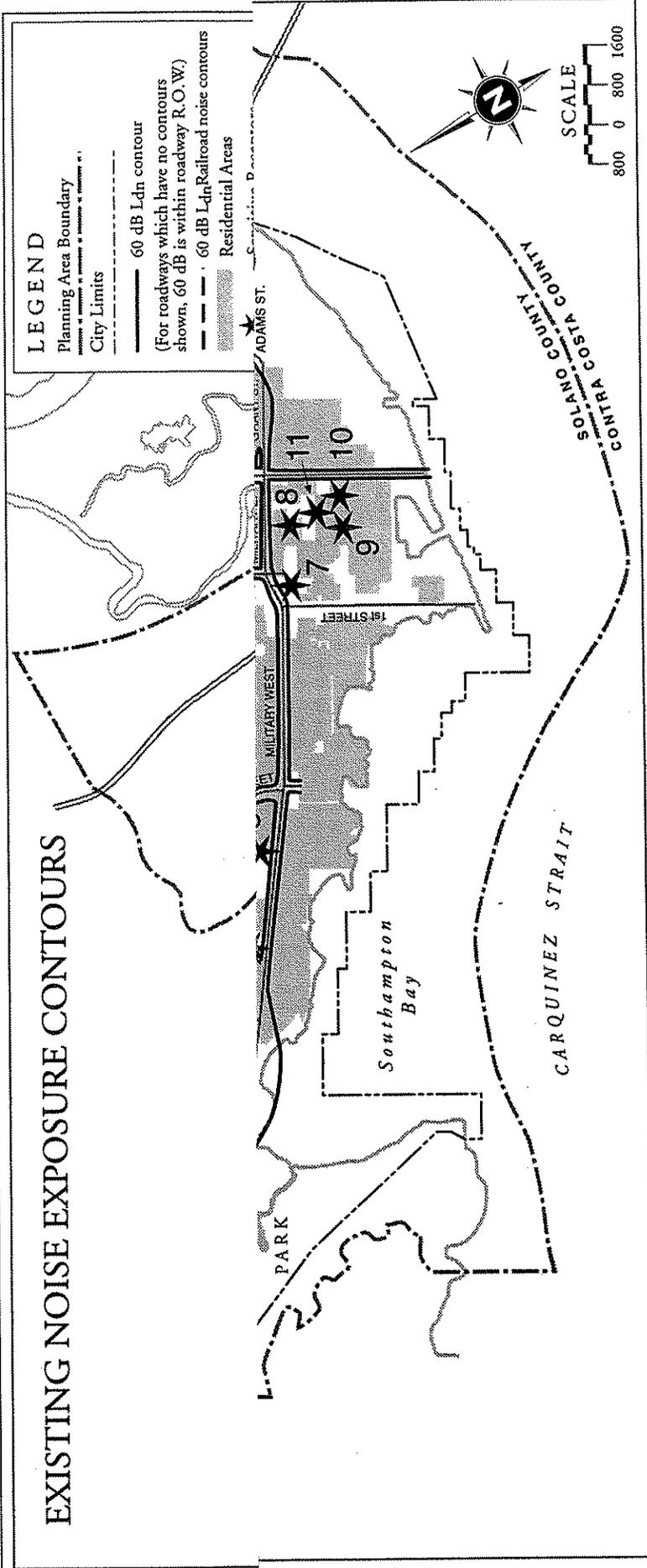


Figure 21



- Noise sensitive uses would be allowed in areas with high existing or project noise levels, in conflict with proposed General Plan Policies 4.31.3 and 4.31.4.

C. IMPACT DISCUSSION

1. TRAFFIC NOISE LEVELS

If the proposed General Plan is adopted, development throughout Benicia would occur consistent with the land use designations as amended. As development occurs, increased traffic would result in increased traffic noise.

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to predict distances to Ldn contours for all highways and major roadways under conditions that are expected to occur with the land use designations proposed by the General Plan, as shown in Table 18. These projected conditions are based upon traffic conditions that are anticipated in the year 2015. This table also shows the relative change in levels from those identified for existing conditions. Figure 22 presents the projected future noise environment based upon these conditions.

The data show that both existing and future traffic noise levels could exceed the proposed General Plan's acceptable limits for existing and proposed uses at some locations. This could occur if new noise-sensitive uses are located inside the 60 dB Ldn roadway noise contours, or if increased noise levels associated with traffic encroach upon existing noise-sensitive land uses or further increase noise levels already in excess of 60 dB Ldn. Examples of such areas include the residential areas that currently encroach onto Interstate 780, residential uses along Southampton Road between Chelsea Hills Drive to Interstate 780, and residential uses along West Seventh Street.

These potential impacts of the General Plan would be mitigated by the General Plan through several policies that are proposed for adoption. Policy 4.31.2 provides for the evaluation of proposed projects against existing and future noise levels, Policy 4.31.3 directs the City to prohibit development of noise-sensitive land uses in areas exposed to significant noise, and Policy 4.31.5 directs the City to mitigate noise created by new transportation projects so as to not exceed the acceptable levels stipulated in the General Plan. With adoption of these policies through the General Plan, no significant impacts related to traffic noise would occur.

Table 18. Noise Contour Data: Distance in Feet from Center of Roadway to Ldn Contours

SEGMENT	DESCRIPTION	EXISTING		YEAR 2015		DIFFERENCE IN dB AT 100 FEET
		60 dB	65 dB	60 dB	65 dB	
I-680						
1	Benicia Bridge	977	453	984	457	+0.1
2	Benicia Bridge to I-780	977	453	984	457	+0.1
3	I-780 to Bayshore Rd.	794	369	820	380	+0.2
4	Bayshore to Industrial Way	725	337	750	348	+0.2
5	Industrial Way to Lake Herman	765	355	791	367	+0.2
I-780						
6	I-680 to 2nd St.	665	309	753	349	+0.9
7	2nd St. to W. Benicia Interchange	743	345	838	389	+0.8
Military						
8	Southampton to Sherman Drive	77	36	109	51	+2.3
9	Sherman Drive to 1st Street	99	46	166	77	+3.4
10	1st Street to East 2nd Street	128	60	201	93	+3.0
11	East 2nd Street to E. 4th Street	75	35	107	50	+2.3
12	East 4th Street to East 5th Street	80	37	112	52	+2.2
13	East 5th Street to East 7th Street	79	37	87	41	+0.7
Southampton Road						
14	South of I-70	79	37	n/a	n/a	n/a
15	Panorama to Chelsea Hills	90	42	108	50	+1.2
16	Chelsea Hills Drive to I-780	154	72	179	83	+1.0
West 7th Street						
17	South of E. Benicia Interchange	110	51	149	69	+2.0
18	North of E. Benicia Interchange	124	58	152	71	+1.3
Chelsea Hills						
19	North of Southampton Road	86	40	100	46	+1.0
East 2nd Street						
20	Military Street to East O Street	116	54	183	85	+3.0
21	East O Street to I-780	121	56	196	91	+3.1
22	I-780 to Tennys Drive	121	56	176	82	+2.5
23	Tennys Drive to Rose Drive	101	47	122	57	+1.2
24	Rose Dr. to West Industrial Way	87	40	131	61	+2.7

SEGMENT	DESCRIPTION	EXISTING		YEAR 2015		DIFFERENCE IN dB AT 100 FEET
		60 dB	65 dB	60 dB	65 dB	
Rose Drive						
25	West of East 2nd Street	73	34	127	59	+3.6
East 5th Street						
26	South of Military	83	38	93	43	+0.7
27	Military Street to I-780	119	55	150	69	+1.5
28	North of I-780	71	33	89	41	+1.5
Lake Herman Road						
29	I-780 to East 2nd Street	64	30	151	70	+3.6
30	East of Goodyear Road	46	21	109	51	+5.7
Industrial Way						
31	East of I-680	41	19	45	21	+0.7
32	Park Street to Oregon Street	60	28	71	33	+1.2
33	Oregon Street to East 2nd Street	54	25	132	61	+5.9
Park Road						
34	North of Industrial Way	43	20	50	23	+0.9
35	Industrial Way to Bayshore Rd..	90	42	103	48	+0.9
36	South of Bayshore Rd..	47	22	54	25	+0.9

2. RAILROAD NOISE

Development under the proposed General Plan could theoretically result in noise-sensitive land uses encroaching within areas affected by noise from the railroad tracks. This could result in individuals being exposed to noise levels which may be considered unacceptable. However, no such conflicts are foreseen, as shown in Figure 22, since no residences or other noise sensitive uses would occur near the railroad tracks.

Railroad noise level measurements and accepted modeling techniques were used to determine the distances to Ldn contours. The approximate distance to the 60 dB Ldn noise contour for the main Union Pacific track is 135 feet from the track centerline. The distance does not account for shielding from buildings or topography, and is considered a worst case scenario.

In order to further avoid potential railroad noise impacts, the City of Benicia is proposing the adoption of several policies through the General Plan. These include policies to evaluate the feasibility of proposed projects with regards to noise and prohibiting development of noise-sensitive land uses in areas exposed to unacceptable noise levels (Policies 4.31.2, 4.31.3, and 4.31.4). With these policies and the review of individual development projects for their compatibility with the existing and future noise environment, no significant impacts are anticipated.

3. INDUSTRIAL AND OTHER FIXED NOISE SOURCES

As additional development occurs throughout the City, the potential exists for noise-sensitive land uses and existing or proposed fixed noise sources to encroach upon each other. However, the General Plan includes guidance to prevent this situation from occurring, and is therefore expected to protect the economic base of the City by protection existing businesses and industries.

