

Draft Programmatic Environmental Impact Report for the County Transportation Expenditure Plan

Prepared for:



SOLANO TRANSPORTATION IMPROVEMENT AUTHORITY



SOLANO TRANSPORTATION AUTHORITY

Prepared by:



Jones & Stokes

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Draft

**Programmatic Environmental Impact Report for
the County Transportation Expenditure Plan**

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Summary

Introduction

The Solano Transportation Authority (STA) is proposing to adopt the County Transportation Expenditure Plan (CTEP) to address shortfalls in funding that are needed to implement various transportation improvement projects within Solano County. This environmental impact report (EIR), which analyzes the CTEP, has been prepared pursuant to the California Environmental Quality Act (CEQA) and State CEQA Guidelines (14 California Code of Regulations 15000 et seq.) by STA. Under CEQA, STA is the lead agency for this project.

This summary discusses:

- the purpose of this EIR,
- the project description,
- the project alternatives,
- the environmental review process,
- the environmental impacts and mitigation measures of the CTEP, and
- the public participation process for the CTEP and for this EIR.

Purpose of This EIR

This EIR has been prepared in accordance with CEQA, which requires all state and local government agencies to consider the environmental consequences of projects over which they have discretionary authority before taking action on those projects (California Public Resources Code Section 21000 et seq.). The purpose of this EIR is to assess the environmental effects (impacts) of the proposed transportation improvements that would be funded under the CTEP and to identify mitigation measures (as required by CEQA) that would avoid or reduce significant impacts that would result from the improvements.

A notice of preparation (NOP) and initial study (IS) were prepared for the proposed project to establish the scope of this EIR. The NOP and IS are found in *Appendix A*. The IS concluded that the topics listed below should be addressed in the EIR.

Scope of This EIR

The following resource topics are analyzed in this EIR (*Chapters 3–15*, respectively):

- land use and planning;
- agricultural lands;
- population and housing;
- biological resources;
- cultural resources;
- hydrology and water quality;
- geology, soils and seismicity;
- transportation;
- air quality;
- noise;
- aesthetics;
- public services and utilities; and
- cumulative impacts and other CEQA issues.

Areas of Known Controversy

State CEQA Guidelines Section 15123(b) requires EIRs to identify areas of controversy known to the lead agency, including issues raised by other agencies and the public. STA prepared and circulated a notice of preparation (NOP) in May 2002, in accordance with Section 15082. Following the 30-day review period for the NOP, written comments that were returned to STA were reviewed to ensure that the EIR addresses all issues of concern identified. In addition, on June 20, 2001, a public scoping meeting was held to solicit public input on environmental issues or concerns that should be addressed in this EIR. Areas of concern raised in comments made on the NOP and during the scoping meeting for the draft EIR included impacts on state transportation facilities, construction-related impacts, and noise impacts. Specific comments on the NOP are provided in *Appendix B*.

Project Description (Balanced Plan)

The CTEP contains specific projects that encompass different types of transportation improvements. Each of these projects is described in terms of three major categories represented within the CTEP: Countywide Priority Projects, Return to Source—Fast Track Congestion Relief and Travel Safety

Program Projects, and Local Road Rehabilitation Projects. These projects are listed below and further discussed in *Chapter 2*. The CTEP has been identified as the “Balanced Plan” option through STA’s coordination and collaboration with numerous local transportation and transit interests. The other options considered are described under “Alternatives to the Proposed Project.”

Countywide Priority Projects

Highway Improvements

- Interstate 80 (I-80)/I-680/State Route (SR) 12 interchange reconstruction
- I-80 corridor improvements from Vallejo to Dixon
- SR 12 corridor improvements from I-80 to Napa County line (Jameson Canyon) and I-80 to the Sacramento River
- SR 113 corridor improvements

Transit Improvements

- Baylink Ferry Service
- commuter rail to Bay Area Rapid Transit System
- commuter rail to Sacramento area
- expansion of Capitol Corridor service
- senior and disabled transit services
- express bus service on I-80, I-680, and I-780
- local transit

Nonmotorized Improvements

- bicycle/pedestrian trails
- park-and-ride lots/rideshare program
- pedestrian- and transit-friendly downtowns
- transportation-related environmental mitigation

Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

- local roadway improvements, including access improvements to Travis Air Force Base
- local interchange improvements
- Countywide Transportation for Livable Communities /downtown improvements
- local transit projects and local safety projects

Local Road Rehabilitation Projects

- local road rehabilitation projects in various cities throughout the county and the unincorporated county

Alternatives to the Proposed Project

No-Project Alternative

Under this alternative, the proposed CTEP would not be implemented and no additional funding would be available for the proposed transportation improvements throughout Solano County. It would not meet STA's goal of providing a plan to allocate funding to implement specific elements of the CTEP to develop a balanced transportation system that reduces congestion and improves access and travel choices by enhancing roads, public transit, bicycle and pedestrian systems, intermodal facilities, and management techniques. The estimated \$3 billion needed to address transportation and transit service inadequacies (e.g., deteriorated local roads and highways, inadequate transit services for senior and disabled, increased need for commuter or transit options, and inadequate highway capacity) proposed under the CTEP would not be met. Existing roadway safety hazards associated with SR 113, SR 12, and local areas identified under the Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would persist.

Highway Emphasis Option

Under this option, the total amount of money to be allocated among the specific projects would remain the same as proposed under the CTEP; however, a greater share of the total funds would be allocated to highway projects. The potential for impacts on the environment would be similar to those for the proposed project. However, this option would not meet the STA's goal of developing a balanced

transportation system because it would place a larger emphasis on highway improvements at the expense of other improvements.

Transit Emphasis Option

Under this option, the total amount of money to be allocated among the specific projects would remain the same as proposed under the CTEP; however, a greater share of the total funds would be allocated to transit projects. The potential for impacts on the environment would be similar to those for the proposed project. However, this option would not meet the STA's goal of developing a balanced transportation system because it would place a larger emphasis on transit improvements at the expense of other improvements.

Environmentally Superior Alternative

State CEQA Guidelines Section 15126(d) require that an EIR identify the environmentally superior of the alternatives examined. Among the CTEP alternatives evaluated in this EIR, there is no single alternative that is clearly more superior than the others. The Transit Emphasis Option has the fewest number of projects among the alternatives, and the impacts of this alternative would probably be less extensive than would occur under the other alternatives; however, the analysis did not result in a clear distinction relative to the degree of impacts among the alternatives.

Environmental Review Process

Purpose of a Program EIR

Because of the nature of the CTEP and transportation improvements, this EIR is a program-level EIR. The State CEQA Guidelines encourage agencies to use a program EIR in circumstances that involve a series of related projects. A program EIR provides a framework for conducting future environmental analyses for the more specific projects, a process known as "tiering." In this case, environmental analyses of individual projects funded by the CTEP would be tiered off this program EIR. The concept of tiering is described in State CEQA Guidelines Section 15152 as follows:

- (a) "Tiering" refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project.

- (b) Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects... . This approach can eliminate repetitive discussions of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review.

This approach reduces repetitive analysis of issues that may be relevant to multiple projects. In this case, use of a program EIR allows STA (the lead agency) to characterize the CTEP as the “project” being analyzed and approved and to consider broad policy alternatives and program-wide mitigation measures early in the planning effort for the transportation improvements.

This program EIR is the first tier of environmental documentation prepared and will be augmented by second-tier environmental documents when additional details for the specific transportation improvements are developed during the engineering design process. Specific improvements included in the CTEP would be reevaluated when they are proposed for implementation. Planning for each improvement would involve refining project information to indicate the type of project to be implemented, the location of the project, and a description of actions to be taken throughout implementation of the project.

Subsequent environmental documents would incorporate by reference appropriate information from this program EIR regarding secondary effects, cumulative impacts, broad alternatives, and other relevant factors. Subsequent environmental documents would focus solely on site-specific issues that have not been considered in this program EIR. If activities were later found to have effects that were not examined in this program EIR, additional CEQA review would be required. If STA finds that implementation of a later activity would have no new effects and that no new mitigation measures would be required, that activity would require no additional CEQA review.

Impact Terminology

An environmental effect, or “impact,” is described as “significant” when the impact would result in a substantial adverse change in the physical conditions that existed at the time of the analysis. An impact is described as “less than significant” if the change is not substantial. (A significant impact can often be reduced to a less-than-significant level by implementing mitigation measures.) The term “no impact” is used when the proposed project would not result in any change to the particular physical environment.

This EIR also recommends mitigation measures to reduce the significance of project impacts. State CEQA Guidelines Section 15370 defines mitigation as:

- avoiding the impact altogether by not taking a certain action or part of an action;
- minimizing the impact by limiting the degree or magnitude of the action and its implementation;

- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- compensating for the impact by replacing or providing substitute resources or improvements to the environment

Environmental Impacts and Mitigation Measures

Significant and Unavoidable Impacts of the CTEP Components

Table S-1 identifies impacts of the CTEP components, as well as mitigation measures to reduce those impacts to a less-than-significant level where such measures are available. These impacts are associated with the Countywide Priority Projects; the impacts associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would be the same. There are no significant impacts associated with Local Road Rehabilitation Projects.

In most cases, impacts would be less than significant after application of relevant general plan policies or after implementation of mitigation measures. However, the impacts listed below cannot be feasibly mitigated to a less-than-significant level and would remain significant and unavoidable. At the program level of environmental analysis, this conclusion serves to focus subsequent environmental review on potentially affected resources. The significant and unavoidable impacts identified are:

- Impact AG-3: Direct Conversion of Important Farmland to Nonagricultural Uses
- Impact AG-4: Conversion of Important Farmland to Nonagricultural Uses through Unplanned Urban Growth (Indirect Farmland Conversion)
- Impact PH-3: Potential for Growth Inducement or Acceleration of Development Resulting from Transportation Improvement Projections
- Impact PH-4: Potential for Displacement of Substantial Numbers of Existing Housing or People Resulting from Transportation Improvement Projects.
- Impact BIO-3: Potential Disturbance or Loss of Special-Status Plant Populations Resulting from Transportation Improvement Projects
- Impact BIO-6: Disturbance or Loss of Waters of the United States, Including Wetlands, Associated with Transportation Improvement Projects
- Impact BIO-7: Potential Disturbance or Loss of Special-Status Wildlife Species and Their Habitat Associated with Transportation Improvement Projects

- Impact CR-4: Restriction of Access to Native American Traditional or Religious Sites
- Impact CR-6: Demolition of Historic Resources
- Impact CR-10: Alterations or Damage to Historic Resources Resulting from Transportation Related Growth Inducement
- Impact T-3: Substantial Increase in Traffic Relative to the Existing Traffic Load and Capacity of Roadways
- Impact T-5: Creation of Need for Capacity-Enhancing Alterations to Existing Facilities
- Impact T-6: Potential Alteration of Present Patterns of Vehicular Circulation, Increased Traffic Delay, and Increased Traffic Hazards during Construction of Specific Projects
- Impact N-5: Potential Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions

Public Participation

CTEP Development

STA initiated the CTEP input process in March 2002 by forming a Community Advisory Committee (CAC). The CAC consists of public, agency, and various community representatives of the Solano County cities and unincorporated areas. The CAC provided input on which types of specific projects to include in the CTEP and on alternatives to the proposed CTEP.

CEQA Review

STA distributed an NOP/IS for the EIR on May 21, 2002, to identify issues of concern regarding the CTEP and to incorporate comments into the analysis for the draft EIR. The NOP and comment letters are provided in *Appendix A*. STA also conducted a public scoping meeting on June 20, 2002, to solicit additional comments from the public on the scope of the environmental analysis to be included in the draft EIR. The scoping report is provided in *Appendix B*.

This draft EIR is being circulated for a 45-day public review period, from August 5, 2002, to September 18, 2002, during which a public hearing will be held on the project. Public and agency comments will be accepted orally at the public hearing and in writing until the close of the public review period.

Written comments should be sent to:

Dan Christians
Solano Transportation Authority
One Harbor Center, Suite 130
Suisun City, CA 94585

Comments should be received no later than 5:00 p.m. on September 18, 2002. The public hearing will be held on September 11, 2002, at the Suisun City Hall, 701 Civic Center Drive, Suisun City, CA 94585. Individuals may provide oral comments about the document during this hearing. Following receipt and consideration of all public and agency comments on the draft EIR, STA will respond to comments and prepare a final EIR. The final EIR will provide written responses to all comments received during the public review period, will identify the preferred CTEP alternative, and will identify all impacts and mitigation commitments. The final EIR will be issued, after which STA will consider certification of the EIR and approval of the preferred alternative.

Table S-1. Summary of Impacts and Mitigation Measures

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Land Use			
Impact LU-1: Beneficial Impact on Land Use from Distribution of Operational Subsidies	Beneficial	—	—
Impact LU-2: No Impact on Land Use from Implementation of Transportation-Related Environmental Mitigation	No impact	—	—
Impact LU-3: Physical Division of an Established Community by Transportation Improvement Projects	Significant	Mitigation Measure LU-1: Conduct Site-Specific Review of Project Design Improvements to Determine Effects on Established Communities Mitigation Measure LU-2: Design Project Improvements to Avoid or Minimize Physical Division of an Existing Community	Less than significant
Impact LU-4: Conflicts between Transportation Improvement Projects and Applicable Open Space/Agricultural Land Use Preservation Policies	Significant	Mitigation Measure LU-3: Design Project Improvements to Minimize Impacts on Open Space and Agriculture Mitigation Measure LU-4: Organize and Participate in Working Groups for all CTEP Major Infrastructure Projects	Less than significant
Impact LU-5: Conflicts between Transportation Improvement Projects and Relevant Land Use Plans	Significant	Mitigation Measure LU-3: Design Project Improvements to Minimize Impacts on Open Space and Agriculture Mitigation Measure LU-4: Organize and Participate in Working Groups for all CTEP Major Infrastructure Projects Mitigation Measure LU-5: Provide Buffers or Setbacks between CTEP Improvements and Adjacent Sensitive Land Uses	Less than significant
Impact LU-6: No Physical Division of an Established Community by Construction of Pedestrian and Nonmotorized Facilities	Less than significant	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Agricultural Resources			
Impact AG-1: No Impact on Agricultural Resources from Distribution of Operational Subsidies for Buses and Ferry Services	No impact	—	—
Impact AG-2: No Impact on Agricultural Resources from Implementation of Transportation-Related Environmental Mitigation	No impact	—	—
Impact AG-3: Direct Conversion of Important Farmland to Nonagricultural Uses	Significant and unavoidable	Mitigation Measure AG-1: Evaluate the Potential for Direct Farmland Conversion at the Project Level and Avoid, Minimize, and Compensate for Loss of Farmland	Significant
Impact AG-4: Conversion of Important Farmland to Nonagricultural Uses through Unplanned Urban Growth (Indirect Farmland Conversion)	Significant and unavoidable	—	—
Impact AG-5: Conflict with Existing Williamson Act Contracts	Significant	Mitigation Measure AG-2: Evaluate the Potential to Displace or Impair Agricultural Operations on Williamson Act Contract Lands	Less than significant
Impact AG-6: Reduction of Farmland Productivity and Efficiency	Significant	Mitigation Measure AG-3: Evaluate and Avoid or Minimize Potentially Significant Agricultural Land Use Conflicts at the Project Level	Less than significant
Population and Housing			
Impact PH-1: Beneficial Impact on Population and Housing from Distribution of Operational Subsidies	Beneficial	—	—
Impact PH-2: No Impact on Population and Housing from Implementation of Transportation-Related Environmental Mitigation	No impact	—	—
Impact PH-3: Potential for Growth Inducement or Acceleration of Development Resulting from Transportation Improvement Projects	Significant and unavoidable	Mitigation Measure PH-1: Determine Projected Population's Local Capacity Needs and Limit Capacity Improvement to that Necessary to Serve those Needs	Significant

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact PH-4: Potential for Displacement of Substantial Numbers of Existing Housing or People Resulting from Transportation Improvement Projects	Significant and unavoidable	Mitigation Measure PH-2: Develop and Implement a Relocation Plan	Significant
Impact PH-5 : Introduction or Creation of Infrastructure Not Included in a General Plan Resulting from Transportation Improvement Projects	Significant	Mitigation Measure PH-3: Consult with Local Planning Staff to Reduce or Avoid Potential Introduction or Creation of Infrastructure Not Evaluated in a General Plan	Less than significant
Impact PH-6: No Impact on Growth Inducement or Acceleration of Development Resulting from the Construction of Pedestrian and Nonmotorized Facilities	No impact	—	—
Impact PH-7: Potential for Displacement of Substantial Numbers of Existing Housing or People, Resulting from Construction of Pedestrian and Nonmotorized Facilities	Less than significant	—	—
Biological Resources			
Impact BIO-1: No Impact on Biological Resources from Distribution of Operational Subsidies	No impact	—	—
Impact BIO-2: No Impact on Biological Resources from Implementation of Transportation-Related Environmental Mitigation	No impact	—	—
Impact BIO-3: Potential Disturbance or Loss of Special-Status Plant Populations Resulting from Transportation Improvement Projects	Significant and unavoidable	Mitigation Measure BIO-1: Document Special-Status Plant Species Populations Mitigation Measure BIO-2: Avoid or Minimize Impacts on Special-Status Plant Species Populations by Redesigning the Project, Protecting Populations, and Developing a Transplantation Plan (If Necessary)	Significant
Impact BIO-4: Potential Introduction or Spread of Noxious Weeds Associated with the Transportation Improvement Projects	Significant	Mitigation Measure BIO-3: Conduct a Noxious Weed Survey and Document Noxious Weed Infestation Mitigation Measure BIO-4: Avoid or Minimize the Dispersal of Noxious Weeds into Uninfested Areas	Less than significant

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-5: Loss or Disturbance of Riparian Habitats Associated with Transportation Improvement Projects	Significant	<p>Mitigation Measure BIO-5: Identify and Document Riparian Habitat</p> <p>Mitigation Measure BIO-6: Avoid or Minimize Disturbance of Riparian Habitats</p> <p>Mitigation Measure BIO-7: Compensate for the Loss of Riparian Habitat</p>	Less than significant
Impact BIO-6: Disturbance or Loss of Waters of the United States, Including Wetlands, Associated with Transportation Improvement Projects	Significant and unavoidable	<p>Mitigation Measure BIO-8: Identify and Delineate Waters of the United States, Including Wetlands</p> <p>Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities</p> <p>Mitigation Measure BIO-10: Compensate for the Loss of Wetland Habitat</p>	Significant
Impact BIO-7: Potential Disturbance or Loss of Special-Status Wildlife Species and Their Habitat Associated with Transportation Improvement Projects	Significant and unavoidable	<p>Mitigation Measure BIO-6: Avoid or Minimize Disturbance of Riparian Habitats</p> <p>Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetlands</p> <p>Mitigation Measure BIO-11: Document Special-Status Wildlife Species and Their Habitats</p> <p>Mitigation Measure BIO-12: Avoid or Minimize Impacts on Special-Status Wildlife Species by Redesigning the Project, Protecting Special-Status Wildlife Habitat, and Developing a Mitigation Monitoring Plan (If Necessary)</p> <p>Mitigation Measure BIO-13: Coordinate with Resource Agencies and Develop Appropriate Compensation Plans for State- and Federally-Listed Wildlife Species</p>	Significant

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact BIO-8: Potential Disturbance and Loss of Common Wildlife Species Associated with Transportation Improvement Projects	Less than significant	—	—
Impact BIO-9: Potential Direct and Indirect Impacts on Special-Status Fish Species Associated with Transportation Improvement Projects	Significant	<p>Mitigation Measure BIO-7: Compensate for the Loss of Riparian Habitat</p> <p>Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities</p> <p>Mitigation Measure BIO-14: Assess and Document Habitat for Special-Status Fish Species</p> <p>Mitigation Measure BIO-15: Avoid or Minimize Impacts on Special-Status Fish Species and Their Habitat</p> <p>Mitigation Measure BIO-16: Consult with NMFS or USFWS when Listed Fish Species May Be Affected, and Initiate Essential Fish Habitat Consultation with NMFS when Chinook Salmon May Be Affected</p>	Less than significant
Impact BIO-10: Conflicts with Local Policies or Ordinances That Protect Biological Resources Resulting from Transportation Improvement Projects	Significant	Mitigation Measure BIO-17: Review Local City and County Policies, Ordinances, and Conservation Plans, and Comply with Requirements	Less than significant
Cultural Resources			
Impact CR-1: No Impact on Cultural Resources Resulting from Operational Subsidies	No Impact	—	—
Impact CR-2: No Impact on Cultural Resources Resulting from Transportation-Related Environmental Mitigation	No Impact	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact CR-3: Potential Damage to Archaeological Resources	Significant	Mitigation Measure CR-1: Document Archaeological Resources Through Public Interpretation Mitigation Measure CR-2: Archaeological Data Recovery	Less than significant
Impact CR-4: Restriction of Access to Native American Traditional or Religious Sites	Significant	Mitigation Measure CR-1: Document Archaeological Resources Through Public Interpretation Mitigation Measure CR-2: Archaeological Data Recovery	Less-than-significant if avoided; otherwise significant and unavoidable
Impact CR-5: Potential Damage to Previously Unidentified Buried Archaeological Resources or Human Remains Associated with the Proposed Transportation Improvements	Significant	Mitigation Measure CR-3: Comply with State Laws Pertaining to the Discovery of Human Remains Mitigation Measure CR-4: Perform Archaeological Monitoring Mitigation Measure CR-5: Covering ("Capping") Archaeological Resources	Less than significant
Impact CR-6: Demolition of Historic Resources	Significant	Mitigation Measure CR-6: Avoid Historic Resources Mitigation Measure CR-7: Conduct Additional Study of Affected Historic Resources Mitigation Measure CR-8: Record Photographic and Written Documentation to Historic American Building Survey/Historic American Engineering Record Standards	Less-than-significant if avoided; otherwise significant and unavoidable

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact CR-7: Relocation of Historic Resources	Significant	<p>Mitigation Measure CR-9: Conduct Records Search, Background Research, Field Survey, and Technical Report for All Proposed Projects</p> <p>Mitigation Measure CR-10: Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation</p> <p>Mitigation Measure CR-11: Review Project Design</p>	Less than significant
Impact CR-8: Changes to Appearance of Historic Resources with Implementation of Transportation Improvements	Significant	<p>Mitigation Measure CR-9: Conduct Records Search, Background Research, Field Survey, and Technical Report for All Proposed Projects</p> <p>Mitigation Measure CR-10: Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation</p> <p>Mitigation Measure CR-11: Review Project Design</p>	Less than significant
Impact CR-9: Alteration of Integrity of Historical Setting Because of Increased Noise Levels Associated with Transportation Improvements	Significant	<p>Mitigation Measure CR-9: Conduct Records Search, Background Research, Field Survey, and Technical Report for All Proposed Projects</p> <p>Mitigation Measure CR-10: Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation</p> <p>Mitigation Measure CR-11: Review Project Design</p>	Less than significant

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact CR-10: Alteration of or Damage to Historic Resources Resulting from Transportation-Related Growth Inducement	Significant and unavoidable	<p>Mitigation Measure CR-1: Document Archaeological Resources Through Public Interpretation</p> <p>Mitigation Measure CR-2: Archaeological Data Recovery</p> <p>Mitigation Measure CR-3: Comply with State Laws Pertaining to the Discovery of Human Remains</p> <p>Mitigation Measure CR-4: Perform Archaeological Monitoring</p> <p>Mitigation Measure CR-5: Covering (“Capping”) Archaeological Resources</p> <p>Mitigation Measure CR-6: Avoid Historic Resources</p> <p>Mitigation Measure CR-7: Conduct Additional Study of Affected Historic Resources</p> <p>Mitigation Measure CR-8: Record Photographic and Written Documentation to Historic American Building Survey/Historic American</p> <p>Mitigation Measure CR-9: Conduct Records Search, Background Research, Field Survey, and Technical Report for All Proposed Projects</p> <p>Mitigation Measure CR-10: Conform to the Secretary of the Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation</p> <p>Mitigation Measure CR-11: Review Project Design</p>	Significant
Hydrology and Water Quality			
Impact H-1: No Impact on Hydrology and Water Quality from Distribution of Operational Subsidies	No impact	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact H-2: No Impact on Hydrology and Water Quality from Implementation of Transportation-Related Environmental Mitigation	No impact	—	—
Impact H-3: Temporary Impairment of Water Quality Associated with Construction of Roadway Projects	Significant	Mitigation Measure H-1: Prepare a Storm Water Pollution Prevention Plan	Less than significant
Impact H-4: Long-Term Impacts Resulting in Impaired Water Quality Associated with the Operation of New Facilities	Significant	Mitigation Measure H-1: Prepare a Storm Water Pollution Prevention Plan	Less than significant
Impact H-5: Substantial Depletion of Groundwater Supplies or Interference with Groundwater Recharge	Significant	Mitigation Measure H-2: Design and Install Infiltration Devices	Less than significant
Impact H-6: Substantial Alteration of the Drainage Pattern of the Project Site	Less than significant	—	—
Impact H-7: Increase in Runoff Peak Flows and Volumes or Exceedance in the Capacity of the Stormwater Management System	Significant	Mitigation Measure H-3: Design and Implement Stormwater Management Measures	Less than significant
Impact H-8: Placement of Structures in the 100-Year Floodplain and Exposure of People or Structures to Significant Risk from Flooding	Significant	Mitigation Measure H-4: Restrict Floodwater Conveyance under Bridges and Other Facilities	Less than significant
Impact H-9: Increased Likelihood of Inundation by Seiche, Tsunami, or Mudflow	Less than significant	—	—
Geology, Soils, and Seismicity			
Impact AG-1: No Impact on Agricultural Resources from Distribution of Operational Subsidies for Buses and Ferry Services	No impact	—	—
Impact AG-2: No Impact on Agricultural Resources from Implementation of Transportation-Related Environmental Mitigation	No Impact	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact G-1: Potential Substantial Adverse Effects Resulting from Surface Fault Rupture Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-1. Conduct Project-Level Fault Investigations and Design all Project Facilities to Avoid or Minimize Fault-Related Impacts	Less than significant
Impact G-2: Potential Substantial Adverse Effects Resulting from Seismic Ground Shaking Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-2: Conduct Project-Level Seismic Hazard Evaluations and Design All Proposed Project Facilities According to Appropriate UBC Standards	Less than significant
Impact G-3: Potential Substantial Adverse Effects Resulting From Earthquake-Induced Liquefaction Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-3: Conduct Site-Specific Geotechnical Investigations for Liquefaction and Implement Appropriate, Proven Geotechnical Methods	Less than significant
Impact G-4: Potential Adverse Effects Resulting from Landslides and/or Other Types of Slope Failures Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-4: Conduct Site-Specific Geotechnical Investigations for Slope Stability and Implement Appropriate, Proven Geotechnical Methods	Less than significant
Impact G-5: Potential Construction-Related Soil Erosion and Sedimentation Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-5. Prepare and Implement an Erosion and Sediment Control Plan, Storm Water Pollution Prevention Plan, or Water Pollution Control Plan at the Project Level	Less than significant
Impact G-6: Potential Adverse Effects Resulting from Expansive Soils and Sediments Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-6: Conduct Site-Specific Geotechnical Investigations for Expansive Soils and Implement Appropriate, Proven Geotechnical Methods	Less than significant
Impact G-7: Potential Adverse Effects Resulting from Land Subsidence or Settlement Associated with Transportation Improvement Projects	Significant	Mitigation Measure G-7: Conduct Site-Specific Geotechnical Investigations for Settlement and Subsidence and Implement Appropriate, Proven Geotechnical Methods	Less than significant
Transportation			
Impact T-1: Impacts from Operational Subsidies	Beneficial	—	—
Impact T-2: Impacts from Transportation-Related Environmental Mitigation	No Impact	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact T-3: Substantial Increase in Traffic Relative to the Existing Traffic Load and Capacity of Roadways	Significant and unavoidable	—	Significant
Impact T-4: Violation (Individually or Cumulatively) of an LOS Standard Established by County Congestion Management Agency for Designated Roads or Highways	Less than significant	—	—
Impact T-5: Creation of Need for Capacity-Enhancing Alterations to Existing Facilities	Significant and unavoidable	Mitigation Measure T-1: Refine Scope and Schedule of the Interstate 80/Interstate 680/State Route 12 Interchange Reconstruction, Interstate 80 Corridor Improvements, and State Route 12 West Widening Projects	Significant
Impact T-6: Potential Alteration of Present Patterns of Vehicular Circulation, Increased Traffic Delay, and Increased Traffic Hazards during Construction of Specific Projects	Significant and unavoidable	Mitigation Measure T-2: Develop and Implement a Traffic Control Plan for Construction of Specific Projects	Significant
Impact T-7: Conflicts among Bicycles, Pedestrians, and Automobiles	Significant	Mitigation Measure T-3: Integrate Bicycle and Pedestrian Facilities and Amenities into Local Road and Applicable Improvement Projects on Regionally Significant Roadways	Less than significant
Impact T-8: Generation of Transit Demand that Current and Planned Systems Cannot Accommodate	Significant	Mitigation Measure T-4: Support Local Transit Operators and Caltrans in Developing Short- and Long-Range Regional Transit Plans to Facilitate the Use of Public Transportation	Less than significant
Impact T-9: Inadequate Parking Capacity	Significant	Mitigation Measure T-5: Promote the Integration of Public Transportation Systems with Other Modes of Travel	Less than significant
Air Quality			
Impact AQ-1: No Impact on Air Quality from Implementation of Transportation Related Environmental Mitigation	No Impact	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact AQ-2: Construction-Related Impacts on Air Quality Associated with the Proposed Transportation Improvements	Significant	Mitigation Measure AQ-1: Implement BAAQMD PM10 Control Measures Mitigation Measure AQ-2: Implement NO _x -Reducing Construction Practices Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis	Less than significant
Impact AQ-3: Construction-Related Impacts on Air Quality Associated with the Interstate 80 Corridor Improvements	Significant	Mitigation Measure AQ-1: Implement BAAQMD PM10 Control Measures Mitigation Measure AQ-2: Implement NO _x -Reducing Construction Practices Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis	Less than significant
Impact AQ-4: Operation-Related Impacts on Air Quality Associated with Interstate 80 Corridor Improvements	Significant	Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis	Less than significant
Impact AQ-5: Construction-Related Impacts on Air Quality Associated with Construction of Pedestrian and Nonmotorized Facilities	Significant	Mitigation Measure AQ-1: Implement BAAQMD PM10 Control Measures Mitigation Measure AQ-2: Implement NO _x -Reducing Construction Practices Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis	Less than significant
Impact AQ-6: Operation-Related Impacts on Air Quality Associated Construction of Pedestrian and Nonmotorized Facilities	Less than significant	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact AQ-7: Construction Impacts Associated with the Development of Commuter Rail Facilities	Significant	Mitigation Measure AQ-1: Implement BAAQMD PM10 Control Measures Mitigation Measure AQ-2: Implement NO _x -Reducing Construction Practices Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis	Less than significant
Impact AQ-8: Operation-Related Impacts on Air Quality Associated with the Development of Commuter Rail Facilities	Significant	Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis	Less than Significant
Noise			
Impact N-1: No Impact on Noise from the Distribution of Operational Subsidies for Buses and Ferry Services	No Impact	—	—
Impact N-2: No Impact on Noise from Implementation of Transportation Related Environmental Mitigation	No Impact	—	—
Impact N-3: Exposure of Persons to or Generation of Noise Levels that Exceed Established Local Agency Noise Standards or Applicable Standards of Other Agencies	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant
Impact N-4: Potential Exposure of Persons to or Generation of Excessive Groundborne Vibration or Noise Levels	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant
Impact N-5: Potential Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions	Significant and unavoidable	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Significant

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact N-6: Substantial Temporary or Periodic Increase in Ambient Noise Levels	Significant	<p>Mitigation Measure N-2: Locate Noise-Generating Equipment as Far as Practicable from Noise-Sensitive Receptors</p> <p>Mitigation Measure N-3: Use Sound-Control Devices on Combustion-Powered Equipment</p> <p>Mitigation Measure N-4: Shield or Shroud Impact or Drilling Tools</p> <p>Mitigation Measure N-5: Shut Off Machinery Not in Use</p> <p>Mitigation Measure N-6: Use Shortest Possible Traveling Routes When Practicable</p> <p>Mitigation Measure N-7: Disseminate Essential Information to Residences and Implement a Complaint Response and Tracking Program</p> <p>Mitigation Measure N-8: Implementation of Additional Mitigation Measures, as Needed and/or Required</p>	Less than significant
Impact N-7: Exposure of People Residing or Working near an Airport or in an Airport Land Use Plan Area to Excessive Noise Levels	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant
Impact N-8: Exposure of People Residing or Working in the Vicinity of a Private Airstrip to Excessive Noise Levels	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant
Impact N-9: Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions due to Operation of Commuter Rail Facilities	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant
Impact N-10: Potential Substantial Adverse Impacts Associated with the Construction of Pedestrian and Nonmotorized Facilities	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact N-11: Exposure of People Residing or Working near an Airport or in an Airport Land Use Plan Area to Excessive Noise Levels	Significant	Mitigation Measure N-1: Conduct a Detailed Noise Analysis	Less than significant
Public Services and Utilities			
Impact PS-1: No Impact on Public Services and Utilities from Distribution of Operational Subsidies	No impact	—	—
Impact PS-2: No Impact on Public Services and Utilities from Implementation of Transportation-Related Environmental Mitigation	No impact	—	—
Impact PS-3: Increased Demand for Public Services and Public Facilities from Transportation Improvement Projects	Significant	Mitigation Measure PS-1: Identify Projected Population Growth and Demand for Public Services and Facilities Associated with CTEP Specific Projects	Less than significant
Impact PS-4: Increase in Solid Waste Generation from Transportation Improvement Projects	Significant	Mitigation Measure PS-1: Identify Projected Population Growth and Demand for Public Services and Facilities Associated with CTEP Specific Projects	Less than significant
Impact PS-5: Increased Need for New Water Supply, or Water or Wastewater Treatment Facilities from Transportation Improvement Projects	Significant	Mitigation Measure PS-1: Identify Projected Population Growth and Demand for Public Services and Facilities Associated with CTEP Specific Projects	Less than significant
Impact PS-6: Conflict with Existing Utilities Because of Transportation Improvement Projects	Significant	Mitigation Measure PS-2: Coordinate Relocation and Interruptions of Service During Construction with Service Providers	Less than significant
Aesthetics			
Impact AES-1: No Impact on Aesthetics from Distribution of Operational Subsidies	No impact	—	—
Impact AES-2: No impact on Aesthetics from Implementation of Transportation Related Environmental Mitigation	No impact	—	—

Table S-1. Continued

Impact	Significance Determination	Mitigation Measure	Significance Determination with Mitigation Incorporation
Impact AES-3: Degrade Scenic Resources along a State Scenic Highway	No impact	—	—
Impact AES-4: Changes in Visual Character or Quality Related to Transportation Improvements	Less than significant	—	—
Impact AES-5: Creation of New Sources of Light and Glare	Significant	Mitigation Measure AES-1: Design Lighting to Meet Minimum Safety and Security Standards	Less than significant

Chapter 1

Introduction

The Solano Transportation Authority (STA) is proposing to adopt the County Transportation Expenditure Plan (CTEP) to address shortfalls in funding that are needed to implement various transportation improvement projects within Solano County. The CTEP would fund transportation improvements that fall within three categories of “specific projects” (defined in *Chapter 2*). The general types of transportation improvements are described below.

- **Highway projects.** Highway projects are the largest type of proposed transportation improvements in terms of cost. These projects include improving highways (e.g., State Route [SR] 12 west and east); constructing or reconstructing interchanges (e.g., Interstate 80 (I-80)/I-680/SR 12 interchange), and creating high-occupancy vehicle (HOV) lanes on highway facilities (e.g., I-80 corridor).
- **Transit projects.** Transit projects include passenger rail station construction, commuter rail service improvements, ferry terminal construction and expansion of service, senior and disabled services, and construction of intermodal stations such as those proposed in Fairfield, Vacaville, Dixon, and Benicia. These projects also include the distribution of operational subsidies for operation and maintenance of existing transit services throughout Solano County.
- **Local road projects.** Local road projects include local roadway improvements, local interchange improvements, local safety projects, and local road maintenance and rehabilitation.
- **Nonmotorized projects.** Nonmotorized projects include bicycle/pedestrian trails, park-and-ride lots, pedestrian- and transit-friendly downtowns, and provisions for establishing potential environmental mitigation sites.