Figure 4-6 of the General Plan provides specific performance standards for determining the compatibility of noise-sensitive land uses with non-transportation sources, as specified in Policy 4.31.8 of the General Plan. The standards are for new noise-sensitive developments which may be affected by an existing non-transportation noise source, such as a new church being proposed adjacent to a light manufacturing facility with noisy outdoor activities. The performance standards also apply to new developments that include a non-transportation noise source which may affect an existing noise-sensitive development. These standards would not affect existing operations or land uses which generate noise, but are to be used only in conjunction with proposed development projects to determine their compatibility with the existing noise environment.

If a new development project is not compatible with the existing environment, the General Plan would ensure that appropriate measures would be taken to reach compatibility, or the new land use would not be allowed.

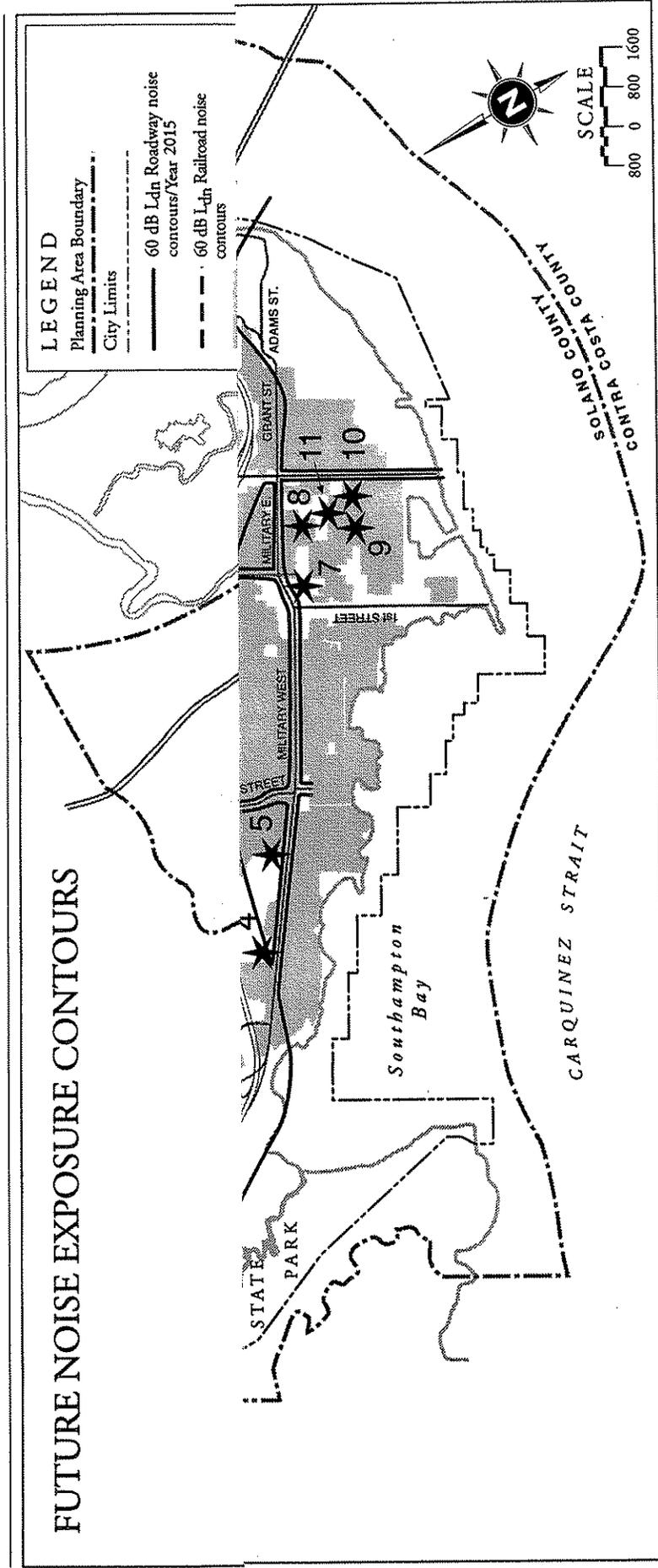


Figure 22

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With the policies and performance standards proposed by the General Plan regarding land use compatibility, no significant noise impacts are anticipated with the operation of existing fixed noise sources, or the implementation of new fixed noise sources.

4. AIRCRAFT NOISE

Operations at Travis AFB are not anticipated to increase substantially, based upon the most recent AICUZ. Implementation of the General Plan would not result in noise-sensitive land uses located within the future 60 dB CNEL contour for Travis AFB. Therefore, no significant noise impacts related to the airport are expected.

4.13 HAZARDOUS MATERIALS

This section summarizes information on hazardous materials in the City and provides an evaluation of the effects of the proposed General Plan on hazardous materials. More detail on the existing hazardous materials setting within the City of Benicia is contained in the Public Safety Background Report.

A. EXISTING SETTING

This chapter provides a broad overview of the potential presence of hazardous substances within the Benicia planning area. Hazardous substances have certain chemical and physical properties which may pose a substantial present or future hazard to human health or the environment when improperly handled, stored, disposed or otherwise managed. These substances are commonly used in commercial, agricultural, and industrial applications, and to a limited extent in residential areas.

1. HAZARDOUS SUBSTANCE REGULATION

Hazardous materials and hazardous wastes, collectively referred to as hazardous substances, are defined in Title 22 of the California Code of Regulations, Sections 66260 through 66261.10.

Hazardous substances are extensively regulated by federal, state, regional, and local regulations, with the major objective of protecting public health and the environment. In general, these regulations provide definitions of hazardous substances; establish reporting requirements; regulate the handling, storage, transport, remediation and disposal of hazardous substances; and require health and safety provisions for both workers and the public.

The major agencies enforcing these regulations in Benicia include the following:

- US Environmental Protection Agency (EPA)
- Department of Toxic Substances Control (DTSC)
- California Regional Water Quality Control Board of the California (RWQCB)
- California Environmental Protection Agency (Cal EPA)

- Bay Area Air Quality Management District (BAAQMD)
- Solano County Department of Environmental Management
- Benicia Fire Department
- Federal Occupational Health and Safety Administration
- California Occupational Health and Safety Administration

DTSC and RWQCB are parts of Cal EPA.

Regulatory agencies also maintain lists, or databases, of sites that are classified as hazardous waste generators or that store hazardous substances in underground storage tanks as well as sites where soil or groundwater quality may have been affected by hazardous substances.

2. MAJOR HAZARDOUS WASTE AREAS IN BENICIA

This section contains a summary of the conditions at the major hazardous waste areas within the City of Benicia, which are shown on Figure 23. This mapping is not intended to show the exact location of hazardous material sites within the City. Additionally, there are many sites outside of the area boundaries shown on the figure. A summary of existing information regarding the soil and groundwater quality in these areas is presented below.

IT PANOCHÉ FACILITY

The IT Panoche Facility is a 242-acre Class I hazardous waste facility that will soon be undergoing closure. During operation, the facility accepted a wide variety of hazardous wastes for disposal, most of which originated from northern California industries and spill cleanups. Currently, IT Corporation is working with regulatory agencies to close the site.

The exact nature of the waste materials disposed at the Panoche Facility is not completely defined due to the limitations of early disposal records and the problems inherent in trying to accurately identify disposed wastes through sampling and analysis. Nevertheless, IT has used available data from those sources to prepare waste characterizations which the DTSC has deemed adequate for the purposes of risk assessment.

A number of waste constituents have been identified in the upper groundwater bearing zone within the Panoche Facility and a slurry wall has been installed and keyed into bedrock at the lower end of the main site drainage to help prevent off-site migration of waste constituents in the groundwater.

No hazardous waste constituents have been found off-site with the exception of volatile organic compounds (VOCs) identified in the upper groundwater bearing zone. The VOCs extend from Drum Burial Area 5 about 2,000 feet northwest to

MAJOR KNOWN HAZARDOUS WASTE AREAS

LEGEND

- Planning Area Boundary
- Sphere of Influence
- City Limits
- ① IT Panoche Facility
- ② Braito Landfill
- ③ Arsenal (Dashed line indicates boundary only - specific sites are inside this area.)
- ④ Parcel 2-4a

Note: This figure only shows major areas with identified hazardous material site. This figure is not intended to show the exact location of hazardous material sites within the city. Additionally, there are many sites outside of these area boundaries. For more detail, please refer to the Public Safety Background Report.

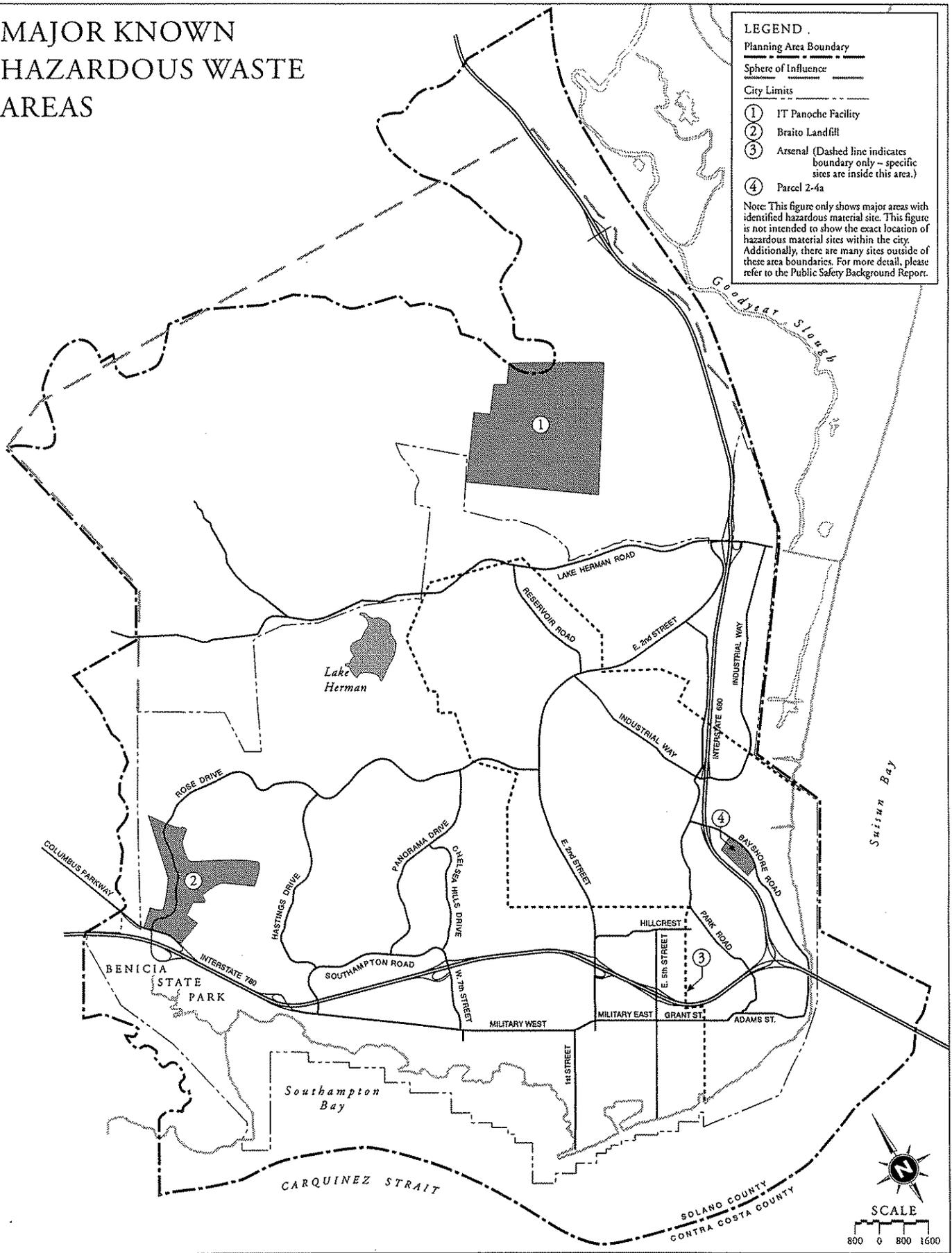


Figure 23

Paddy Creek. IT has undertaken preliminary remediation measures for the off-site VOC plume including diversion trenches and groundwater recovery systems. Numerous borings and monitoring wells have been installed as part of their efforts to identify the extent and pathways of the plume.

The DTSC is evaluating closure plan alternatives for the IT facility and expects to approve a closure plan by early 1998. Formal closure pursuant to the requirements of the Resource Conservation and Recovery Act could then begin later in 1998.

BRAITO LANDFILL

The Braitto Landfill, also known as the Solano County Sanitary Landfill, was located in the hills of northwestern Benicia, in what is now the western portion of the Southampton development. During its operation from 1955 to 1979, the landfill accepted household waste, scrap metal, tannery waste, and some other industrial wastes including sewage sludge. The landfill was comprised of the East Canyon and North Canyon. The East Canyon has been closed and is being maintained by the developer in accordance with Regional Water Quality Control Board requirements. Wastes in North Canyon were to have been moved to East Canyon prior to development of the North Canyon area with homes. A decision was made to leave some wastes in place in the area that is now Blake Court. However, it was recently discovered that other areas of residual waste also remained in and near North Canyon. Some of these wastes are hazardous or contain hazardous constituents.

Residual wastes have been identified beneath 861 Rose Drive, adjoining lots, and other locations within the former North Canyon area and outlying areas of the landfill. Wastes have been identified in seven areas associated with the North Canyon as well as an area outside of the boundaries of the East Canyon.

Three areas, including the area outside of the East Canyon, have been remediated to the satisfaction of the regulatory agencies and the remediation of the Hillside area is still under evaluation. A remedial investigation and feasibility study and baseline risk assessment have been completed for the remaining four areas and further actions are being discussed with the regulatory agencies.

ARSENAL

The Benicia Arsenal was established in 1851 by the US Army as one of the five permanent arsenals in the country and the first on the Pacific Coast. The Arsenal served as a principal depot for the Division of the Pacific and was used for ordnance repair, storage, and issuance and the manufacture and testing of small arms, mobile and seacoast artillery targets. The Arsenal provided ordnance support to the western US in World War I, it was a principal supply point for the Pacific campaign in World War II, and it reached its peak of production during the Korean conflict. The Arsenal was a transshipment depot for chemical warfare materials. The Arsenal was declared excess by the Department of Defense (DOD) in 1962 and deactivated in 1964. In 1965 the DOD transferred ownership of the Arsenal to the City.

At its greatest extent, the Arsenal occupied 2,728 acres of owned and leased lands. Most of the property is now privately owned and the majority is planned for industrial use with smaller portions planned for residential, commercial and open space. The City has retained ownership of the tidelands area at the port, including the area where the Benicia Industries and Exxon docks are located. The tidelands are leased to Benicia Industries which subleases a portion of the port to Exxon. Most of what is now the Benicia Industrial Park, including the Exxon Refinery, is located on former Arsenal property. Portions of the property planned for industrial development are currently undeveloped.

In 1989, approximately 200 acres in the northwest portion of the Arsenal were approved for development of 238 single family homes as part of a larger 800-home project proposed by the Southampton Company. The EIR for the Southampton development noted the existence of two concrete bunkers left over from the Arsenal use on a portion of the leased property known as the Tourtelot property, and concluded that the bunkers would need to be removed unless an engineering study determined that they could be safely filled. In 1995, while conducting preliminary grading operations on the Tourtelot property, the successor developer, Pacific Bay Homes, found a number of projectiles, some of which appeared to be dummy rounds associated with testing. Several rounds of unexploded live ordnance were also found, however, and development activities were halted pending the results of studies by the Army Corps of Engineers to determine what additional ordnance might exist in the area.

After the discovery of live ordnance on the Tourtelot property, the Corps of Engineers completed a 1997 supplement to the previously completed 1994 *Archives Search Report*. The 1997 supplement found that there is the potential for chemical weapons material (CWM) presence at the Arsenal, though the report does conclude that it appears unlikely that any of the mustard from mustard bombs was disposed of on any of the Arsenal property. The report identifies eleven areas where there is some potential for residual ordnance, as listed below:

1. *Modified Cistern.* A cistern was modified in 1926 for CWM storage. It was destroyed during the construction of Interstate 680.
2. *CWM Storage Igloos.* Documents indicate that CWM may have been stored in two igloos and also in tarp-covered structures on the ground between the igloos. The two igloos were destroyed during industrial development.
3. *Dunnage Burn Area.* This 13-acre area near the Clocktower is now an undeveloped open area. There was no information on the types of materials dumped.
4. *Dump Site.* This 3-acre area near the Clocktower is now an undeveloped open area. There is no available information on the types of materials dumped.
5. *Dump Site.* This 20-acre area near the bay was used from the late 1940s until 1962. It is now a paved parking area. There is no available information on the types of materials dumped.
6. *Demolition Area on the Tourtelot Property.* This area consists of about 15 acres in a deep draw where the developer, Pacific Bay Homes, found live ordnance. The area was used for demolition of ammunition. It is possible that some rounds from the former firing range further down the draw could be found in this area.
7. *Demolition/Demilitarization Area on the Tourtelot Property.* This 23-acre area was used for demilitarization and demolition of ammunition. Bulk explosives were burned here and the area also contained the 155 mm howitzer test tunnels (bunkers) and firing butts. The test tunnels and firing points have been removed by Pacific Bay Homes.
8. *Demolition Area on Exxon Property.* This 2-acre area is located west of East Second Street in the buffer area owned by Exxon. Historical documents indicate that it was used both as a firing range and a demolition area.
9. *Small Arms Range.* This area was shown as a small arms range on a 1918 map. The target berm was excavated for construction of Interstate 780.
10. *Small Arms Ammunition Disposal Structure.* This area contained a special structure constructed for the disposal of small arms ammunition.
11. *Primer Destruction Area.* This one-acre area was used for the destruction of primers.

The Corps of Engineers will be conducting field investigation of these eleven areas, which will be followed by remediation, if necessary. On a parallel track, the Corps of Engineers has begun an archives search report scheduled for completion in mid-1998 to determine the potential for residual chemical contamination at the Arsenal. If potential contamination is identified, site specific studies and remediation will be conducted.

PARCEL 2-4A

Parcel 2-4a is an 8-acre site located east of Interstate 680 in the Benicia Industrial Park; this area was previously part of the Benicia Arsenal. The site was previously used as a lead recycling facility to reclaim lead from organic lead sludge. The facility was closed between 1967 and 1970. During this closure, the recycling facility and furnace were dismantled and several hundred cubic yards of sludge were removed from the site. A remedial action was conducted in 1993 and 1994 to remove lead containing soil, treat the soil, deposit the treated soil in an on-site repository, cap the repository, and grade the site to prevent erosion. The DTSC has placed a deed restriction on the property restricting future land uses for the property to those that would avoid potential harm to persons or property from exposure to the treated material within the repository.

3. OTHER HAZARDOUS SUBSTANCE SITES IN BENICIA

Potential sources of hazardous materials within Benicia include sites with historic or existing use of hazardous materials as well as potential and confirmed hazardous waste sites. When handled properly and when used in compliance with permitting and other regulatory requirements, hazardous materials do not necessarily pose a human health concern or a threat to the environment.

Computerized database searches were conducted to identify sites in Benicia with currently permitted underground storage tanks and sites permitted to handle hazardous wastes under the Resource Conservation and Recovery Act (RCRA) within Benicia. These sites are identified in the Public Safety Background Report. There were 64 sites with permitted underground storage tanks and 77 RCRA permitted sites identified within Benicia.