STA has determined that the CTEP is a project as defined by the California Environmental Quality Act (CEQA) and one which requires an approval from the STA Board of Directors. Therefore, this environmental impact report (EIR) is being prepared to comply with CEQA.

Purpose of the EIR

This EIR has been prepared in accordance with CEQA, which requires all state and local government agencies to consider the environmental consequences of

projects over which they have discretionary authority before taking action on those projects (California Public Resources Code Section 21000 et seq.). The purpose of this EIR is to assess the environmental effects (impacts) of the proposed transportation improvements that would be funded under the CTEP and to identify mitigation measures (as required by CEQA) that would avoid or reduce significant impacts that would result from the improvements.

A notice of preparation (NOP) and initial study (IS) were prepared for the proposed project to establish the scope of this EIR. The NOP and IS are found in *Appendix A*. The IS concluded that the topics listed below should be addressed in the EIR.

Scope and Organization of the EIR

The following resource topics are analyzed in this EIR (*Chapters 3–15*, respectively):

- land use and planning;
- agricultural lands;
- population and housing;
- biological resources;
- cultural resources;
- hydrology and water quality;
- geology, soils and seismicity;
- transportation;
- air quality;
- noise;
- aesthetics;
- public services and utilities; and
- cumulative impacts and other CEQA issues.

This EIR is organized as follows:

- *Summary* presents a summary of the proposed CTEP and alternatives; a summary of the impacts and mitigation measures; and impact conclusions regarding cumulative impacts, growth inducement, irreversible environmental changes, and known areas of controversy. The environmentally superior alternative is also identified.
- *Chapter 1, “Introduction,”* provides background information on the CTEP and an overview of the EIR.

- *Chapter 2, “Description of County Transportation Expenditure Plan and Alternatives,”* describes the CTEP objectives, the CTEP components, alternative CTEP options, and public participation.
- *Chapters 3–15* are each devoted to an issue area (as indicated above), describing the existing conditions or setting; specific impacts that would result from implementation of the CTEP; and mitigation measures, if available, that would eliminate or reduce significant impacts.
- *Chapter 16, “Report Preparation,”* lists the individuals involved in preparing this draft EIR.
- *Chapter 17, “References Cited,”* identifies the documents used (printed references) and individuals consulted (personal communications) during preparation of this EIR.

Technical appendices are included at the end of the report.

Program-Level Analysis and Tiering

Because of the nature of the CTEP and transportation improvements, this EIR is a program-level EIR. The State CEQA Guidelines encourage agencies to use a program EIR in circumstances that involve a series of related projects. A program EIR provides a framework for conducting future environmental analyses for the more specific projects, a process known as “tiering.” In this case, environmental analyses of individual projects funded by the CTEP would be tiered off this program EIR. The concept of tiering is described in State CEQA Guidelines Section 15152 as follows:

- (a) “Tiering” refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project.
- (b) Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects... . This approach can eliminate repetitive discussions of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review.

This approach reduces repetitive analysis of issues that may be relevant to multiple projects. In this case, use of a program EIR allows STA (the lead agency) to characterize the CTEP as the “project” being analyzed and approved and to consider broad policy alternatives and program-wide mitigation measures early in the planning effort for the transportation improvements.

This program EIR is the first tier of environmental documentation prepared and will be augmented by second-tier environmental documents as appropriate when

additional details for the specific transportation improvements are developed during the engineering design process. Specific improvements included in the CTEP would be reevaluated when they are proposed for implementation. Planning for each improvement would involve refining project information to indicate the type of project to be implemented, the location of the project, and a description of actions to be taken throughout implementation of the project.

Subsequent environmental documents would incorporate by reference appropriate information from this program EIR regarding secondary effects, cumulative impacts, broad alternatives, and other relevant factors. Subsequent environmental documents would focus solely on site-specific issues that have not been considered in this program EIR. If activities were later found to have effects that were not examined in this program EIR, additional CEQA review would be required. If STA finds that implementation of a later activity would have no new effects and that no new mitigation measures would be required, that activity would require no additional CEQA review.

Impact Terminology

An environmental effect, or “impact,” is described as “significant” when the impact would result in a substantial adverse change in the physical conditions that existed at the time of the analysis (State CEQA Guidelines Section 15382). An impact is described as “less than significant” if the change is not substantial. (A significant impact can often be reduced to a less-than-significant level by implementing mitigation measures.) The term “no impact” is used when the proposed project would not result in any change to the particular physical environment.

This EIR also recommends mitigation measures to reduce the significance of project impacts. State CEQA Guidelines Section 15370 defines mitigation as:

- avoiding the impact altogether by not taking a certain action or part of an action;
- minimizing the impact by limiting the degree or magnitude of the action and its implementation;
- rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- compensating for the impact by replacing or providing substitute resources or improvements to the environment.

Description of the County Transportation Expenditure Plan and Alternatives

This chapter identifies the location of the area covered under the CTEP, describes the background for the preparation of the CTEP and this EIR, lists the objectives of the CTEP, summarizes the CTEP components, and summarizes alternative CTEP strategies that were considered by STA. This chapter also outlines the public participation process associated with development of the CTEP and this EIR, identifies the lead and responsible agencies associated with the preparation of this EIR, and describes the agencies' subsequent roles and actions.

Project Location

The specific projects in the CTEP are located throughout Solano County, California, including the incorporated cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo (Figure 2-1). Specific projects are located on state highways, regionally significant roads, and some local streets, as well as within railroad rights-of way and public lands.

Background

STA is the agency responsible for planning, coordinating, and financing transportation-related projects within Solano County. In addition to rapid local growth and regional transportation demands, Solano County faces several challenges, including limited intercity roadway and transit networks, heavy use of existing transit centers, a substantial road maintenance backlog, a growing senior population, increasingly congested freeways, and a funding shortfall (Solano Transportation Authority 2002a).

STA prepared the draft Comprehensive Transportation Plan (CTP) for Solano County in spring 2002. The CTP was prepared to establish a vision, provide direction, and set priorities for meeting the transportation needs of Solano County through 2025. STA held a series of public meetings between March and May 2002 to gather public input on the transportation projects and services that are identified in the draft CTP. The STA Board of Directors adopted the final CTP on May 8, 2002.

STA, in collaboration with its transportation partners, identified a shortfall of \$3 billion in the availability of funds necessary to implement the transportation projects and services described in the CTP. As a result, STA proposed to develop the CTEP (the proposed project) as a plan for the expenditure of a retail use-tax measure that would be placed on the countywide ballot in November 2002. If approved, the bond measure would provide a new funding mechanism for the CTP. The CTEP includes a select list of specific projects outlined in the CTP¹. The specific projects in the CTEP are described below.

Pursuant to CEQA, STA, as the lead agency, is preparing this programmatic EIR to analyze and disclose the potentially significant environmental impacts of the CTEP. In addition, the Solano Transportation Improvement Authority was established to pursue and, if successful, manage the sales tax revenue to fund the needed, but unfunded, transportation improvements proposed under the CTEP.

Project Description

Goal and Objective

The goal of the CTEP is to provide a plan for funding allocation to implement specific elements of the CTEP to develop a balanced transportation system that reduces congestion and improves access and travel choices through enhancement of roads, public transit, bicycle and pedestrian systems, intermodal facilities, and management techniques. The objective of the CTEP is to implement priority transportation improvements and services identified for Solano County and its cities.

CTEP Components (Balanced Plan)

As described in *Chapter 1*, the CTEP contains specific projects that encompass different types of transportation improvements. Each of these projects is described in terms of three major categories represented within the CTEP: Countywide Priority Projects, Return to Source—Fast Track Congestion Relief and Safety Program, and Local Road Rehabilitation. Each specific project and category is described below. The CTEP has been identified as the “Balanced Plan” option through STA’s coordination and collaboration with numerous local transportation and transit interests. The other options considered are described under “Alternatives to the Proposed Project.”

¹ All dollar values included in this document are based on estimated measure revenues of \$1 billion over 20 years.

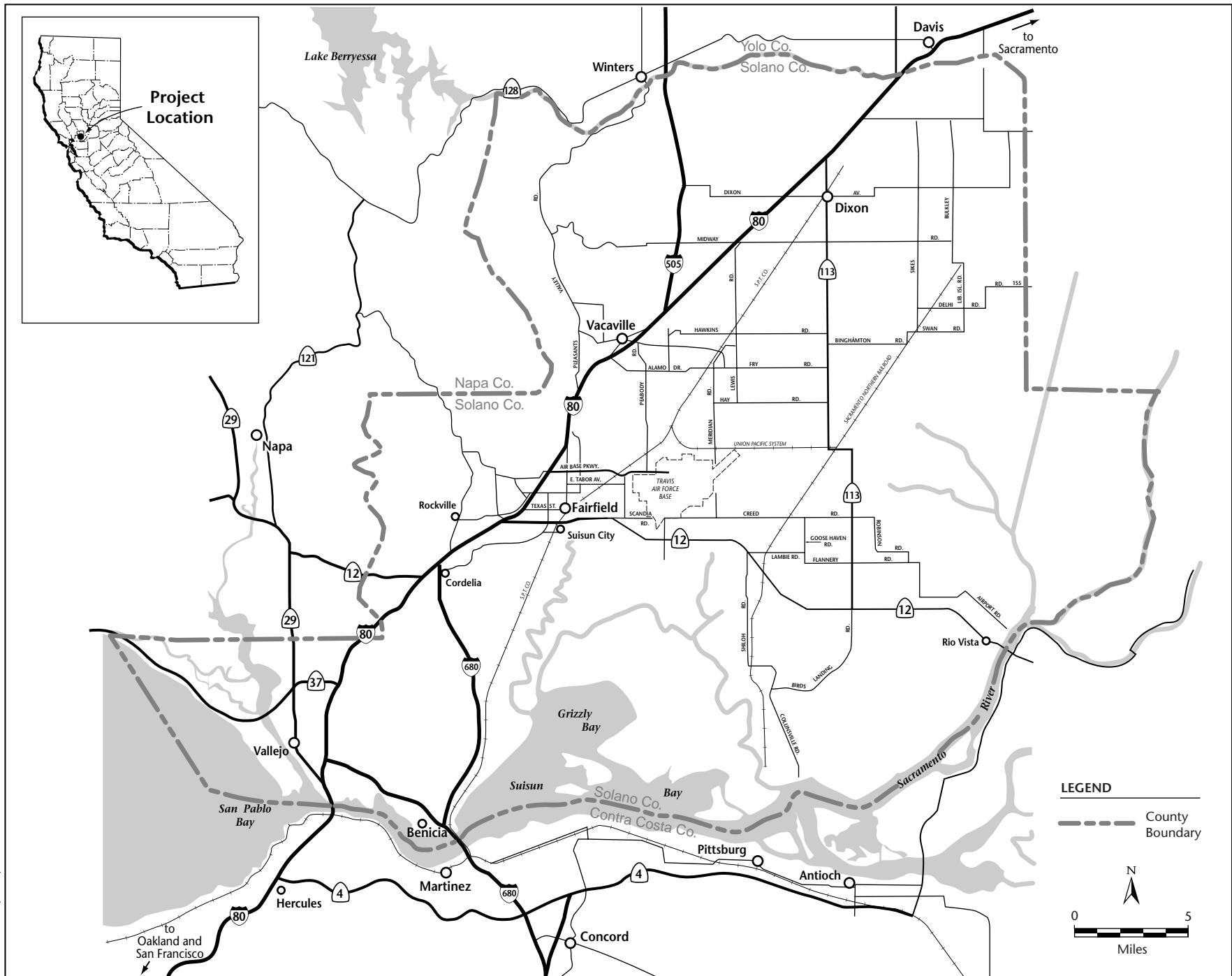


Figure 2-1
Project Location

Countywide Priority Projects

Highway Improvements

Interstate 80/Interstate 680/State Route 12 Interchange Reconstruction

The I-80/I-680/SR 12 interchange reconstruction project is a major regional transportation improvement project in the San Francisco Bay Area and is included in the Metropolitan Transportation Commission's (MTC's) 2001 Regional Transportation Plan (RTP). The interchange is a major access point to San Francisco from the east via I-80, to Sacramento and the eastern Bay Area via I-680, and to western Solano County and Napa County via SR 12.

This specific project consists of additional through capacity on I-80 and I-680, HOV lane improvements, local interchange ramp improvements to address current hazards with weaving sections, local arterial improvements, and improvements to the truck scales on I-80. The total estimated cost of the specific project is \$740 million; committed funding is currently \$173 million. Under the CTEP, sales tax funding would contribute an additional \$200 million in committed funding by matching state and federal funding projected in the RTP, which is 50% of the total project cost.

Interstate 80 Corridor Improvements from Vallejo to Dixon

This specific project would improve segments of the I-80 corridor from the Carquinez Bridge to the Yolo County line near Dixon. Potential improvements include construction of an HOV lane from I-680 to I-505, widening of I-80 from Vacaville to Dixon, improvements to I-80 in Vallejo, correction of the I-505 weave in Vacaville, and matching funds for key local interchange improvements. The total estimated cost of the specific project is \$717 million; committed funding is currently \$82 million. Under the CTEP, sales tax funding would contribute an additional \$200 million in committed funding.

State Route 12 Corridor Improvements from Interstate 80 to Napa County Line (Jameson Canyon) and Interstate 80 to the Sacramento River

This specific project consists of the widening of westbound SR 12 near Jameson Canyon from the Napa County line to I-80, as well as safety, operational, and interchange improvements on eastbound SR 12 from I-80 to the Rio Vista Bridge over the Sacramento River. The total estimated cost of the project is \$171 million; committed funding is currently \$62 million. Under the CTEP, sales tax funding would contribute an additional \$60 million in committed funding. The Jameson Canyon improvements would be advanced and completed within 8–10 years, approximately \$7 million would be allocated for near-term improvements to SR 12, and \$23 million would be allocated for long-term improvements to SR 12 from I-80 to the Rio Vista Bridge.

State Route 113 Corridor Improvements

This specific project consists of implementation of safety improvements to the SR 113 corridor adjacent to Dixon. The total cost of this project is being

determined; there are currently no committed funds available. Under the CTEP, sales tax funding would contribute approximately \$5 million to this project.

Transit Improvements

Baylink Ferry Service

The Baylink Ferry Service project is a major regional transit improvement project that is included in the 2001 RTP. This specific project consists of improvements to the existing Vallejo Intermodal Station, acquisition of new ferry boats, maintenance facility improvements, and operating and maintenance funds. The total estimated cost of the project is \$60 million; there are currently no committed funds available. Under the CTEP, sales tax funding would contribute \$50 million in committed funding.

Commuter Rail to Bay Area Rapid Transit System

This specific project consists of rail track improvements (e.g., adding new track), acquisition of new cars, operation and maintenance funds for existing commuter rail service that links Solano County stations to the Bay Area Rapid Transit System (BART), and capital costs for construction of three Capital Corridor commuter rail stations in Fairfield/Vacaville, Dixon, and Benicia. The total estimated cost of the project is \$212 million; committed funding is currently \$8 million. Under the CTEP, sales tax funding would contribute an additional \$97 million in committed funding.

Commuter Rail to Sacramento Area

This specific project consists of track improvements, acquisition of new rail cars, and operating and maintenance funds for commuter rail service linking Solano County to the Sacramento area. The total estimated cost of this project is \$125 million; currently, there is no committed funding available. Under the CTEP, sales tax funding would contribute \$15 million in committed funding.

Expanded Capitol Corridor Service

This specific project generally consists of future track improvements in Solano County. The total cost of this project is being determined; there are currently no committed funds available. Under the CTEP, sales tax funding would allocate approximately \$5 million to this project.

Senior and Disabled Transit Services

This specific project addresses the need for increased senior and disabled transit services beyond those currently available in Solano County. The proposed services include an increase from 8 to 24 buses for disabled transit services, new senior service with 14 new buses, and funding for operation of the new services. The total estimated cost of the project is \$65 million; there is currently no committed funding. Under the CTEP, sales tax funding would contribute approximately \$65 million in committed funding to the project.

Express Bus Service on Interstates 80, 680, and 780

This specific project consists of capital funds for intermodal station improvements, bus purchases, funding for maintenance facilities, and operating and maintenance funds for express bus service. The total estimated cost of the project is \$149 million; committed funding is currently \$5 million. Under the CTEP, sales tax funding would contribute an additional \$63 million in committed funding to the project.

Local Transit

This specific project consists of capital funds for station improvements in Fairfield, Vallejo, and Vacaville; improved bus stops; incentives for alternative fuel vehicles; funding for maintenance facilities; and operating and maintenance funding for local bus service. The total cost of this project is being determined; there is currently no committed funding. Under the CTEP, sales tax funding would contribute approximately \$50 million to the project.

Nonmotorized Improvements**Bicycle/Pedestrian Trails**

This specific project consists of construction of new bicycle and pedestrian trails in urbanized areas. The total estimated project cost is \$64 million; committed funding is currently \$5 million. Under the CTEP, sales tax funding would contribute approximately \$10 million to the project.

Park-and-Ride Lots/Rideshare Program

This specific project consists of construction of new park-and-ride facilities and funding for continuation and expansion of the existing rideshare program throughout the county. The total estimated project cost is \$44 million; committed funding is currently \$3 million. Under the CTEP, sales tax funding would contribute approximately \$17 million to the project.

Pedestrian- and Transit-Friendly Downtowns

This specific project consists of implementation of the “Countywide Transportation for Livable Communities” (TLC) program, which would provide more pedestrian- and transit-friendly downtown and activity centers. TLC is also part of the 2001 RTP TLC program. Candidate projects are located in city centers of Benicia, Dixon, Fairfield, Old Town Cordelia (unincorporated Solano County), Suisun City, Vacaville, Rio Vista, Vallejo, and the multijurisdictional Jepson Parkway area. The total estimated cost for this project is \$100 million; committed funding is currently \$10 million. Under the CTEP, sales tax funding would contribute \$15 million to the project, equivalent to approximately 100% of MTC’s expanded regional TLC program identified in the 2001 RTP for Solano County.

Transportation-Related Environmental Mitigation

This specific project is the allocation of funds to develop environmental mitigation areas related to various transportation projects within Solano County.

The total cost of this project is not estimated; there is no committed funding. The CTEP would contribute \$10 million in committed funding to the project.

Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Eligible projects under this category include local roadway improvements, including access improvements to Travis Air Force Base (AFB), local interchange improvements, TLC/downtown improvements, local transit projects and local safety projects. The total project cost is currently not known. The CTEP would contribute \$38 million in committed funding to the project.

Local Road Rehabilitation Projects

This category generally includes local road rehabilitation projects in various cities throughout the county and unincorporated county areas. The total estimated cost is \$554 million; committed funding is currently \$184 million. The CTEP would contribute an additional \$100 million in committed funding. The funds would be allocated at an average rate of \$5 million annually, over 20 years.

Alternatives to the Proposed Project

No-Project Alternative

Under this alternative, the proposed CTEP would not be implemented and no additional funding would be available for the proposed transportation improvements throughout Solano County. It would not meet STA's goal of providing a plan to allocate funding to implement specific elements of the CTEP to develop a balanced transportation system that reduces congestion and improves access and travel choices by enhancing roads, public transit, bicycle and pedestrian systems, intermodal facilities, and management techniques. The estimated \$3 billion needed to address transportation and transit service inadequacies (e.g., deteriorated local roads and highways, inadequate transit services for senior and disabled, increased need for commuter or transit options, and inadequate highway capacity) proposed under the CTEP would not be met. Existing roadway safety hazards associated with SR 113, SR 12, and local areas identified under the Return to Source—Fast Track Congestion Relief and Safety Program would persist.

Highway Emphasis Option

Under this option, the total amount of money to be allocated among the specific projects would remain the same as proposed under the CTEP; however, a greater share of the total funds would be allocated to highway projects (Table 2-1). The potential for impacts on the environment would be similar to those for the proposed project. However, this option would not meet the STA's goal of developing a balanced transportation system because it would place a larger emphasis on highway improvements at the expense of other improvements.

Transit Emphasis Option

Under this option, the total amount of money to be allocated among the specific projects would remain the same as proposed under the CTEP; however, a greater share of the total funds would be allocated to transit projects (Table 2-1). The potential for impacts on the environment would be similar to those for the proposed project. However, this option would not meet the STA's goal of developing a balanced transportation system because it would place a larger emphasis on transit improvements at the expense of other improvements.

Public Participation

One of the purposes of CEQA is to establish opportunities for the public to review and comment on projects that may affect the environment. CEQA provides for public participation through:

- project scoping,
- publication of an NOP,
- public review of environmental documents, and
- public hearings.

CEQA also requires that a final EIR include responses to all comments received from the public regarding the draft EIR. The following provides additional information on public involvement in the environmental review process for the CTEP.

CTEP Development

STA initiated the CTEP input process in March 20002 by forming a Community Advisory Committee (CAC). The CAC consists of public, agency, and various community representatives of the Solano County cities and unincorporated areas.

The CAC provided input on which types of specific projects to include in the CTEP and on alternatives to the proposed CTEP.

CEQA Review

Public participation is an important component of the environmental review process. STA distributed an NOP/IS for the EIR on May 21, 2002, to identify issues of concern regarding the CTEP and to incorporate comments into the analysis for the draft EIR. The NOP and comment letters are provided in *Appendix A*. STA also conducted a public scoping meeting on June 20, 2002, to solicit additional comments from the public on the scope of the environmental analysis to be included in the draft EIR. The scoping report is provided in *Appendix B*.

STA will conduct a public hearing to present the results of the draft EIR and solicit comments. The purpose of this hearing is to provide agencies and the public with opportunities to comment on or express concerns regarding the draft EIR. These comments will be addressed in the final EIR.

Required Approvals for the Programmatic EIR

Solano Transportation Authority

As the lead agency under CEQA, the STA Board of Directors will certify the EIR. This EIR is intended to be used solely for the consideration for approval of the CTEP and should not be used for the approval of individual projects included in the CTEP. However, information in this document may be referenced as applicable.

Other Agencies

The preparation of this program EIR does not relieve the proponents of projects listed in the CTEP of the responsibility of complying with the requirements of CEQA (and/or National Environmental Policy Act [NEPA] for projects requiring federal funding or approvals). This EIR represents the first tier of environmental review for the projects proposed in the CTEP. The lead agency responsible for reviewing individual projects will determine the level of further, project-level environmental review needed, as project details are refined. The agencies may reference the discussion of regional impacts in this EIR as a basis of their assessment of regional or cumulative transportation impacts.

Table 2-1. Proposed Funding Allocation under the CTEP (Proposed Project) and Options

Specific Project	Proposed Funding (millions of dollars)		
	Proposed Project	Highway Option	Transit Option
Interstate 80/Interstate 680/State Route 12	200	255	175
Senior and Disabled Transit Services	65	55	65
Interstate 80 Corridor Improvements	200	250	150
State Route 12 (Jameson Canyon and Interstate 80 to Sacramento River [Rio Vista Bridge])	60	90	45
Commuter Rail to BART	97	77	122
Express Bus Service (Interstate 80/Interstate 680/Interstate 780)	63	52	85
Pedestrian & Transit Friendly Downtowns (TLC)	15	10	15
Transportation-Related Environmental Mitigation	10	5	10
Baylink Ferry Service (Vallejo Intermodal Station)	50	60	40
Commuter Rail (Sacramento)	15	28	0
Expand Capitol Corridor Service	5	5	10
Bicycle/Pedestrian Trails	10	5	15
Park-and-Ride Lots/Rideshare Program	17	13	17
State Route 113	5	5	5
Local Transit	50	0	60
Napa/Solano Passenger Rail	NA	NA	NA
Local Road Rehabilitation (“Potholes”—Return to Source)	100	100	100
Fast Track Congestion Relief and Travel Safety Program (Local Improvements—Return to Source)	38	38	38
Source: Solano Transportation Authority 2002b.			

Chapter 3

Land Use and Planning

Environmental Setting

Regional Setting

Solano County is one of the nine counties considered part of the San Francisco Bay region. The county is located in central California approximately halfway between the San Francisco and Sacramento metropolitan areas. The central California area is characterized by a diversity of landscapes and land uses. To the east, the region is bordered by the Sierra Nevada and foothills, which slope down to the Sacramento Valley basin. The Sacramento Valley runs from Redding south to Bakersfield. The western edge of the valley is defined by the Coast Ranges, which run north-south between the valley and the Pacific Ocean. The major urban centers in the region are San Francisco and the surrounding Bay Area cities, including San Jose and Oakland, and the state capitol of Sacramento. Numerous smaller urban centers with histories tied closely to the Gold Rush era of the mid-1800s and the area's agriculture are scattered throughout the region, as are bedroom communities associated with the urban centers. The vast majority of the land in the region is dedicated to agriculture (including ranching) and open space. Other land uses in the region include low-, medium-, and high-density residential; commercial; office; institutional; industrial, military, and recreational.

Countywide Setting

Solano County encompasses 898 square miles composed of 823 square miles of land and 75 square miles of water. Water areas include San Pablo Bay, the Mare Island Strait, Suisun Bay, the Sacramento River, and related sloughs. Land area is divided into two topographic sections. The western quarter extends into the Coast Ranges foothills, characterized by steep slopes becoming more gently rolling to the east. The remainder of the county is part of the Sacramento Valley Basin, except for isolated areas of low rolling hills. Other features include the Suisun Marsh, with an area of more than 80 square miles, and the Napa Marsh. (Solano County Department of Planning 1980.)

There are six urban areas distributed throughout the county: Vallejo/Benicia, Cordelia, Dixon, Fairfield/Suisun City, Rio Vista, and Vacaville (Figure 2-1). These areas are separated by lands designated for intensive and extensive agricultural use.

According to the Solano County general plan, almost 45,000 acres within the county are designated for residential use (approximately 30,000 acres of which are located within urban areas). An additional 5,500 acres are planned for commercial development, and 20,000 acres are planned for industrial use (11,400 acres of which are located within urban areas). Extensive and intensive agricultural uses encompass 314,200 acres within the county, and 119,500 acres are dedicated to multi-use marsh and watershed purposes. For unincorporated areas, the pattern of land use is one that allocates most of the land to agricultural and open space uses. This pattern conforms to the geographic distribution of the county's physical resources, constraints, and existing land uses and is consistent with the traditional role of the unincorporated area in Solano County. Commercial, residential, and industrial uses occupy much smaller areas. New residential development (subdivisions, etc.) is not allowed in the unincorporated areas of the county. (Solano Department of Planning County 1980.)

Approximately 95% of the total unincorporated land area of Solano County is in some form of agricultural use. Agricultural pursuits occur on a wide variety of soils and are conducted through a wide variety of farming techniques. Farmers in Solano County produce more than 75 different commodities with an annual wholesale value (farm gate value) of approximately \$200 million (Solano County Department of Environmental Management 2000).

Land Uses within Incorporated Areas

Benicia

Benicia is approximately 35 miles northeast of San Francisco and 57 miles southwest of Sacramento. 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 Ranges. The city is built on a peninsula that reaches south from the main body of Solano County and creates a prominent bend in the Carquinez Strait. From this peninsula, highway and railroad bridges span the strait to connect Benicia with the Contra Costa County city of Martinez.

The Benicia planning area is made up primarily of rolling hills, rising to an elevation of 1,160 feet in the northern part of the planning area. On the west boundary, Sulphur Springs Mountain reaches approximately 950 feet. On the south side of the city, the land slopes down to the Carquinez Strait. Most of the older residential areas and the downtown are in this area. The eastern city limits are bordered by the marshlands of Suisun Bay. Relatively flat areas adjacent to the marshes provide sites for industry.

The Benicia planning area encompasses a total of 8,163 acres. According to the city's general plan, the largest category of land use is industrial (31%), followed closely by parks/open space (25%), and residential (21%). Transportation uses account for 15%, commercial uses 5%, and public/quasi-public land uses 3%. (City of Benicia 1999.)

Dixon

Dixon is located on the I-80 corridor, 19 miles west of Sacramento and approximately 67 miles northeast of San Francisco. Dixon is bounded on the east by the City of Davis, to the north by Yolo County, to the west by the City of Vacaville, and to the south by unincorporated Solano County. Dixon is located in the central Sacramento Valley, where the terrain is generally flat and agriculture is the dominant land use.

The city's general plan indicates that future residential development would take place in portions of the planning area that are either already served by existing infrastructure or can be served by extending the existing infrastructure. To better balance anticipated residential development, additional land for industrial and commercial development has been designated on the general plan map. Areas to the east, southeast, south, and southwest of the existing city limits would accommodate future residential development, while a large area to the northeast of the existing city limits and a smaller area in the southwest near I-80 would accommodate future industrial and commercial development. (City of Dixon 1993.)

Fairfield

Fairfield is located along the I-80 corridor in central Solano County between the San Francisco Bay Area and Sacramento metropolitan areas, covering an area of approximately 37 square miles (Figure 2-1). Fairfield is bisected by the I-80 and I-680 corridors, as well as by SR 12. Fairfield is bordered by hills to the west, Suisun City and Suisun Marsh to the south, the Vaca Mountains to the north, Lagoon Valley to the northeast, and ranch lands to the east. Fairfield includes Travis AFB, which is located in the easternmost portion of Fairfield, and the Cordelia area, which is located in the westernmost portion of Fairfield near the I-80/I-680 interchange. Vacaville is located to the northeast along the I-80 corridor.

The city's current planning area comprises approximately 78,900 acres: 24,400 acres (31%) under city jurisdiction and 54,500 acres (69%) under county jurisdiction. Three distinct communities characterize Fairfield: central Fairfield, Cordelia, and the Travis AFB/Northeast area. (Jones & Stokes 2001a.)

Rio Vista

Rio Vista is located in the heart of the Sacramento-San Joaquin River Delta, approximately 48 miles southwest of Sacramento and 65 miles northeast of San Francisco. The Rio Vista planning area includes the existing city limits and the sphere of influence. The planning area also includes lands outside these limits, extending from Liberty Island Road across SR 12, south and east of Azevedo Road, and north of Emigh Road. The sphere of influence was amended in 1973 and 1982 to include parts of the Montezuma Hills and areas within the jurisdiction of the Delta Protection Commission that are precluded from urban development.

Approximately 6,455 acres of land within the sphere of influence but outside the city limits is included in the 11,255-acre planning area. Although not located within the incorporated boundaries, this acreage bears on Rio Vista's planning efforts; these lands, which are almost exclusively devoted to agricultural use and natural gas production, are considered likely to be within the ultimate physical boundaries and service area of Rio Vista.

The city's general plan identifies six distinct sub-planning areas identified by their common geographical and development characteristics. These areas and their associated acreages are summarized in Table 3-1 (City of Rio Vista 2002).

Table 3-1. Acreages of Rio Vista Sub-Planning Areas

Sub-Planning Area	Gross Acres	Percent of Total
1. Existing developed city near the Sacramento River	652	5.8%
2. Esperson and river walk properties and homecoming neighborhood	847	7.5%
3. Industrial/employment and service commercial lands north of SR 12	643	5.7%
4. Northwest area neighborhoods	1,524	13.5%
5. Airport, public, and restricted lands	787	7.0%
6. Agricultural and open space lands	<u>6,802</u>	60.4%
Total planning area	11,255	

Note: These acreages are approximate and for planning uses only.

Source: City of Rio Vista 2002.

Suisun City

Suisun City is situated midway between San Francisco and Sacramento in central Solano County. The "Old Town" section of the city is located on the Suisun Channel, which empties into Suisun and Grizzly Bays, the connecting point for the Sacramento River and San Francisco Bay.

Suisun City and its sphere of influence lie on approximately 3,000 acres of former pasture and marsh land. The city is located at the southwestern edge of an increasingly urbanized part of central Solano County. It lies on low-lying ground and is characterized by flat topography. The primary land uses in the developed portions of the city are residential and commercial. The distribution of land uses in the general plan are 2350 acres (77.8%) residential, 515 acres (17.1%) commercial/industrial, and 155 acres (5.1%) public. (City of Suisun City 1992.)

Vallejo

Vallejo is located in the northern Bay Area and is bordered on the west by San Pablo Bay, on the north by the City of American Canyon and unincorporated Napa County, on the east by the City of Fairfield sphere of influence and the City of Benicia, and on the south by the Carquinez Strait and Benicia State Park. Vallejo is 30 miles from San Francisco and 60 miles from Sacramento.

The incorporated portion of the city covers 51.5 square miles. Of this total, 25.4 square miles are mainland, 2.4 square miles are Mare Island, and 23.7 square miles are water or submerged lands. There are approximately 4.4 additional square miles in Vallejo's sphere of influence. No information is available on the distribution of land uses in the city (City of Vallejo 1999)

Vacaville

The City of Vacaville is located along the I-80 corridor approximately 53 miles northeast of San Francisco and 33 miles west of Sacramento. The Vacaville planning area covers approximately 100 square miles. The planning area includes land outside the sphere of influence or "probable ultimate physical boundaries and service area of a local governmental agency," as currently designated by the Solano County Local Agency Formation Commission.

Measured by the land use policies of the general plan, as of 1999, the 100-square-mile planning area has reached about 68% of its housing capacity. Of the land designated for commercial and industrial use, approximately 30% had been developed by 1999. The distribution among land use designations of the 4,608 acres of vacant land remaining in the planning area is shown in Table 3-2 (City of Vacaville 2002).

Table 3-2. Vacant Land Use Designations for the Vacaville Planning Area

Land Use Type	Acres
Residential	1,623
Business Park	568
Industrial	996
Commercial	446
Other/Open Space	<u>964</u>
Total	4608

Sources: City of Vacaville 2002.

Regulatory Setting

Land use and development in the project area is guided by the Solano County general plan and the general plans of the incorporated cities in the county. Federal land (e.g., Travis AFB) is not subject to the provisions of general plans or to local land use regulations. The county general plan encompasses all of the unincorporated areas in the county. The following discussion summarizes the relevant goals and policies of the county and city general plans. Farmlands and farmland protection policies are discussed in detail in *Chapter 4*.

Solano County

- **Development Strategy Goal 1:** Provide for orderly growth which assures a harmonious relationship of land uses, both rural and urban, and maintains the distinctive character of each community in Solano County.
- **Development Strategy Objective 1:** Preserve and protect the existing development pattern of distinct and identifiable cities and communities.
- **Development Strategy Objective 2:** Encourage land use development patterns and circulation and transportation systems which minimize energy consumption.
- **Development Strategy Objective 3:** Encourage a development pattern which first seeks to maintain existing communities, second to develop vacant lands within existing communities presently served by public services, and third, to develop lands immediately adjacent to existing communities where services can easily be provided.
- **Agricultural and Open Space Land Use Goal:** Maintain and enhance environmental quality of Solano County as it relates to the use of land, water, and air by managing and preserving the diverse natural resources of the County for the use and enrichment of the lives of present and future generations.