Current requirements for underground storage tanks include monitoring and tightness testing on a regular basis to monitor for leakage. These requirements reduce the potential for undetected leakage from these underground storage tanks. Any soil or groundwater contamination at a site with a permitted underground storage tank would typically be identified when agency required samples are collected during tank repairs or replacement. Similarly, RCRA contains provisions for enforcing clean up actions at a site where RCRA violations have occurred.

In preparing Hazardous Materials Business Plans and Risk Management and Prevention Plans, site owners must inventory the chemicals used at their facilities and develop emergency response procedures to abate potential releases. This inventory also assists public agencies such as the fire department who would be required to respond to an emergency at the facility. The Solano County Environmental Management Department records were reviewed to identify businesses that have filed Hazardous Materials Business Plans or Risk Management and Prevention Plans and the sites were screened to identify those that use the chemicals which are considered to have the greatest potential to affect human health or the environment if released. Thirty-seven sites met the screening criteria. More detail on these sites can be found in the Public Safety Technical Background Report.

4. HAZARDOUS BUILDING MATERIALS

Some building materials commonly used in older buildings could present a public health risk if disturbed during an accident or during demolition of an existing building. These materials include asbestos, electrical equipment such as transformers and fluorescent light ballasts that contain polychlorinated biphenyls (PCBs), fluorescent lights containing mercury vapors and lead based paints. Asbestos and lead based paint may also present a health risk to existing building occupants if they are in a deteriorated condition. If removed during demolition of a building, these materials would also require special disposal procedures.

B. STANDARDS OF SIGNIFICANCE

The Benicia General Plan would have a significant impact with regard to hazardous materials if it would:

- Create a potential public health hazard.
- Involve the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the affected area.

C. IMPACT DISCUSSION

Adoption of the Benicia General Plan would provide guidelines for development within the City of Benicia and could stimulate commercial and industrial development within certain areas of the City. Compliance with existing laws and adoption of specific policies and programs of the proposed General Plan would minimize potential public health impacts associated with use and presence of hazardous substances in Benicia.

Potential hazardous substances impacts can generally be categorized into three groups: land use compatibility, normal commercial and industrial operations, and construction at sites with hazardous substances, as further described below.

1. LAND USE COMPATIBILITY

Business and commercial operations commonly involve the use of hazardous substances which could be released to the environment through accidental releases. The proximity of housing to land uses that involve the use of hazardous materials can increase the potential for public exposure to any hazardous substances released. The potential for exposure exists where designated land uses allow residential or public land uses mixed with or directly adjacent to commercial or industrial land uses.

Mixed residential and commercial land uses are planned in the areas designated for Downtown Mixed Use and Lower Arsenal Mixed Use. In these areas, there is a greater potential for exposure to hazardous substances by sensitive receptors than in single land use areas. Even with proper precautions and compliance with regulatory requirements, accidental spills or other inadvertent releases could expose residential and community uses to hazardous substances associated with commercial or business activities.

Businesses which handle hazardous materials are required to have a Hazardous Materials Business Plan which includes procedures for safe handling of the hazardous substances and emergency response procedures to be followed in the event of a release. Additionally, the proposed General Plan directs the City to only allow mixed land uses when adequate buffers are established (Policy 2.2.3). Several areas of the Benicia Industrial Park which border on other types of land uses have been designated as Limited Industrial to provide a buffer between the General Industrial Areas and the rest of the City. The proposed General Plan also includes several policies and programs that provide for improved separation of residential and industrial/commercial land uses which would reduce the potential for community exposure to hazardous substances (Policy 2.2.2, Program 2.2.C, Policy 2.6.1, Program 2.6.A, and Policy 2.11.2).

The public could also be exposed to potential health risks if residential or other land uses were allowed adjacent to known hazardous waste sites where potential health risks exist, including the IT Panoche Facility, Braito Landfill, the Arsenal, and other hazardous waste sites that could be identified in the future. In these areas, there is a greater potential for exposure to hazardous substances by sensitive receptors. The proposed General Plan would eliminate potential development north of Lake Herman Road near the IT site. Moreover, businesses which handle hazardous materials are required to have a Hazardous Materials Business Plan or Risk Management and Prevention Plan which includes procedures for safe handling of the hazardous substances and emergency response procedures to be followed in the event of a release.

Policy 2.57.1 of the General Plan would allow churches to locate in industrial areas as conditional uses, which is consistent with existing City policy. Program 2.57.A requires the City to establish specific regulations for churches in non-residential zones.

The General Plan, in combination with existing hazardous substance regulations, would provide for an adequate level of protection and should prevent any land use compatibility impacts related to hazardous substances.

2. OPERATIONAL EFFECTS

In accordance with recent regulations, businesses which handle hazardous materials are required to have a Hazardous Materials Business Plan, and businesses which handle acutely hazardous materials are required to have a Risk Management and Prevention Program. Implementation of these plans requires the safe handling of hazardous materials, provides the City with an inventory hazardous materials used throughout the City, and allows the City to improve its emergency response to hazardous materials incidents. In addition, the General Plan includes several policies and programs that relate to potential operational impacts and would provide for safe handling of hazardous substances (Policies 2.11.1, 4.12.1, 4.12.2, 4.20.1, 4.22.1, 4.22.4, 4.22.5, 4.23.1, 4.24.1, and 4.24.2 and associated programs).

Hazardous materials are also used to a limited extent in residential areas and, accordingly, hazardous wastes are produced. The proposed General Plan includes several programs and a policy to address hazardous waste in residential areas (Program 4.12.G, Policy 4.22.2, and Program 4.22.D). The impacts associated with any increased long-term use of hazardous substances would not be significant, since implementation of the proposed policies and programs in the General Plan described above would address these concerns.

3. CONSTRUCTION-RELATED EFFECTS

Adoption of the General Plan could result in stimulating development in various parts of Benicia, which in turn would result in an increase in the potential for demolition and renovation activities. Policy 2.42.1 encourages the upgrade of older buildings without losing affordable housing. Many of these buildings could contain hazardous building materials and demolition or renovation could result in exposure to hazardous building materials, such as asbestos, lead, mercury or PCBs, with associated public health concerns. However, existing laws and regulations plus Policy 4.27.1 and Program 4.27A of the proposed General Plan would mitigate any potential public health impacts associated with exposure to hazardous building materials.

An increase in construction activities could also result in increased likelihood of encountering contaminated soil or groundwater, particularly in areas where land uses are being changed from those which historically involved the use of hazardous substances. If contaminated soil or groundwater is encountered, workers and the community could be potentially exposed to hazardous substances. Programs 4.12.I and 4.12.K would require testing at sites with known or suspected contamination.

In addition to the above measures, the General Plan directs the City to monitor and participate in the remedial planning process for major hazardous waste sites and to monitor implementation of any remedial actions (Policy 4.25.1).

As previously discussed, the Corps of Engineers has identified eleven areas of concern in the Arsenal area where there is the potential for residual ordnance from the historical use of the property. Though the Corps of Engineers is planning on conducting additional field work in these areas to identify the potential remaining ordnance, and will conduct necessary remediation if required in the future, this work has not been completed. For this reason, development proximate to these eleven areas may encounter unexploded ordnance which could result in construction-related hazards.

With the exception of potential construction-related impacts with regard to unexploded military ordnance, the General Plan in combination with existing hazardous substance regulations would provide for an adequate level of protection and should prevent any construction-related impacts related to hazardous substances.

D. IMPACTS AND MITIGATION MEASURES

Impact HAZ-1: Development within or adjacent to the eleven areas of concern identified by the Corps of Engineers could encounter unexploded ordnance which could result in construction-related hazards.

Mitigation Measure HAZ-1: The General Plan should include a policy and/or program to require site investigation of sites with possible unexploded ordnance prior to development of the properties. Should any unexploded ordnance be discovered, the remediation of the property should be required before grading or construction occurs.

5. ALTERNATIVES TO THE PROPOSED PROJECT

The Benicia General Plan has been described and analyzed in the previous sections with an emphasis on potentially significant impacts and recommended mitigation measures to avoid those impacts. The State CEQA Guidelines also require the description and comparative analysis of a range of reasonable alternatives to the proposed project that could feasibly attain the objectives of the project.

The following discussion is intended to inform the public and decision makers of project alternatives that have been developed and the positive and negative aspects of those alternatives. In accordance with the CEQA guidelines and procedures, three alternatives are discussed below, including a No Project Alternative. CEQA Guidelines also require that the environmentally superior alternative be identified. This information is included at the conclusion of this chapter.

The three alternatives are as follows:

- ◆ **No Project Alternative.** The proposed General Plan would not be adopted and the existing General Plan for the City of Benicia would remain in effect.
- ◆ **Land Use Changes Alternative A.** The proposed General Plan would be amended to incorporate the land use changes shown in Figure 24. The goals, policies and programs of the General Plan would also be amended as needed to reflect the land use designations proposed by this alternative.
- ◆ **Land Use Changes Alternative B.** The proposed General Plan would be amended as needed to incorporate the land use changes shown in Figure 25. The goals, policies and programs of the General Plan would also be amended to reflect the land use designations proposed by this alternative.

Each alternative is analyzed against the impact factors considered for the proposed project, according to whether it would have a mitigating or adverse effect. Table 19 summarizes the results of the analysis.

LAND USE CHANGES— ALTERNATIVE OPTION A

LEGEND

	General Commercial		Low Density Residential	Sphere of Influence Planning Area Boundary City Limits
	Downtown Commercial		Open Space - General	
	Industrial Park		Downtown - Mixed Use	
	Public/Quasi-Public			

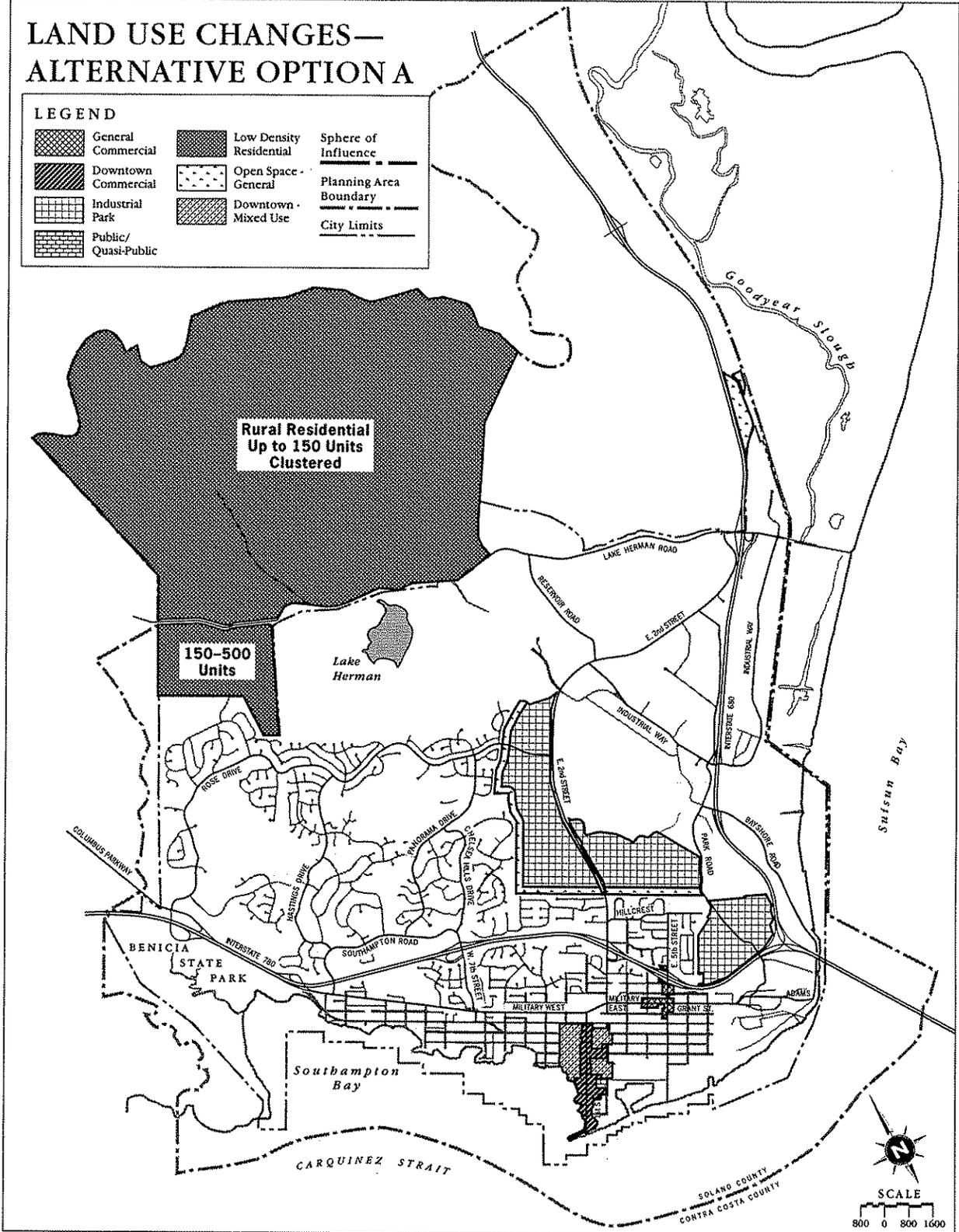
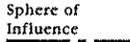
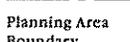
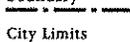


Figure 24

LAND USE CHANGES— ALTERNATIVE OPTION B

LEGEND

	Low Density Residential		Sphere of Influence
	Open Space - General		Planning Area Boundary
	Partial Reduction of Water-Related Industrial		City Limits

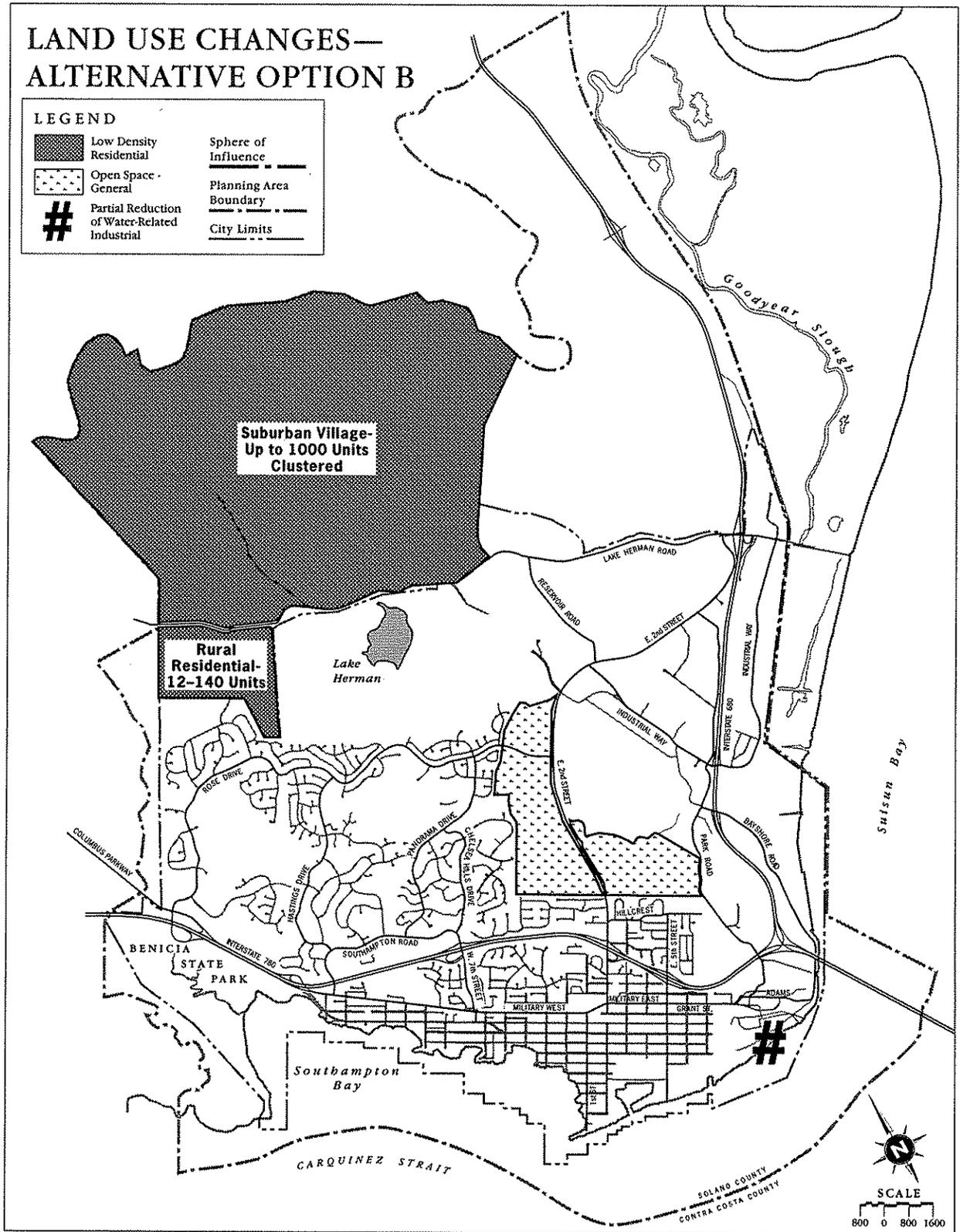


Figure 25

This chapter also includes an analysis of two alternative General Plan policies that are still under consideration by the City. These two policies could be included in any of the General Plan alternatives, including the proposed General Plan itself. The analysis of these alternatives is found in Section D of this chapter.

A. NO PROJECT ALTERNATIVE

1. PRINCIPAL CHARACTERISTICS

Under this alternative, the proposed General Plan would not be adopted and the existing General Plan would remain in effect. The No Project Alternative would not prevent development in the City. Rather, development would occur according to the existing General Plan land use designations and the existing policy guidance within the City.

2. IMPACT ANALYSIS

The No Project Alternative would have the following impacts relative to adoption of the proposed General Plan.

LAND USE

The No Project Alternative would have the potential to result in more development in the City of Benicia since the land use designation changes proposed by the General Plan would not be implemented. The most significant difference would be the retention of the Low Density Residential and Medium Density Residential land use designations in the Sky Valley area, for which the General Plan proposes a General Open Space land use designation, and maintenance of the commercial development area near the IT site north of Lake Herman Road. Further, the new mixed-use designations would not be implemented in the Downtown or in the Arsenal area.

The No Project Alternative would not have the beneficial effect of lowering the likelihood that land use incompatibilities would occur. The proposed General Plan policies directing the City to establish and maintain buffers between industrial/commercial uses and existing and future residential uses would not be implemented and the open space buffers proposed through the land use designation changes along West Channel Road and California Court and the Exxon property in the vicinity of East Second Street would not be implemented.

With these considerations, the Citywide benefits of the General Plan on land use and the beneficial effects of the newly proposed policies and land use changes on land use compatibility outweigh the potential for adverse impacts resulting from changes in industrial zones. Overall the No Project Alternative is considered worse than the proposed General Plan from a land use compatibility perspective.