- **Agriculture Objective 1:** Preserve the County's high quality soils and protect and maintain essential agricultural lands including areas which possess unique characteristics for the raising of specialty crops.
- **Watershed Lands Objective 1:** Preserve and maintain watershed lands in agricultural and open space uses.
- **Marsh and Wetland Habitat Objective 1:** Preserve and enhance the quality and diversity of marsh aquatic and wildlife habitats.
- **Marsh and Wetland Habitat Objective 2:** Preserve and enhance the water resources available to Solano County, and protect significant waterways and their habitats.
- **Resource Conservation Objective 1:** Provide for managed production of Solano County's mineral resources in a manner which does not adversely affect the environment and is compatible with surrounding land use.
- **Resource Conservation Objective 2:** Protect and preserve the County's significant historical and archaeological resources.
- **Resource Conservation Objective 3:** Protect and preserve the County's visual corridors and significant scenic features by encouraging their retention in open space uses.
- **Resource Conservation Objective 4:** Encourage measures which seek to maintain and/or improve the County's water and air quality while still providing for economic development within the County.
- **Historical and Archaeological Features Objective 1:** The County shall identify and preserve its significant historical structures and features.
- **Historical and Archaeological Features Objective 2:** The county shall establish a mechanism for the identification, review and protection of significant archaeological sites.
- **Recreation Land Use Goal 1:** Maintain and enhance the environmental quality of Solano County by managing and preserving its diverse natural resources for the use and enrichment of the lives of present and future generations.
- **Residential Land Use Goal 1:** Promote and ensure adequate housing in a satisfying environment for all citizens of Solano County.
- **Residential Land Use Objective 1:** Provide sufficient housing jointly with the cities to meet Solano County's projected housing needs.
- **Residential Land Use Objective 2:** Provide phased residential development consistent with economic and social needs and environmental constraints.
- **Residential Land Use Objective 4:** Enhance and preserve the environmental quality of residential areas in the County.
- **Commercial Land Use Goal 1:** Establish a strong diversified economic base and provide for a wide choice of employment opportunities in a pleasant working environment.

- **Commercial Land Use Objective 1:** Provide for adequate commercial development that is located in close proximity to the population to be served.
- **Commercial Land Use Objective 2:** Provide for limited commercial activities within the unincorporated area to service primarily unincorporated community needs, as well as, limited highway service commercial facilities.
- **Industrial Land Use Goal 1:** Establish a strong diversified economic base and provide for a wide choice of employment opportunities in a pleasant working environment.
- **Industrial Land Use Objective 1:** Provide for diversified industrial development located in a manner which provides for the needs of industry while protecting surrounding uses and activities from adverse impacts.
- **Industrial Land Use Objective 1:** Reserve and protect a sufficient quantity of well-located lands jointly with the cities to meet projected future industrial needs.
- **Public Facilities and Services Objective 2:** Design and provide necessary public facilities and services that promote rational land use in accord with the General Plan policies.
- **Circulation and Transportation Objective 1:** Provide and maintain a safe, economical and efficient system of roads, streets, and highways to ensure adequate multi-modal movement of people and goods within, to and from the County, while incurring the least social, economic, and environmental harm to existing or planned activities and land uses.

Benicia

- **Land Use and Growth Management Goal 2.1:** Preserve Benicia as a small-sized city.
- **Land Use and Growth Management Goal 2.2:** Maintain lands near Lake Herman and north of Lake Herman Road in permanent agriculture/open space use.
- **Land Use and Growth Management Goal 2.3:** Ensure orderly and sensitive site planning and design for large undeveloped areas of the City, consistent with the land use designations and other policies in this General Plan.
- **Land Use and Growth Management Goal 2.4:** Ensure that development pays its own way.

Dixon

- **Urban Development and Community Design Goal 1:** To maintain Dixon's "small town character."

- **Urban Development and Community Design Goal 2:** To protect, preserve and enhance the significant historic features of the Dixon area to the maximum extent feasible.
- **Urban Development and Community Design Goal 4:** To preserve individual structures of historic value.
- **Urban Growth and Development Policy 11:** The City shall restrict land uses north and west of Interstate 80 to agricultural use, except as otherwise provided in the general plan.
- **Historic Preservation, Community Design and Appearance Goal 24:** The City shall promote the design of new development that is conducive to use of alternative transportation modes and that will be pedestrian-oriented, i.e.; walkways, pathways, bike paths, and open areas that foster interaction of people.
- **Residential Environment Policy 9:** The City shall be philosophically opposed at this time to residential development in those portions of the Planning Area northwest of I-80.
- **Downtown Area Policy 24:** The City shall continue efforts to relocate Highway 113 to Pedrick Road (or an alternate alignment), and/or to designate an alternative bypass route for through truck movements, in order to provide further protection to and preservation of the valued functions and character of the Downtown area.

Fairfield

- **Land Use Objective LU 1:** Achieve a level of population and employment which preserves and enhances the desired character of the City.
- **Land Use Objective LU 2:** Achieve a pattern of development that reinforces the City's desired image.
- **Land Use Policy LU 2.1:** Encourage the preservation of agricultural land surrounding the City and permanently preserve agriculture in the Suisun Valley.
- **Land Use Policy LU 2.4:** Establish and maintain a greenbelt buffer around the City.
- **Land Use Objective LU 3:** Establish an urban limit line that allows development to be satisfactorily planned before it occurs.
- **Land Use Objective LU4:** Achieve a rate of growth that is consistent with the provision of public facilities and services, that balances jobs and housing, and that does not result in the degradation of the natural environment.
- **Land Use Objective LU 5:** Participate and cooperate in regional planning activities.
- **Land Use Objective LU 7:** Achieve a maximum amount of open space land permanently available to citizens of Fairfield.

- **Land Use Objective LU 13:** Minimize conflicts between land uses.
- **Land Use Policy LU 13.1:** New development shall preserve and enhance, to the extent possible, the existing natural vegetation, landscape features, and open space.
- **Land Use Policy LU 13.3:** Proposed land uses shall be consistent with the land use compatibility guidelines of the Airport Land Use Plan for Travis Air Force Base incorporated into this General Plan.
- **Land Use Objective LU 15:** Reserve identified prominent topographical features, including ridgelines, steep slopes and hillsides; and natural features such as tree stands and riparian areas.
- **Land Use Objective LU 16:** Development of identified hillside areas should be sensitive, to preserve natural features.

Rio Vista

- **Land Use Goal 4.1:** Continue a comprehensive, logical land use planning process rather than an incremental, piecemeal approach.
- **Land Use Goal 4.2:** To ensure that the use and character of all lands within the city's planning area are consistent with the intent of [the] General Plan
- **Land Use Policy 4.2.F:** Sub-Planning Area 6-Agricultural and Open Space Lands. The City shall strive to ensure that these lands remain in non-urban, predominantly agricultural and open space uses.
- **Land Use Goal 4.4:** To provide a range of land uses through the establishment of districts that will promote a balanced mix of needs in the community including residential, commercial, industrial, agricultural, recreational, and public service uses.
- **Land Use Policy 4.4.A:** The City shall establish a Neighborhood Core district at the center of the three major new growth neighborhoods. This district shall accommodate community- and regional-serving commercial needs, provide medium-to high-density residential uses, support designated transit facilities, encourage non-auto travel, and allow for ease of internal pedestrian access for multiple purposes and destinations.
- **Land Use Policy 4.4.D:** The City shall strive to preserve and strengthen the original downtown, waterfront, and historic community and ensure that this district remains the community's civic and commercial focus.

Suisun City

- **General Land Use Goal:** To provide for a balance of land uses to meet the basic needs of the City's residents and workers and to achieve the desired community character articulated by [the Suisun City] General Plan

- **Commercial Goal:** To expand job-creating activities needed to support population growth, construction, and the delivery of public services. Opportunities for improving the economic base should be pursued.
- **Industrial Goal:** To allow for a mixture of environmentally sensitive industrial land uses that would rely on their proximity to the Union Pacific Railroad, Travis Air Force Base, and arterial roads.
- **Industrial Objective 1:** To designate areas that are appropriate for a mixture of manufacturing, commercial storage and distribution, and transportation-related land uses that can take advantage of transportation access to the Union Pacific Railroad line, Highway 12, and arterial roads bordering Suisun City.
- **Public and Quasi-Public Land Use Goal:** To allow necessary public, quasi-public, and private institutional use in appropriate areas of the City.

Vacaville

- **Community Form and Image Policy 2.1-G 1:** Maintain Vacaville as a free-standing community surrounded by foothills, farmland, and other open space.
- **Community Form and Image Policy 2.1-G 3:** Establish open space linkages by preserving habitat areas, including natural creek corridors. Use utility easements where possible as open space linkages.
- **Community Form and Image Policy 2.1-G 5:** Design aesthetically pleasing roadways, including a loop street system lined with trees or other appropriate landscaping, that connect Vacaville neighborhoods and serve planned development. Streets alone should not be used to set the outer limits of urbanization.
- **Community Form and Image Policy 2.1-G 7:** Develop standards for entry points to the city, including landscape design and a coherent signage design.
- **Community Form and Image Policy 2.1-G 9:** Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.
- **Community Form and Image Policy 2.1-G 10:** Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands or other significant natural features wherever appropriate to establish ultimate City boundaries.
- **Growth Strategy Policy 2.2-G 5:** Plan for and carry out improvements to the City's infrastructure, consistent with the General Plan to preserve economic vitality, accommodate new housing, increase the City's revenue base, enhance mobility and economic opportunity, and correct deficiencies.
- **Growth Strategy Policy 2.2-G 8:** Distribute housing, shopping, and employment opportunities on each side of I-80 to minimize the need for excessive travel across I-80.

- **Residential Areas Policy 2.5-I 10:** Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development “must pay its own way.”
- **Retailing and Commercial Services Policy 2.6-G 6:** Encourage the location of visitor-serving highway commercial services at appropriate locations along the I-80 and I-505 corridors.
- **Retailing and Commercial Services Policy 2.6-G 9:** Maintain the quality of public services by requiring all new commercial development to meet its share of public costs.
- **Park and Recreation Policy 4.6-G 10:** Establish policies to prevent the degradation or despoilment of the City’s parklands through inappropriate uses.
- **Park and Recreation Policy 4.6-G 14:** Plan park and recreational facilities in cooperation with concerned public and private agencies and organizations.

Vallejo

- **Urban Design Goal 1:** To establish a strong city identity.
- **Urban Design Goal 2:** To have within each neighborhood an image, sense of purpose and means of orientation.
- **Hillside Development Goal:** To preserve the natural character of the hillsides for the enjoyment of all.
- **Hillside Development Policy 1:** Development in hilly areas should be designed to capture views. The development, in turn, should be pleasing to observe from a distance. The appearance of rows along the hillside should be avoided. There should be heavy landscaping to soften manmade features.
- **Commercial Development Goal 3:** To develop the Northeast Quadrant so that it complements the city as a whole.
- **Commercial Development Policies 1:** Use the Northgate Specific Plan as the development guide to evaluate projects proposed within the Northeast Quadrant.

Impacts and Mitigation Measures

Methods of Analysis

The general plan land use elements of Solano County and the incorporated cities were reviewed for consistency with the proposed CTEP projects. In addition, a windshield survey through the county was conducted on May 30, 2002, to verify existing land uses in the project area. The windshield survey sampled major transportation routes throughout the county and covered areas proposed for major

transportation improvements under the CTEP. A more detailed land use impact analysis would be required during development of plans for individual projects.

Criteria for Determining Significance

The proposed CTEP projects would have significant environmental impacts related to land use and planning if they would:

- physically divide an established community; or
- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental impact.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact LU-1: Beneficial Impact on Land Use from Distribution of Operational Subsidies

Allotment of operational subsidies for the following specific projects would not have any direct effects on land use within the project area: senior and disabled transit services, express bus service along I-80/I-680/I-780, Baylink Ferry Service, and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs, and provide extra service hours. These projects would not adversely affect land use policies and resources in Solano County. These projects would have a beneficial effect on implementation in that they support land use goals and policies of the county and cities that directly or indirectly promote transit use, such as Solano County Development Strategy Objective 2 and Resource Conservation Objective 4, Fairfield Land Use Objective LU4, Rio Vista Land Use Policy 4.4A, and Vacaville Growth Strategy Policy 2.2-G5. Therefore, the impact is beneficial.

Impact LU-2: No Impact on Land Use from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for the loss of sensitive habitats resulting from construction of specific projects

under the CTEP. The CTEP would merely allocate funds for this process. Therefore there is no impact.

Impact LU-3: Physical Division of an Established Community by Transportation Improvement Projects

Several specific projects under the CTEP could have the potential to physically divide established communities. These projects include the westbound SR 12 widening, commuter rail (Sacramento), expansion of the Capitol Corridor service, and SR 113 improvements. Because many of these potential improvement projects could occur within incorporated areas, several cities could be affected. Intersection and interchange improvements, especially grade separations, may create visual and physical barriers between adjacent land uses in cities, depending on the location and design of the interchanges. In many cases, these projects involve improvements to transportation facilities where physical division of communities already exists. Proposed new construction and operational improvement projects could include widened lanes, addition of new lanes, road rehabilitation, and safety projects that could also present a barrier between existing contiguous land uses.

Because of the volume of improvements, it is assumed that transportation improvement projects that affect roads and interchanges present the greatest potential for impacts regarding the division of an established community and conflicts with city land use plans and policies. In addition, depending on the specific location of rail transit projects, adding tracks and constructing multiple passenger rail stations could also result in physical division of existing communities. Therefore, this impact is considered significant. Implementation of the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measure LU-1: Conduct Site-Specific Review of Project Design Improvements to Determine Effects on Established Communities

STA should ensure that project proponents consult with local planning staff to avoid or reduce the potential for physically dividing a community. At the time of subsequent project approval, a more detailed project-level analysis of land uses adjacent to proposed improvements should be required to identify specific impacts related to physical division of existing communities. Analysis of new road widths and specific project locations in relation to existing roads would be analyzed when such design plans are available.

Before approving funding for a specific project, STA should ensure that, in determining the locations of potential impacts, the cities and county assess the sensitivity of communities to division, the proposed new roadway width and other project characteristics, and the adjacent land uses. If site-specific analyses indicate that a community could be physically divided by proposed improvements, STA should ensure that the following Mitigation Measure LU-2 is implemented.

Mitigation Measure LU-2: Design Project Improvements to Avoid or Minimize Physical Division of an Existing Community

STA and/or the affected member agency should ensure that project proponents avoid or minimize the physical division of communities by a project. Measures to avoid the division would include realignment of the roadway or interchange improvements to avoid the affected area of residential communities or cohesive neighborhoods. Where complete avoidance of an area is determined infeasible, measures to reduce the impact would include alignment shifts to minimize the area affected; reduction of the proposed right-of-way take to minimize the overall area of impact; provisions for bicycle, pedestrian, and vehicle access across improved roadways; or reduction of the visual impact of the improved roadway using landscaping, paving materials, or road design. In addition, STA should encourage project proponents to comply with applicable city, county, or state design standards for highway, expressway, and interchange improvements.

Impact LU-4: Conflicts between Transportation Improvement Projects and Applicable Open Space/Agricultural Land Use Preservation Policies

Several specific projects under the CTEP have the potential to convert open space and agricultural lands to transportation uses. These projects may include the I-80/I-680/SR 12 interchange, I-80 corridor improvements, westbound 12 widening, commuter rail to BART, construction of bicycle/pedestrian trails, and commuter rail facilities. Most of the proposed open space conversion would occur in Solano County's jurisdiction. Impacts on agricultural uses and appropriate mitigation measures are discussed in *Chapter 4*.

The percentage of land converted from open space/agricultural use as part of the proposed improvements would not be substantial relative to the county's total agricultural acreage. Also, most converted land would be in the form of long, narrow bands adjacent to roadways, not large, contiguous parcels. However, this impact is considered significant because open space would be permanently converted to a more intensive land use. Implementation of Mitigation Measures LU-3, and LU-4 would reduce this impact to a less-than-significant level.

Mitigation Measure LU-3: Design Project Improvements to Minimize Impacts on Open Space and Agriculture

STA should ensure that project proponents design improvements to minimize the amount of open space conversion. Design measures may include, but are not limited to, reducing the proposed roadway width or realigning the improvement to avoid open space and agricultural lands. Lands with significant economic, scenic, or local value, such as Prime Farmland, should be avoided when feasible.

Mitigation Measure LU-4: Organize and Participate in Working Groups for All CTEP Major Infrastructure Projects

STA should organize and participate in working groups for all CTEP major infrastructure projects to ensure that preservation of open space is considered in the design of projects.

Impact LU-5: Conflicts between Transportation Improvement Projects and Relevant Land Use Plans

CTEP projects are generally compatible with existing land use policies; however, several specific projects proposed under the CTEP could conflict with county and city land use policies and designations. Solano County and each of the cities have developed policies regarding the preservation of agricultural land. The local jurisdictions intend to retain agricultural lands for economic purposes, open space values, as buffers, and to define adjacent cities. Conversion of these lands could conflict with local policies to prevent the premature conversion of agricultural lands to urban uses. (See the discussion in Impacts LU-4, AG-3, and AG-4.)

Some of the proposed improvements would increase the amount of pavement and bring automobile traffic closer to residences, resulting in increased exposure of people to noise, visual disruption, and odors. This issue is discussed further in *Chapters 11, 12, and 14*.

This impact is considered significant; however, implementation of the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measure LU-3: Design Project Improvements to Minimize Impacts on Open Space and Agriculture

Mitigation Measure LU-4: Organize and Participate in Working Groups for All CTEP Major Infrastructure Projects

Mitigation Measure LU-5: Provide Buffers or Setbacks between CTEP Improvements and Adjacent Sensitive Land Uses

STA should encourage member agencies and/or project proponents to provide buffers or setbacks between the improvements and adjacent sensitive land uses where feasible and appropriate to minimize conflicts. Buffers may include vegetation, berms, or soundwalls. The size and type of buffer or setback should be determined during the individual project design phase.

Impact LU-6: No Physical Division of an Established Community by Construction of Pedestrian and Nonmotorized Facilities

The CTEP includes proposals to construct bicycle and pedestrian trails, and park-and-ride lots throughout Solano County. Additional potential projects include trail improvements, ridesharing program, TLC program enhancements, and pedestrian-friendly downtowns. New or widened bikeways and pedestrian trails would require minimal additional roadway width. The scale of this additional paving is not anticipated to physically divide an established community. Bikeway signage and striping also would not physically divide an established community. Park-and-ride lots would require relatively small amounts of land and would be located adjacent to existing roadways or transit corridors where

they would not be anticipated to physically divide an established community. Therefore, this impact is considered less than significant. No mitigation is required.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of existing substandard streets. These improvements would not result in significant impacts on land use because new facilities would not be constructed and projects would consist of maintenance of existing facilities.

Chapter 4

Agricultural Resources

Environmental Setting

Approximately 65% of the land in Solano County is used for agricultural production. Half of the lands in production is used for irrigated crops, and the other half is used for dryland grain crops and grazing (Solano County Farm Bureau 2000). Agricultural production and associated support businesses are significant components of the Solano County economy, generating over \$1.5 billion in sales annually (Solano County Department of Agriculture 2002).

The leading crops in Solano County, in terms of total acreage and production value, are tomatoes, nursery stock, alfalfa hay, cattle and calves, wine grapes, sugar beets, field corn, sheep and lambs, wheat, and milk. The large alluvial plain surrounding Dixon is the center of agricultural production in Solano County. This area is used primarily for the production of grain and hay crops, pasture, and irrigated field and truck crops, such as sugar beets, corn, and tomatoes.. The southeastern portion of the county is used primarily for pasture, sugar beets, grain crops, and hay crops. The rolling Montezuma Hills area south of SR 12 is used primarily for producing dryland wheat, barley, and oats, and for sheep grazing. Most of the orchards and vineyards in the county are located in Green, Lagoon, Suisun, Gordon, Paradise, and Vaca Valleys. (California Department of Water Resources 1994; Solano County Department of Planning 2001.)

Farmland Quality

Farmland quality refers to the ability of farmland to support various levels of crop or livestock production. Factors that affect farmland quality include the physical and chemical characteristics of a site's soils (i.e., soil quality), as well as climate, moisture supply, topography, and the quality and availability of irrigation water. The Land-Capability Classification System developed by the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) and the Storie Index Rating System developed by the University of California are two land classification systems that are commonly used throughout the country to evaluate and rate the suitability of a given tract of land for agricultural production or other types of land. In California, the farmland classification system developed by the California Department of Conservation's (DOC) Important

Farmland Mapping and Monitoring Program (FMMP) is the primary system used to evaluate the quality and distribution of farmland in California. The FMMP prepares Important Farmland maps approximately every 2 years for most of the state's agricultural regions based on soil survey information and land inventory and monitoring criteria developed by the USDA Natural Resources Conservation Service (NRCS). The farmland classification system used by the FMMP consists of eight mapping categories: five categories of agricultural lands and three categories of nonagricultural lands. The characteristics of these categories are summarized below.

Agricultural Land

- **Prime Farmland.** Lands with the combination of physical and chemical features best able to sustain long-term production of agricultural crops. The land must be supported by a developed irrigation water supply that is dependable and of adequate quality during the growing season. For this classification, the land must have been used for the production of irrigated crops at some time during the 4 years before the mapping data were collected.
- **Farmland of Statewide Importance.** Lands with agricultural land use characteristics, irrigation water supplies, and physical characteristics similar to prime farmland but with minor shortcomings (e.g., steeper slopes or less ability to hold and store moisture).
- **Unique Farmland.** Lands with lesser-quality soils used for the production of California's leading agricultural cash crops. These lands are usually irrigated but may include nonirrigated orchards or vineyards as found in some of the state's climatic zones.
- **Farmland of Local Importance.** Lands of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee. In Solano County, the Board of Supervisors determined that there will be no Farmland of Local Importance.
- **Grazing Land.** Lands on which the existing vegetation is suited to the grazing of livestock.

Nonagricultural Land

- **Urban and Built-Up Land.** Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This type of land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **Other Land.** Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; vacant and nonagricultural land surrounded on all sides by urban development; confined

livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres.

- **Water.** Perennial water bodies with an extent of at least 40 acres.

Nearly half (46%) of the agricultural land in Solano County is classified as Important Farmland, most of which is associated with the county's primary agricultural production region around Dixon and the vineyards and orchards west of Fairfield and Vacaville. The Important Farmland west of Fairfield and Vacaville are mainly orchards and vineyards, and deciduous fruit and nut orchards respectively (Figure 4-1 and Table 4-1). The overwhelming majority (86%) of the Important Farmland in Solano County is classified as Prime Farmland (Table 4-1).

Table 4-1. Acreage Summary of FMMP Mapping Categories in Solano County

FMMP Mapping Category	Acres in County
Agricultural Land	
Important Farmland	
Prime Farmland	148,119
Farmland of Statewide Importance	10,597
Unique Farmland	13,860
Farmland of Local Importance	0
<i>Important Farmland Subtotal</i>	<u>172,576</u>
Grazing land	<u>198,826</u>
<i>Agricultural Land Total</i>	371,402
Urban and Built-Up Land	53,809
Other Land	104,977
Water	<u>52,182</u>
Total Area Inventoried	582,370

Source: California Department of Conservation 2000b.

As in most agricultural counties in California, Solano County has experienced a net reduction in Important Farmland acreage in recent years. Most recently, during the 1998–2000 FMMP update cycle, Solano County posted net loss of 2,837 acres of Important Farmland. These losses occurred because Important Farmland has changed to Grazing Land and Important Farmland was directly converted to Urban and Built-Up Land.

Williamson Act Contract Lands

The California Land Conservation Act, better known as the Williamson Act, was enacted by the State Legislature in 1965 to encourage the preservation of agricultural lands. The Williamson Act program permits property tax

adjustments for landowners who contract with a city or county to keep their land in agricultural production or approved open space uses. Lands covered by Williamson Act contracts are assessed on the basis of their agricultural value instead of their potential market value under nonagricultural uses. In return for the preferential tax rate, the landowner is required to agree contractually not to develop the land for at least 10 years.

Williamson Act contracts are renewed annually for 10 years unless a party to the contract files for nonrenewal. If a landowner files a nonrenewal application, the automatic annual extension of a contract ends and a 9-year phase-out of the contract begins. During the phase-out period, the land remains restricted to agricultural and open-space uses, but property taxes gradually return to levels associated with the market value of the land. At the end of the 9-year nonrenewal process, the contract expires and the owner's uses of the land are restricted only by applicable local zoning. Under extraordinary circumstances, Williamson Act contracts can be cancelled without completing the term nonrenewal process.

The Williamson Act defines compatible use of contracted lands as any use determined by the county or city that administers the agricultural preserve to be compatible with the agricultural, recreational, or open-space use of land within the preserve and subject to contract (California Government Code, Section 51202[e]). However, uses deemed compatible by a county or city government must be consistent with the principles of compatibility set forth in California Government Code Section 51238.1.

As of December 2000, 265,759 acres of farmland in Solano County were under Williamson Act contracts (Boyle pers. comm.). This acreage represents approximately 46% of all land and 72% of agricultural land in Solano County.

Impacts and Mitigation Measures

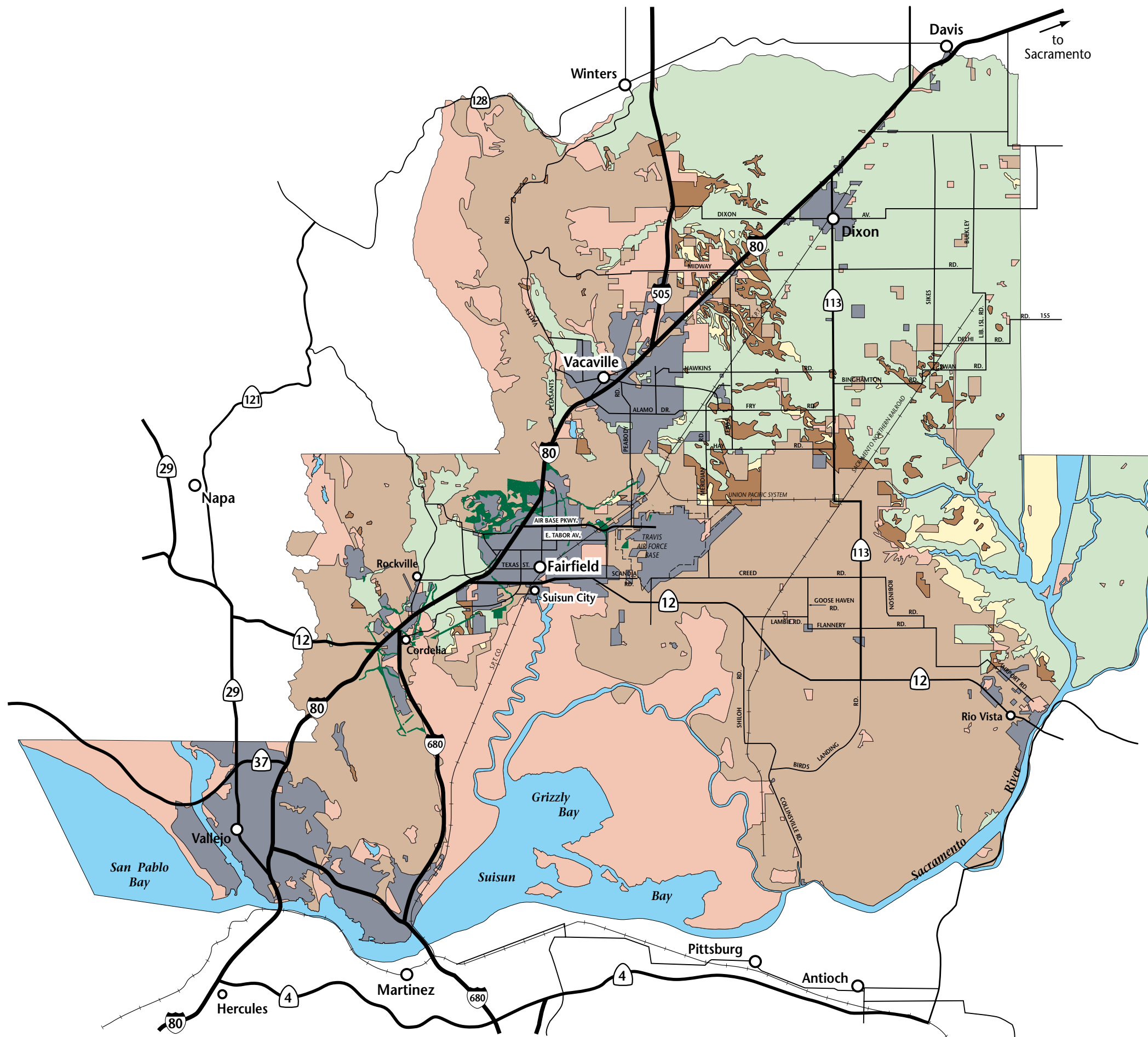
Methods of Analysis

The analysis of potential environmental impacts related to agricultural resources was based on the qualitative review and comparison of the type, distribution, and quality of agricultural lands in Solano County and the potential effect of the proposed CTEP projects.

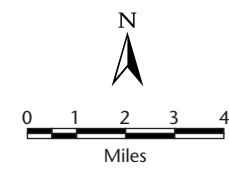
Criteria for Determining Significance

The CTEP would have a significant effect on agricultural resources if it would:

- convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the FMMP, to nonagricultural use;



- FARMLAND MAPPING AND MONITORING PROGRAM
MAPPING CATEGORIES**
- Prime Farmland
 - Farmland of Statewide Importance
 - Unique Farmland
 - Grazing Land
 - Other Land
 - Water
 - Urban and Built-Up Land
 - Open Space



Source: Department of Conservation, Farmland Mapping and Monitoring Program, 2000.

Note: This map is intended for planning purposes only; further site-specific review would be required for projects affecting Important Farmland.

**Figure 4-1
Important Farmland Map
of Solano County**

- involve other changes in the existing environment that, because of their location or nature, could result in the conversion of farmland to nonagricultural use;
- conflict with existing Williamson Act contracts; or
- conflicts with adjacent uses in a manner that induces those lands to be converted to nonagricultural uses.

Potential zoning and land use conflicts are addressed in *Chapter 3*.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact AG-1: No Impact on Agricultural Resources from Distribution of Operational Subsidies for Buses and Ferry Services

The allotment of operational subsidies for the following specific projects would neither result in the direct or indirect conversion of farmland to nonagricultural uses nor conflict with existing zoning for agricultural use or a Williamson Act contract: senior and disabled transit services, express bus service along I-80/I-680/I-780, Baylink Ferry Service, and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs and provide extra service routes. Therefore, such projects would not affect agricultural resources in Solano County.

Impact AG-2: No Impact on Agricultural Resources from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact AG-3: Direct Conversion of Important Farmland to Nonagricultural Uses

Several specific projects under the CTEP have the potential to result in the conversion of some Important Farmland to nonagricultural uses (e.g., highways). These projects include the following: I-80/I-680/SR 12 interchange, I-80 corridor improvements, SR 113 improvements, commuter rail (Sacramento), expansion of the Capitol Corridor service, and park-and-ride lots. This impact is considered potentially significant because Solano County cannot guarantee that conversion of farmland can be avoided as part of future projects. Implementation of the following mitigation measure would reduce this impact, but not to a less-than-significant-level for all projects. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure AG-1: Evaluate the Potential for Direct Farmland Conversion at the Project Level and Avoid, Minimize, and Compensate for Loss of Farmland

STA should encourage member agencies and/or project proponents to evaluate the environmental significance of potential farmland conversion impacts at the project level using the California Agricultural Land Evaluation and Site Assessment Model, which was developed by DOC's Division of Land Resource Protection to provide lead agencies with a systematic and objective method for evaluating the potential impacts of proposed projects on agricultural resources. STA should encourage project proponents to implement the following measures to reduce significant farmland:

- design the proposed CTEP projects to avoid or minimize the direct conversion of Important Farmland to nonagricultural uses, and
- compensate for unavoidable Important Farmland conversion impacts by:
 - enrolling offsite agricultural lands under Williamson Act contracts,
 - protecting productive offsite agricultural land subject to conversion through the purchase or transfer of its development rights, or
 - making agricultural improvements on "potential prime agricultural lands" identified by Solano County Department of Agriculture.

Impact AG-4: Conversion of Important Farmland to Nonagricultural Uses through Unplanned Urban Growth (Indirect Farmland Conversion)

Indirect conversion of Important Farmland as a result of urban growth in agricultural areas has been identified as an issue of concern by Solano County (Solano County Department of Planning 2001). Several specific projects under the CTEP would be located in portions of Solano County that contain Important Farmland. As described in Impact AG-1, several projects have the potential to result in the direct conversion of some Important Farmland to nonagricultural uses (e.g., highways). Construction of these projects could help to induce urban

growth and conversion of Important Farmland to nonagricultural uses. As a result, it is likely that implementation of the proposed projects could induce substantial urban growth on Important Farmland with the contribution of other growth-inducing factors. Therefore, this impact is considered significant and unavoidable.

Impact AG-5: Conflict with Existing Williamson Act Contracts

The Williamson Act allows county and city governments to define compatible land uses for contract lands within their jurisdictions if those uses are consistent with the compatibility principles set forth in Government Code Section 51238.1. Williamson Act contract lands represent approximately 72% of the total agricultural land in Solano County. Therefore, it is likely that at least several specific projects under the CTEP have the potential to displace or impair existing or reasonably foreseeable agricultural operations on or open space use of Williamson Act contract lands in Solano County. Such displacement or impairment would conflict with the compatibility principles set forth in Government Code Section 51238.1. These potential conflicts could result in nonrenewal or cancellation of affected Williamson Act contracts. This impact is considered potentially significant. Implementation of Mitigation Measure AG-2 would reduce this impact to a less-than-significant level.

Mitigation Measure AG-2: Evaluate the Potential to Displace or Impair Agricultural Operations on Williamson Act Contract Lands

STA should encourage member agencies and/or project proponents to conduct an analysis of potential conflicts with Williamson Act contracts at the project level, consistent with the State CEQA Guidelines and other applicable state or local regulations. If the impacts of the proposed projects on Williamson Act contract lands are determined to be significant at the project level, the following measures would be implemented:

- The proposed projects would be designed to avoid or minimize the displacement of existing and reasonably foreseeable agricultural operations from affected Williamson Act contract lands.
- The displacement of agricultural operations from affected Williamson Act contract lands would be compensated for by enrolling offsite agricultural lands under Williamson Act contracts.

Impact AG-6: Reduction of Farmland Productivity and Efficiency

Several specific projects under the CTEP have the potential to be located in portions of Solano County that contain Important Farmland. Construction and operation of some of these proposed projects, such as I-80 corridor improvements and SR 12 improvements, could reduce the productivity and efficiency of affected farmland by creating parcels from large tracts of farmland or by creating

the potential for conflicts between agricultural and nonagricultural land uses (e.g., restrictions on farming practices that generate noise, dust, odor, or pesticide drift). This impact is considered potentially significant. Implementation of Mitigation Measure AG-3 would reduce this impact to a less-than-significant level.

Mitigation Measure AG-3: Evaluate and Avoid or Minimize Potentially Significant Agricultural Land Use Conflicts at the Project Level

STA should encourage member agencies to evaluate the potential for the productivity and efficiency of existing farming operations to be significantly impaired by the construction and operation of proposed CTEP projects during the project-level environmental review process. If potentially significant land use conflicts are identified, STA should coordinate with member agencies and/or agricultural land owners and implement measures to avoid or minimize such conflicts.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements including access to Travis AFB, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on agricultural resources.

Chapter 5

Population and Housing

Environmental Setting

Countywide Setting

Solano County is located halfway between the San Francisco and Sacramento metropolitan areas. The gross area of the county is 898 square miles, which is composed of 823 square miles of land and 75 square miles of water.

Population Trends

There are six population centers distributed throughout the county: Cordelia, Dixon, Fairfield/Suisun City, Rio Vista, Vacaville, and Vallejo/Benicia (Figure 2-1). The county has seven incorporated cities: Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo. The urban areas are separated by lands designated for intensive and extensive agricultural use. The cities are located along the major interstate highways in the county, except for Rio Vista, which is located near the Sacramento River in the southeastern part of the county.

In 2000, Solano County's population was 394,542, approximately 1.16% of the total state population. This represents an increase in county population of 15.9% since 1990 and an increase of 0.02% in the county's share of the state population. These trends are expected to continue. Association of Bay Area Governments (ABAG) projections indicate that Solano County will experience an annual growth rate of 2.1% between 2000 and 2010, slightly higher than the statewide growth rate of 1.6%. The total increase from 2000 to 2010 would be 23%.

Table 5-1. ABAG Population Projections by Jurisdiction

Location	1990 Population	2000 Population	2010 Population (Forecasted)	Annual Growth Rate, 2000–2010 (%)
Benicia	24,437	26,865	28,800	0.7
Dixon	10,401	16,103	22,000	3.2
Fairfield	77,211	96,178	117,700	2.0
Rio Vista	3,316	4,571	13,000	11.0
Suisun City	22,686	26,118	31,900	2.0
Vacaville	71,479	88,625	110,600	2.2
Vallejo	109,199	116,760	134,800	1.5
Unincorporated	<u>24,437</u>	<u>19,322</u>	<u>26,700</u>	<u>3.3</u>
Total County	340,421	394,542	485,500	2.1
California ^a	29,760,021	33,871,648	40,262,400	1.6

^a Population estimates for 1990 and 2000 are from U.S. Bureau of the Census. 2010 population forecast is from California Department of Finance for July 2010.

Sources: U.S. Bureau of the Census 1990, 2000; California Department of Finance 2001; Association of Bay Area Governments 2001a.

Approximately 95% of the county population lives in the seven cities. Vallejo has the largest population in the county with an estimated 116,760 residents (Table 5-1). Rio Vista is the smallest incorporated city with a population of 4,571. Dixon and Rio Vista had the most significant population growth from 1990–2000—55% and 38%, respectively. Interregional commuters (e.g., from the Bay Area) seeking affordable housing and an increase in immigrants have contributed to the increase in population growth. (Solano Economic Development Corporation 2002.)

Race and Ethnicity

The race/ethnicity composition of Solano County is shown in Table 5-2. The largest ethnic group in Solano County is White, representing 49.2% of the 2000 population. However, the proportion of Whites in the total population has declined to current levels from 70.2% in 1980 and 61.1% in 1990.

The largest minority ethnic group in Solano County is Hispanic, representing 17.6% of the 2000 population (Table 5-2). Demographic information indicates that, while the proportion of non-Hispanic Whites has declined, the proportion of Hispanics has grown from 10.6% in 1980 and 13.4% in 1990 to current levels. Other ethnic groups such as African American and Asian/Pacific Islander have increased in proportion in recent years also. (California Department of Finance 1999, U.S. Bureau of the Census 2000.)

Table 5-2. Population by Race/Ethnicity in Solano County

Race/Ethnicity	2000		1990		1980	
	Total Population	Percent of Total	Total Population	Percent of Total	Total Population	Percent of Total
White	194,282	49.2	207,936	61.1	166,532	70.2
Hispanic	69,598	17.6	43,890	12.9	25,224	10.6
African American	57,597	14.6	44,177	13.0	27,814	11.7
Native American	2,194	0.6	2,923	0.9	1,746	0.7
Asian/Pacific Islander	52,258	13.2	40,958	12.0	15,884	6.7
Other	955	0.2	537	0.2	—	—
Two or more races	17,658	4.5	—	—	—	—
Total	393,587		340,421		237,200	

— = not available

Source: California Department of Finance 1999, U.S. Bureau of the Census 2000.

Employment

According to the California Department of Finance (DOF), the labor force in Solano County in 2000 was 196,900. Civilian employment was 188,500 with an unemployment rate was 4.2%. The services industry accounts for the largest number of jobs and firms in the county. Trade and government are also significant sectors; combined, they contribute nearly half of the county's jobs. (California Department of Finance 2002.)

Agriculture is the most significant economic activity in the unincorporated areas of the county. Solano County is committed to maintaining its agriculture industry. About 75% percent of all unincorporated county lands are dedicated to agricultural activities. Average personal income from farm-based activity has steadily decreased since 1993. The *2000 Solano Agriculture Report* valued agricultural production at \$185,109,100, 5% lower than 1999. (Solano Economic Development Corporation 2002.)

Table 5-3. Nonagricultural Industry Distribution and Employment by Industry in Solano County

Industry	Number of Firms	Percent of Total	Employment	Percent of Total
Mining, construction	680	11.0	10,200	8.9
Manufacturing	278	4.5	10,200	8.9
Transportation, utilities	245	4.0	4,200	3.7
Trade	1,350	21.9	30,100	26.3
Finance, insurance, real estate	614	9.9	4,900	4.3
Services	3,007	48.7	30,400	26.5
Government	—	—	24,600	21.5
Total	6,174		114,600	

— = not available

Source: California Department of Finance 2002.

Housing

The 2000 U.S. Census estimated that the population in households in Solano County was 378,568. (Households are associated with year-round residency regardless of housing type.) The average county household size is estimated to be 2.9 persons per household, the same as it was in 1990.

DOF estimated the housing stock in the county to be 136,035 in January 2001 with a vacancy rate of 3.1%. In 1990, 72% of housing stock was single-family, 23% multifamily, and 5% mobile homes and trailers (California Department of Finance 2002). Owners occupy 65% and renters 35% of the occupied units. (U.S. Bureau of the Census 2000).

Most county residents live in single-family homes. In 2000, 2,346 housing authorizations were issued; of those, 87% were for single-family units (California Department of Finance 2001).

Additional housing will be needed to accommodate future growth in the county. Based on population projections, ABAG estimates that 18,681 additional housing units will be needed by 2006. According to the regional housing need determination, 3,697 of the new homes should be for very low-income families, 2,638 for low-income, and 12,346 for moderate- and above-moderate.

Regulatory Setting

The county and city general plans guide development in the project area. Federal land (e.g., Travis AFB) is not subject to the provisions of general plans or to local land use regulations. The Solano County general plan encompasses all of the unincorporated areas in the county. The following discussion summarizes the

relevant goals and policies of city and county general plans relevant to population and housing.

Solano County

- **Housing Conservation and Rehabilitation Objective 1:** Conserve and rehabilitate the existing housing stock of unincorporated Solano County.
- **Housing Costs Objective 2:** Provide affordable housing to meet the needs of low and moderate income households.
- **Future Housing Development Objective 4:** To provide sufficient housing jointly with the Cities to meet Solano County's projected housing needs.
- **Housing Location, Density, and Timing Objective 5:** Provide properly timed residential development in a pattern which is consistent with County economic, social, and environmental needs.

Benicia

- **Land Use and Growth Management Goal 2.1:** Preserve Benicia as a small-sized city.
- **Land Use and Growth Management Goal 2.2:** Maintain lands near Lake Herman and north of Lake Herman Road in permanent agriculture/open space use.
- **Land Use and Growth Management Goal 2.3:** Ensure orderly and sensitive site planning and design for large undeveloped areas of the City, consistent with the land use designations and other policies in this General Plan.
- **Land Use and Growth Management Goal 2.4:** Ensure that development pays its own way.
- **Circulation Goal 2.14:** Enhance Benicia's small-town atmosphere of pedestrian-friendly streets and neighborhoods.
- **Circulation Goal 2.15:** Provide a comprehensive system of pedestrian and bicycle routes which link the various components of the community: employment centers, residential areas, commercial areas, schools, parks, and open space.

Dixon

- **Residential Environment Policy 3:** The City shall encourage new residential development that is compatible with the City's predominantly low-density, small-town character and scale.

- **Residential Environment Policy 4:** The City shall identify adequate residential development sites which will be made available through appropriate zoning and development standards, with public services and facilities needed to facilitate and encourage the development of a variety of types of housing for all income levels, including rental housing, factory built housing, emergency shelters and transitional housing in order to meet the community's housing goals.
- **Residential Environment Policy 9:** The City shall be philosophically opposed at this time to residential development in those portions of the Planning Area northwest of I-80.
- **Residential Environment Policy 20:** The City shall conserve and improve the condition of the existing affordable housing stock.

Fairfield

- **Objective LU 8:** Develop and maintain a pattern of residential land uses which provides for a variety and balance of densities and opportunities for a mixture of different dwelling and tenure types.
- **Objective LU 11:** Provide multi-family ownership and rental units in a variety of cost ranges dispersed throughout the City
- **Objective LU 18:** Encourage infill development and compact growth.
- **Objective LU 19:** Encourage intensification in downtown and central Fairfield.

Rio Vista

- **Housing Goal 6.1:** To provide a continuing supply of affordable housing to meet the needs of existing and future Rio Vista residents in all income categories.
- **Housing Goal 6.2:** To protect and conserve the existing housing stock while ensuring that necessary health and safety requirements are met.
- **Housing Goal 6.6:** To conserve existing affordable housing stock.
- **Housing Goal 6.7:** To reduce public and private constraints to housing production while providing an appropriate level of environmental review, as well as maintaining design and construction quality and fiscal responsibility.
- **Housing Goal 6.9:** To ensure that all City residents are afforded equal housing opportunities.

Suisun City

- **Housing Goal 1:** Promote decent, safe, sanitary, and affordable housing.
- **Housing Goal 2:** Ensure that the City's plans, policies, regulations, and housing program incentives encourage the provision of a mix of housing types responsive to household size, income, and accessibility needs.
- **Housing Goal 3:** Conserve and upgrade the existing housing stock.
- **Housing Goal 4:** Encourage the provision of suitable sites for low- and moderate-income housing while avoiding the concentration of low-income households in any area.
- **Housing Goal 5:** Encourage and preserve compatible land uses with the preservation, development, and redevelopment of neighborhoods and homes.

Vacaville

- **Growth Policy Guiding Policy 2.2-G2:** Establish a growth strategy for the urban service zone which matches residential growth with adequate public facilities. Monitor the rate of non-residential growth to ensure that it does not overburden the City.
- **Growth Policy Guiding Policy 2.2-G7:** Strive to maintain a reasonable balance between new job income levels and housing costs within the City, recognizing the importance of housing choice and affordability to economic development in the City. It is important for there to be housing opportunities for all residents in the City, including higher income corporate executives and lower income wage earners.
- **Growth Policy Guiding Policy 2.2-G10:** Ensure that all new urban development within the Planning Area occurs within the City of Vacaville. A single exception is the Elmira area where infill of the townsite area under the jurisdiction of the Solano County is anticipated. New urban developments within the City limits are expected to annex to the City of Vacaville as a prerequisite to development.

Vallejo

- **Affordability Goal:** On a citywide basis, provide a sufficient number of affordable housing units to meet the needs of current Vallejo residents and to provide a fair share of the market area housing needs.
- **Housing and Neighborhood Conservation Goal:** Conserve the existing housing stock and maintain residential areas as safe, attractive, and diversified neighborhoods with distinct identities serving a social and economic mix of residential uses.

- **Balanced Neighborhoods Goal:** Develop a balanced residential environment with access to employment opportunities, community facilities, and adequate public and commercial services.
- **Historic Preservation Goal:** Preserve and improve historically and architecturally significant structures and neighborhoods.

Impacts and Mitigation Measures

Methods of Analysis

The following assessment is based on housing, employment, and population data gathered from the following sources: the 2000 U.S. Census, DOF, U.S. Census Bureau, Solano County Economic Development Corporation, ABAG projections and land use assumptions, and local general plans. The locations of potential transportation improvements were reviewed to determine the potential for the CTEP projects to result in increased growth. Areas of potential residential displacement resulting from the proposed improvements were conceptually identified based on general land use designations and a windshield survey of the area.

Criteria for Determining Significance

The CTEP would have a significant impact on population and housing if it would:

- induce substantial population growth in an area, either directly or indirectly;
- displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact PH-1: Beneficial Impact on Population and Housing from Distribution of Operational Subsidies

Allotment of operational subsidies for the following specific projects would not have any adverse effects on population and housing within the project area: senior and disabled transit services, express bus service along I-80/I-680/I-780,

Baylink Ferry Service, and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs, and provide extra service routes. These projects would have a beneficial effect in that they support goals and policies of Solano County and cities that directly or indirectly promote transit use, such as Solano County Housing Location, Density, and Timing Objective 5; Dixon Residential Environment Policy 4; Fairfield Land Use Objectives LU18 and LU 19, Suisun City Housing Goals 2 and 4; Vacaville Growth Policy Guiding Policy 2.2-G2 and Vallejo Affordability Goal. Therefore, the impact is considered beneficial.

Impact PH-2: No Impact on Population and Housing from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact PH-3: Potential for Growth Inducement or Acceleration of Development Resulting from Transportation Improvement Projects

Several projects under the CTEP have the potential to induce growth or accelerate development. These projects may include the following: I-80/1-680/SR 12 interchange, I-80 corridor improvements, westbound SR 12 widening, commuter rail to BART, and expansion of Capitol Corridor service.

Highway widenings, interchange improvements, and creation of HOV lanes in the CTEP area would increase the capacity of the existing circulation system. The increased capacity could facilitate accelerated growth and development in currently undeveloped areas and/or induce population growth, either directly or indirectly. Undeveloped areas include county agricultural lands, urban transition zones, or infill areas in cities. As described under “Regulatory Setting,” numerous policies in the county and city general plans address the timing and amount of population growth in each jurisdiction. However, these policies cannot completely address the timing and amount of population growth related to the projects proposed in the CTEP.

Introduction of commuter rail facilities would increase the capacity of the circulation system and would have a similar impact related to growth inducement and acceleration of development as capacity-increasing highway improvements.

The potential for projects to cause growth or acceleration of development in an undeveloped area or exceed growth projections is considered a significant

impact. Implementation of the following mitigation measure would reduce this impact, but not to a less-than-significant level for all projects. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure PH-1: Determine Projected Population's Local Capacity Needs and Limit Capacity Improvement to That Necessary to Serve Those Needs

STA shall require project proponents to conduct project-specific environmental reviews to project demand for and proposed level of service (LOS) on CTEP facilities. On construction of a project, capacity shall be limited to that necessary to serve projected population at the established LOS over the project lifetime.

Impact PH-4: Potential for Displacement of Substantial Numbers of Existing Housing or People Resulting from Transportation Improvement Projects

The proposed widenings and interchange and expressway improvements likely will require right-of-way acquisitions and could displace both existing housing and people located adjacent to roadways and interchanges in the rural and urban areas of the county where these improvements would take place. Improvements located in more densely populated urban and suburban areas could displace numerous households, residences, and businesses. Displacement could lead to an increase in demand for housing in nearby areas and economic losses to business owners. Displaced households and businesses may require relocation assistance as required by state and federal law.

The development of commuter rail facilities will likely require right-of-way acquisitions and could displace both existing housing and people located adjacent to proposed rail lines and rail stations in the rural and urban areas of the county where these projects would take place. Improvements located in more densely populated urban and suburban areas could displace numerous households, residences, and businesses. Displacement could lead to an increase in demand for housing in nearby areas and economic losses to business owners. Displaced households and businesses may require relocation assistance as required by state and federal law.

Displacing substantial numbers of housing or people, necessitating the construction of replacement housing elsewhere, is considered a significant impact. Implementation of the following mitigation measure would reduce this impact, but not to a less-than-significant level for all projects. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure PH-2: Develop and Implement a Relocation Plan

STA shall require project proponents to develop and implement a relocation plan consistent with federal and state requirements to ensure that eligible residential, commercial, and industrial uses are compensated for moving costs and residential/business replacement costs. Eligibility of specific residences or

businesses for compensation will be determined after evaluation of the specific improvement project.

Federal and state laws require, where applicable, project proponents to implement federal and state guidelines for relocating and compensating displaced people and land uses. STA shall require project proponents to use applicable relocation assistance programs (including those administered by local, state and federal governments) to compensate owners and tenants for the relocation costs of residential, commercial, and industrial uses displaced by CTEP projects. As specific project plans are developed, further analysis should be conducted as part of subsequent environmental review to identify the likely locations and numbers of displaced people and structures.

Impact PH-5 : Introduction or Creation of Infrastructure not Included in a General Plan Resulting from Transportation Improvement Projects

Several specific projects under the CTEP would introduce roadway infrastructure to the county. Infrastructure that has not been assessed in local planning documents could contribute to unplanned growth and development. Project-level environmental documents prepared for these improvements would need to review the applicable circulation elements of local general plans to determine whether the proposed improvements were evaluated in general plans. If the project was assessed as a part of applicable general plans and addressed adequately in the related environmental documents, there would be no additional impact; however, if the project was not assessed, the project could result in significant impacts related to unplanned growth and development. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure PH-3: Consult with Local Planning Staff to Reduce or Avoid Potential Introduction or Creation of Infrastructure not Evaluated in a General Plan

STA shall consult with city and county planning staffs to ensure that upcoming transportation needs are planned for, consistent with population projections and other needs (see Mitigation Measure PH-1). As general plans are updated, it is anticipated that projected transportation needs will be added to updated plans. STA shall collaborate with local planning staffs to reduce or avoid significant impacts regarding projects that are not anticipated or evaluated in a general plan.

Impact PH-6: No Impact on Growth Inducement or Acceleration of Development Resulting from the Construction of Pedestrian and Nonmotorized Facilities

Pedestrian/bike paths and trails are used for personal transportation; they would not create the potential for increased growth. Therefore, pedestrian/bicycle facility projects would result in no impacts related to growth inducement. Park-and-ride facilities are not capacity-enhancing and would not have a sufficient

impact on traffic congestion to be considered growth-inducing. No mitigation is required.

Impact PH-7: Potential for Displacement of Substantial Numbers of Existing Housing or People, Resulting from Construction of Pedestrian and Nonmotorized Facilities

Some displacement of housing or people could occur from proposed bicycle or park-and-ride facility projects; however, because of the narrow width necessary to make the proposed improvements and the anticipated locations of the improvements, displacement is not anticipated. The potential numbers of people or housing displaced by such improvements would not be substantial. Therefore, impacts related to the displacement of substantial numbers of people or housing are considered less than significant for construction of pedestrian and nonmotorized facilities. No mitigation is required.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include existing local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on population and housing.

Environmental Setting

Jones & Stokes reviewed the following sources of information to prepare the biological resources section of this chapter:

- the California Department of Fish and Game's (DFG's) California Natural Diversity Database (CNDDDB) for all U.S. Geological Survey (USGS) quadrangles that cover Solano County (California Natural Diversity Database 2002),
- the California Native Plant Society's (CNPS's) *Inventory of Rare and Endangered Vascular Plants of California*—sixth edition (2001),
- species lists provided by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) (Appendix C),
- previously prepared environmental documents,
- county and city general plans,
- published and unpublished literature, and
- Jones & Stokes file information.

Information presented about the existing biological setting of Solano County is general and is not based on site-specific field surveys for most of the project area. Field surveys would be conducted as needed, and site-specific biological resource information would be conducted under subsequent environmental review for those projects not currently undergoing environmental review.

This setting section contains information on the following biological resources:

- plant communities and associated biological habitat uses;
- noxious weeds;
- waters of the United States, including wetlands; and
- special-status species.

Regional Setting

Solano County is located at the southwestern edge of the Sacramento Valley within the California Floristic Province (Hickman 1993). It includes portions of the North Coast Ranges, Central Coast, and Great Valley subregions. The region has a Mediterranean climate and supports a mosaic of developed areas, natural vegetation communities, and open water.

Countywide Setting

Solano County encompasses portions of the Sacramento Valley, Vaca Mountains, Suisun Marsh, Delta, and San Pablo Bay. The County includes a variety of vegetation communities adapted to a wide range of environmental conditions. The county includes rural or undeveloped areas and urbanized cities and towns, including Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo.

The county contains a variety of geologic formations, climatic conditions, and associated common and sensitive plant communities. The most common upland and artificially created plant communities are agricultural lands, annual grassland, scrub/chaparral, and landscape vegetation in developed areas.

Sensitive plant communities occur throughout developed and undeveloped areas in Solano County. For the purpose of this EIR, sensitive plant communities are defined as communities that are especially diverse, regionally uncommon, considered sensitive natural communities (as defined by Holland [1986]), or regulated by state or federal agencies and policies (e.g., federal Clean Water Act [CWA] Section 404). Most sensitive plant communities are given special consideration because they perform important ecological functions, such as maintaining water quality and providing essential habitat for plants and wildlife. Some plant communities support a unique or diverse assemblage of plant species, and therefore are considered sensitive from a botanical standpoint. The sensitive plant communities that occur in the county are:

- seasonal wetland complexes in agricultural or annual grassland areas;
- marsh habitats, including freshwater and salt water/brackish marsh;
- riparian habitats; and
- oak savanna and oak woodland communities

Mapping developed in support of the Solano County Water Agency (SCWA) habitat conservation plan (HCP) process was used to identify the plant community types and areas of open water in the county (LSA Associates 2001). The plant communities and open water areas that occur within the county and their respective acreages are summarized in Table 6-1.

Table 6-1. Approximate Acreages of Plant Communities and Open Water in Solano County

Plant Community Type or Open Water	Area (acres)
Agriculture	172,591
Annual grassland	102,394
Salt/brackish marsh (includes diked marsh)	70,916
Developed (includes urban landscape areas)	69,138
Open water	52,147
Annual grassland/seasonal wetland complex	47,722
Oak woodland	28,005
Agriculture/seasonal wetland complex	11,453
Scrub/Chaparral	11,271
Oak savanna	9,436
Riparian	3,521
Freshwater marsh	736

The typical plant and wildlife species that are present and the locations of each plant community type within the county are discussed below. A general map of the plant community types and open water areas is provided in Figure 6-1. For the purpose of this analysis, plant communities are grouped into sensitive plant communities/wildlife habitats, which includes unvegetated open water areas, and common or artificial plant communities/wildlife habitats.

Sensitive Plant Communities/Wildlife Habitats

Oak Savanna and Oak Woodland

Oak savanna and woodland communities range from a sparse savanna of individual oaks within an annual grassland community to a closed-canopy woodland with a shrub and herbaceous understory. Most oaks in these communities are interior live oaks (*Quercus wislizeni*), although coast live oak may intergrade. The county supports approximately 80,152 acres of oak woodland and savanna, which occur predominately in the hilly areas of the westernmost portion of the county (Figure 6-1).

Oak savanna and oak woodland are particularly important habitats because of their high value to wildlife and the diversity of wildlife species that they support. The structure and the abundance of food, shade, and nesting sites make these habitats attractive to mammals such as Brazilian free-tailed bats, big brown bats, hoary bats, and western gray squirrel. Birds associated with oak woodlands and savannas include acorn woodpeckers, Nuttall's woodpeckers, scrub jay, yellow-billed magpie, and many warblers and flycatchers. Cavities in oak trees are

important nesting sites for American kestrel, tree swallow, plain titmouse, wrens, and western bluebird. Woodlands also provide nesting platforms for raptors, such as red-tailed hawks, red-shouldered hawks, and great-horned owls. Invertebrates that occur in oak woodlands and oak savannas include valley elderberry longhorn beetle and San Francisco lacewing.

Salt Marsh

Salt marsh is a perennial wetland that supports herbaceous emergent vegetation but is inundated by salt or brackish water and may be tidally influenced, although a substantial area of marsh in the southern part of the county is diked. Approximately 70,916 acres of salt marsh is mapped in the county (Figure 6-1). Salt marsh occurs along sloughs and tidal flats. Salt marsh habitat occurs in the southernmost portion of the county adjacent to the Suisun Marsh near Cordelia and adjacent to San Pablo Bay along SR 37.

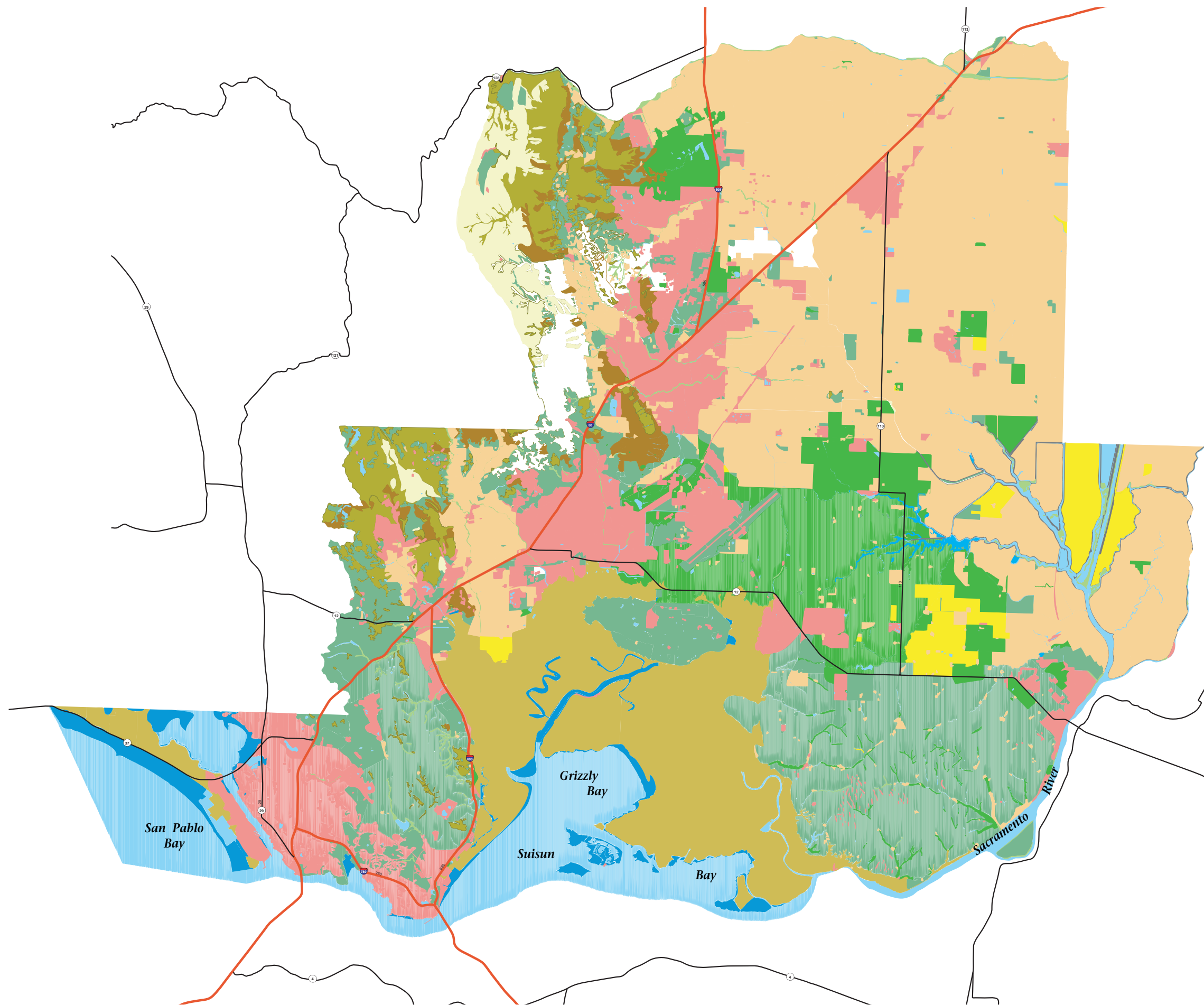
Suisun Marsh is one of the largest contiguous wetlands in the United States and one of the most important wintering waterfowl areas in the western United States. Suisun Marsh also supports many special-status wildlife species (Jones & Stokes Associates 1975).

The salt marshes provide high-quality foraging habitat, breeding habitat, and cover for many wildlife groups, including rodents, waterfowl, shorebirds, and wading birds. The marshes support approximately 200 species of birds, including 30 species of waterfowl (Jones & Stokes Associates 1975). The marshes near Cordelia Road contain dense cattail and tule vegetation, which supports many water bird species and mammals, including red-winged blackbird, river otter, striped skunk, and California vole.

Seasonal Wetland

Seasonal wetlands are seasonally inundated pools and depressions that occur within an annual grassland or agricultural land matrix. The mapping for the county includes areas that are complexes of upland (agricultural land or annual grassland) and seasonal wetland habitat, but it does not attempt to identify individual pools. Approximately 59,175 acres of upland/seasonal wetland complexes are mapped within the county (Figure 6-1). Seasonal wetland communities occur in the eastern half of the county, with the greatest concentration in and around Travis AFB.

Seasonal wetlands are similar to vernal pools but have fewer native species, generally because of a higher level of direct or indirect disturbance to the wetland or a more limited period of inundation. Vernal pool plants include primarily native herbaceous species that are adapted to the cycles of inundation and summer drying. A portion of the seasonal wetlands within the county can be classified as vernal pools because of their plant community composition.



- Legend**
- Agriculture/Seasonal Wetland Complex
 - Agriculture
 - Diked Marsh
 - Annual Grassland
 - Annual Grassland/Seasonal Wetland Complex
 - Riparian
 - Salt Marsh
 - Freshwater Marsh
 - Open Water
 - Oak Savanna
 - Oak Woodland
 - Scrub/Chaparral
 - Developed
 - Levee

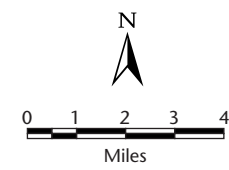


Figure 6-1
Habitat Types within
Solano County

Seasonal wetlands and vernal pools in grassland areas provide habitat for numerous species of invertebrates and amphibians. The invertebrates, amphibians, and plant seeds, in turn, provide food for many other wildlife species. Wildlife species occurring in vernal pools include vernal pool fairy shrimp, conservancy fairy shrimp, mid-valley fairy shrimp, vernal pool tadpole shrimp, delta green ground beetle, Ricksecker's water scavenger beetle, California tiger salamander, western spadefoot, western toad, Pacific treefrog, western terrestrial garter snake, great blue heron, great egret, mallard, cinnamon teal, American avocet, killdeer, greater yellowlegs, and western sandpiper. Large vernal pools also provide brood water for nesting waterfowl.

Open-Water Habitats

Open-water habitats in the county include stream channels, lakes and ponds, sloughs, and bays. Approximately 52,147 acres of open-water habitats occur in the county (Figure 6-1). The natural stream channels traversing the county are Putah, McClure, Dudley, Dickson, Sweany, Gibson Canyon, Horse, Ulatis, Alamo, Laguna, Fagan, Green Valley, Dan Wilson, Suisun, Ledgewood, Laurel, McCoy, Union, Denverton, and Sonoma Creeks; the lower portions of the Napa and Sacramento Rivers; and numerous unnamed tributaries and seasonal drainages. The Putah South Canal is a constructed drainage that extends along the base of the Vaca Mountains and Cement Hill. The open-water freshwater habitats in the county are lakes, stock ponds, reservoirs, and other constructed ponds. Stream channels and freshwater habitats may support riparian, freshwater marsh, or seasonal wetland vegetation.

The open-water saltwater or brackish habitats in the county are sloughs, straits, and bays. The sloughs that traverse the county are Goodyear, Cordelia, and Hill Sloughs in the Suisun Marsh, and White and Dutchman Sloughs in the Napa Marsh. The straits and bays in the southern part of the county— San Pablo Bay, Carquinez Strait, Grizzly Bay, Suisun Bay, and Honker Bay—connect to San Francisco Bay to the west.

Open-water habitats provide habitat for numerous species of wildlife, including mallard, cinnamon teal, great blue heron, snowy egret, American coot, and belted kingfisher use aquatic habitat to feed on algae, crayfish, bullhead, black bass, sunfish, Pacific treefrog, western toad, and bullfrog. Mallard and cinnamon teal use open-water areas as escape cover for broods. Open water also provides drinking water and foraging opportunities for mammals such as raccoon, striped skunk, and mule deer.

Riparian Communities

Riparian communities occur along county streams and include woodland habitats with multistoried vegetation ranging from large trees to herbaceous plants and scrub habitats of small, dense willows and shrubs. The county supports approximately 3,521 acres of riparian communities (Figure 6-1). Riparian habitat

occurs along many drainages in the county, including Putah, Dudley, Ulatis, Alamo, Laguna, Dan Wilson, Laurel, Ledge wood, and Suisun Creeks, and unnamed tributaries and drainages.

Riparian habitats provide high-quality foraging habitat, breeding habitat, and cover for many wildlife species. The diversity of plant species and multistoried canopy in riparian forests provides food and favorable microhabitat conditions for wildlife. Riparian forests are typically cooler, moister, and more productive than surrounding habitats. Insectivorous birds occurring in this habitat include Nuttall's woodpecker, warbling vireo, black-throated gray warbler, and yellow-rumped warbler. Insect species occurring in riparian habitats include San Francisco lacewing, valley elderberry longhorn beetle, and Sacramento anthicid beetle. Riparian habitat provides food, water, and cover for many small mammals, including raccoon, striped skunk, opossum, and gray fox.

Freshwater Marsh

Freshwater marsh is a generally perennial wetland type that supports herbaceous emergent vegetation such as cattail and tule. Approximately 736 acres of freshwater marsh is mapped in the county (Figure 6-1). Freshwater marsh occurs in stream channels, within floodplains outside stream channels, around detention ponds and stock ponds, and within irrigation ditches.

Freshwater marshes provide important foraging, breeding, and cover habitat for waterfowl, small and medium-sized mammals, reptiles, and amphibians. During winter, seeds and invertebrates in freshwater marshes are food for waterfowl. Herons and egrets feed on crayfish, fish, and amphibians in shallow areas. Wildlife species commonly found in this habitat include the American bittern, great blue heron, great egret, mallard, ruddy duck, cinnamon teal, marsh wren, song sparrow, red-winged blackbird, river otter, muskrat, raccoon, common garter snake, and Pacific tree frog.

Common or Artificial Plant Communities/Wildlife Habitats

Agricultural Land

Agricultural lands in the county include walnut orchards and fields planted in row, grain, and hay crops and occur in areas converted from annual grassland and oak savanna. The county supports approximately 172,591 acres of agricultural land (Figure 6-1). Agricultural land is concentrated in the northeastern part of the county, with a substantial area in the central-western part.

Wildlife diversity and abundance are relatively low in walnut orchards primarily because of clean-farming techniques and pesticide application. They do, however, provide an abundance of seasonal food for locally common species

such as northern flicker, scrub jay, American crow, American robin, and house finch.

Row, hay, and grain crops support a greater variety of wildlife species, including small mammals that provide food for raptor and mammalian predators. During winter, this type of agricultural land also provides important foraging and roosting habitat for wintering waterfowl.

Annual Grassland

Annual grassland in the county includes extensive grazed fields of many acres, as well as small patches of primarily ruderal (weedy) species within urban areas. A total of approximately 102,394 acres of annual grassland occurs in the county (Figure 6-1). The largest concentrated extents of annual grassland are in the southwest and southeast parts of the county.

Annual grassland is dominated by nonnative annual grasses and associated native and nonnative forbs. Ruderal grasslands are dominated by nonnative grasses and forbs. Interspersed shrubs and small trees may also be present.

Many wildlife species use annual grassland during all or part of their life cycles. Mammals typical of annual grassland habitats include California vole, deer mouse, Bottae's pocket gopher, Townsend's big-eared bat, pallid bat, California ground squirrel, American badger, and coyote. Birds common to annual grasslands include western meadowlark, western kingbird, loggerhead shrike, and Brewer's blackbird. The Callippe silverspot butterfly also occurs in annual grasslands. Rodent populations provide foraging opportunities for birds of prey, such as American kestrel, sharp-shinned hawk, merlin, prairie falcon, red-tailed hawk, and red-shouldered hawk.

Urban Landscape

Urban landscape includes golf courses, parks, and all areas that are planted and maintained as landscaped areas. Approximately 69,138 acres of the county are developed areas, part of which is urban landscape vegetation (Figure 6-1). Urban landscape occurs throughout the county, with the greatest density in and around the cities. Landscape plantings include primarily nonnative turf grass and ornamental species of grasses, forbs, shrubs, and trees. It should be noted, however, that part of the mapped developed area in Figure 6-1 is also undeveloped land surrounded by urbanized areas; the undeveloped land could include wetlands or other isolated habitats containing special-status species.

Urban and industrial areas attract wildlife species that are tolerant to human disturbance, exploit human food resources, or use human-made structures for nesting and roosting. These habitats are usually lower in wildlife habitat quality than nearby natural habitats because the flora of landscaped areas is generally poorly developed compared to natural plant communities. This landscaping,

however, provides wildlife habitat for many common wildlife species, including mourning dove, Anna's hummingbird, cliff swallow, American crow, scrub jay, American robin, house finch, California ground squirrel, and western toad.

Chaparral

Chaparral in the county is a transitional habitat between oak woodland and annual grassland, and is dominated by evergreen shrubs with a limited understory of grasses and forbs. It occurs in relatively small, isolated patches. Approximately 11,271 acres of chaparral occur in the county (Figure 6-1). Chaparral occurs along the northwestern edge of the county and within the unincorporated lands east of Rockville Hills Park.