Table 19. Comparison of Project Alternatives

IMPACT FACTORS	NO PROJECT	ALT. A	ALT. B
Land Use	-	=	=
Population, Employment and Housing	=	=	=
Community Services	-	-	-
Open Space and Recreation	--	--	--
Transportation	-	-	-
Visual Quality and Urban Design	--	--	--
Cultural Resources	=	=	=
Geologic and Seismic Hazards	=	=	=
Hydrology and Water Quality	--	--	--
Biological Resources	--	--	--
Air Quality	-	-	-
Noise	-	=	=
Hazardous Materials	=	=	=

- ++ Substantial improvement compared to the proposed project.
+ Insubstantial improvement compared to the proposed project.
= Same impact as proposed project.
- Insubstantial deterioration compared to the proposed project.
-- Substantial deterioration compared to the proposed project.

Note: Competing aspects within some factors would create both improvement and deterioration simultaneously for a single alternative. These trade-offs are discussed in the text.

POPULATION, EMPLOYMENT AND HOUSING

Development that could occur under the No Project Alternative would likely result in more population and housing growth when compared to the General Plan, primarily because the property in the Sky Valley area would retain its residential land use designation. Growth in employment and industry under the No Project Alternative would be similar to that anticipated under the General Plan since the land use changes proposed by the General Plan are not expected to change commercial or industrial development patterns significantly (although some additional commercial development would be allowed under the No Project Alternative near the IT site north of Lake Herman Road). With the No Project Alternative, it is likely that the City of Benicia would continue to have a slight jobs to housing imbalance, with more housing than jobs available within the City limits. None of these differences would result in a significant impact to population, employment or housing, similar to the proposed General Plan.

COMMUNITY SERVICES

Overall, development under the No Project Alternative could result in an increase in housing, commercial, and industrial development when compared to the proposed General Plan. As discussed in the land use and community service analyses in this report, the land use designation changes proposed by the General Plan actually reduce the current development potential within the City. For this reason, the No Project Alternative would likely result in the same if not greater impacts to community services. As the population of Benicia grows, provisions will have to be made to keep police services, fire services, schools, and sewer and water services at their current level of service. Because the No Project Alternative would allow more overall development than the proposed General Plan, the likelihood that the City would be impacted by the need to provide additional services is greater. This would be of particular concern in the Sky Valley area, where additional services would be needed and could be difficult or expensive to provide.

OPEN SPACE AND RECREATION

Based on the findings of the *Parks, Trail and Open Space Master Plan*, the City has identified additional sites for neighborhood parks through the General Plan. Though the No Project Alternative would not include the directive to develop these additional parks, the City could develop these parks under the existing General Plan. The No Project Alternative would also fail to provide the beneficial policies and programs of the General Plan which would provide additional access to important open space areas and minimize the potential for adverse changes or impacts on the open space resources north of Lake Herman Road. With these considerations in mind, the No Project Alternative is considered substantially worse than the proposed General Plan from an open space and recreation perspective.

TRANSPORTATION

Development under the current General Plan would result in worse traffic conditions when compared to the General Plan. However, these differences are not significant since improvements recommended through the City's Capital Improvement Program (CIP) could also be implemented to mitigate these traffic conditions. Additionally, the City of Benicia would continue to monitor traffic conditions and improve the circulation system on an as-needed basis.

Development under the current General Plan could require less transit service in the downtown and Arsenal areas due to the lower density allowed in these areas. The No Project Alternative would also require the extension of transit service into the northern development area, which would not be required under the General Plan.

Development in the northern area of the City would also result in an increased demand for bicycle and pedestrian trails connecting to Lake Herman and other recreational destinations in the northern area. However, these demands could easily be addressed.

With these considerations in mind, the No Project Alternative is considered worse than the proposed General Plan from a transportation and circulation perspective, but only to a less than significant degree.

VISUAL QUALITY AND URBAN DESIGN

The No Project Alternative would not have the beneficial effect of providing additional policy guidance on the protection of visual and urban design resources within the City of Benicia. Additionally, the No Project Alternative would result in the potential development of the lands to the north of Lake Herman Road, which could negatively impact this natural visual resource and the scenic enclosure around the City. With these considerations, the No Project Alternative is considered substantially worse than the proposed General Plan from a visual quality and urban design perspective.

CULTURAL RESOURCES

Most of the policy guidance contained in the proposed General Plan regarding cultural resources is either already mandated by existing conservation plans adopted by the City of Benicia, or by State regulations. Though it is important to incorporate this specific guidance into the General Plan, the net benefit of the General Plan on cultural resources is minimal. For this reason, the No Project Alternative is considered equivalent to the General Plan from a cultural resources perspective.

GEOLOGIC AND SEISMIC HAZARDS

The changes in land use designations proposed by the General Plan would eliminate the need to mitigate potential geologic hazards north of Lake Herman

Road, since these areas would be maintained as open space. Additionally, the General Plan proposes several policies and programs to protect people and property from geologic and seismic hazards. Though these beneficial effects of the General Plan would not occur with the No Project Alternative, they are not considered significant since most of these regulations and requirements would be implemented through project-specific environmental review and building requirements regardless of General Plan policy. Additionally, if low intensity development were to occur within the northern area, geologic impacts of this development could be mitigated with the implementation of common engineering solutions. For this reason, the No Project Alternative is considered equivalent to the General Plan from a geologic and seismic hazards perspective.

HYDROLOGY AND WATER QUALITY

The additional development in the northern area allowed by the current General Plan would significantly increase the urban stormwater load conveyed in Sulphur Springs Creek and its tributaries. This would increase flooding potential through the downstream reaches of the creek, which are primarily industrial areas. The increased suburban development could also increase the loading of urban stormwater pollutants on Lake Herman inflows. The already threatened lake water quality could undergo further deterioration due to increased nutrient input from upstream lawn fertilization residues in stormwater and wash water runoff, although some of the increases would be offset by a potential reduction in grazing and other agricultural uses. Additionally, the proposed policies of the General Plan which would minimize many of these potential impacts would not be adopted with the No Project Alternative. For these reasons, the No Project Alternative is considered significantly worse than the proposed project from a hydrology and water quality perspective.

BIOLOGICAL RESOURCES

Because the No Project Alternative would allow development in the northern area, it has the potential to affect significant biological resources. Development under existing General Plan regulations could affect essential habitat for the callippe silverspot butterfly, proposed for federal listing as an endangered species, and would contribute to fragmentation of wildlife habitat north of Lake Herman Road. Thus, the No Project Alternative is considered significantly worse than the proposed General Plan with regard to biological resources.

AIR QUALITY

The No Project Alternative would not include the adoption of policies that constitute implementation of the Clean Air Plan Transportation Control Measures (TCMs), which are included in the General Plan. Additionally, the No Project Alternative could result in the development of additional residential units on the Sky Valley property which would result in more traffic, and thus more air quality emissions. For these reasons, the No Project Alternative is considered worse than the proposed General Plan from an air quality perspective.

NOISE

The No Project Alternative would not include the adoption of policies directing the City to establish and maintain buffers between industrial/commercial uses and residential uses. Additionally, the proposed open space buffers along West Channel Road and California Court and the Exxon property in the vicinity of East Second Street would not be implemented. These provisions of the General Plan would be beneficial and, for this reason, the No Project Alternative is considered worse than the proposed General Plan from a noise perspective.

HAZARDOUS MATERIALS

The No Project Alternative would not include the additional hazardous materials and public safety policies and programs proposed by the General Plan. However, hazardous materials generation, storage and clean-up are heavily regulated by federal, State, and local regulations, so this is not a significant difference.

B. ALTERNATIVE A

1. PRINCIPAL CHARACTERISTICS

Changes in land use designations proposed in Alternative A are shown in Figure 24. The land use designation changes proposed in Alternative A would result in the designation of the western half of the northern area as well as the Zocchi property south of Lake Herman Road for Low Density Residential development. This development could result in the addition of 300 to 650 residential units. Residential development in the northern area could require the development of a new roadway connection from Lake Herman Road to Bantry Way to allow more direct access.

In addition to the above land use changes, a significant amount of industrial land along East Second Street and Park Road would be redesignated from General Industrial and Limited Industrial to Industrial Park, which would be a new land use designation. Some adjustments would also occur to the land use designations in the Downtown. This alternative would not include any change in land use designation for the Arsenal area, though the mixed use designation in the Downtown would be implemented. Additionally, there would be no change to the "Yuba" industrial area, which would remain designated as General Industrial.

The goals, policies, and programs of the General Plan would remain the same as are currently proposed, except where the proposed policy direction would clearly conflict with the land use changes proposed by Alternative A. Additionally, Policy 3.63.5 would be added to the General Plan, which directs the City to avoid urban development on steep hillsides north of Lake Herman Road. This policy would be implemented to govern the development that could occur in the northern area and would prevent urban development in the steepest portions of this area.

2. IMPACT ASSESSMENT

Alternative A would have the following impacts relative to adoption of the proposed General Plan.

LAND USE

Alternative A would have the potential to result in more development in the northern area when compared to the proposed General Plan since development would be allowed north of Lake Herman Road and on the Zocchi property. Though this development may result in the conversion of visual and biologically sensitive lands to residential uses (as described below), no land use incompatibilities are anticipated with the development of housing in this area.

Additionally, industrial lands in the vicinity of East Second Street would be governed by the new Industrial Park designation, which would be a new land use designation. However, the Open Space buffer proposed by the General Plan, which would be located between these industrial lands and the residential areas to the west and south, would also be provided by Alternative A. The policies directing the City to establish and maintain buffers between industrial/commercial uses and existing and future residential uses would also be implemented, and would have a beneficial effect on land use compatibility.

With these considerations, the effects of Alternative A are considered equivalent from a land use perspective when compared to the proposed General Plan.