Chaparral provides foraging habitat, breeding habitat, and cover for many shrub-dependent wildlife species. Chaparral plants provide browse, berries, or seeds for mule deer, California quail, rufous-sided towhee, California towhee, and dark-eyed junco. Insectivorous birds such as the Bewick's wren, bushtit, wrentit, and orange-crowned warbler feed on insects on chaparral foliage. Chaparral also provides habitat for small mammals and reptiles, including gray fox, deer mouse, western fence lizard, western rattlesnake, and gopher snake.

Noxious Weeds

For the purpose of this analysis and future project-specific assessments, a noxious weed is defined as a plant that could displace native plants and natural habitats, affect the quality of forage on rangelands, or affect cropland productivity. The California Department of Food and Agriculture (CDFA) lists weeds and assigns ratings (A–C) to each species on the list. The ratings reflect CDFA's view of the statewide importance of the pest, the likelihood that eradication or control efforts would be successful, and the present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances. The rating system is explained below.

- A: an organism of known economic importance subject to state (or commissioner, when acting as a state agent) enforced action involving eradication, quarantine, containment, rejection, or other holding action.
- B: an organism of known economic importance subject to eradication, containment, control, or other holding action at the discretion of the individual county agricultural commissioner, or an organism of known economic importance subject to state-endorsed holding action and eradication only when found in a nursery.
- C: an organism subject to no state-enforced action outside of nurseries except to retard spread at the discretion of the commissioner, or an organism subject to no state-enforced action except to provide for pest cleanliness in nurseries.

In subsequent environmental review of CTEP projects, a qualified botanist would develop a target list of noxious weeds that present a risk to the specific project area. The target list would include all A-rated weed species. Some B- and C-rated species would be included on project-specific target lists if they are identified as target noxious weeds by the county agricultural commission. Weeds would also be included in target lists if they are considered to have great potential for displacing native plants and damaging natural habitats but are not considered too widespread to be controlled effectively. Noxious weeds in Solano County were not inventoried for this program-level analysis because target weeds would differ widely from project to project, depending on the sensitivity of the site to infestation, the nature of the proposed project, and the type of weeds in the immediate area.

An executive order (EO) on invasive species (February 3, 1999) directs weed control (see “Regulatory Setting”). As part of project-level environmental analyses, the Solano County Agricultural Commissioner would be contacted to discuss noxious weed infestation and dispersal on private and public rights-of-way.

Waters of the United States, Including Wetlands

For the purposes of this document, the term “waters of the United States” is an encompassing term used by the U.S. Army Corps of Engineers (Corps) for areas that would qualify for federal regulation under CWA Section 404. Waters of the United States are categorized as “wetlands” or “other waters of the United States.” Each of these categories is described below.

Wetlands

The Corps defines wetlands as areas that are inundated or saturated by surface water or groundwater at a frequency and duration that is sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 Code of Federal Regulations [CFR] 328.3[b], 40 CFR 230.3). For a wetland to qualify as a jurisdictional aquatic site, and therefore be subject to regulation under CWA Section 404, it must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology.

On January 9, 2001, a federal court ruling in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* [121 S.Ct. 675, 2001] resulted in a determination that isolated wetlands (e.g., vernal pools) are no longer regulated by the Corps under CWA Section 404. Counsel for the Environmental Protection Agency (EPA) and the Corps published guidance on “[n]on-navigable, isolated [and] intrastate waters” on January 19, 2001, in response to the ruling. The guidance essentially resulted in a determination that nonnavigable, isolated waters are not regulated by the Corps. This determination

would be considered as part of the subsequent environmental analysis and permitting process for specific transportation projects proposed in the CTEP.

DFG's and USFWS' definition of a wetland differs from the Corps'. These agencies use a one-parameter definition of wetlands, defining wetlands as having wetland hydrology, and hydric soils or hydrophytic plants (or both). The Corps definition, by contrast, requires the presence of all three criteria for an area to be designated as a wetland for regulatory purposes. Subsequent, project-level environmental analysis for projects proposed in the CTEP would identify and discuss Corps jurisdictional wetlands and nonjurisdictional DFG and USFWS wetlands (e.g., seasonal wetlands, vernal pools, and other types of isolated wetlands that are no longer considered jurisdictional by the Corps).

In Solano County, Corps jurisdictional wetlands include marshes and seasonal wetland communities that are connected hydrologically to drainages and other bodies of water (e.g., ponds and reservoirs on drainage systems). Hydrologically isolated wetlands (e.g., seasonal wetlands/vernal pools and ponds or reservoirs without drainage systems) are not subject to regulation under CWA Section 404 but are considered wetlands by DFG and USFWS. In the county, many of these isolated wetlands provide habitat for a variety of special-status species.

Other Waters of the United States

Other waters of the United States are sites that typically lack one or more of the three wetland indicators identified above. Other waters of the United States that occur in the county include drainages (all streams, creeks, rivers, sloughs, and other surface features with defined beds and banks), reservoirs, ponds, and bays.

Special-Status Species

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts (ESAs) or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are species in the following categories:

- species listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.12 [listed plants], 50 CFR 17.11 [listed animals], and various notices in the Federal Register [FR] [proposed species]);
- species that are candidates for possible future listing as threatened or endangered under the federal ESA (67 FR 40657, June 13, 2002);
- species listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA) (14 California Code of Regulations 670.5);

- species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380);
- plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.);
- plants considered by the CNPS to be “rare, threatened, or endangered in California” (Lists 1B and 2 in California Native Plant Society 2001);
- plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in California Native Plant Society 2001), which may be included as special-status species on the basis of local significance or recent biological information;
- animal species of special concern to DFG (Remsen 1978 [birds], Williams 1986 [mammals], and Jennings and Hayes 1994 [amphibians and reptiles]); and
- animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], 5050 [amphibians and reptiles], and 5515 [fish]).

Other laws that protect wildlife species include:

- California Fish and Game Code Sections 3503 and 3503.5, which protect nesting raptors, their nests, and eggs;
- the federal Migratory Bird Treaty Act (MBTA), which protects nesting migratory birds;
- the Bald and Golden Eagle Protection Act, which prohibits, except under certain specified conditions, the taking, possession, transportation, export or import, barter, or offers to sell, a bald or golden eagle, alive or dead, or any part, nest, or eagle egg; and
- fish species that are considered commercially valuable under essential fish habitat protection established by the Sustainable Fisheries Act of 1996, which amended the Magnuson-Stevens Fishery Conservation and Management Act

As described under “Impacts and Mitigation Measures,” additional field surveys may be conducted as part of the subsequent, project-level environmental analysis for projects proposed in the CTEP to determine the exact location and distribution of special-status species in the project area.

Special-Status Plant Species

Table 6-2 identifies 62 special-status plant species known to occur in and near Solano County that have potential to occur within the CTEP project area. The table summarizes the legal status, period of identification, distribution, and habitat for each species. The table was compiled based on the following sources:

- draft program EIR for the Comprehensive Amendment to the City of Fairfield General Plan (Jones & Stokes 2001a),
- USFWS species list for Solano County (Appendix C),
- draft list of special-status species for the SCWA HCP and natural community conservation plan (NCCP) (Solano County Water Agency n.d.),
- search of the CNDDDB for Solano County (California Natural Diversity Database 2002), and
- CNPS' *Inventory of Rare and Endangered Plants of California*, sixth edition (2001).

Two species, Contra Costa goldfields and dwarf downingia, are known to be present within the CTEP project area and have been observed in the Jepson Parkway study area. A total of 54 special-status plant species were identified as having high to moderate potential to occur in the CTEP project area. Species with high potential are recorded as currently occurring in Solano County (California Natural Diversity Database 2002). Species with moderate potential have suitable habitat in the county, but are not yet recorded in the county or known only from historic records in the county (California Natural Diversity Database 2002). Six special-status plant species have only a low potential to occur in the project area. Two of these species, bearded popcorn flower and showy Indian clover, are believed to be extinct; the four others—Ferris's milk-vetch, big tarplant, Congdon's tarplant, and native stands of northern California black walnut—are thought to be extirpated in the county.

Special-Status Wildlife Species

Table 6-3 identifies special-status wildlife species known to occur in and near Solano County. It includes the legal status, distribution, and habitat for each special-status wildlife species within Solano County. The table was compiled based on the following sources:

- draft program EIR for the Comprehensive Amendment to the City of Fairfield General Plan (Jones & Stokes 2001a),
- USFWS species list for Solano County (Appendix C),
- draft list of special-status species for the SCWA HCP and NCCP (Solano County Water Agency n.d.); and
- CNDDDB search for Solano County (California Natural Diversity Database 2002).

A total of 70 special-status wildlife species were determined to be present or to have the potential to occur within the county. Salt-marsh harvest mouse, California clapper rail, and California red-legged frog are known to occur within the CTEP project area. Designated critical habitat for California red-legged frog occurs in eastern Solano County, south of SR 12 and east of I-680. Other special-status wildlife species with high potential to occur in the CTEP project

Table 6-2. Special-Status Plant Species Known to Occur or with Potential to Occur in Solano County

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Suisun Marsh aster <i>Aster lentus</i>	SC/—/1B	June–October	Occurs in the Delta area, including Contra Costa and Solano Counties; Suisun Marsh; in brackish marshes below 500 feet	High; salt marsh and brackish marsh habitats; recorded in the southern part of the county along SR 12
Ferris’s milk-vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	—/—/1B	April–May	Central Valley from Butte to Alameda County; subalkaline flats and floodlands, usually on adobe soils of valley and foothill grasslands, below 200 feet	Low; annual grassland habitat; historical record (1962) in central part of the county, thought to be extirpated in the county
Alkalai milk-vetch <i>Astragalus tener</i> var. <i>tener</i>	SC/—/1B	March–June	Merced, Solano, and Yolo Counties; historically more widespread; grassy flats and vernal pool margins, on alkali soils, below 200 feet	High; seasonally wet annual grassland habitat; recorded in Dixon and central part of the county
Heartscale <i>Atriplex cordulata</i>	SC/—/1B	May–October	Western Central Valley and valleys of adjacent foothills; alkali grassland, alkali meadow, alkali scrub, below 660 feet	High; annual grassland habitat; recorded near Vacaville, at Jepson Prairie, and along SR 113
Crownscale <i>Atriplex coronata</i> var. <i>coronata</i>	—/—/4	April–October	Southern Sacramento Valley, San Joaquin valley, eastern south coast inner range, Alameda, Contra Costa, Fresno, Kings, Kern, Glenn, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, and Stanislaus Counties; chenopod scrub, valley and foothill grassland, vernal pools, on fine alkaline soils below 660 feet	Moderate; seasonally wet annual grassland habitat; no CNDDDB records in the county
Brittlescale <i>Atriplex depressa</i>	SC/—/1B	May–October	Western Central Valley and valleys of adjacent foothills on west side of Central Valley; alkali grassland, alkali meadow, alkali scrub, chenopod scrub, playas, valley and foothill grasslands on alkaline or clay soils, below 660 feet	High; annual grassland habitat; recorded in the central and southern parts of the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
San Joaquin spearscale <i>Atriplex joaquiniana</i>	SC/—/1B	April–September	West edge of Central Valley from Glenn County to Tulare County; alkali grassland, alkali scrub, alkali meadows, saltbush scrub, below 1,000 feet	High; annual grassland habitat; recorded in the central and southern parts of the county
Vernal pool smallscale <i>Atriplex persistens</i>	SC/—/1B	June–October	Central Valley from Glenn County to Tulare County; dry vernal pool beds on alkaline soils, below 400 feet	High; seasonally wet annual grassland habitat; recorded at Jepson Prairie
Big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	SLC/—/1B	March–June	San Francisco Bay region, Sierra Nevada foothills, Coast Ranges, eastern Cascade Ranges, Sacramento Valley; rocky annual grassland and fields, foothill woodland hillsides, sometimes serpentine, below 4,600 feet	High; annual grassland and oak woodland habitats; recorded in the western part of the county on rocky slopes in the inner Coast Ranges
Big tarplant <i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>	SC/—/1B	July–October	Interior Coast Ranges foothills, Alameda, Contra Costa, San Joaquin, Stanislaus*, and Solano* Counties; annual grassland, on dry hills and plains, 50–1,500 feet	Low; annual grassland habitat on hills in the western part of the county; no CNDDDB records in the county, possibly extirpated from the county
Mt. Diablo fairy-lantern <i>Calochortus pulchellus</i>	—/—/1B	April–June	Northeastern San Francisco Bay, Mount Diablo, Endemic to Contra Costa and Alameda Counties; on wooded, brushy slopes of chaparral, cismontane woodland, riparian woodland, valley and foothill grassland, 650–2,600 feet	Moderate; oak savanna, riparian, and scrub/chaparral habitats in the western part of the county; no CNDDDB records in the county
Tiburon Indian paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	E/T/1B	April–June	Southern inner north Coast Ranges, northwestern San Francisco Bay region, Marin, Napa and Santa Clara Counties; serpentine grasslands	Moderate; annual grassland habitat in the western part of the county; no CNDDDB records in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Salt marsh owl's clover <i>Castilleja ambigua</i> ssp. <i>ambigua</i>	SLC/—/—	May–August	San Francisco Bay Area and coastal areas north to Vancouver; coastal bluffs and saline grasslands	Moderate; annual grassland habitat in the southwestern part of the county; species not tracked on the CNDDDB
Holly-leaved ceanothus <i>Ceanothus purpureus</i>	SLC/—/1B	February–April	Inner north coast ranges, Napa and Solano Counties; chaparral on volcanic, rocky substrate	Moderate; chaparral habitat in the western part of the county; no CNDDDB records in the county
Congdon's tarplant <i>Centromadia parryi</i> ssp. <i>congdonii</i>	SC/—/1B	June–November	Eastern Bay Area, Salinas Valley, Los Osos Valley; annual grassland, on lower slopes, flats, and swales, sometimes on alkaline or saline soils, below 700 feet	Low; annual grassland habitat; record of extirpated population between Cordelia and Benecia, thought to be extirpated in the county
Suisun Marsh thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	E/—/1B	July–September	Occurs in Solano County; in brackish marshes below 500 feet; known from only one historic occurrence	High; salt marsh and brackish marsh habitats; recorded in Suisun Marsh
Hispid bird's-beak <i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	SC/—/1B	June–August	Occurs in Sacramento and San Joaquin Valleys; in alkaline meadows, sinks, and marshes	High; freshwater or brackish marsh habitat; recorded in the central part of the county north of SR 12
Soft bird's-beak <i>Cordylanthus mollis</i> ssp. <i>mollis</i>	E/R/1B	June–August	Occurs in Sacramento and San Joaquin Valleys and Marin County; in coastal salt marshes at low elevations	High; salt marsh and brackish marsh habitats; recorded in the southern part of the county along SR 12
Recurved larkspur <i>Delphinium recurvatum</i>	SC/—/1B	March–May	San Joaquin Valley and central valley of the South Coast Ranges, Contra Costa County to Kern County; subalkaline soils in annual grassland, saltbush scrub, cismontane woodland, vernal pools, 100–2,000 feet	Moderate; annual grassland habitat; historic record (1902) in Vacaville

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Dwarf downingia <i>Downingia pusilla</i>	—/—/2	March–May	Occurs in southern Sacramento, Sonoma, and northern San Joaquin Valleys; in swales and vernal pools of valley and foothill grasslands; type locality in Sonoma Valley	Present along Walters Road; seasonally wet annual grassland habitat; recorded in the central part of the county, at Jepson Prairie, and along I-505 and SR 12
Streamside daisy <i>Erigeron biolettii</i>	—/—/3	June–September	Northern outer coast ranges, Humboldt, Mendocino, Marin, Napa, Solano, and Sonoma Counties; moist, rocky areas in broad-leaved upland forest, cismontane woodland, north coast coniferous forest, and ledges along rivers, 100–3,600 feet	Moderate; oak woodland and riparian habitats in the western part of the county; no CNDDDB records in the county
Mount Diablo buckwheat <i>Eriogonum truncatum</i>	—/—/1A	April–June	Occurs in northern portion of Mount Diablo Range in Alameda, Contra Costa, and Solano Counties; in bedrock outcrops, rock scree, and thin, rocky soil of grassland, oak woodland, and chaparral communities from 1,000–1,500 feet; type locality at east base of Mt. Diablo, Contra Costa County, California	Moderate; annual grassland, oak woodland, and scrub/chaparral habitats; no CNDDDB records in the county
Round-leaved filaree <i>Erodium macrophyllum</i>	—/—/2	March–May	Sacramento Valley, northern San Joaquin Valley, Central Western California, South Coast, and northern Channel Islands (Santa Cruz Island); open sites, dry grasslands, and shrublands below 4,000 feet	Moderate; annual grassland and scrub/chaparral habitats; no CNDDDB records in the county
Fragrant fritillary <i>Fritillaria liliacea</i>	SC/—/1B	February–April	Coast Ranges from Marin County to San Benito County; adobe soils of interior foothills, coastal prairie, coastal scrub, annual grassland, often on serpentinite, below 1,350 feet	High; annual grassland and oak savannah habitats; recorded at Jepson Prairie and in the southern part of the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Adobe lily <i>Fritillaria pluriflora</i>	SC/—/1B	February–April	Occurs along eastern and western edges of the Sacramento Valley and adjacent foothills; on heavy clay often adobe soils in grasslands, oak woodlands, and chaparral communities; type locality in Sacramento Valley	Moderate; annual grassland, oak savanna/woodland, and chaparral habitats; historic record (1913) in Vacaville
Boggs Lake Hedge-hyssop <i>Gratiola heterosepala</i>	—/E/1B	April–June	Inner north Coast Ranges, Central Sierra Nevada foothills, Sacramento Valley and Modoc Plateau; Fresno, Lake, Lassen, Madera, Modoc, Placer, Sacramento, Shasta, San Joaquin, Solano, and Tehama Counties; clay soils in areas of shallow water, lake margins and vernal pool margins	High; seasonally wet annual grassland habitat; recorded at Jepson Prairie
Marsh gum plant <i>Grindelia stricta</i> var. <i>angustifolia</i>	—/—/4	August–October	Alameda, Contra Costa, Monterey, Marin, Napa, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma Counties; coastal salt marshes and tidal areas	High; salt marsh habitat in the southern part of the county; no records in the CNDDDB, but known to occur in Suisun Marsh
Hogwallow starfish <i>Hesperervax caulescens</i>	—/—/4	March–June	Alameda, Amador, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Napa, San Diego, San Joaquin, San Luis Obispo, Solano, Stanislaus, Sutter, Tehama, and Yolo Counties; valley and foothill grassland (mesic clay), 0–1,600 feet	Moderate; seasonally wet annual grassland habitat throughout the county; no CNDDDB records in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Brewer's dwarf flax <i>Hesperolinon breweri</i>	SC/—/1B	May–July	Occurs in Vaca Mountains in Solano and Napa Counties and northern Diablo Range in Contra Costa and Alameda Counties; on bedrock outcrops, rock scree serpentine, and clay soils with low herb cover in annual grasslands and openings in various oak woodland and chaparral communities from 400–3,300 feet	High; annual grassland, oak savanna/woodland, and chaparral habitats; recorded in the Vaca Mountains and inner Coast Ranges
Rose-mallow <i>Hibiscus lasiocarpus</i>	—/—/2	August–September	Central and southern Sacramento Valley, Deltaic Central Valley, Butte, Contra Costa, Colusa, Glenn, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties; wet banks, freshwater marshes, generally below 135 feet	High; freshwater marsh and riparian habitats; recorded in the southeastern part of the county along the Sacramento River
Carquinez goldenbush <i>Isocoma arguta</i>	SC/—/1B	August–December	Deltaic Sacramento Valley, Suisun Slough, Contra Costa and Solano Counties; annual grassland on alkaline soils and flats, generally below 70 feet	High; annual grassland habitat; recorded in the central and southeastern parts of the county along SR 113 and SR 12
Northern California black walnut <i>Juglans californica</i> var. <i>hindsii</i>	SC/—/1B	April–May	Last two native stands in Napa and Contra Costa Counties. Historically widespread through southern north inner Coast Ranges, southern Sacramento Valley, northern San Joaquin Valley, San Francisco Bay region; canyons, valleys, riparian forest, riparian woodland, 160–660 feet	Low; riparian habitat; record of extirpated occurrence along the Sacramento River in the southeastern part of the county; no other known native stands remaining in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Contra Costa goldfields <i>Lasthenia conjugens</i>	E/—/1B	April–May	Occurs in Alameda, Contra Costa, Solano, and Napa Counties; historically widespread in Coast Ranges from Mendocino to Santa Barbara Counties; in seasonal wetlands such as vernal pools, vernal meadows, and riverbanks; often on alkaline, clay-based soils of valley and foothill grasslands below 700 feet	Present along Walters Road, Air Base Pkwy, and between Air Base Pkwy and Cement Hill Rd; seasonally wet annual grassland habitat; recorded in central part of the county and along SR 12
Ferris's goldfields <i>Lasthenia ferrisiae</i>	—/—/4	February–May	Occurs in Alameda, Butte, Contra Costa, Colusa, Fresno, Kings, Kern, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, Solano, Stanislaus, Tulare, Ventura, and Yolo Counties; vernal pools on alkaline, clay-based soils, 60–2,300 feet	Moderate; seasonally wet annual grassland habitat throughout the county; no CNDDDB records in the county
Delta tule pea <i>Lathyrus jepsonii</i> ssp. <i>jepsonii</i>	SC/—/1B	May–June	Occurs in the Delta and Central Valley from Butte to Tulare Counties; along river and canal banks in brackish and freshwater marshes and riparian woodlands below 500 feet	High; salt marsh and brackish marsh habitat along sloughs; recorded in Suisun Marsh, near I-680, and in the southern part of the county
Legenere <i>Legenere limosa</i>	SC/—/1B	May–June	Occurs primarily in the lower Sacramento Valley in Lake and Solano Counties and upper San Joaquin Valley in San Mateo and Stanislaus Counties; in dried beds of vernal pools below 700 feet; type locality near Elmira	High; seasonally wet annual grassland and freshwater marsh habitats; recorded in the central and southern parts of the county, at Jepson Prairie, near SR 113, and near SR 12
Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>	SLC/—/1B	April–May	Southern Sacramento Valley, Glenn, Solano, and Yolo Counties; annual grassland on margins of alkali scalds, below 660 feet	High; annual grasslands and seasonally wet annual grassland; recorded in central-eastern part of the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Woolly-headed lessingia <i>Lessingia holoceuca</i>	—/—/3	June–October	Southern north Coast Ranges, southern Sacramento Valley, northern San Francisco Bay region, Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo Counties; clay or serpentinite soils of coastal scrub, lower montane coniferous forest, valley and foothill grassland, below 1,000 feet	Moderate; annual grassland and oak savanna habitats; recorded in the western part of the county
Mason's lilaeopsis <i>Lilaeopsis masonii</i>	SC/R/1B	May–August	Occurs in the Sacramento-San Joaquin River Delta; in freshwater and brackish marshes in muddy or silty soil often formed through river deposition or river bank erosion; type locality on Twitchell Island, margin of Sacramento River 0.5 mile south of Rio Vista, California	High; salt marsh, brackish marsh, and freshwater marsh habitats and along slough and stream habitats; recorded in central and southern parts of the county, in Suisun Marsh, and near SR 113
Delta mudwort <i>Limosella subulata</i>	—/—/2	May–August	Deltaic Central Valley, Contra Costa, Sacramento, San Joaquin, and Solano Counties; Oregon; muddy or sandy intertidal flats and marshes, streambanks in riparian scrub generally at sea level	High; ; salt marsh, brackish marsh, and freshwater marsh habitats and along slough and stream habitats; recorded in central and southern parts of the county, in Suisun Marsh, and near SR 113
Napa lomatium <i>Lomatium repostum</i>	—/—/4	April–May	Occurs in the Inner Coast Ranges, including Lake, Napa, Solano, and Sonoma Counties; on slopes of chaparral and blue oak woodland below 3,000 feet; type locality near Collin's Springs, Vaca Mountains, California	Moderate; oak savanna/ woodland habitat; no CNDDB records in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	—/—/3	April–May	Southern North coast ranges, southern south outer coast ranges, Sierra Nevada Foothills, San Francisco Bay area. Alameda, Contra Costa, Lake, Monterey, Marin, Napa, Santa Cruz, and Sonoma Counties; bare grassy rocky slopes in broad-leaved upland forest, cismontane woodland, valley and foothill grassland	Moderate; annual grassland and oak woodland habitats; no CNDDDB records in the county
Sylvan microseris <i>Microseris sylvatica</i>	—/—/4	March–June	Occurs in Alameda, Amador, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Lassen, Los Angeles (?*), Merced, Napa, Nevada, Placer, San Benito, Santa Clara*, Solano, Stanislaus, Sutter, Tehama, Tuolumne, Tulare, and Yolo Counties; chaparral, Great Basin scrub, pinyon and juniper woodland, oak woodland, and valley and foothill grassland on serpentinite, 150–5,000 feet	Moderate; annual grassland and oak savanna/woodland habitats on serpentinite; no CNDDDB records in the county
Robust monardella <i>Monardella villosa</i> ssp. <i>globosa</i>	—/—/1B	June–July	North Coast Ranges and Eastern San Francisco Bay Area; Alameda, Contra Costa, Humboldt, Lake, Marin, Napa, San Mateo, and Sonoma Counties; oak woodland and grassy openings in chaparral	Moderate; oak savanna/woodland habitat in western part of the county; no CNDDDB records in the county
Green monardella <i>Monardella viridis</i> ssp. <i>viridis</i>	—/—/4	July–September	Lake, Napa, Solano, Sonoma Counties; broad-leaved upland forest, chaparral, cismontane woodland	Moderate; oak woodland and scrub/chaparral habitats in western part of the county; no CNDDDB records in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Little mouseltail <i>Myosurus minimus</i> ssp. <i>apus</i>	SC/—/3	March–June	Central valley, San Francisco Bay region, southern outer Coast Ranges, South Coast. Alameda, Butte, Contra Costa, Colusa, Kern, Riverside, San Bernardino, San Diego, Solano, and Stanislaus Counties; alkaline vernal pools and marshes, below 5,000 feet	Moderate; seasonally wet annual grassland, oak savanna/woodland, and scrub/chaparral habitats; no CNDDDB records in the county
Cotula navarretia <i>Navarretia cotulifolia</i>	—/—/4	May–June	Occurs in Alameda, Butte, Contra Costa, Colusa, Glenn, Lake, Mendocino, Marin, Napa, San Benito, Santa Clara, Siskiyou?, Solano, Sonoma, Sutter, and Yolo Counties; chaparral, woodland, valley and foothill grassland, 15–6,000 feet	Moderate; annual grassland, oak savanna/woodland, and scrub/chaparral habitats; no CNDDDB records in the county
Baker's navarettia <i>Navarettia leucocephala</i> ssp. <i>bakeri</i>	SC/—/1B	May–July	Inner north Coast Ranges, western Sacramento Valley, Colusa, Lake, Mendocino, Marin, Napa, Solano, Sonoma, and Tehama Counties; vernal pools and swales in woodland, lower montane coniferous forest, mesic meadows, and grassland, generally below 5,600 feet	High; seasonally wet annual grassland habitat; recorded at Jepson Prairie
Colusa grass <i>Neostapfia colusana</i>	T/E/1B	May–September	Central Valley, Colusa*, Glenn*, Merced, Solano, Stanislaus, and Yolo Counties presumed extinct in Colusa and Glenn Counties; adobe soils of vernal pools, generally below 650 feet	High; seasonally wet annual grassland habitat; recorded at Jepson Prairie

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Gairdner's yampah <i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	SC/—/4	June–July	Wide distribution from British Columbia and Washington, through the Coast Ranges to southern California, east to Alberta and New Mexico; in wet, heavy soils of broadleaved upland forests and chaparral communities; type locality in California	Moderate; oak savanna/woodland and scrub/chaparral habitats; no CNDDDB records in the county
Bearded popcorn flower <i>Plagiobothrys hystriculus</i>	SC/—/1A	April–May	Endemic to Solano* County, presumed extinct; mesic grassland, vernal pools	Low; seasonally wet annual grassland habitat; historic record (1892) in the southeast part of the county
Marin knotweed <i>Polygonum marinense</i>	SLC/—/3	April–October	Coastal Marin, Napa, Solano, and Sonoma Counties; coastal salt marsh, brackish marsh	High; brackish and salt marsh habitat; recorded in the southern part of the county near SR 37
Delta woolly-marbles <i>Psilocarphus brevissimus</i> var. <i>multiflorus</i>	—/—/4	May–June	Deltaic central valley and San Francisco bay area, Alameda, Napa, Santa Clara, San Joaquin, Solano, Stanislaus, and Yolo Counties; vernal pools, 30–1,650 feet	Moderate; seasonally wet annual grassland habitat; no CNDDDB records in the county
Lobb's aquatic buttercup <i>Ranunculus lobbii</i>	—/—/4	February–April	Occurs from Sonoma, Lake, and Solano Counties to the Santa Cruz Mountains and Alameda County, and in Oregon and British Columbia; in shallow vernal and woodland ponds and on moist soils in valley and foothill grasslands below 2,000 feet; type locality in Oregon	Moderate; seasonally wet annual grassland, and ponds in oak savanna/woodland habitat; no CNDDDB records in the county
Victor's gooseberry <i>Ribes victoris</i>	—/—/4	March–April	Occurs in Marin, Mendocino, Sonoma, Napa, and Solano Counties; on wooded slopes in shaded canyons and chaparral habitats	Moderate; oak savanna/woodland and scrub/chaparral habitats; no CNDDDB records in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Rayless ragwort <i>Senecio aphanactis</i>	—/—/2	January–April	Scattered locations in central western California and southwestern California, from Alameda County to San Diego County; oak woodland, coastal scrub, open sandy or rocky areas, on alkaline soils	High; oak woodland and scrub/chaparral habitats; recorded in the southwestern part of the county
Pacific cordgrass <i>Spartina foliosa</i>	SLC/—/—	July–November	San Francisco Bay Area and coastal California; tidal salt marshes	Moderate; salt marsh habitat in the southern part of the county; species not tracked on the CNDDDB
California seablite <i>Suaeda californica</i>	E/—/1B	July–October	Known only from one extant occurrence at Morro Bay; previously prevalent around San Francisco Bay; in coastal salt marshes	Moderate; salt marsh and brackish marsh habitats in the southern part of the county; no CNDDDB records in the county
Showy Indian clover <i>Trifolium amoenum</i>	E/—/1B	April–June	Historically widespread in Coast Ranges from Santa Clara County north to Mendocino County, but currently believed extinct; poorly known, reported from grasslands and oak woodlands in low swales and other seasonally moist sites below 200 feet; type locality in Vanden Station, Sacramento Valley	Low; annual grassland habitat; historic record (1902) in the central part of the county
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	SC/—/1B	April–June	Sacramento Valley and central coast; open areas in salt marsh on alkaline soils; below 900 feet	Moderate; salt marsh and brackish marsh habitats in the southern part of the county; no CNDDDB records in the county
Dark-mouthed triteleia <i>Triteleia lugens</i>	—/—/4	April–June	Occurs in Lake, Monterey, Napa, San Benito, Solano, and Sonoma Counties; broadleaved upland forest, chaparral, coniferous forest, 330–3,300 feet	Moderate; oak woodland and scrub/chaparral habitats; no CNDDDB records in the county

Table 6-2. Continued

Species Name	Legal Status ^a	Period in Which Species is Identifiable	Distribution and Habitat	Potential for Occurrence in the CTEP Project Area
	Federal/State/CNPS			
Crampton's tuctoria, Solano grass <i>Tuctoria mucronata</i>	E/E/1B	April–July	Southwestern Sacramento valley, Solano and Yolo Counties; mesic grassland, vernal pools, below 500 feet	High; seasonally wet annual grassland habitat; recorded at Jepson Prairie

^a Status explanations see the “Definitions of Special-Status Species” section above for citations:

Federal

- E = listed as endangered under the federal ESA.
- T = listed as threatened under the federal ESA.
- SC = species of concern to USFWS.
- SLC = species identified by USFWS as being of local or regional concern or conservation significance.

State

- E = listed as endangered under the CESA.
- T = listed as threatened under CESA.
- R = listed as rare under CESA (this category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation).

California Native Plant Society

- 1A = List 1A species: presumed extinct in California.
- 1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
- 2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
- 3 = List 3 species: plants about which more information is needed to determine their status.
- 4 = List 4 species: plants of limited distribution.
- ? = uncertainty about distribution or identity.
- * = known populations believed extirpated from that county.
- = no listing.

Determination of Potential for Occurrence

- Present = species has been observed by Jones & Stokes during field surveys.
- High = suitable habitat is present in the county and the CNDDDB records the species in the county.
- Moderate = suitable habitat is present in the county, but there are no CNDDDB records of the species in the county or the CNDDDB records are historic occurrences that are currently unverified.
- Low = some suitable habitat is present in the county, but the species is only historically recorded in the county or thought to be extirpated from the county or extinct.