POPULATION, EMPLOYMENT AND HOUSING

Development that could occur under Alternative A would likely result in more population and housing growth when compared to the General Plan. Development of the northern area and the Zocchi property could result in the addition of up to 650 new residential units. Growth in employment and industry under Alternative A would be more oriented to Industrial Park development in the vicinity of East Second Street. With Alternative A it is also likely that the City would continue to have a slight jobs to housing imbalance, with more housing than jobs available within the City limits. None of these differences would result in a significant impact to population, employment or housing, similar to the proposed General Plan.

COMMUNITY SERVICES

Development under Alternative A could result in an increase in housing development when compared to the proposed General Plan. Development of the northern area and the Zocchi property could result in the addition of up to 650 new residential units. Implementation of Alternative A would require additional provisions for police services, fire services, schools, and sewer and water services when compared to the proposed General Plan. Because Alternative A would allow more overall development, the likelihood that the City would be impacted by the need to provide additional services is greater. However, the provision of

these services could be required before development of these properties was allowed. For this reason, Alternative A is considered worse than the proposed General Plan, but only to a less than significant degree.

OPEN SPACE AND RECREATION

Alternative A would include the same provisions for additional parks in the City that are proposed in the General Plan, as well as the beneficial policies and programs of the General Plan which would provide additional access to important open space areas. However, policies directing the City to protect open space resources north of Lake Herman Road would need to be revised to be made compatible with the land use changes proposed by Alternative A. Overall, this alternative would result in a decrease in open space, since the expansive open space north of Lake Herman Road could be developed. For this reason, Alternative A is considered significantly worse than the proposed General Plan from an open space perspective.

TRANSPORTATION

The additional residential units that could be developed under Alternative A would add approximately one pm peak hour trip per unit to Benicia roadways, for a net trip generation increase of 300 to 650 trips. These trips would use Lake Herman Road, Reservoir Road, East Second Street, and Rose Drive as the primary routes to the downtown, I-680, and I-780. This additional traffic would worsen intersections which are projected to operate at LOS F under the General Plan, and would require additional transportation improvements in the form of additional lanes on certain approaches of some intersections. The City of Benicia would continue to monitor traffic conditions and improve the circulation system on an as-needed basis.

Development under Alternative A would allow an area of development in the northern area that would be unserved by transit; this would not occur under the General Plan. In addition, development in the northern area of the City would also result in an increased demand for bicycle and pedestrian trails connecting to Lake Herman and other recreational destinations in the northern area. However, these demands could easily be addressed.

With these considerations in mind, Alternative A is considered worse than the proposed General Plan from a transportation and circulation perspective, but only to a less than significant degree since these conditions could be mitigated through traffic and circulation system improvements, which would be integrated into the City's Capital Improvement Program.

VISUAL QUALITY AND URBAN DESIGN

Alternative A would have the beneficial effect of providing additional policy guidance for the protection of visual and urban design resources within the City of Benicia. However, Alternative A would also result in the potential

development of the Zocchi property and lands to the north of Lake Herman Road, which could negatively impact a natural visual resource and scenic enclosure of the City. If this development were to occur, the natural backdrop of the hills would be replaced with housing development. With these considerations, Alternative A is considered substantially worse than the proposed General Plan from a visual quality and urban design perspective.

CULTURAL RESOURCES

Most of the policy guidance contained in the proposed General Plan regarding cultural resources is either already mandated by existing conservation plans adopted by the City of Benicia, or by State regulations. This policy guidance would also be implemented with Alternative A. For this reason, Alternative A is considered equivalent to the General Plan from a cultural resources perspective.

GEOLOGIC AND SEISMIC HAZARDS

Alternative A would result in potential development in the northern area. This development would be low density and would generally minimize the overall amount of grading and potential exposure to landslide hazards. The steepest slopes of the area would not be developed, since a new policy directing the City to prevent development from occurring on steep hillsides would be incorporated in the General Plan with the implementation of Alternative A. Additionally, the General Plan proposes several policies and programs to protect people and property from geologic and seismic hazards. These beneficial effects would also occur under Alternative A. For these reasons, Alternative A would be similar to the proposed General Plan from a geologic and seismic perspective.

HYDROLOGY AND WATER QUALITY

The additional development in the northern area would significantly increase the urban stormwater load conveyed in Sulphur Springs Creek and its tributaries. This would increase flooding potential through the downstream reaches of the creek, which are primarily industrial areas. The increased suburban development could also increase the loading of urban stormwater pollutants on Lake Herman inflows. The already threatened lake water quality could undergo further deterioration due to increased nutrient input from upstream lawn fertilization residues in stormwater and wash water runoff, although some of the increases would be offset by a potential reduction in grazing and other agricultural uses. The proposed policies of the General Plan would minimize many of these potential impacts. However, Alternative A is still considered worse than the proposed project from a hydrology and water quality perspective.

BIOLOGICAL RESOURCES

Alternative A would allow for considerable development in the northern area. Development under this alternative could affect essential habitat for the callippe silverspot butterfly, proposed for federal listing as an endangered species, and would contribute to the fragmentation of wildlife habitat in the northern portion

of the planning area. Therefore, this alternative is considered significantly worse than the proposed project from a biological perspective.

AIR QUALITY

Alternative A would include the adoption of policies that constitute implementation of the Clean Air Plan Transportation Control Measures (TCMs), which are included in the General Plan. However, Alternative A would result in the development of additional residential units on the Zocchi property and property north of Lake Herman Road. This development would result in more traffic, and thus more air quality emissions. For these reasons, Alternative A is considered worse than the proposed General Plan from an air quality perspective.

NOISE

Alternative A would include the adoption of policies directing the City to establish and maintain buffers between industrial/commercial uses and residential uses. Additionally, the proposed open space buffers along West Channel Road and California Court and the Exxon property in the vicinity of East Second Street would be implemented. The provisions of Alternative A and the General Plan would be similarly beneficial. Thus, Alternative A is considered similar to the proposed project from a noise perspective.

HAZARDOUS MATERIALS

Alternative A would include the additional hazardous materials and public safety policies and programs proposed by the General Plan. Additionally, hazardous materials generation, storage and clean-up are heavily regulated by federal, State, and local regulations. With these considerations, Alternative A would be considered the same as the proposed project from a hazardous materials perspective.

C. ALTERNATIVE B

1. PRINCIPAL CHARACTERISTICS

Changes in land use designations proposed in Alternative B are shown in Figure 25. The land use designation changes proposed by Alternative B would result in the redesignation of the western half of the northern area to Suburban Village and the redesignation of the Zocchi property south of Lake Herman Road to Rural Residential. This development could result in the addition of up to 1,140 new residential units. Residential development in the northern area could require the development of a new roadway connection from Lake Herman Road to Bantry Way to allow more direct access.

Additional land uses changes include the redesignation of a significant amount of industrial land along East Second Street from General Industrial and Limited Industrial to Open Space, and some adjustments to the Lower Arsenal area that

would result in a partial reduction of water-related industry. This alternative would not include any change in land use designations for the downtown area or other commercial areas of the City. Additionally, there would be no change to the "Yuba" industrial area, which would remain designated as General Industrial.

The goals, policies, and programs of the General Plan would remain the same as are currently proposed, except where the proposed policy direction would clearly conflict with the land use changes proposed by Alternative B. Additionally, Policy 3.63.5 would be added to the General Plan, which directs the City to avoid urban development on steep hillsides north of Lake Herman Road. This policy would be implemented to govern the development that could occur in the northern area and would prevent urban development on the steepest portions of this development area.

2. IMPACT ANALYSIS

Alternative B would have the following impacts relative to the adoption of proposed General Plan.

LAND USE

Alternative B would have the potential to result in significantly more development in the northern area and on the Zocchi property when compared to the proposed General Plan. Though this development may result in the conversion of visual and biologically sensitive lands to residential uses (as described below), no land use incompatibilities are anticipated with this development.

Additionally, industrial lands in the vicinity of East Second Street would be changed to the Open Space-General land use designation. This land use designation change would result in no land use incompatibility issues, since this property would be retained as open space and would be a visual and natural resource for the adjacent residential neighborhoods.

With these considerations, Alternative B is considered equivalent from a land use perspective when compared to the proposed General Plan.

POPULATION, EMPLOYMENT AND HOUSING

Development that could occur under Alternative B would likely result in more population and housing growth when compared to the General Plan. Development of the northern area and the Zocchi property could result in the addition of more than 1,000 new residential units. Growth in employment and industry under Alternative B could not be as significant as that which could occur under the General Plan since the property in the vicinity of East Second Street would have an Open Space land use designation, rather than the Limited Industrial designation proposed by the General Plan. Because Alternative B encourages housing development, but discourages significant industrial

development, this alternative would likely exacerbate Benicia's existing jobs to housing imbalance. However, none of these differences would result in a significant environmental impact to population, employment or housing, similar to the proposed General Plan.

COMMUNITY SERVICES

Development under Alternative B could result in a significant increase in housing development when compared to the proposed General Plan. Development of the northern area and the Zocchi property could result in the addition of more than 1,000 new residential units. Implementation of Alternative B would require additional provisions for police services, fire services, schools, and sewer and water services when compared to the proposed General Plan. Because Alternative B would allow more overall development, the likelihood that the City would be impacted by the need to provide additional services is greater. However, the provision of these services could be required before development of these properties was allowed. For this reason, Alternative B is considered worse than the proposed General Plan, but only to a less than significant degree.

OPEN SPACE AND RECREATION

Alternative B would include provisions for providing additional parks in the City as well as the beneficial policies and programs of the General Plan which would provide additional access to important open space areas. However, policies directing the City to protect open space resources north of Lake Herman Road would need to be revised to be made compatible with the land use changes proposed by Alternative B. Overall, this alternative would result in a decrease in open space, since the expansive open space north of Lake Herman Road would be developed with suburban uses. For this reason, Alternative B is considered significantly worse than the proposed General Plan from an open space perspective.