Table 6-3. Special-Status Wildlife Species Known to Occur or with Potential to Occur in Solano County

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	E/—	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large, deep vernal pools in annual grasslands	High; five CNDDDB records from east Solano County
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T/—	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	High; 10 CNDDDB records from east Solano County
Midvalley fairy shrimp <i>Branchinecta mesovallensis</i>	—/—	Central Valley, scattered populations in Sacramento, Solano, Contra Costa, San Joaquin, Madera, Merced, and Fresno Counties	Small short-lived vernal pools, seasonal wetlands, and depressions	High; known to occur on Jepson Prairie, Travis AFB, and surrounding area
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	E/—	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	High; 16 CNDDDB records from east Solano County
San Francisco lacewing <i>Nothochrysa californica</i>	SC/—	Northern and central Coast Ranges	Riparian oak woodlands	Low; no records from Solano County
Antioch Dunes anthicid (beetle) <i>Anthicus antiochensis</i>	SC/—	Population in Antioch Dunes believed extinct; Now known only from Grand Island and in and around Sandy Beach County Park, Sacramento County	Loose sand on sand bars and sand dunes	Low; no recent or historic records in Solano County, suitable habitat may occur in the southern end of the county
Sacramento anthicid (beetle) <i>Anthicus sacramento</i>	SC/—	Dune areas at mouth of Sacramento River; western tip of Grand Island, Sacramento County; upper Putah Creek and dunes near Rio Vista, Solano County; Ord Ferry Bridge, Butte County	Found in sand slip-faces among willows; associated with riparian and other aquatic habitats	High, two CNDDDB records from near Rio Vista
San Joaquin dune beetle <i>Coelus gracilis</i>	SC/—	Restricted to isolated small sand dunes along the western edge of the San Joaquin Valley; Contra Costa, Fresno, and Kings Counties	Vegetated sand dunes	Low; no records from Solano County
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T/—	Stream side habitats below 3,000 feet throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberry (<i>Sambucus</i> sp.) is the host plant	High; seven CNDDDB records from north and northwest Solano County

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Delta green ground beetle <i>Elaphrus viridus</i>	T/—	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve, Solano County	Sparsely vegetated edges of vernal lakes and pools; occur up to 250 feet from pools	High; three CNDDB records from the Jepson Prairie area
Ricksecker's water scavenger beetle <i>Hydrochara rickseckeri</i>	SC/—	San Francisco Bay Area including San Mateo, Sonoma, Alameda, and Marin Counties; also in Solano and Sacramento Counties	Aquatic in vernal pools, ponds, and seasonal wetlands	High; one CNDDB record from Dozier quadrangle, suitable habitat occurs in east Solano County
Callippe silverspot <i>Speyeria callippe callippe</i>	E/—	San Bruno Mountain, San Mateo County, and a single location in Alameda County.	Open hillsides where wild pansy (<i>Viola pendunculata</i>) grows; larvae feed on Johnny jump-up plants, whereas adults feed on native mints and non-native thistles.	Moderate; one CNDDB record from a ridge between Vallejo and Lake Herman
California tiger salamander <i>Ambystoma californiense</i> (=A. tigrinum c.)	C/SSC	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County.	Small ponds, lakes, or vernal pools in grass-lands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	High; five CNDDB records from the north and central areas in the county
Western spadefoot <i>Scaphiopus hammondi</i>	SC/SSC, P	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands.	Moderate; no records of this species in the CNDDB but suitable is habitat present
California red-legged frog <i>Rana aurora draytoni</i>	T/SSC, P	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehema County to Fresno County	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May estivate in rodent burrows or cracks during dry periods.	High; eight records from CNDDB from the southwest areas of the county (Cordelia and Fairfield South USGS quadrangles)
Foothill yellow-legged frog <i>Rana boylei</i>	SC/SSC, P	Occurs in the Klamath, Cascade, north Coast, south Coast, Transverse, and Sierra Nevada ranges up to approximately 6,000 feet	Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. Usually found near riffles with rocks and sunny banks nearby.	Moderate; one CNDDB record and suitable habitat exists in the northwestern areas of Solano County

Table 6-3. Continued

Common and Scientific Name	Status	California Distribution	Habitats	Potential for Occurrence in Study Area
	Federal/State			
Northwestern pond turtle <i>Clemmys marmorata marmorata</i>	SC/SSC	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	High; two CNDDDB records occur in the northwest area of Solano County; suitable habitat exists
California horned lizard <i>Phrynosoma coronatum frontale</i>	SC/SSC	Sacramento Valley, including foothills, south to southern California; Coast Ranges south of Sonoma County; below 4,000 feet in northern California	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging	Low; no records from Solano County
Silvery legless lizard <i>Anniella pulchra pulchra</i>	SC/SSC	Along the Coast, Transverse, and Peninsular Ranges from Contra Costa County to San Diego County with spotty occurrences in the San Joaquin Valley	Habitats with loose soil for burrowing or thick duff or leaf litter; often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas	Low; no records from Solano County
Giant garter snake <i>Thamnophis couchi gigas</i>	T/T	Central Valley from the vicinity of Burrell in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	High; three CNDDDB records; suitable habitat occurs in the eastern and northern areas of Solano County
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	T/T	Restricted to Alameda and Contra Costa Counties; fragmented into five disjunct populations throughout its range	Valleys, foothills, and low mountains associated with northern coastal scrub or chaparral habitat; requires rock outcrops for cover and foraging	Low; no records; Solano County is outside the range for this species
Common loon <i>Gavia immer</i> (nesting)	—/SSC	Primarily a winter visitor to California, but an occasional year-round resident; found along the entire coast and large inland bodies of water; formerly nested in northeastern California	Nearshore coastal waters and bays; less common at large inland bodies of deep water with productive fisheries	Low for nesting; records in Solano County are for wintering and migrating individuals

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
California brown pelican (nesting colony) <i>Pelecanus occidentalis californicus</i>	E/E	Present along the entire coastline, but does not breed north of Monterey County; extremely rare inland	Typically in littoral ocean zones, just outside the surf line; nests on offshore islands	Low; non-breeding individuals have been recorded in White Slough (R. Leong)
American white pelican <i>Pelecanus erythrorhynchos</i> (nesting colony)	—/SSC	Historically, nested at large lakes throughout California; only breeding colonies in the state occur at lower Klamath National Wildlife Refuge, Siskiyou County, and at Clear Lake, Modoc County; winters along the California coast from southern Sonoma County	Freshwater lakes with islands for breeding; inhabits river sloughs, freshwater marshes, salt ponds, and coastal bays during the rest of the year	Low; non-breeding individuals have been recorded in wetlands throughout Solano County
Double-crested cormorant <i>Phalacrocorax auritus</i> (rookery site)	—/SSC	Winters along the entire California coast and inland over the Coast Ranges into the Central Valley from Tehama County to Fresno County; a permanent resident along the coast from Monterey County to San Diego County, along the Colorado River, Imperial River	Rocky coastlines, beaches, inland ponds, and lakes; needs open water for foraging, and nests in riparian forests or on protected islands, usually in snags	High; rookeries known from Solano County
Snowy egret <i>Egretta thula</i> (rookery)	—/—	Permanent resident in suitable wetland habitats throughout California except for high elevations in montane regions	Forages in marshes, agricultural fields, coastal bays and estuaries, rivers, creeks, lakeshores, ponds.	High; no CNDDDB rookery records; many records throughout the year in suitable habitat
Great blue heron <i>Ardea herodias</i> (rookery)	—/—	Permanent resident in suitable wetland habitats throughout California except for high elevations in montane regions	Forages in marshes, agricultural fields, coastal bays and estuaries, rivers, creeks, lakeshores, ponds.	High; one CNDDDB record in the Dozier USGS quadrangle
Western least bittern <i>Ixobrychus exilis hesperis</i>	—/SSC	Permanent residents along the Colorado River and Salton Sea and in isolated areas in Imperial, San Diego, and Los Angeles Counties; summers at Tulare Lake and parts of Yolo, Sutter, Fresno, Merced, Madera, Siskiyou, and Modoc Counties	Marshes and along pond edges, where tules and rushes can provide cover; nests are built low in the tules over the water	Moderate; few records in Yolo, Sacramento, Solano Counties
American bittern <i>Botarus lentiginosus</i>	SC/—	Permanent resident of the Central Valley and locally along the coastal plain of northern and central California; more widespread in winter including southern California	Marshes, flooded rice fields, agricultural canals with emergent vegetation	High; no CNDDDB rookery records; many records throughout the year in suitable habitat

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
White-faced Ibis <i>Plegadis chihi</i> (rookery site)	SC/SSC	Both resident and winter populations on the Salton Sea and in isolated areas in Imperial, San Diego, Ventura, and Fresno Counties; breeds at Honey Lake, Lassen County, at Mendota Wildlife Management Area, Fresno County, and near Woodland, Yolo County	Prefers freshwater marshes with tules, cattails, and rushes, but may nest in trees and forage in flooded agricultural fields, especially flooded rice fields	Moderate; no CNDDDB rookery records in Solano County; species is increasing its range in California and may colonize sites in Solano County in the near future
Tule white-fronted Goose <i>Anser albifrons elgasi</i>	—/SSC	Winters very locally in the northern San Francisco Bay region and in the Central Valley	Winters in marshes and agricultural fields	High; many winter records from Solano County
Aleutian canada goose <i>Branta canadensis leucopareia</i>	T/—	The entire population winters in Butte Sink, then moves to Los Banos, Modesto, the Delta, and East Bay reservoirs; stages near Crescent City during spring before migrating to breeding grounds	Roosts in large marshes, flooded fields, stock ponds, and reservoirs; forages in pastures, meadows, and harvested grainfields; corn is especially preferred	High; no CNDDDB records in Solano County, but migrants probably move through the county annually; a few winter records of individuals (Jones & Stokes files)
Redhead <i>Aythya americana</i>	—/SSC	Nests in northeastern and eastern California, the Central Valley and locally in southern California including the Mojave Desert.	Nests in freshwater ponds and marshes; winters also in coastal bays and estuaries	High; many records from Solano County
Golden eagle <i>Aquila chrysaetos</i>	PR/SSC, FP	Foothills and mountains throughout California. Uncommon nonbreeding visitor to lowlands such as the Central Valley	Nest on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals	High; one CNDDDB record of a nest in western Solano County; many records throughout the year in Solano County
Bald eagle <i>Haliaeetus leucocephalus</i>	T/E	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean	High; multiple winter records but no CNDDDB nesting records in Solano County

Table 6-3. Continued

Common and Scientific Name	Status	California Distribution	Habitats	Potential for Occurrence in Study Area
	Federal/State			
Osprey <i>Pandion haliaetus</i>	—/SSC	Nests along the north coast from Marin County to Del Norte County, east through the Klamath and Cascade Ranges, and in the upper Sacramento Valley. Important inland breeding populations at Shasta Lake, Eagle Lake, and Lake Almanor and small numbers elsewhere south through the Sierra Nevada. Winters along the coast from San Mateo County to San Diego County	Nests in snags, trees, or utility poles near the ocean, large lakes, or rivers with abundant fish populations	High; known nest on Mare Island in Solano County
Northern harrier <i>Circus cyaneus</i>	—/SSC	Occurs throughout lowland California. Has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands	High; known throughout Solano County
Sharp-shinned hawk <i>Accipiter striatus</i>	—/SSC	Permanent resident in the Sierra Nevada, Cascade, Klamath, and north Coast Ranges at mid elevations and along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey Counties. Winters over the rest of the state except at very high elevations	Dense canopy ponderosa pine or mixed-conifer forest and riparian habitats	High; no nesting records from suitable habitat in the northwest areas of Solano County but many records of wintering and migrating individuals throughout the county
Cooper's hawk <i>Accipiter cooperii</i>	—/SSC	Throughout California except high altitudes in the Sierra Nevada. Winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range	Nests in a wide variety of habitat types, from riparian woodlands and digger pine-oak woodlands through mixed conifer forests	High; multiple records from suitable habitat throughout Solano County
Swainson's hawk <i>Buteo swainsoni</i>	—/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields	High; more than 100 records of this species nesting in Solano County
Ferruginous hawk <i>Buteo regalis</i>	SC/SSC	Does not nest in California; winter visitor along the coast from Sonoma County to San Diego County, east-ward to the Sierra Nevada foothills and south-eastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County	Open terrain in plains and foothills where ground squirrels and other prey are available	High; many winter records in Solano County

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
White-tailed kite <i>Elanus leucurus</i>	—/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	High; six CNDDDB records throughout northern Solano County
American peregrine falcon <i>Falco peregrinus anatum</i>	—/E	Permanent resident along the north and south Coast Ranges. May summer in the Cascade and Klamath Ranges and through the Sierra Nevada to Madera County. Winters in the Central Valley south through the Transverse and Peninsular Ranges and the plains east of the Cascade Range	Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large prey populations	High; recorded at White Slough in western Solano County (R. Leong), and multiple records from other locations in the county
Prairie falcon <i>Falco mexicanus</i>	—/SSC	Permanent resident in the south Coast, Transverse, Peninsular, and northern Cascade Ranges, the southeastern deserts, Inyo-White Mountains, foothills surrounding the Central Valley, and in the Sierra Nevada in Modoc, Lassen, and Plumas Counties. Winters in the Central Valley, along the coast from Humboldt County to San Diego County	Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands	High; multiple records for Solano County
California clapper rail <i>Rallus longirostris obsoletus</i>	E/E	Marshes around the San Francisco Bay and east through the Delta to Suisun Marsh	Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickle-weed; feeds on mollusks removed from the mud in sloughs	High; 12 CNDDDB records; suitable habitat throughout western Solano County
California black rail <i>Laterallus jamaicensis coturniculus</i>	SC/T	Permanent resident in the San Francisco Bay and east-ward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations	High; 10 CNDDDB records; suitable habitat throughout western Solano Co.
Yellow rail <i>Coturnicops moveboracensis</i>	—/SSC	Historical records of nests in Mono County east of the Sierra Nevada and formerly Marin County on the coast; winter records also on the coast from Humboldt County to Orange County	Freshwater marshes, brackish marshes, coastal salt marshes, and grassy meadows	High; recent and historic wintering records from Grizzly Island area

Table 6-3. Continued

Common and Scientific Name	Status	California Distribution	Habitats	Potential for Occurrence in Study Area
	Federal/State			
Greater sandhill crane <i>Grus canadensis tabida</i>	—/T	Breeds in Siskiyou, Modoc, Lassen, Plumas, and Sierra Counties. Winters in the Central Valley, southern Imperial County, Lake Havasu National Wildlife Refuge, and the Colorado River Indian Reserve	Summers in open terrain near shallow lakes or freshwater marshes. Winters in plains and valleys near bodies of fresh water	Moderate; suitable wintering habitat occurs in Solano County but no CNDDB records to date
Western snowy plover (coastal populations) <i>Charadrius alexandrinus nivosus</i> (nesting)	T/SSC	Population defined as those birds that nest adjacent to or near tidal waters, including all nests along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries. Twenty breeding sites are known in California from Del Norte to Diego County	Coastal beaches above the normal high tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent	Moderate; recorded in White Slough, western Solano County (R. Leong)
Mountain plover <i>Charadrius montanus</i>	PT/SSC	Does not breed in California; in winter, found in the Central Valley south of Yuba County, along the coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern, and Los Angeles Counties	Occupies open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water are not needed; may use newly plowed or sprouting grainfields	High; one CNDDB record of this species in the Bird's Landing USGS quadrangle; large wintering flock found in recent years in southern Solano County
Western snowy plover (inland population) <i>Charadrius alexandrinus nivosus</i>	SC/SSC	Nests at inland lakes throughout northeastern, central, and southern California, including Mono Lake and Salton Sea	Barren to sparsely vegetated ground at alkaline or saline lakes, reservoirs, ponds and riverine sand bars; also along sewage, salt-evaporation, and agricultural waste-water ponds	Moderate; may occasionally migrate through Solano County
Long-billed curlew <i>Numenius americanus</i>	—/SSC	Nests in northeastern California in Modoc, Siskiyou, and Lassen Counties. Winters along the coast and in interior valleys west of Sierra Nevada	Nests in high-elevation grasslands adjacent to lakes or marshes. During migration and in winter; frequents coastal beaches and mudflats and interior grasslands and agricultural fields	Low; no CNDDB nesting records in Solano County
California least tern <i>Sterna antillarum</i> (=albifrons) browni (nesting colony)	E/E	Nests on beaches along the San Francisco Bay and along the southern California coast from southern San Luis Obispo County south to San Diego County	Nests on sandy, upper ocean beaches, and occasionally uses mudflats; forages on adjacent surf line, estuaries, or the open ocean	Moderate; recorded in White Slough (R. Leong)

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Black tern <i>Chlidonias niger</i>	—/SSC	Spring and summer resident of the Central Valley, Salton Sea, and northeastern California where suitable emergent wetlands occur	Freshwater wetlands, lakes, ponds, moist grasslands, and agricultural fields; feeds mainly on fish and invertebrates while hovering over water	Moderate; many records for migrants and known to nest in nearby counties; there is suitable breeding habitat
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	—/E	Nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers	Wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley-oak riparian habitats where scrub jays are abundant	Low; no CNDDDB records of this species in Solano County
Western burrowing owl <i>Athene cunicularia hypugea</i>	SC/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows	High; multiple records of this species throughout Solano County
Long-eared owl <i>Asio otus</i>	—/SSC	Permanent resident east of the Cascade Range from Placer County north to the Oregon border, east of the Sierra Nevada from Alpine County to Inyo County. Scattered breeding populations along the coast and in southeastern California. Winters throughout the Central Valley and southeastern California	Nests and winter roosts in abandoned crow, hawk, or magpie nests, usually in dense riparian stands of willows, cottonwoods, live oaks, or conifers	High; several records of wintering birds in Solano County; lack of breeding records may indicate poor observer coverage of potential breeding areas
Short-eared owl <i>Asio flammeus</i>	—/SSC	Permanent resident along the coast from Del Norte County to Monterey County although very rare in summer north of San Francisco Bay, in the Sierra Nevada north of Nevada County, in the plains east of the Cascades, and in Mono County; small, isolated populations	Freshwater and salt marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts	High; one CNDDDB record; multiple records in suitable habitat in southern Solano County
Vaux's swift <i>Chaetura vauxi</i>	—/SSC	Coastal belt from Del Norte County south to Santa Cruz County and in mid elevation forests of the Sierra Nevada and Cascade Range	Nests in hollow, burned-out tree trunks in large conifers	Low; no nesting records in Solano County (Sterling and Paton 1996)

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Willow flycatcher <i>Empidonax traillii</i>	SC/E	Summers along the western Sierra Nevada from El Dorado to Madera County, in the Cascade and northern Sierra Nevada in Trinity, Shasta, Tahama, Butte, and Plumas Counties, and along the eastern Sierra Nevada from Lassen to Inyo County	Riparian areas and large wet meadows with abundant willows. Usually found in riparian habitats during migration	Low; no CNDDDB nesting records in Solano County
California horned lark <i>Eremophila alpestris actia</i>	—/SSC	Found along the coast from southern Humboldt to San Diego Counties; inland in the San Joaquin Valley and valleys within the southern Coast Ranges	Common to abundant resident in a variety of open habitats, usually where large trees and shrubs are absent. Grasslands and deserts to dwarf shrub habitats above tree line	Moderate; Solano County is on northern extreme of subspecies range
Purple martin <i>Progne subis</i>	—/SSC	Coastal mountains south to San Luis Obispo County, west slope of the Sierra Nevada, and northern Sierra Nevada and Cascade Ranges. Absent from the Central Valley except in Sacramento. Isolated, local populations in southern California	Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats. Also nests in vertical drainage holes under elevated freeways and highway bridges	Moderate; no CNDDDB nesting records in Solano County
Bank swallow <i>Riparia riparia</i>	—/T	Occurs along the Sacramento River from Tahama County to Sacramento County, along the Feather and lower American Rivers, in the Owens Valley; and in the plains east of the Cascade Range in Modoc, Lassen, and northern Siskiyou Counties. Small populations near the coast from San Francisco County to Monterey County	Nests in bluffs or banks, usually adjacent to water, where the soil consists of sand or sandy loam	Moderate; no CNDDDB records in Solano County
Swainson's thrush <i>Catharus ustulatus</i>	—/SSC	Common summer resident of humid, coastal riparian and deciduous forests from Del Norte south to central Santa Barbara Counties; rare breeder in southern coast, and in the interior coastal, Sierra Nevada and Cascade Range	Nests in humid riparian and deciduous forests	Moderate; many records of migrants; may breed occasionally and locally in northwestern Solano County
Loggerhead shrike <i>Lanius ludovicianus</i>	—/SSC	Resident and winter visitor in lowlands and foothills throughout California. Rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	High; suitable habitat for this species throughout Solano County

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	SC/SSC	Found only in the San Francisco Bay Area in Marin, Napa, Sonoma, Solano, San Francisco, San Mateo, Santa Clara, and Alameda Counties	Freshwater marshes in summer and salt or brackish marshes in fall and winter; requires tall grasses, tules, and willow thickets for nesting and cover	High; 10 CNDDDB records in southwestern Solano County
Yellow-breasted chat <i>Icteria virens</i>	—/SSC	Nests locally in coastal mountains and Sierra Nevada foothills, east of the Cascades in northern California, along the Colorado river, and very locally inland in southern California	Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines	High; records from suitable habitat in the northern portion of Solano County
Tricolored blackbird <i>Agelaius tricolor</i>	SC/SSC	Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties. Rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields. Habitat must be large enough to support 50 pairs. Probably requires water at or near the nesting colony	High; six CNDDDB records; habitat located throughout Solano County
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	—/SSC	Permanent resident in the Central Valley and southern California; summer resident in northeastern and eastern California (east of the Sierra Nevada/Cascade crest)	Nests in colonies in emergent marsh vegetation, such as tules and cattails. Forages throughout the years in marshes and agricultural fields	High; many records of wintering birds and known to nest in nearby counties and probably nests in Solano County
Grasshopper sparrow <i>Ammodramus savannarum</i>	—/SSC	Local summer resident and rare winter resident of the Central Valley and adjacent foothills; local summer resident along coastal plain from Humboldt to San Diego Counties; rare elsewhere in southern California and in interior valleys in the north Coast Ranges.	Nests and winters in grasslands.	Moderate; lack of records may indicate poor observer coverage of habitat and secretive behavior of this species
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	SC/SSC	Restricted to the extreme western edge of the Delta, between the cities of Vallejo and Pittsburg near Suisun Bay	Brackish and tidal marshes supporting cattails, tules, various sedges, and pickleweed	High; nine CNDDDB records in southern Solano County

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	SC/SSC	Found in San Pablo Bay	Uses tidal sloughs within pickleweed marshes; requires tall bushes (usually grindelia) along sloughs for cover, nesting, and songposts; forages over mudbanks and in the pickleweed	High; two CNDDDB records in western Solano County
Suisun ornate shrew <i>Sorex ornatus sinuosus</i>	SC/SSC	Restricted to San Pablo Bay and Suisun Bay, both in Solano County	Tidal, salt, and brackish marshes containing pickleweed, grindelia, bulrushes, or cattails; requires driftwood or other objects for nesting cover	High; 10 records in western Solano County
Pacific Townsend's (=western) big-eared bat <i>Corynorhinus townsendii townsendii</i>	SC/SSC	Coastal regions from Del Norte County south to Santa Barbara County	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings. Very sensitive to disturbances and may abandon a roost after one onsite visit	Moderate; no records, no known roost sites in Solano County
Fringed myotis <i>Myotis thysanodes</i>	SC/—	Occurs throughout California except the southeastern deserts and the Central Valley	Found in a wide variety of habitats from low desert scrub to high elevation coniferous forests. Day and night roosts in caves, mines, trees, buildings, and rock crevices	High; suitable habitat within the county
Long-eared myotis <i>Myotis evotis</i>	SC/—	Occurs throughout California except the southeastern deserts and the Central Valley	Occurs primarily in high elevation coniferous forests, but also found in mixed hardwood/conifer, high desert, and humid coastal conifer habitats	Low; little suitable habitat within Solano County
Small-footed myotis <i>Myotis ciliolabrum</i>	SC/—	Occurs in the Sierra Nevada, south Coast, Transverse, and Peninsular Ranges, and in the Great Basin	Open stands in forests and woodlands, as well as shrub lands and desert scrub. Uses caves, crevices, trees, and abandoned buildings	Moderate; no records within Solano County
Long-legged myotis <i>Myotis volans</i>	SC/—	Mountains throughout California, including ranges in the Mojave desert	Most common in woodlands and forests above 4,000 feet, but occurs from sea level to 11,000 feet	Moderate; no records within Solano County
Yuma myotis <i>Myotis yumanensis</i>	SC/—	Common and widespread throughout most of California except the Colorado and Mojave deserts	Found in a wide variety of habitats from sea level to 11,000 feet, but uncommon above 8,000 feet. Optimal habitat is open forests and woodlands near water bodies	High; no records by suitable habitat throughout Solano County

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Riparian brush rabbit <i>Sylvilagus bachmani riparius</i>	E/E	Limited to San Joaquin County at Caswell State Park near the confluence of the Stanislaus and San Joaquin Rivers and Paradise Cut area on UPRR right-of-way lands	Native valley riparian habitats with large clumps of dense shrubs, low-growing vines, and some tall shrubs and trees	Low; no records in Solano County
San Joaquin pocket mouse <i>Perognathus inornatus</i>	SC/—	Occurs throughout the San Joaquin Valley and in the Salinas Valley	Favors grasslands and scrub habitats with fine textured soils	Low; no records in Solano County
Riparian (San Joaquin Valley) woodrat <i>Neotoma fuscipes riparia</i>	E/SSC, FP	Historical distribution along the San Joaquin, Stanislaus, and Tuolumne Rivers, and Caswell State Park in San Joaquin, Stanislaus, and Merced Counties; presently limited to San Joaquin County at Caswell State Park and a possible second population near Vernalis	Riparian habitats with dense shrub cover, willow thickets, and an oak overstory	Low; no records in Solano County
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	SC/SSC	West side of Mount Diablo to coast and San Francisco Bay	Present in chaparral habitat and in forest habitats with a moderate understory	Low; no records in Solano County
Salt marsh harvest mouse <i>Reithrodontomys raviventris</i>	E/E, FP	San Francisco, San Pablo, and Suisun Bays; the Delta	Salt marshes with a dense plant cover of pickle-weed and fat hen; adjacent to an upland site	High; multiple records in the southern and western portions of Solano County
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	T/—	Delta, lower portions of the Sacramento and San Joaquin Rivers	Primarily low salinity shallow water; shallow, flooded vegetated habitat for spawning and foraging	Moderate; potential to move upstream
Delta smelt <i>Hypomesus transpacificus</i>	T/T	Delta	Estuarine or brackish waters to 14 ppt; spawn in shallow brackish water upstream of the mixing zone (zone of saltwater-freshwater interface) where salinity is around 2 ppt	Low; does not typically inhabit streams
Central Valley steelhead <i>Oncorhynchus mykiss</i>	T/SC	Sacramento and San Joaquin Rivers and their tributaries	Cold, clear water with clean gravel of appropriate size for spawning. Most spawning occurs in headwater streams. Steelhead migrate to the ocean to feed and grow until sexually mature.	High; known to occur in Solano County

Table 6-3. Continued

Common and Scientific Name	Status		Habitats	Potential for Occurrence in Study Area
	Federal/State	California Distribution		
Central Valley spring-run chinook salmon <i>Oncorhynchus tshawytscha</i>	T/T	Sacramento and Yuba Rivers, Deer, Mill, Butte, and Big Chico Creeks	Cold, clear water with clean gravel of appropriate size for spawning; most spawning occurs in headwater streams; migrate to the ocean to feed and grow until sexually mature.	High; known to occur in Solano County
Sacramento winter-run chinook salmon <i>Oncorhynchus tshawytscha</i>	E/E	Sacramento River	Cool, clear water with spawning gravel; migrate to the ocean to feed and grow until sexually mature	High, known to occur in Solano County
Central Valley fall-run and late fall-run chinook salmon <i>Oncorhynchus tshawytscha</i>	C/SC	Sacramento River and its tributaries, San Joaquin River and its tributaries	Cool, clear water with spawning gravel; migrate to the ocean to feed and grow until sexually mature	High; known to occur in Solano County

Status explanations:

Federal

- E = listed as endangered under the federal ESA.
- T = listed as threatened under the federal ESA.
- PE = proposed for federal listing as endangered under the federal ESA.
- PT = proposed for federal listing as threatened under the federal ESA.
- C = species for which USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposed rule to list, but issuance of the proposed rule is precluded.
- SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
- FS = U.S. Forest Service sensitive species (Region).

State

- E = listed as endangered under the CESA.
- T = listed as threatened under the CESA.
- FP = fully protected under the California Fish and Game Code.
- SSC = species of special concern in California.
- = no listing.

area include federally listed vernal pool invertebrates such as vernal pool fairy shrimp and vernal pool tadpole shrimp.

Special-Status Fish Species

Table 6-3 includes special-status fish species known to occur in and near Solano County. It includes the legal status, distribution, and habitat preference for each special-status fish species within Solano County. The table was compiled based on the following sources:

- telephone conversation with Mike Healey, District Fisheries Biologist, DFG, on June 19, 2002, (Healey pers. comm.) and
- draft list of special-status species for the SCWA HCP and NCCP (Solano County Water Agency n.d.)

Regulatory Setting

This section describes the federal, state, and local plans, policies, and laws that are relevant to biological resources within the project area.

Federal

This discussion focuses on the federal requirements associated with subsequent CEQA compliance for project-specific components of the CTEP. Additional federal requirements would apply to project-specific components of the CTEP that receive federal funding or otherwise affect federal lands and decision making. The additional federal requirements do not apply to the CTEP or this program EIR, but they would need to be addressed if federal funding or another federal action (e.g., if federal lands were crossed or a federal permit were required) were triggered at the time of consideration and approval of the specific project.

Federal Endangered Species Act

USFWS (jurisdiction over plants, wildlife, and resident fish) and NMFS (jurisdiction over anadromous fish and marine fish and mammals) oversee ESA. ESA Section 7 mandates that all federal agencies consult with USFWS and NMFS to ensure that the agencies' actions do not jeopardize the continued existence of a listed species, or destroy or adversely modify critical habitat for listed species. The agencies are required to consult with USFWS and NMFS if they determine that a project "may affect" protected resources.

ESA prohibits the taking of any fish or wildlife species listed as endangered, including destruction of habitat that would prevent recovery of the species. *Take*

is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Fish and wildlife species that are federally listed as threatened are generally protected from take, but the overall level of protection for these species may be modified at the time of their listing.

Under ESA Section 9, the take prohibition applies only to wildlife and fish species. However, Section 9 prohibits the unlawful removal and reduction to possession, or the malicious damage or destruction of, any endangered plant species from federal land. Section 9 also prohibits acts that would remove, cut, dig up, damage, or destroy an endangered plant species in nonfederal areas in knowing violation of any state law or in the course of criminal trespass. Candidate species and species that are proposed or under petition for listing receive no protection under Section 9.

ESA Section 10 requires that an incidental take permit be issued before any nonfederal public or private action that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt (i.e., take) any individual of an endangered or threatened species. The permit requires preparation and implementation of an HCP that would offset the possible take of individuals incidental to implementation of the project. One objective of the HCP is to offset take by providing for the overall preservation of the affected species through specific mitigation measures.

Regulation of Waters of the United States, Including Wetlands

The Corps and EPA regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under CWA Section 404. Projects that would result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the Corps. Some classes of fill activities may be authorized under general permits if specific conditions are met.

Many of the bridge and road widening projects proposed in the CTEP may be covered under a nationwide permit (at the discretion of the Corps). Nationwide permits do not authorize activities that are likely to jeopardize the existence of a species that is listed as threatened or endangered, or proposed for such listing, under ESA. In addition to conditions outlined under each nationwide permit, the Corps may impose project-specific conditions as part of the Section 404 permitting process.

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

If waters of the United States are present and could be affected by an CTEP project, a wetland delineation would need to be conducted and submitted to the Corps for verification. In addition, a wetland assessment may be conducted as part of a Caltrans natural environment study (NES) if substantial wetland impacts could result from the project.

Executive Order 13112 (Prevention and Control of Invasive Species)

EO 13112 (February 3, 1999) directs all federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. It established a national Invasive Species Council comprising federal agencies and departments and a supporting Invasive Species Advisory Committee comprising state, local, and private entities. The Invasive Species Council and Invasive Species Advisory Committee has prepared a National Invasive Species Management Plan (2001) that recommends objectives and measures to implement the EO and prevent the introduction and spread of invasive species. The EO and directives from FHWA require consideration of invasive species in NEPA analyses, including identification and distribution, potential impacts, and prevention or eradication measures.

Executive Order 13186 (Migratory Bird Treaty Act)

EO 13186 (January 10, 2001) directs each federal agency taking actions that would have, or would likely have, a negative impact on migratory bird populations to work with USFWS to develop a memorandum of understanding (MOU) to promote the conservation of migratory bird populations. Protocols developed under the MOU shall include the following agency responsibilities:

- avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- restore and enhance habitat of migratory birds, as practicable; and
- prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The EO is designed to assist federal agencies in their efforts to comply with the MBTA. It does not constitute any legal authorization to “take” migratory birds. Take, under the MBTA, is defined as the action of or an attempt to pursue, hunt, shoot, capture, collect or kill (50 CFR 10.12) and includes “intentional” take (take that is the purpose of the activity in question) and “unintentional” take (take that results from, but is not the purpose of, the activity in question).

State

California Endangered Species Act

California implemented CESA in 1984. It prohibits the take of endangered and threatened species; however, habitat destruction is not included in the state's definition of take. CESA Section 2090 requires state agencies to comply with endangered species protection and recovery, and to promote conservation of these species. DFG administers CESA and authorizes take through Section 2081 agreements (except for species designated as fully protected).

For rare plant species, CESA defers to the California Native Plant Protection Act of 1977, which prohibits importing, taking, or selling rare and endangered plants. State-listed plants are protected mainly in cases in which state agencies are involved in projects under CEQA. In such cases, plants that are listed as rare under the California Native Plant Protection Act are not protected under CESA but can be protected under CEQA.

California Fish and Game Code

California Fish and Game Code Section 3503.5 prohibits the removal of raptor nests. Section 1601 requires issuance of a streambed alteration agreement for all projects that may disturb streams. DFG is responsible for issuing the agreements.

Policies and Regulations on Streams and Wetlands

DFG regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of, a lake, river, or stream. These activities are regulated under California Fish and Game Code Sections 1601 (for public agencies) and 1603 (for private individuals). Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. Requirements may include avoidance or minimization of the use of heavy equipment, limitations on work periods to avoid impacts on wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses.

Local

Local Policies and Ordinances

Local policies and ordinances that pertain to biological resources that could affect or be affected by the CTEP are summarized below. Policies may support or conflict with proposed project improvements. The policies were excerpted from the county and city general plans.

Solano County (Land Use and Circulation Element)

- **Policy 1:** The County shall preserve and enhance wherever possible the diversity of wildlife and aquatic habitats found in the Napa Marsh and Suisun Marsh and surrounding upland areas to maintain these unique wildlife resources.
- **Policy 2:** The County shall protect its marsh waterways, managed and natural wetlands, tidal marshes, seasonal marshes and lowland grasslands which are critical habitats for marsh-related wild-life.
- **Policy 3:** Existing uses should continue in the upland grasslands and cultivated areas surrounding the critical habitats of the Suisun Marsh in order to protect the marsh and preserve valuable marsh-related wildlife habitats. Where feasible, the value of the upland grasslands and cultivated lands as habitat for marsh-related wildlife should be enhanced.
- **Policy 6:** In marsh areas, the county shall encourage the formation and retention of parcels of sufficient size to preserve valuable tidal marshes, seasonal marshes, managed wetlands and contiguous grassland areas for the protection of aquatic and wildlife habitat.
- **Policy 7:** The County shall ensure that development in the County occurs in a manner which minimizes impacts of earth disturbance, erosion and water pollution.
- **Policy 8:** The County shall preserve the riparian vegetation along significant County waterways in order to maintain water quality and wildlife habitat values.

Benicia

- **Policy 3.15.5:** Encourage the landscaping of existing open spaces, and landscape new open spaces with native plants.
- **Policy 3.19.1:** Protect essential habitat of special-status plant and animal species.
- **Policy 3.20.1:** Protect native grasslands, oak woodlands, and riparian habitat
- **Policy 3.20.2:** Restore native vegetation, such as birch [sic] grasses and oaks, wherever possible for open spaces of existing developed areas.
- **Policy 3.21.1:** Encourage avoidance and enhancement of sensitive wetlands as part of future development.
- **Policy 3.21.2:** Require replacement for wetlands eliminated as a result of development at a higher wetlands value and acreage than the area eliminated.

Dixon

- **Open Space, Policy 3:** The City shall, to the greatest extent possible, preserve natural resource and wildlife habitat areas . . . by reserving the . . . productive Class I and II soils which surround Dixon.

Fairfield

- **Policy OS 7.1:** Establish policies to protect indigenous wildlife and their habitats.

- **Program OS 7.1 A:** Adopt a conservation plan and mitigation banking program for annual grassland wildlife habitat during the areawide planning process for each phasing area. The plan should identify sites for habitat preservation and enhancement and establish predictable mitigation requirements for developers, mitigation funding mechanisms, and interagency agreements on mitigation measures and priorities. Preparation of the plan would include tasks described in the General Plan EIR.
- **Program OS 7.1 B:** Require surveys of active raptor nests and protection of nest trees, if found, on a project-by-project basis as a condition of project approval. The surveys should be conducted in accordance with the General Plan EIR. If no raptor nests are found during the surveys, grading may proceed unconstrained by conflicts with raptors. If a raptor nest is found, implement one of the measures described in the General Plan EIR.
- **Policy OS 7.4:** Provide for the permanent protection of wildlife habitat areas.
- **Policy OS 7.5:** Identify and protect vernal pools located in the entire General Plan Area. For vernal pools located in Phasing Areas D and E, establish a habitat reserve similar to the Jepson Prairie Nature Preserve.
- **Program OS 7.5 A:** Adopt a conservation plan and mitigation banking program for vernal pools and seasonal wetland habitats during the areawide planning process for each phasing area. The components of this program are described in the General Plan EIR.
- **Policy OS 7.7:** Promote the preservation of existing mature trees and encourage the planting of appropriate shade trees in new developments. (See Policy UD 6.1 and Program UD 6.1 A)
- **Program OS 7.7 A:** Develop and adopt standards to require the planting of an adequate number of shade trees in new residential and commercial developments.
- **Program OS 7.7 B:** Adopt a conservation plan and mitigation banking program for oak savannah and oak woodland habitat during the areawide planning process for each phasing area. The plan should identify habitat preservation and enhancement sites and criteria for incorporating and protecting oak savannah habitat and individual valley oaks as part of development projects, and would establish predictable mitigation requirements for developers, mitigation funding mechanisms, and interagency agreements on mitigation measures and priorities. Preparation of the plan would include tasks described in the General Plan EIR.
- **Policy OS 9.1:** Promote restoration and establish permanent mechanisms to protect wetlands and riparian corridors.
- **Policy OS 9.2:** Manage all seasonal creeks and other drainage courses so as to protect and enhance the Suisun Marsh. (See Policy PF 8.4 A)
- **Policy OS 9.4:** Allow no development on the east side of I-680 between Parish Road and the Cordelia historic area.

- **Policy OS 9.6:** Continue to endorse the integrity of the Suisun Marsh Secondary Management Zone.

Rio Vista

- **Policy 9.2.C:** Opportunities for preservation and maintenance of open space resources shall be maximized, including the establishment of private open space areas and coordination with private and public organizations.
- **Policy 9.4.A:** The City shall provide open space protection for areas of natural resource and scenic value, including wetlands, riparian corridors, floodplains, woodlands, and hillsides.
- **Policy 10.1.B:** The City shall require that new development be designed and constructed to preserve the following types of areas and features as open space to the maximum extent feasible:
 - High erosion hazard areas
 - Scenic and trail corridors
 - Streams and riparian vegetation
 - Wetlands
 - Drainage corridors
 - Other significant stands of vegetation
 - Wildlife corridors
 - Key hilltops
 - Views of the Sacramento River
 - Any areas of federal, state or local significance
 - Sensitive Local Resource Areas shown in Figure 10-2
- **Policy 10.1.E:** The City shall require that significant natural habitat areas be identified in advance of development and incorporated into site-specific development project design.
- **Policy 10.1.F:** The City shall ensure that development constructs linkages between natural habitat preservation areas.
- **Policy 10.1.G:** The City shall ensure that development identifies alternative sites for linkages where sensitive habitat areas may be adversely affected.
- **Policy 10.4.A:** The City shall require that development projects be designed to protect and enhance the area's biological resources to the greatest extent feasible.
- **Policy 10.4.D:** The City shall require new development to mitigate wetland loss in both regulated and non-regulated wetlands to achieve "no net loss" through any combination of the following, in descending order of their desirability:
- **Policy 10.4.E:** The City shall require new private or public developments to preserve and enhance existing native riparian habitat, unless public safety

concerns require removal of habitat for flood control or other public purposes.

- **Policy 10.5.A:** The City shall preserve Sensitive Local Resource Areas (SLRAs) to the greatest extent possible.
- **Policy 10.5.C:** The City shall review individual projects to determine the setback requirements that will adequately buffer natural drainage corridors from development.
- **Policy 10.5.E:** The City shall ensure that natural drainage corridors and other watercourses are protected from the adverse effects of construction activities and urban runoff.
- **Policy 10.5.F:** The City shall require proposed development projects that would encroach into natural drainage corridors to implement one or more of the following measures, in descending order of their desirability:
 - Avoid disturbance of the drainage corridor.
 - Replace any riparian vegetation (onsite, in-kind).
 - Restore another section of drainage corridor (in-kind).
 - Pay a mitigation fee for restoration elsewhere in the City.
 - Implement other mitigation as appropriate.
- **Policy 10.5.G:** The City shall require dedication of lands in the 100-year floodplain to protect sensitive wildlife or vegetation.
- **Policy 10.5.H:** The City shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of drainageways and damage to riparian habitat.
- **Policy 10.6.D:** The City shall ensure that existing trees and vegetation are retained and incorporated into the project design wherever feasible.
- **Policy 10.11.C:** The City shall encourage new development to use natural vegetation in buffer areas (if required) between the development and adjacent farmland

Suisun City

- **Policy 7:** Use and Protection of the Suisun Marsh: Land within the Primary Management area prescribed by the Suisun Marsh Protection Plan will be preserved as open space for appropriate agricultural and wildlife habitat and limited outdoor recreation use compatible with the objectives of the Suisun Marsh Protection plan. Other use of the Primary Management Area will be limited to constructing any roads or bicycle and pedestrian paths, required for access to the marsh for the above uses, to publicly and privately sponsored recreation activities which are compatible with the marsh environment, and the transportation and utility corridors along the south side of Highway 12. Such access must be in conformity to the Marsh Protection Plan policies on utilities, facilities and transportation.

- **Policy 9:** Protection of Watercourses and Floodways: Natural watercourses and drainage channels shall be protected and preserved to the extent possible; runoff from urban development and upland watershed areas will be contained by channels and reservoirs to control debris, sediment, and the rate and dispersal of run-off.
- **Policy 10:** Habitat Protection: Fish and wildlife habitats along the Suisun Slough, tributary water courses, and Pierce island will be preserved according to the standards of the Downtown/Waterfront Specific Plan. The specific Plan will ensure that land uses are set back an appropriate distance from watercourses and riparian habitats to ensure adequate flood control, water quality preservation, and wildlife protection. The intensity of development adjacent to sensitive environmental habitats will be controlled to assure the preservation of these habitats.
- **Policy 13:** Preservation of Natural Features: The City will require developments containing environmentally significant features (waterways, riparian habitats, stands of mature trees, etc.) to preserve and incorporate those features into the development. The types and significance of resources present and the degree of preservation that is feasible shall be reviewed and determined on a case-by-case basis, through the development review process (See Community Character Policy 23, Chapter II).

Vacaville

- **Policy 8.1-G 1:** Preserve and enhance Vacaville's creeks for their value in providing visual amenity, drainage, and wildlife habitat.
- **Policy 8.1-G 4:** Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson and Ulatis Creek watersheds.
- **Policy 8.1-I 2:** Continue to impose creek setback standards on new development.
- **Policy 8.1-I 3:** Discourage culverting of creeks of significance to the City.
- **Policy 8.1-I 4:** Develop standards requiring protection of creekways during construction, and restoration of creekways after construction.
- **Policy 8.1-I 5:** Protect existing stream channels by requiring buffering or landscaped setbacks and storm runoff interception.
- **Policy 8.2-G 1:** Protect natural environments in recognition of their importance as wildlife habitats and visual amenities.
- **Policy 8.2-G 2:** Manage open space in a manner consistent with wildlife protection.
- **Policy 8.2-I 1:** Require preservation or, where preservation is not possible, replacement of riparian vegetation. Resource protection regulation should address conservation of riparian vegetation.
- **Policy 8.2-I 2:** Minimize removal of woodland habitat.
- **Policy 8.2-I 3:** Provide wildlife corridors, where feasible, to enable free movement of animals and minimize wildlife-urban conflicts.

- **Policy 8.2-I 4:** Continue to implement the City's existing regulations which protect mature trees and existing natural non-agricultural trees.
- **Policy 8.2-I 6:** Identify areas of wetlands at the earliest possible stage of development application processing. Policies to protect and preserve wetland habitats shall be contained in the Resource Management section of applicable Policy Plans.

Vallejo

- **Water Resources Goal:** To protect the city's water resources against pollution and wasteful use so that it will be available for the city's future needs.
- **Policy 1:** Retain major drainage swales, particularly those indicated as blue line streams on U.S. Geological Survey Maps.
- **Fish and Wildlife Resources Goal:** To protect valuable fish and wildlife habitats.
- **Policy 1:** Cluster units so that more open space areas are left in a natural state.
- **Policy 2:** Landscape parks, water tank sites, creek channels, and other infrastructure with vegetation associated with the area to mitigate destroyed habitat area.
- **Policy 4:** Protect valuable or unique fish and wildlife habitats through control of coastline development, upgrading of effluent levels and requiring use permits for all development along the critical areas of the Napa Marsh lands.

Native and Heritage Tree Ordinances

Some of the cities in the county have, or will have in the future, native or heritage tree ordinances to protect large or native trees. Most ordinances or policies require the project applicant to obtain a tree removal permit and compensate for the removal of protected trees. Compensatory mitigation for native or heritage trees would be determined as part of the environmental analysis and permit process for individual projects proposed in the CTEP.

Habitat Conservation Plans

SCWA; the Cities of Fairfield, Suisun City, Vacaville, and Vallejo; and two irrigation districts are required to participate in the preparation of a joint HCP as a condition of water delivery to SCWA by the U.S. Bureau of Reclamation. The HCP is in the early stages of preparation. HCPs provide a mechanism for conserving habitat for federally listed threatened, endangered, and proposed species while allowing specified levels of take as defined under a Section 10(a) incidental take permit. Identification of covered species, covered projects, quantification of effects, and development of conservation measures are in

progress. The HCP participants also intend to prepare an NCCP to address CESA compliance. The communities to be covered under the NCCP have not been finalized. The CTEP projects are not covered under the HCP and NCCP, but the conservation strategies in the HCP and NCCP would serve as a template for designing mitigation requirements for the CTEP projects.

Because the HCP and NCCP are likely to be adopted in the future, their existence and applicability to future projects in the county must be determined during environmental analysis for individual CTEP projects. This information would be obtained through contacts with city and county offices, and state and federal resource agencies. Specifications or guidelines described in a relevant HCP or NCCP would be applied to appropriate projects. This analysis assumes that mitigation measures proposed in this EIR for the HCP-covered species and NCCP-covered communities are consistent but could be superseded by the HCP and NCCP conservation measures once the HCP and NCCP are completed and approved by the agencies.

Impacts and Mitigation Measures

Methods and Assumptions for the Impact Analysis

The biological resources impact analysis is qualitative; it is not based on site-specific information for most of the impact area. The mitigation measures described for potential impacts on sensitive biological resources have not been developed through formal consultation or coordination with resource agencies (e.g., DFG, USFWS, NMFS, and the Corps). As part of subsequent, project-level environmental analysis, agencies would need to be contacted to determine specific compensatory mitigation for impacts on wetlands, federally and state-listed species, and riparian habitats. Additional mitigation measures may also be identified as conditions of project permits (e.g., a Section 404 permit or a streambed alteration agreement).

This impact analysis assumes that biological resources could be affected directly or indirectly by construction and maintenance activities associated with projects proposed in the CTEP. Disturbance could be caused by the following activities:

- stream dewatering or installation of temporary water-diversion structures;
- loss of habitat associated with widening roadways and bikeways;
- constructing new transportation facilities or implementing interchange, rail, bikeway, and aviation improvements;
- temporary stockpiling of soil or construction materials, and sidecasting of soil and other construction wastes;
- removal of riparian vegetation along waterways during construction of bridges;

- removal of vegetation during construction of temporary staging areas and access roads;
- soil compaction and generation of dust by construction equipment,
- water runoff from the construction area;
- herbicide application and removal of vegetation as part of road maintenance; and
- degradation of water quality in wetlands and waterways resulting from road runoff that contains petroleum products.

Criteria for Determining Significance

The State CEQA Guidelines and professional judgement were used to determine whether the proposed CTEP would have a significant environmental effect on biological resources.

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

- have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by DFG or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by DFG or USFWS;
- have a substantial adverse effect on federally protected wetlands as defined by CWA Section 404 (including, but not limited to, marsh, vernal pool, and coastal areas) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state habitat conservation plan;
- result in long-term degradation of a sensitive plant community because of substantial alteration of land form or site conditions (e.g., alteration of wetland hydrology);
- result in substantial disturbance or loss of a native plant community and associated wildlife habitat;
- result in introduction of new noxious weed species or the spread of noxious weed species in the project area;

- result in fragmentation or isolation of wildlife habitats, especially riparian and wetland communities;
- result in substantial disturbance of wildlife resulting from human activities;
- result in avoidance by fish of biologically important habitat for substantial periods, which may increase mortality or reduce reproductive success; or
- result in direct mortality of fish because of degradation of water quality and riparian habitat.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

The impact discussion is organized according to the following categories:

- countywide priority projects;
- Local Improvement—Return to Source Projects; and
- “Potholes”—Return to Source Projects

Impacts Related to Countywide Priority Projects

Impact BIO-1: No Impact on Biological Resources from Distribution of Operational Subsidies

The allotment of operational subsidies for the following specific projects would not have any direct effects on land use within the project area: senior and disabled transit services, express bus service along I-80/I-680/I-780, Baylink Ferry Service, and local transit improvements. These projects involve using funds to purchase new vehicles, improve existing facilities, cover operation and maintenance costs, and provide extra service hours. These projects would not affect biological resources in Solano County. Therefore, there is no impact and no mitigation is required.

Impact BIO-2: No Impact on Biological Resources from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP would involve conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact BIO-3: Potential Disturbance or Loss of Special-Status Plant Populations Resulting from Transportation Improvement Projects

Construction and maintenance activities associated with several specific projects could result in the direct loss or indirect disturbance of special-status plant species that are known to grow or that could grow in the county (Table 6-2). These projects may include the I-80/I-680/SR 12 interchange, I-80 corridor improvements, construction of new commuter rail facilities, westbound SR 12 widening, SR 113 improvements, construction of bicycle and pedestrian trails, and construction of park-and-ride lots. The I-80 corridor improvements and the I-80/I-680/ SR 12 interchange are expected to have a greater impact on special-status plants than other specific projects given their project areas. Impacts on special-status plant species could result in a substantial reduction in local population size, lowered reproductive success, or habitat fragmentation.

This impact is considered significant because the county cannot guarantee that special-status plant species can be avoided as part of future projects. Implementation of the following mitigation measures would reduce this impact, but not to a less-than-significant level for all projects; the degree of reduction would depend on the plant species (listed versus unlisted) and the extent of impact. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure BIO-1: Document Special-Status Plant Species Populations

As part of the environmental review process for individual projects, the project proponent shall retain a qualified botanist to document the presence or absence of special-status plant species before implementing the project. The following steps shall be taken to document special-status plant species for each project:

1. **Review existing information:** The botanist shall review existing information to develop a list of special-status plant species that could occur in the project area. Sources of information consulted shall include the CNDDDB, previously prepared environmental documents, city and county general plans, materials developed for the SCWA HCP and NCCP, and the CNPS electronic inventory.
2. **Coordinate with agencies:** The botanist shall coordinate with the appropriate agencies (DFG, USFWS, and Caltrans) to discuss botanical resource issues and determine the appropriate level of surveys necessary to document special-status plant species.
3. **Conduct field studies:** The botanist shall evaluate existing habitat conditions for each project and determine what level of botanical survey is required. The type of botanical survey shall depend on species richness, habitat type and quality, and the probability of special-status species occurring in a particular habitat type. Depending on these factors and the proposed construction activity, one or more of the following levels of survey may be required.

- a. **Habitat assessment:** A habitat assessment determines whether suitable habitat is present. This type of assessment can be conducted at any time of year. It is used to assess and characterize habitat conditions and determine whether return surveys are necessary. If no suitable habitat is present, no additional surveys shall be required.
- b. **Species-focused surveys:** Species-focused surveys (or target species surveys) shall be conducted if suitable habitat is present for special-status plant species. The surveys shall focus on special-status plant species that could grow in the region. It would be conducted during a period that the target species are evident and identifiable.
- c. **Floristic protocol-level surveys:** Floristic surveys that follow the CNPS botanical survey guidelines (revised from Nelson 1987; approved by the CNPS board on June 2, 2001; included in California Native Plant Society 2001) shall be conducted in areas that are relatively undisturbed and/or have a moderate to high potential to support special-status plant species. The guidelines require that all species be identified to the level necessary to determine whether they qualify as special-status plant species, or are species with unusual or significant range extensions. The guidelines also require that field surveys be conducted when special-status plant species that could occur in the area are evident and identifiable. To account for different special-status plant identification periods, one or more series of field surveys may be required in spring and summer.

Special-status plant populations identified during the field surveys shall be mapped and documented as part of CEQA, NEPA, and Caltrans NES reports (if required). The project proponent shall implement Mitigation Measure BIO-2 concurrently.

Mitigation Measure BIO-2: Avoid or Minimize Impacts on Special-Status Plant Species Populations by Redesigning the Project, Protecting Populations, and Developing a Transplantation Plan (if Necessary)

The project proponent shall implement the following measures to avoid or minimize impacts on special-status plant species.

1. The project will be redesigned or modified to avoid direct and indirect impacts on special-status plant species, if feasible.
2. Special-status plant species near the project site will be protected by installing environmentally sensitive area fencing (orange construction barrier fencing) around special-status plant species populations. The environmentally sensitive area fencing shall be installed at least 20 feet from the edge of the population where feasible. Where special-status plant populations are located in wetlands, silt fencing shall also be installed. The location of the fencing shall be marked in the field with stakes and flagging and shown on the construction drawings. The construction specifications shall contain clear language that prohibits construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within the fenced environmentally sensitive area.

3. The project proponent will coordinate with the appropriate resource agencies and local experts to determine whether transplantation of special-status plant species is feasible. If the agencies concur that it is a feasible mitigation measure, the botanist shall develop and implement a transplantation plan in coordination with the appropriate agencies. The transplantation plan shall involve identifying a suitable transplant site, moving the plant material and seed bank to the transplant site, collecting seed material and propagating it in a nursery, and monitoring the transplant sites to document recruitment and survival rates.

Impact BIO-4: Potential Introduction or Spread of Noxious Weeds Associated with the Transportation Improvement Projects

Construction activities associated with several specific projects could introduce noxious weeds or result in their spread into currently uninfested areas, possibly resulting in the displacement of special-status plant species and degradation of habitat for special-status wildlife species. These projects may include the I-80/I-680/SR 12 interchange, I-80 corridor improvements, construction of new commuter rail facilities, westbound SR 12 widening, SR 113 improvements, construction of bicycle and pedestrian trails, and construction of park-and-ride lots. Plants or seeds may be dispersed via construction equipment if appropriate measures are not implemented.

This impact is considered significant because the introduction or spread of noxious weeds could result in a substantial reduction or elimination of species diversity or abundance. Implementation of Mitigation Measures BIO-3 and BIO-4 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-3: Conduct a Noxious Weed Survey and Document Noxious Weed Infestation

As part of project-level environmental review, the project proponent shall retain a qualified botanist to address noxious weed impacts. The botanist shall determine whether noxious weeds are an issue for the project and whether they could displace native plants and natural habitats, affect the quality of forage on rangeland, or affect cropland productivity. If the botanist determines that noxious weeds are an issue, the project proponent shall review the county agricultural commission's noxious weed list, CDFA's lists of noxious weeds, and the California Exotic Pest Plant Council's list of pest plants of ecological concern. These lists shall be used to identify weeds that will be targeted during field surveys by the botanist. Surveys shall focus on target weed species that are considered locally important for documentation and control purposes.

If noxious weed infestations are located during the field surveys, they shall be mapped and documented as part of CEQA, NEPA, and Caltrans NES reports (if required). The project proponent shall implement Mitigation Measure BIO-4 concurrently.

Mitigation Measure BIO-4: Avoid or Minimize the Dispersal of Noxious Weeds Into Uninfested Areas

To avoid or minimize the introduction or spread of noxious weeds into uninfested areas, the project proponent shall incorporate the following measures into highway project plans and specifications.

- Certified, weed-free, imported erosion-control materials (or rice straw in upland areas) will be used.
- The project proponent will coordinate with the county agricultural commissioner and land management agencies to ensure that the appropriate best management practices (BMPs) are implemented.
- Construction supervisors and managers will be educated about noxious weed identification and the importance of controlling and preventing their spread.
- Equipment will be cleaned at designated wash stations after leaving noxious weed infestation areas.

Impact BIO-5: Loss or Disturbance of Riparian Habitats Associated With Transportation Improvement Projects

Construction activities associated with several proposed roadway and rail transit projects could result in the disturbance or removal of riparian habitat along project area streams, including Putah, Dudley, Ulatis, Alamo, Laguna, Green Valley, Ledgewood, Suisun Creeks. These projects may include the I-80/I-680/SR 12 interchange, I-80 corridor improvements, construction of new commuter rail facilities, westbound SR 12 widening, SR 113 improvements, construction of bicycle and pedestrian trails, and construction of park-and-ride lots. Project-related improvements could result in long-term degradation of sensitive plant communities, fragmentation or isolation of an important wildlife habitat, or disruption of natural wildlife movement corridors or important rearing habitat for juvenile chinook salmon and steelhead.

This impact is considered significant. Depending on the type of riparian habitat and extent of impact, implementation of Mitigation Measures BIO-5–BIO-7 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-5: Identify and Document Riparian Habitat

The project proponent shall retain a qualified botanist to document the location, type, extent, and habitat functions and values for riparian habitat that occurs in the highway study area. This information shall be mapped and documented as part of CEQA, NEPA and Caltrans NES reports (if required). Mitigation Measure BIO-6 and BIO-7 shall be implemented concurrently.

Mitigation Measure BIO-6: Avoid or Minimize Disturbance of Riparian Habitats

To the extent possible, the project proponent shall avoid impacts on riparian habitats by implementing the following measures.

- The project will be redesigned or modified to avoid direct and indirect impacts on riparian habitats, if feasible.
- Riparian habitats that occur near the project site will be protected by installing environmentally sensitive area fencing at least 20 feet from the edge of the riparian vegetation where feasible. Depending on site-specific conditions, this buffer may be narrower or wider than 20 feet to protect the area from erosion. The location of the fencing shall be marked in the field with stakes and flagging and shown on the construction drawings. The construction specifications shall contain clear language stating that construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities are prohibited within the fenced environmentally sensitive area.
- The potential for long-term loss of riparian vegetation will be minimized by trimming vegetation rather than removing the entire shrub where feasible. Shrub vegetation shall be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting shall be limited to a minimum area necessary within the construction zone. This type of removal shall be allowed only for shrub species (all trees shall be avoided) in areas that do not provide habitat for sensitive species (e.g., yellow-breasted chat and valley elderberry longhorn beetle). To protect migratory birds, no removal of woody riparian vegetation shall be allowed between March 15 and September 15, as required under the MBTA.

Mitigation Measure BIO-7: Compensate for the Loss of Riparian Habitat

If riparian habitat is removed as part of the transportation improvement projects, the project proponent shall compensate for the loss of riparian vegetation to ensure no net loss of habitat functions and values. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (including DFG, USFWS, NMFS, and the Corps). Compensation shall be provided at a minimum ratio of 1 acre restored or created for every 1 acre removed. Compensation may comprise restoration/creation, off-site restoration, or mitigation credits (or a combination of these elements). The project proponent shall develop and implement a restoration and monitoring plan that describes how riparian habitat shall be enhanced or recreated, then monitored over a minimum period of time, as determined by the appropriate state and federal agencies.

Impact BIO-6: Disturbance or Loss of Waters of the United States, Including Wetlands, Associated with Transportation Improvement Projects

Construction activities associated with several specific projects, including the I-80 corridor improvements and the I-80/I-680/SR 12 reconfiguration, could result in the disturbance or loss of waters of the United States, including the creeks listed under Impact BIO-3; Laurel, Union, McCoy, and Denverton, Ledgewood, and Suisun Creeks; unnamed streams; vernal pools; tidal salt

marshes; freshwater marshes; and other types of seasonal and perennial wetland communities. Wetlands and other waters of the United States could be affected through direct removal, filling, hydrological interruption (including dewatering), alteration of bed and bank, and other construction-related activities.

This impact is considered significant because it could result in long-term degradation of a sensitive plant community, fragmentation or isolation of an important wildlife habitat, and disruption of natural wildlife movement corridors. This impact could also result in a loss of fish habitat for spawning and/or rearing. The extent of project-level impacts and types of affected communities have not been determined. Implementation of Mitigation Measures BIO-8–BIO-10 would reduce this impact, but not necessarily to a less-than-significant level for all specific projects. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure BIO-8: Identify and Delineate Waters of the United States, Including Wetlands

As part of project-level environmental review, the project proponent shall retain a botanist to identify areas that could qualify as waters of the United States, including wetlands. Wetlands shall be identified using both the Corps and USFWS/DFG definitions of wetlands. Corps jurisdictional wetlands shall be delineated using the methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The jurisdictional boundary for other waters of the United States shall be identified based on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding area (33 CFR 328.3[e]).

This information shall be mapped and documented as part of CEQA, NEPA, Caltrans NES (if required), and wetland delineation reports. For projects within the Corps' Sacramento District, delineation reports shall include all information to meet the revised minimum standards. Mitigation Measure BIO-9 shall be implemented concurrently.

Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities

To the extent possible, the project proponent shall avoid or minimize impacts on wetlands and other waters of the United States (creeks, streams, and rivers) by implementing the following measures.

- The project shall be redesigned or modified to avoid direct and indirect impacts on wetland habitats, if feasible.
- Wetland habitats that occur near the project site will be protected by installing environmentally sensitive area fencing at least 20 feet from the edge of the wetland. Depending on site-specific conditions and permit requirements, this buffer may be wider than 20 feet to prevent erosion and sedimentation impacts on wetland habitats (e.g., 250 feet for seasonal

wetlands that are considered special-status shrimp habitat). The location of the fencing shall be marked in the field with stakes and flagging and shown on the construction drawings. The construction specifications shall contain clear language stating that construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities are prohibited within the fenced environmentally sensitive area.

- Installation activities shall be avoided in saturated or ponded wetlands during the wet season (spring and winter) to the maximum extent possible. Where such activities are unavoidable, protective practices, such as use of padding or vehicles with balloon tires, shall be used.
- Where determined necessary by resource specialists, geotextile cushions and other materials (e.g., timber pads, prefabricated equipment pads, or geotextile fabric) shall be used in saturated conditions to minimize damage to the substrate and vegetation.
- Exposed slopes and streambanks shall be stabilized immediately on completion of installation activities. Other waters of the United States shall be restored in a manner that encourages vegetation to reestablish to its preproject condition and reduces the effects of erosion on the drainage system.
- In highly erodible stream systems, banks shall be stabilized using a nonvegetative material that binds the soil initially and breaks down within a few years. If the project engineers determine that more aggressive erosion control treatments are needed, geotextile mats, excelsior blankets, or other soil stabilization products will be used.
- During construction, trees, shrubs, debris, or soils that are inadvertently deposited below the ordinary high-water mark of drainages in a manner that minimizes disturbance of the drainage bed and bank will be removed.

These measures shall be incorporated into contract specifications and implemented by the construction contractor. In addition, the project proponent shall ensure that the contractor incorporates all permit conditions into construction specifications.

Mitigation Measure BIO-10: Compensate for the Loss of Wetland Habitat

If wetlands are filled or disturbed as part of the specific project, the project proponent shall compensate for the loss of wetland habitat to ensure no net loss of habitat functions and values. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies (including DFG, USFWS, and the Corps). The compensation shall be at a minimum ratio of 1 acre restored or created for every 1 acre filled.

Compensation may comprise onsite restoration/creation, off-site restoration, or mitigation credits (or a combination of these elements). The project proponent will develop and implement a restoration and monitoring plan that describes how wetlands shall be created and monitored over a minimum period of time.

Impact BIO-7: Potential Disturbance or Loss of Special-Status Wildlife Species and Their Habitat Associated with Transportation Improvement Projects

Construction and maintenance activities associated with the proposed transportation improvement projects could result in the direct loss or indirect disturbance of special-status wildlife species or their habitats that are known to occur, or have potential to occur, in the county (Table 6-3). Impacts on special-status wildlife species or their habitat could result in a substantial reduction in local population size, lowered reproductive success, or habitat fragmentation. Significant impacts on special-status wildlife species associated with transportation improvement projects include, but are not limited to:

- direct mortality from the collapse of underground burrows, resulting from soil compaction;
- direct mortality resulting from the movement of equipment and vehicles through the project area;
- increased mortality caused by higher numbers of automobiles on new or widened roads in migration corridors;
- loss of breeding and foraging habitat resulting from the filling of seasonal or perennial wetlands;
- loss of breeding, foraging, and refuge habitat resulting from the permanent removal of riparian vegetation;
- loss of suitable habitat for vernal pool invertebrates resulting from the destruction or degradation of vernal pools or seasonal wetlands;
- direct mortality or loss of suitable habitat resulting from the trimming or removal of obligate host plants;
- abandoned eggs or young and subsequent nest failure for special-status nesting birds, including raptors, resulting from construction-related noises;
- loss of suitable foraging habitat for special-status raptor species; and
- loss of migration corridors resulting from the construction of permanent building structures or features.

This impact is considered significant because Solano County cannot guarantee that special-status wildlife species can be avoided. Implementation of the following mitigation measures would reduce this impact, but not necessarily to a less-than-significant level for all projects; the degree of reduction would depend on the wildlife species (listed versus unlisted) and the extent of impact. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure BIO-11: Document Special-Status Wildlife Species and Their Habitats

As part of project-level environmental review, the project proponent shall retain a qualified wildlife biologist to document the presence or absence of suitable habitat for special-status wildlife species in the project area. The following steps

shall be implemented to document special-status wildlife species and their habitats for each project.

1. **Review existing information:** The wildlife biologist shall review existing information to develop a list of special-status wildlife species that could occur in the project area. Sources of information would include the USFWS special-status species list and designated critical habitat for the project region, the CNDDDB, previously prepared environmental documents, city and county general plans, applicable HCPs and NCCPs, and USFWS-issued biological opinions and programmatic agreements for previous projects.
2. **Coordinate with state and federal agencies:** The wildlife biologist shall coordinate with the appropriate agencies (including DFG, USFWS, and Caltrans) to discuss wildlife resource issues in the project region and determine the appropriate level of surveys necessary to document special-status wildlife species and their habitats.
3. **Conduct field studies:** The wildlife biologist shall evaluate existing habitat conditions and determine what level of biological survey is required. The type of survey required shall depend on species richness, habitat type and quality, and the probability of special-status species occurring in a particular habitat type. Depending on the existing conditions in the project area and the proposed construction activity, one or more the following levels of survey may be required:
 - a. **Habitat assessment:** A habitat assessment determines whether suitable habitat is present. This type of assessment can be conducted at any time of year. It is used to assess and characterize habitat conditions and to determine whether return surveys are necessary. If no suitable habitat is present, no additional surveys shall be required.
 - b. **Species-focused surveys:** Species-focused surveys (or target species surveys) shall be conducted if suitable habitat is present for special-status wildlife species and if it is necessary to determine whether the species is present in the project area. The surveys shall focus on special-status wildlife species that have the potential to occur in the region. The surveys shall be conducted during a period when the target species are present or active.
 - c. **Protocol-level wildlife surveys:** The project proponent shall comply with protocols and guidelines issued by responsible agencies for certain special-status species. USFWS and DFG have issued survey protocols and guidelines for several special-status wildlife species that could occur in the project region, including valley elderberry longhorn beetle, vernal pool branchiopods, California red-legged frog, California tiger salamander, western burrowing owl, and California clapper rail. The protocols and guidelines may require that surveys be conducted during a particular time of year and/or time of day when the species is present and active. Many survey protocols require that only a USFWS- or DFG-approved biologist perform the surveys. The project proponent shall

coordinate with the appropriate state or federal agency biologist before initiating protocol-level surveys to ensure that the survey results will be valid. Because some species can be difficult to detect or observe, multiple field techniques may be used during a survey period, and additional surveys may be required in subsequent seasons or years, as outlined in the protocol or guidelines for each species.

Special-status wildlife or suitable habitat identified during the field surveys shall be mapped and documented as part of CEQA, NEPA, and Caltrans NES reports (if required). The project proponent shall implement a combination of the following mitigation measures to avoid or minimize significant impacts on special-status wildlife species.

Mitigation Measure BIO-12: Avoid or Minimize Impacts on Special-Status Wildlife Species by Redesigning the Project, Protecting Special-Status Wildlife Habitat, and Developing a Mitigation Monitoring Plan (if Necessary)

This mitigation measure focuses on avoiding or minimizing all direct and indirect impacts on special-status wildlife species and their habitats. The project proponent shall implement the following measures.

- The project will be redesigned or modified to avoid direct and indirect impacts on special-status wildlife species or their habitats, if feasible.
- Special-status wildlife species and their habitat near the project site will be protected by installing environmentally sensitive area fencing around habitat features, such as seasonal wetlands, burrows, and nest trees. The environmentally sensitive area fencing or staking shall be installed at a minimum distance from the edge of the resource as determined through coordination with state and federal agency biologists (DFG and USFWS). The location of the fencing shall be marked in the field with stakes and flagging and shown on the construction drawings. The construction specifications shall contain clear language stating that construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities are prohibited within the fenced environmentally sensitive area.
- Construction-related activities will be restricted to the nonbreeding seasons of special-status wildlife species that could occur in the project area where feasible. Timing restrictions may vary depending on the species and could occur during any time of the year.
- The project proponent will coordinate with the appropriate resource agencies to determine whether a monitoring plan for special-status wildlife species is necessary as part of all highway projects. If a monitoring plan is required, it shall be developed and implemented in coordination with appropriate agencies and shall include:
 - a description of each of the wildlife species and of suitable habitat for species that could occur at the project site,

- ❑ the locations of known occurrences of special-status wildlife species within the project site,
- ❑ the location and size of no-disturbance zones in and adjacent to environmentally sensitive areas for wildlife,
- ❑ directions on handling and relocating special-status wildlife species found on the project site that are in immediate danger of being destroyed, and
- ❑ notification and reporting requirements for special-status species that are identified on the project site.

Mitigation Measure BIO-13: Coordinate with Resource Agencies and Develop Appropriate Compensation Plans for State- and Federally Listed Wildlife Species

If construction activities would result in significant impacts on federally or state-listed wildlife species after the implementation of the above mitigation measure, either a compensation plan shall be developed in coordination with the appropriate resource agency, or agency-approved compensation guidelines shall be followed to reduce the impact to a less-than-significant level. Compensation guidelines have been identified for several special-status wildlife species, including valley elderberry longhorn beetle, vernal pool branchiopods, giant garter snake, Swainson's hawk, and burrowing owl. The amount of compensation shall vary depending on the amount and quality of habitat loss or degree of habitat disturbance anticipated. The compensation plan shall be developed and implemented in coordination with the appropriate state or federal agency and would involve identifying an agency-approved mitigation bank or site (on- or off-site); transplanting (elderberry shrubs), recreating (burrows and vernal pools), and/or preserving additional habitat for special-status wildlife species; monitoring the mitigation site; and funding the management of the mitigation site.

Mitigation Measure BIO-6: Avoid or Minimize Disturbance of Riparian Habitats

Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetlands

Impact BIO-8: Potential Disturbance and Loss of Common Wildlife Species Associated With Transportation Improvement Projects

Construction activities related to several proposed transportation improvement projects could temporarily disturb habitat for many common wildlife species within the project area. These projects may include the I-80/I-680/SR 12 interchange, I-80 corridor improvements, construction of new commuter rail facilities, westbound SR 12 widening, SR 113 improvements, construction of bicycle and pedestrian trails, and construction of park-and-ride lots. Also, some habitat for common wildlife species would be removed because of increasing the

paved surface, but the amount would be small relative to the amount of habitat available to these common species in the project region. In addition to habitat loss, many species would move away from project sites to nearby habitat areas. Inevitably, some individuals would be lost as a result construction activities. However, this loss of individual animals would not result in a significant impact on common wildlife species because it would not lead to a substantial reduction or elimination of species diversity or abundance in the project region. This impact is considered less than significant. No mitigation is required.

Impact BIO-9: Potential Direct and Indirect Impacts on Special-Status Fish Species Associated With Transportation Improvement Projects

Several proposed transportation improvements projects, including the I-80 corridor improvements and the I-80/I-680/SR 12 interchange reconfiguration, could have impacts on special-status fish species. Impacts on aquatic systems could result from an increase in sediment and/or contaminant input, diversion of water flow, and removal of riparian vegetation. Construction activities adjacent to waterways could disturb soils and cause sediment to be transported into and through the channel, which would result in temporary increases in turbidity and sedimentation downstream of construction sites. Periods of localized, high suspended sediment concentrations and turbidity owing to channel disturbance can result in a reduction of feeding opportunities for sight-feeding fish and clogging and abrasion of gill filaments. Increased sediment loading can degrade food-producing habitat downstream of project areas. Finally, sediment can interfere with photosynthesis of aquatic flora and result in the displacement of aquatic fauna.

Fuel and concrete could spill into the waterway during construction. Various contaminants, such as fuel oils, grease, and other petroleum products used in construction activities, could be introduced into the system either directly or through surface runoff. Contaminants may be lethal or sublethally toxic to fish and other aquatic organisms, or may change the rate at which oxygen is diffused; as a result, they may reduce the survival and growth rates of aquatic species.

In-water construction often requires the alteration of stream flow, either through a culvert of a constructed channel or through part of the original channel. This can result in increased water velocities surrounding the project site. Water velocities that are too high can prevent or substantially reduce fish movement.