TRANSPORTATION

The additional residential units that could be developed under Alternative B would add approximately one pm peak hour trip per unit to Benicia roadways, for a net trip generation change of up to 1,140 trips. These trips would use Lake Herman Road, Reservoir Road, East Second Street and Rose Drive as the primary routes to the downtown, I-680, and I-780. This additional traffic would worsen intersections which are projected to operate at LOS F under the General Plan, and would require additional transportation improvements in the form of additional lanes on certain approaches of some intersections. The City of Benicia would continue to monitor traffic conditions and improve the circulation system on an as-needed basis.

Development under Alternative B would allow an area of development in the northern area that would be unserved by transit; this would not occur under the General Plan. In addition, development in the northern area of the City would

also result in an increased demand for bicycle and pedestrian trails connecting to Lake Herman and other recreational destinations in the northern area. However, these demands could easily be addressed.

With these considerations in mind, Alternative B is considered worse than the proposed General Plan from a transportation and circulation perspective, but only to a less than significant degree.

VISUAL QUALITY AND URBAN DESIGN

Alternative B would have the beneficial effect of providing additional policy guidance on the protection of visual and urban design resources within the City of Benicia, though it is likely that some of these policies would require revision since many of them direct protection of the open spaces in the northern area.

Alternative B would also result in significant development of the lands to the north of Lake Herman Road, which would destroy a natural visual resource and scenic enclosure of the City. If this development were to occur, the natural backdrop of the hills would be replaced with housing development. With these considerations, Alternative B is considered substantially worse than the proposed General Plan from a visual quality and urban design perspective.

CULTURAL RESOURCES

Most of the policy guidance contained in the proposed General Plan regarding cultural resources is either already mandated by existing conservation plans adopted by the City of Benicia, or by State regulations. This policy guidance would also be implemented with Alternative B. For this reason, Alternative B is considered equivalent to the General Plan from a cultural resources perspective.

GEOLOGIC AND SEISMIC HAZARDS

The development allowed by Alternative B in the northern area would be low density clustered single family development. Though the development allowed through Alternative B would be greater than that allowed under Alternative A, it would still be possible to develop the northern area without creating geologic and seismic hazards. The steepest slopes of the area would not be developed, since a new policy directing the City to prevent development from occurring on steep hillsides would be incorporated in the General Plan with the implementation of Alternative B. Additionally, the General Plan proposes several policies and programs to protect people and property from geologic and seismic hazards. These beneficial effects would also occur under Alternative B. For these reasons, Alternative B would be similar to the proposed General Plan from a geologic and seismic perspective.

HYDROLOGY AND WATER QUALITY

The substitution of large scale suburban development for open space in the northern area would likely result in a net increase in flood potential through the lower reaches of Sulphur Springs Creek. This is due to the effect of development

in the upper reaches of the watershed on the time of concentration for stormwater runoff, which would be significantly reduced. The more dense suburban configuration proposed by Alternative B would also increase the contaminant loading in stormwater in the Sulphur Springs Creek drainages and in Lake Herman relative to both the General Plan and Alternative A. The proposed policies of the General Plan would minimize some of these potential impacts. However, Alternative B is still considered worse than the proposed project from a hydrology and water quality perspective.

BIOLOGICAL RESOURCES

Alternative B would allow for considerable development in the northern area. Development under this alternative could affect essential habitat for the callippe silverspot butterfly, proposed for federal listing as an endangered species, and would contribute to the fragmentation of wildlife habitat in the northern portion of the planning area. Therefore, this alternative is considered significantly worse than the proposed project from a biological standpoint. Because of the extent of development allowed by this alternative, it is the least desirable from a biological perspective.

AIR QUALITY

Alternative B would include the adoption of policies that constitute implementation of the Clean Air Plan Transportation Control Measures (TCMs), which are included in the General Plan. However, Alternative B would result in the development of additional residential units on the Zocchi property and property north of Lake Herman Road. This development would result in more traffic, and thus more air quality emissions. For these reasons, Alternative B is considered worse than the proposed General Plan from an air quality perspective.

NOISE

Alternative B would include the adoption of policies directing the City to establish and maintain buffers between industrial/commercial uses and residential uses. Additionally, the land which is currently designated for industrial uses in the vicinity of East Second Street would be redesignated to Open Space-General. Similar to the proposed project, Alternative B would not create any significant noise effects and is considered similar to the proposed project from a noise perspective.

HAZARDOUS MATERIALS

Alternative B would include the additional hazardous materials and public safety policies and programs proposed by the General Plan. Additionally, hazardous materials generation, storage and clean-up are heavily regulated by federal, State, and local regulations. With these considerations, Alternative B would be considered the same as the proposed project from a hazardous materials perspective.

D. ALTERNATIVE POLICIES

In addition to the above alternatives, the City is also considering several alternative General Plan policies in the General Plan. The environmental effects of these alternative policies and programs are summarized below so that the City may select among the policy and program options without further environmental review.

1. CHURCHES AND INDUSTRIAL ZONES

The proposed General Plan would allow churches to establish in industrial zones, as currently allowed by the City, which could result in potential issues regarding land use compatibility. An option for the City would be to replace the currently proposed policy and program with the following policy and program:

Policy 2.57.1: Allow churches to locate in non-industrial zoned areas (i.e., residential, commercial, mixed uses) as conditional uses, with use permits specifying standards and conditions. Churches are not allowed in industrial zones.

Program 2.57.A: Remove regulations that allow churches as a permitted use in industrial zones, and establish specific regulations that allow churches in non-industrial zones.

The implementation of the above policy and program would prevent churches from establishing in industrial zones, thus removing the potential significant impacts related to their location in these zones. Thus the alternative policy and program are preferred.

2. PUBLIC ART

The City of Benicia is also considering several alternative policies regarding public art, as follows:

Policy 3.15.1: Continue to allow and promote art in public places.

Policy 3.15.3: Encourage meaningful funding for public art through the General Fund.

These policies would have no significant environmental consequence since they would not affect any of the environmental topics addressed in this EIR. Either of them could be adopted without an environmental impact.

E. ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA is generally interpreted as requiring the identification of the environmentally superior alternative in an EIR. Based on the information contained in this chapter, which is summarized in Table 19, it can be seen that the proposed General Plan is the environmentally superior alternative.

6. CEQA-REQUIRED ASSESSMENT CONCLUSIONS

As required by CEQA, this chapter provides an overview of the impacts of the proposed General Plan based on the technical analyses presented in this EIR. The topics covered in this chapter include growth inducement; cumulative impacts; unavoidable significant effects; and expected significant irreversible changes. A more detailed analysis of the effects the General Plan would have on the environment is provided in Chapter 4: Environmental Evaluation.

A. GROWTH INDUCEMENT

A project is typically considered to be growth-inducing if it fosters economic or population growth. Typical growth inducements might be the extension of urban services or transportation infrastructure to a previously unserved or under-served area or the removal of major barriers to development. Not all growth inducement is necessarily negative. Negative impacts associated with growth inducement would occur only where the projected growth would cause foreseeable environmental impacts.

The proposed General Plan is expected to result in limited and beneficial growth in the City. Proposed changes to regulations are meant to spur positive, high-quality urban development, while discouraging undesirable development in the area, such as development in areas with natural and visual resources outside the existing City limits. The limited growth induced by the Plan would be beneficial because the area delineated for development already has urban services and most of the property within the City is already developed. Development allowed under the General Plan is expected to be largely infill development or redevelopment of already developed sites. Moreover, the intensity of development allowed by the General Plan would be less overall than that which is currently allowed under the existing General Plan.

B. CUMULATIVE IMPACTS

CEQA Guidelines require consideration of the potential cumulative impacts that could result from a proposed project in conjunction with other projects in the vicinity. Such impacts can occur when two or more individual effects either together create a considerable environmental impact or compound other environmental consequences.

In the case of a City-wide planning document, such as a General Plan, cumulative effects are effects that combine impacts from development in the City with those from development in other areas of the region. Such cumulative effects are addressed where appropriate in the individual topical sections in Chapter 4, particularly in Section 4.5: Transportation and Circulation. The traffic analysis finds that cumulative regional traffic conditions in and around Benicia are expected to remain acceptable, and that the proposed General Plan would result in marginally less traffic than the existing General Plan. Hence no significant cumulative traffic impacts are expected. The effects of cumulative traffic are also considered in the noise and air quality sections of this EIR, where they are also found to be less-than-significant.

C. UNAVOIDABLE SIGNIFICANT EFFECTS

As shown in Chapter 4, adoption of the General Plan is not expected to cause any significant unavoidable environmental impacts under CEQA definitions. All identified potential impacts can be mitigated to a less than significant level with the implementation of the mitigation measures outlined in this EIR.

D. SIGNIFICANT IRREVERSIBLE CHANGES

An EIR on a General Plan must analyze the extent to which a proposed project will commit nonrenewable resources to uses that future generations will probably be unable to reverse. An example of such an irretrievable commitment is the construction of highway improvements that will provide public access to previously inaccessible areas.

Benicia is currently developed with a mixture of uses, and the General Plan would not increase the allowed amount of development over that already allowed by the existing General Plan. For these reasons, adoption of the General Plan would not result in any significant irreversible changes.

E. RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

An EIR must describe the long-term effects of a proposed project, with special attention to impacts which narrow the range of beneficial uses of the environment or pose long-term risks to health or safety. The proposed General Plan is not expected to result in any long-term risks to health or safety, significantly limit future beneficial uses of the environment, or prevent the maintenance and enhancement of the environment. Additionally, the preservation of the northern area as an open space use, as proposed by the General Plan, would maximize the future use of this area for environmentally beneficial purposes.

7. REPORT PREPARATION

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