Removal of riparian vegetation could weaken the streambank by loosening the soil, thus increasing the bank's susceptibility to erosion. Alteration of fish habitat would occur if the channel bed and banks were disturbed (e.g., if riprap were placed there) or if sites that have been disturbed mechanically were further disturbed by high-flow events before they are stabilized. Riparian vegetation provides cover for juvenile rearing, shade to reduce temperatures, and food input (i.e., terrestrial invertebrates), and is considered a very valuable component of fish habitat. The removal of woody riparian vegetation may affect fish directly

by removing habitat. Fish use complex woody debris structure to avoid predators and conceal themselves from prey. Woody debris in the waterway reduces water velocity, providing resting habitat as well.

This impact is considered significant because project activities could result in avoidance by fish of biologically important habitat for substantial periods. Avoidance of important habitat may increase mortality, reduce reproductive success, or substantially reduce local population size. Implementation of the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-14: Assess and Document Habitat for Special-Status Fish Species

As part of project-level environmental review, the project proponent shall retain a qualified fisheries biologist to locate and identify streams that could support special-status fish habitat. Habitat shall be mapped and documented as part of the CEQA, NEPA, Caltrans NES, and biological assessment reports (if required) that are prepared for the project. The project proponent shall implement Mitigation Measure BIO-15 concurrently.

Mitigation Measure BIO-15: Avoid or Minimize Impacts on Special-Status Fish Species and Their Habitat

The project proponent shall implement the following measures to avoid or minimize impacts on special-status fish and their habitats.

- For each project, a stormwater pollution prevention plan (SWPPP) will be developed and implemented that includes BMPs to minimize the potential for impacts on special-status fish and their habitat. The SWPPP shall include measures to control the transport of sediment to streams, promote the restoration of construction areas to preconstruction conditions, and avoid the potential for spills of hazardous substances. The SWPPP shall include pollution prevention measures (erosion and sediment control measures and measures to control nonstormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion and sediment control standards, identification of responsible parties, a detailed construction timeline, and a BMP monitoring and maintenance schedule. A staging and storage area shall be provided away from the waterway for equipment, construction materials, fuels, lubricants, solvents, and other possible contaminants. The contractor shall conduct periodic maintenance of erosion and sediment control measures. Soil exposure shall be minimized through the use of BMPs, ground cover, and stabilization practices. Exposed dust-producing surfaces shall be sprinkled daily until wet while avoiding the production of runoff. Paved streets shall be swept daily after construction activities.
- The project will be constructed during periods that avoid the sensitive life stages of special-status fish species. Construction activities shall be scheduled so that they do not interfere with the reproductive cycles of fish species. Work in most of the systems shall take place between June 1 and October 15. Construction in this time frame would avoid causing impacts on

the majority of the adult and juvenile migration stages of anadromous species, as well as the larval rearing delta smelt and splittail.

Mitigation Measure BIO-16: Consult with NMFS or USFWS when Listed Fish Species May Be Affected, and Initiate Essential Fish Habitat Consultation with NMFS when Chinook Salmon May Be Affected

Any project affecting the tributaries of the Suisun Marsh, San Pablo Bay, Delta, or Sacramento River in Solano County could affect steelhead, splittail, or delta smelt, or essential fish habitat for chinook salmon. These fish and their habitats are protected under ESA and the Sustainable Fisheries Act of 1996. Therefore, the project proponent shall initiate consultation with NMFS and/or USFWS to obtain from the agency a determination and approval to proceed with the project and associated mitigation measures.

Mitigation Measure BIO-7: Compensate for the Loss of Riparian Habitat

Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities

Impact BIO-10: Conflicts with Local Policies or Ordinances That Protect Biological Resources Resulting From Transportation Improvement Projects

Construction activities associated with transportation improvement improvements could result in conflicts with local policies or ordinances that protect locally significant biological resources, including heritage or native trees. This impact is considered significant. Implementation of Mitigation Measure BIO-17 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-17: Review Local City and County Policies, Ordinances, and Conservation Plans, and Comply with Requirements

As part of project-level environmental review, the project proponent shall ensure that projects comply with general plans, policies, ordinances, and conservation plans (including HCPs; NCCPs; and other local, regional, and state plans). Review of these documents and compliance with their requirements shall be demonstrated in project-level environmental documentation. The project proponent shall ensure that projects comply with all policies, ordinances, and plans that exist at the time of project-level review, regardless of whether they existed during the program-level analysis.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with fast-track congestion relief and safety program would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the countywide priority projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with this category include local road maintenance and rehabilitation, such as repair and maintenance of existing substandard streets. These improvements would not result in significant impacts on biological resources because new facilities would not be constructed and projects would consist of maintenance of existing facilities.

Chapter 7

Cultural Resources

Environmental Setting

Prehistoric Setting

Early archaeological work in the Sacramento Valley, in which Solano County is located, defined three cultural levels: Early, Middle, and Late (Lillard, Heizer and Fenenga 1939). This work produced the first organized chronology of prehistoric cultures in the region: the Delta Sequence (Moratto 1984:180). Subsequent work in the mid-20th century refined the cultural sequences. Beardsley (1954a and 1954b) confirmed the outlines of the Delta Sequence and examined the relationship between Bay Area and interior valley archaeological artifact assemblages. Beardsley's conclusions were challenged by the work of archaeologists Gerow and Force (1968), who identified a culture on the San Francisco Peninsula that appeared, on the surface, to be similar to the Windmill (Early Period) components of the Delta. On closer inspection, the artifact assemblages differed from any known component recognized in the Delta or Bay Area. Based upon these findings, Gerow and Force speculated that separate and distinct cultures characterized the early prehistory of the Bay Area and Sacramento Valley (Gerow and Force 1968:12).

Fredrickson and Bennyhoff (1994:15-24) unified these cultures into a five-part scheme in the late 1960s and early 1970s. Their framework defined three patterns: Windmill, Berkeley, and Augustine, which were previously recognized in the Delta Sequence and Central California Taxonomic System as the Early, Transitional, and Late Periods or Horizons. They also added a fourth pattern: Borax Lake. Although these patterns echoed the chronology established by previous work, Bennyhoff and Fredrickson were cautious in applying the patterns as a clear sequence (Bennyhoff and Fredrickson 1994:18).

Ethnographic Setting

The project area is in the historic territory of the Patwin (Johnson 1978:350, Kroeber 1925:Plate 34). "Patwin" is a Euroamerican name for the speakers of one of the three languages in the Wintuan group, a part of the Penutian language family. Several politically autonomous tribelets in the southwestern part of the

Sacramento Valley are known to have used the word in reference to their respective individual groups (Powers 1877). The approximate area of Patwin territory in the late 18th and early 19th centuries spanned from the town of Princeton in Colusa County south to Suisun Bay, and from the Sacramento River west across the eastern slope of the Coast Ranges (Johnson 1978).

Characteristics of the culture that developed in the Patwin region are known from ethnographic and historic sources that date from the late 18th century to early 20th century. The effects of the Missions San Francisco de Asís, San Jose de Guadalupe, and San Francisco Solano de Sonoma, in combination with the malarial epidemic of 1833 and the smallpox epidemic of 1837, led to a severe decline in Patwin population and the abandonment of significant portions of Patwin territory (Johnson 1978:351–352). Most of the actual ethnographic data from native Patwin informants postdates the cultural upheaval of the earlier period.

The Patwin economy was based on the utilization of natural resources from the riverine corridor, wetlands, and grasslands of the lower Sacramento Valley, and from the open woodlands on the eastern foothills of the Coast Ranges (Johnson 1978; Kroeber 1925, 1932). Fish, shellfish, and waterfowl were important sources of protein and two types of valley oak acorns and a variety of hill and mountain oak were the primary plant resources in the Patwin diet (Johnson 1978:355; Kroeber 1932:277–280).

Historic Setting

Solano County is one of California's original 27 counties and has retained its original boundaries. It was named in honor of a Native American. The county seat was originally in Benicia, but it was moved to Fairfield in 1858.

Fairfield is located on lands that were originally part of the Tolenas and Suisun land grants, the first of five grants in the county confirmed by patents issued by the United States. In 1839, Jose Francisco Armijo petitioned for 3 square leagues of land in Suisun Valley in northern California; he received the grant to Rancho Tolenas from Governor Alvarado the following year. Jose Francisco Armijo's son, Antonia, acquired the title to the 13,315-acre rancho on the elder's death in 1850. In 1858, Captain R.H. Waterman acquired land in the Armijo grant. Shortly after getting title to the land, Waterman offered 16 acres to Solano County for use as a new county seat. The county seat had been located in Benicia at the far edge of the county, but many wanted to move the county administration to a more centralized location. In 1858, Solano County voters accepted Waterman's offer, making the new town of Fairfield (named after Waterman's hometown in Connecticut) the new county seat, where it has remained. (Hunt 1926, Kyle 1990, Wood Alley and Co. 1879.)

Early settlers in Fairfield and the surrounding vicinity cultivated fruits and vegetables on a limited basis and grains on a larger scale. Fruits and vegetables were shipped to the mines in the Sierra Nevada foothills. Dry farm crops, such

as wheat and oats for the raising of cattle, proved to be manageable in the area with limited irrigation. The transport of agricultural goods depended on access to navigable Suisun Slough. Quarries in the area supplied cobblestones to the Fairfield (Wood Alley and Co. 1879). With the arrival of the railroad, most products that had been transported by water were shifted to the railroad (Rawls and Bean 1993). The first railroad to pass through the area, the California Pacific Railroad, bisected Fairfield and Suisun City by 1874. (Hunt 1926.)

After the turn of the 20th century, agriculture dominated the Solano County region (Hunt 1926). Significant changes to the area again occurred as a result of local transportation improvements; the increasing use of bicycles and automobiles in California made development and settlement dependent on the existence of modern roads. Fairfield benefited from its location alongside major transportation routes. The main highway through Solano County was constructed between 1912 and 1914; the Yolo Bypass opened 1 year later, which allowed automobiles to pass over the Yolo Basin during times of flood (Keegan 1989). The passage of the Federal Highways Act in 1921 paved the way for signed interstate arteries maintained by federal funds (Hokanson 1988). U.S. Highway 40, part of which is now Texas Avenue, once traveled through Fairfield.

Cultural Resources Investigation

Previous Archaeological Research

Archaeology in Solano County has produced few reports relative to the richness and significance of the region. Solano County straddles the Delta and the edge of the Central Valley; it is situated between the cultures of the Bay Area and the interior. The region has access to valley, coast range, and delta environments. This location offers a unique opportunity to investigate the interface of the prehistoric cultures of the San Francisco Bay and the state's interior.

Artifacts that have found in Solano County sites include *Saxidomus* (clamshell) and magnesite disk beads, as well as faunal and floral assemblages that suggest a diversification of diet; mollusk, acorn, migratory bird, fish, and mammalian remains were all recovered from Solano County sites. Human occupation dates at sites within Solano County range from 2650 BC–AD 1500, spanning from the Middle Archaic to Lower Emergent Period. Grave goods included bone tube beads, atlatl spurs, unmodified faunal bone, *Olivella* saddle beads, circular *Haliotis* beads, obsidian lanceolate points, and red ochre.

Much of the work in Solano County has focused on two sites: Ca-Sol-320 and Ca-Sol-270 (McGonagle 1964, Thompson 1986). Excavations at Ca-Sol-320 recovered unassociated human bone fragments, Napa Valley obsidian, faunal remains, and *Saxidomus* clamshell disk beads. Ca-Sol-270 (the Cook Site) produced evidence of an earlier occupation spanning the Archaic to Emergent Period, with the strongest presence in the Middle and Upper Archaic. The Cook Site yielded approximately 45 burials. A rich assemblage of grave goods and

nonfunerary artifacts were also recovered, including atlatl spurs, mortar fragments, *Olivella* beads, baked clay cooking balls, and flaked stone.

The combined dates and assemblages from these sites in Solano County demonstrate a strong aboriginal presence from approximately 2,500 years ago into the time of contact with European explorers, with some indication of a much earlier human presence (Moratto 1984).

Records Search

Because of the programmatic nature of this document, formal records searches covering the entire county were not conducted, and Native American Heritage Commission (NAHC) and other interested parties have not been consulted. However, Jones & Stokes archaeologists have conducted project-specific research for three other STA projects within the project area: Jepson Parkway, Vacaville Archaeological Investigation, and the I-80/I-680/SR 12 connector. These projects cover relatively large geographic areas and a variety of landforms, providing an indication of potential sensitivity at areas in which CTEP projects may be implemented.

The records searches were conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University. The NWIC serves as the official state repository of archaeological and historical records and reports for an 18-county region of California.

The records searches were conducted within a 0.25-mile radius of the two projects to identify previous cultural resources investigations and known archaeological and historical resources within and near the project areas. These records searches also allows the archaeologist to assess the level of sensitivity for the presence of cultural resources in the project area based on regional distribution of known sites and environmental settings.

Jepson Parkway

The records search for the Jepson Parkway project encompasses areas on the following Fairfield South, Fairfield North, Denverton, and Elmira USGS 7.5-minute quadrangles. In general terms, the project area includes both sides Peabody Road; Leisure Town Road; portions of Walters Road and Airbase Parkway; Vanden Road; Huntington Road; Cement Hill Road; portions of the SPRR; and portions of SR 12 in Vacaville, Fairfield, and Suisun.

Interstate 80/Interstate 680/State Route 12

A records search for the I-80/I-680/SR 12 project encompassed portions of the Cordelia, Fairfield South, and Fairfield North USGS 7.5-minute quadrangles.

The project area includes either side of I-80 to approximately 0.5 mile west of Red Top Road. All of Red Top Road is included as well as the historic town of Cordelia. The project area extends to the east as far as the City of Fairfield and the southern boundary of the area researched follows the Southern Pacific Railroad.

Identification of Areas of Sensitivity

Based on the records searches, field survey for the Jepson Parkway project, and geography of the area covered by this EIR, it is possible to identify areas of probable archaeological and architectural sensitivity, which are described below. However, in the interest of confidentiality and the protection of archaeological sites, no specific locations are provided at this time.

Archaeological Resources

Areas in which prehistoric archaeological sites are likely present within Solano County include, but are not limited to, areas adjacent or near to year-round or seasonal water courses, valley floors, bases of hills, and some ridge tops with accessible areas with a very moderate slope. Areas in which historic archaeological resources are likely present include, but are not limited to, areas with large, old eucalyptus trees or any other stand or grouping of non native trees that appear old (such as orchards); near railroads; historic farms and ranches; and places on which old structures are indicated on historic maps but are no longer standing.

Peabody Road

The records search for the Jepson Parkway project revealed no previously recorded archaeological sites within the area of potential effects for its proposed alternatives. However, two archaeological sites are located within 0.1 mile of the project area, in the vicinity of Peabody Road. An isolated artifact was recorded just within the project boundaries in the vicinity of Peabody Road, within 0.5 mile of the other archaeological sites. The west side of Peabody Road appears to have moderate sensitivity for the presence of archaeological deposits.

Green Valley

Based on the records search conducted for the I-80/I-680/SR 12 interchange project, the area of Green Valley is a highly sensitive area for the presence of prehistoric archaeological sites. Projects that are located within the vicinity of Green Valley would have a high potential for impacting archaeological resources.

Vacaville

Jones & Stokes performed investigations at CA-Sol-324, a prehistoric archaeological site, to determine its vertical and horizontal boundaries, and to evaluate its eligibility for the National Register of Historic Places (NRHP) in May 2001. This investigation was performed to facilitate compliance with

Section 106 of the National Historic Preservation Act (NHPA), for the City of Vacaville. The archaeological investigation used a backhoe to excavate the deeply stratified alluvial deposits on site. This program of excavation revealed a prehistoric site, in the eastern end of the project area, at a depth of approximately 2.4 meters (about 8 feet) below the existing grade.

Architectural and Historic Resources

Concentrations of historic resources in the planning area are expected to occur adjacent to transportation corridors (historic highways, railroads, navigable sloughs); on historic ranches; in areas of historic rock, soil, and mineral extraction; and within historic neighborhoods and business districts.

The Historic Property Data File, which is maintained by the California Office of Historic Preservation, identifies properties that have been recorded and whether those properties are considered eligible or ineligible for listing in the NRHP. The listing for Solano County contains several hundred properties that are listed or appear to meet the criteria for listing in the NRHP. The distribution of these properties by city is discussed briefly below.

Benicia

More than 40 buildings in the Benicia area are listed in or appear to meet the criteria for listing in the NRHP. The rich architectural history of the city includes the courthouse that served as the State Capitol building from 1853–1854 and the Benicia Arsenal Historic District, which was established in 1849. California State Historical Landmarks in Benicia include the Benicia Arsenal Historic District, the State Capitol building, the first Masonic Lodge in California, the site of the first Protestant church in the state, the Benicia Seminary, the Fischer-Hanlon House, and the Turner/Robertson Shipyard.

Dixon

The Stevenson Bridge on Stevenson Bridge Road is the only resource in the vicinity of Dixon that has been determined to meet the criteria for listing in the NRHP. The Carnegie Library and several residences appear to meet the criteria. Other properties, mostly residences dating to the late 19th and early 20th centuries may be determined eligible with further study.

Fairfield

A few buildings in Fairfield are listed or appear eligible for listing in the NRHP and California Register of Historic Resources (CRHR), including the Broadway Building (built in the 1800s and located on Broadway), the Goosen Mansion (built in 1910 and located on Empire Street), a building at Travis AFB built in 1955, and the Denverton Overhead Bridge on SR 12.

Cordelia, in southern Fairfield, has 33 properties that could be eligible for listing on the NRHP and CRHR. These properties are homes that were built between 1870 and 1930 in the Old Cordelia area along Bridgeport Avenue, Cordelia Road, Red Rock Road, or Ritchie Road.

Rio Vista

A bridge identified as Bridge 23-24 on SR 84 is the only property in the vicinity of Rio Vista that is listed as “may become eligible” for listing in the NRHP. Several other buildings have been recorded and evaluated, but none appear to meet the eligibility criteria.

Suisun City

Fourteen properties in the Suisun City area have been determined to meet the criteria for listing in the NRHP. The properties comprise residences, fire houses, and store buildings dating from the 1860s–1917. Two properties in Suisun City—Masonic Lodge 55 (1868) and the Samuel Martin House (1861)—are listed in the NRHP.

Vacaville

The historic core of Vacaville has more than 24 residential and commercial buildings that appear to meet the criteria for listing in the NRHP or may become eligible for listing with further study. Two properties in the city are listed in the NRHP: the Frank H. Buck house (1892) and the old Town Hall (1907). In addition, the Vaca-Pena Adobe, a California State Historical Landmark, is located near Vacaville.

Vallejo

The Vallejo area includes the densest population of buildings and structures that have been listed in or appear to meet the criteria for listing in the NRHP. In the historic core of Vallejo, there are well over 100 residences and other building that have been listed in the NRHP, at least 100 buildings and structures that appear to meet the criteria for listing, and several that may become eligible for listing. The site of the State Capitol, which was located in Vallejo from 1851–1853, is designated a California Historical Landmark. The area also includes the Mare Island Historic District, which includes more than 500 contributing features that date from 1854 to the Cold War era. In 1974, George R. Adams, Managing Editor of the American Association for State and Local History prepared a survey of historic sites on Mare Island. This survey resulted in Mare Island being declared a National Historic Landmark (NHL) (“Mare Island Naval Shipyard”) with 52 buildings and sites. The original NHL consisted of four discrete historic districts or areas with tightly drawn boundaries that included only the oldest and most significant buildings and sites on the island. In 1996, as part of the Department of Defense’s Base Realignment and Closure program, the entire island was resurveyed and a NRHP nomination was prepared. The 1996 NRHP nomination essentially expanded the boundary of the discontinuous NHL districts to create one contiguous district that took into account the very important World War II and Cold War features overlooked by Caldwell.

Regulatory Setting

State Regulations

In addition to CEQA, other state laws governing cultural resources include California Public Resources Code Section 5097.9 et seq. (Native American heritage) and California Health and Human Safety Code Section 7050.5 et seq. (human remains). If federal funds or permits are required for a project, it may also be necessary to comply with NHPA Section 106.

Records about Native American graves, cemeteries, and sacred places, as well as information about the location of archaeological sites, are exempt from being disclosed to the public under California's equivalent of the Freedom of Information Act (also known as "Sunshine Laws") (California Government Code Section 6254.10). Such information is considered sensitive and confidential; it should not be contained in a public document.

California Environmental Quality Act

CEQA requires assessment of effects on historical resources (buildings, sites, structures, objects, or districts, each of which may have historical, architectural, archaeological, cultural, or scientific significance) that would result from public or private projects financed or approved by public agencies. CEQA requires that alternative plans or mitigation measures be considered an effect may cause a substantial adverse change in the significance of a historical resource, which would represent a significant impact on the environment (State CEQA Guidelines Section 15064.5[b]).

A substantial adverse change in the significance of a resource is the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that its significance would be materially impaired. Actions that would materially impair the significance of a historical resource are any actions that would demolish or adversely alter the physical characteristics of a historical resource that convey its historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of California Public Resources Code Sections 5020.1(k) and 5024.1(g).

In practice, the significance of cultural resources must be determined before effects are assessed or mitigation measures are determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows: (1) identify potential historical resources, (2) evaluate the eligibility of historical resources, and (3) evaluate the effects of a project on all eligible historical resources.

Regulations on Native American Heritage

California Public Resources Code Section 5097.9 states that no public agency or private party on a public property shall “interfere with the free expression or exercise of Native American Religion.” It also states the following:

No such agency or party [shall] cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine...

Except for parklands larger than 100 acres, city and county lands are exempt from this provision.

Regulations on Human Remains

The disturbance of human remains without authority of law is considered a felony (California Health and Safety Code Section 7052). If human remains are Native American in origin, they are within the jurisdiction of the NAHC (California Health and Safety Code Section 7052.5c, California Public Resources Code Section 5097.98).

According to state law (California Health and Safety Code Section 7050.5, California Public Resources Code Section 5097.98), if human remains are discovered or recognized in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

- the county coroner has been informed and has determined that no investigation of the cause of death is required, and
- if the remains are of Native American origin,
 - the descendants from the deceased Native Americans have made a recommendation to the land owner or person responsible for the excavation work for means of treating or disposing of with appropriate dignity the human remains and any associated grave goods as provided in California Public Resources Code Section 5097.98, or
 - NAHC was unable to identify a descendent or the descendent failed to make a recommendation within 24 hours after being notified.

According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and disturbance of Native American cemeteries is a felony (Section 7052).

Local Regulations

Solano County

The Land Use and Circulation Element of the Solano County general plan recognizes several studies will have to be undertaken to identify significant historical features within the county (e.g., studies by City of Vallejo and Central Solano County Cultural Heritage Commission). The element recognizes that the county is considered a rich archaeological area, although investigation identifying specific sites has been limited. Solano County has set policy goals to identify and preserve significant historical structures and features, and to establish a mechanism for the identification, review, and protection of significant archaeological sites.

Like the Land Use and Circulation Element, the Resource Conservation and Open Spaces Element acknowledges that the county has many notable historical features and is a rich archaeological area. It also recognizes that investigations of historic buildings and structures and archaeological features are needed. There is no proposal or policy set to implement these goals; however, to protect sensitive archaeological sites, Solano County proposes that all land development proposals that require the preparation of an EIR be referred routinely to the California Office of Historic Preservation.

Benicia

The “Community Identity” section of the Benicia general plan states that the city is committed to preserving and enhancing its “unique cultural inheritance.” The city contains historic districts with more than 40 historic sites. To meet the goal of maintaining and enhancing Benicia’s historic character, the general plan outlines several policies and programs that encourage the reuse and maintenance and of historic buildings, trees, and landscape features. It also encourages the protection and preservation of archaeological sites.

Dixon

The Urban Development and Community Design Element of the Dixon general plan calls for the promotion of the preservation of historic buildings and other landmarks that “give residents a tie with the past.” The general plan advocates the consideration of the establishment of procedures and criteria to encourage historic preservation within Dixon, and encourages and supports the use of federal, state, and local funding and incentives for the restoration of historic structures.

Fairfield

The Open Space, Conservation, and Recreation Element specifies objectives, policies, and programs to achieve the permanent preservation and management of public open space lands and natural resources, and the enhancement of community recreational opportunities. The “Conservation” section of the element includes guidelines on historic, and cultural resources conservation.

Policies from the general plan that address cultural resources are listed below.

- assigning to the Open Space Commission the responsibility for the official inventory of historical and archaeological sites;
- consultation with the California Archaeological Inventory at the Northwest Information Center at Sonoma State University on any project that could have an impact on cultural resources;
- avoid impacts on cultural resources when archeological studies reveal the presence of cultural resources at a development site;
- archeological studies by a certified archeologist in areas of archeological significance prior to approval of development projects;
- inventories of historic structures within the general plan area and, where appropriate, promote the inclusion of these structures on the CRHR and NRHP;
- promote the preservation and restoration of historical sites and structures within the general plan area that are significant to the city’s or the region’s cultural or historic background;
- encouraging private preservation of buildings which have historic significance and/or architectural merit; and
- the architectural design of any new buildings within Old Town Cordelia shall reflect its historic character.

Rio Vista

The Resource Conservation and Management Element of the draft Rio Vista general plan recognizes that the historic structures in the downtown area enhance the City’s “rural character” and that development should be sensitive to archaeological and historical resources. Specific policies in the Resource Conservation and Management Element and Community Character and Design Element address cultural resources. In general, these policies require that the city encourage historic preservation, that new or remodeled buildings be consistent with the character of the existing historic buildings, that demolition of historic structure occur only if there is no other reasonable course of action, and that new development projects identify important cultural resources.

Suisun City

The Suisun City general plan notes that archaeologically sensitive areas lie south of “Old Town” but outside the planning area. The Cultural Heritage Commission completed an inventory of the city’s residential and commercial buildings that identifies 41 buildings as being historically significant and worthy of preservation. This survey formed the basis of the local historic district in Old Town. The general plan encourages the maintenance of historic buildings in Old Town and the compatibility of new buildings with the historic character of the historic district.

Vacaville

The Conservation Element of the Vacaville general plan recognizes the existence of over 24 recorded prehistoric archaeological sites within the planning area and the potential for the discovery of additional sites. It also recognizes nearly 200 recorded historic structures, including the downtown area historic district and the NRHP-listed Peña Adobe, Will S. Buck House, and Vacaville Town Hall. Additional historic resources likely exist within unsurveyed portions of the planning area. The Historic Preservation Ordinance mandates the maintenance of designated buildings and review of any changes to the building exteriors or building demolitions.

The general plan lists two guiding policies with regard to historic and archaeological resources. One is to continue protection of these resources for their “aesthetic, scientific, educational, and cultural values.” The other is to protect the historic value of the downtown area. Implementing policies include reviewing each proposed development to determine whether the site contains known or potential prehistoric or historic cultural resources, and requiring consultation with qualified professional archaeologists and historians for appropriate protection and preservation of identified resources. The implementing policies also encourage the preservation of historic buildings in the downtown area and any new construction to be sympathetic to the character of the existing buildings, and urge consideration of a historic preservation district for residential areas west of downtown.

Vallejo

The Historic Preservation Goal in the Vallejo general plan is to “preserve and improve historically and architecturally significant structures and neighborhoods.” Objectives listed include developing awareness and pride in the city’s heritage, assisting property owners in the restoration of historically significant buildings, preventing integrity diminishing alterations to historically significant buildings, and promoting restoration (when feasible) of historic buildings over demolition. Specific policies include promotion of the city’s heritage, regulation of changes to historic structures, seeking public and private funding for historic preservation, and use of the state building code on any

identified historic building. The general plan includes no provision for archaeological sites.

Impacts and Mitigation Measures

Methods of Analysis

This analysis is a preliminary cultural resources sensitivity study based on secondary source materials related to the history, prehistory, and ethnography of Solano County. The assessment of property types is based on knowledge of the county, as well as general patterns among historic buildings, structures, archaeological sites, and modern cultural locations. This analysis assumes that any development on or near a cultural resource may have a significant impact on that resource. Archaeological resources are sensitive to direct impacts from development, while architectural and modern cultural resources may be subject to direct or indirect impacts (e.g., changes to their historic setting).

The following impacts address activity types that could adversely affect cultural resources. Any project that involves these activity types would be required to be mitigated to a level which would reduce the significance of the impacts.

After cultural resources are identified, their archaeological or historical significance is evaluated, and the nature of the impacts is assessed, mitigation measures would be identified and implemented. Because the particular mitigation measures will depend on the nature of the impacts and the affected resource, mitigation programs must be developed on a project-by-project basis and in consultation with the appropriate agencies or interested parties. Demolition of historic buildings or structures cannot be mitigated to a less-than-significant level.

Criteria for Determining Significance

Based on the State CEQA Guidelines and professional standards of practice, the CTEP would have a significant impact on cultural resources if it would:

- cause a substantial adverse change in the significance of a historical resource as defined in State CEQA Guidelines Section 15064.5;
- cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA Guidelines Section 15064.5;
- directly or indirectly destroy a unique paleontological resource or site, or a unique geological feature;
- disturb any human remains, including those interred outside formal cemeteries;
- damage, disturb, or degrade an archaeological resource that:

- ☐ is associated with a state-recognized person or event,
- ☐ provides information of demonstrable public interest and of interest to researchers,
- ☐ is of special or particular quality, or
- ☐ is listed on the NRHP or CRHR; or
- result in substantial adverse changes to historic resources including :
 - ☐ demolition of a significant resource,
 - ☐ relocation of a significant resource without maintaining integrity,
 - ☐ conversion, rehabilitation, or alteration of a significant resources that does not conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings; or
 - ☐ construction that reduces the integrity or significance of the significant resources in the project or vicinity.

Impact Mechanisms

For the evaluation of impacts on archaeological and historical cultural resources the types of impacts that could result from proposed CTEP improvements are discussed in general terms under Impacts CR-1–CR-9. The specific types of activities associated with the proposed transportation improvements under which these types of impacts would occur are summarized below.

- Highway widenings may result in ground disturbance, demolition or relocation of buildings and structures, visual changes, increases in noise levels, growth inducement, and restriction of access to Native American traditional or religious sites.
- New expressways or widening existing roadways and intersections may result in ground disturbance, demolition or relocation of buildings and structures, visual changes, increases in noise levels, and growth inducement, and restriction of access to Native American traditional or religious sites.
- Constructing or reconstructing interchanges may result in ground disturbance, demolition or relocation of buildings and structures, visual changes, increases in noise levels, and growth inducement.
- Local road projects or alterations may result in ground disturbance, demolition or relocation of buildings and structures, visual changes, increases in noise levels, and growth inducement.
- Pedestrian and nonmotorized facility projects, such as widening existing bikeways, signage or striping of bikeways, and railroad crossing improvements, may be proposed in the CTEP. Widening bikeways may result in ground disturbance.

- Construction of passenger rail stations/tracks may result in ground disturbance, demolition or relocation of buildings and structures, visual changes, increases in noise levels, and growth inducement.
- Increases in passenger rail service may lead to increases in noise levels, and growth inducement that leads to impacts on railway facilities and surrounding neighborhoods.
- Construction of bus maintenance yards may result in ground disturbance, demolition or relocation of buildings and structures, visual changes, and increases in noise levels.
- The acquisition of new right-of-way may lead to eventual reuse of the acquired area which could entail ground disturbance, demolition or relocation of resources, or a different level of maintenance of resources.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact CR-1: No Impact on Cultural Resources Resulting from Operational Subsidies

The allotment of operational subsidies for the following specific projects would not have any adverse effects on cultural resources within the project area: senior and disabled transit services; express bus service along I-80/I-680/I-780; Baylink Ferry Service; and local transit improvements. These projects involve the use of funds to purchase new vehicles, fund operation and maintenance costs, and provide extra service hours, none of which would have ground disturbing, visual, or auditor impacts that would result in an impact on cultural resources.

Impact CR-2: No Impact on Cultural Resources Resulting from Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP would involve conceptualizing areas where habitat could be set aside to compensate for the loss of sensitive habitats that results from construction of specific projects under the CTEP. The environmental mitigation is described in *Chapter 2*. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact CR-3: Potential Damage to Archaeological Resources

Construction of the proposed transportation improvement projects could alter or damage existing archaeological sites or resources within the county. Alteration or damage of archaeological sites or resources that are considered historically significant under CEQA is considered a significant and unavoidable impact. Types of activities related to the proposed project that could cause this impact are described above under “Impact Mechanisms.” Implementation of Mitigation Measures CR-1 and CR-2 would reduce this impact to a less-than-significant level. However, if a resource cannot be avoided, the resource could be permanently damaged under project implementation. In this case, the impact would be considered significant and unavoidable.

Mitigation Measure CR-1: Document Archaeological Resources through Public Interpretation

Public interpretation could include plaques, Web sites, brochures, museum exhibits, and public art. This type of mitigation seeks to engage the public directly regarding the historical significance of a resource and its importance to the community.

Mitigation Measure CR-2: Archaeological Data Recovery

After identification and evaluation efforts by a qualified archaeologist, if an archaeological site is determined to meet the criteria for inclusion in the NRHP or CRHR and if avoidance or redesign of the project is not feasible, research and fieldwork to recover and analyze the data contained at that site should be conducted. This effort may involve additional archival and historical research; excavation; analysis of artifacts, features, and data discovered; presentation of the results in a technical report; and curation of the recovered artifacts and accompanying data. Consultation with the Advisory Council on Historic Preservation, the State Historic Preservation Officer (SHPO), and other interested or knowledgeable parties may be required.

Impact CR-4: Restriction of Access to Native American Traditional or Religious Sites

Transportation improvements may restrict access to previously accessible Native American religious sites or locations. For example, at some locations, turnouts or side roads could be blocked by road widening or improved right-of-way fencing. This impact is considered significant. Implementation of Mitigation Measures CR-1 and CR-2 would reduce this impact to a less-than-significant level.

Mitigation Measure CR-1: Document Archaeological Resources through Public Interpretation**Mitigation Measure CR-2: Archaeological Data Recovery****Impact CR-5: Potential Damage to Previously Unidentified Buried Archaeological Resources or Human Remains Associated with the Proposed Transportation Improvements**

Buried archaeological sites or deposits or buried human remains that were not identified during previous research and field studies could be inadvertently unearthed during ground-disturbing activities, possibly resulting in damage to significant archaeological resources. This impact is considered significant. Implementation of Mitigation Measures CR-3 to CR-5 would reduce the impact to a less-than-significant level.

Mitigation Measure CR-3: Comply with State Laws Pertaining to the Discovery of Human Remains

If human remains are discovered, the project proponent should comply with state laws relating to the discovery and identification of human remains. (Please see the section above titled “Regulations on Human Remains.”)

Mitigation Measure CR-4: Perform Archaeological Monitoring

If construction or earthmoving activities are proposed in an area that has been determined to be sensitive for cultural resources, monitoring of earthmoving activities by a qualified archaeologist is required. Monitoring is not a substitute for the identification and evaluation process, but it may be recommended where the inadvertent discovery of archaeological or human remains is considered possible. The archaeologist can identify whether archaeological resources are present and can make further recommendations for their evaluation or treatment (e.g., cessation of earthmoving activities in the vicinity of the discovery; additional fieldwork, including controlled archaeological excavation; or consultation with interested or knowledgeable parties, including SHPO). Monitoring by an archaeologist and a Native American representative is also required in areas where the discovery of Native American human remains is considered possible.

If archaeological remains or suspected archaeological remains are discovered and an archaeological monitor is not present, the contractor should halt earthmoving activity within 100 feet of the discovery. The contractor should notify the project proponent; in turn, the project proponent should retain a qualified archaeologist to assess the nature, extent, and significance of the find and, if necessary, develop appropriate treatment measures in consultation with SHPO and other interested or knowledgeable parties.

Mitigation Measure CR-5: Covering (“Capping”) Archaeological Resources

If an inadvertent discovery or identified archaeological resource is damaged, the STA should require the project proponent to perform capping of the resources. When done properly, covering (“capping”) an archaeological resource can preserve it from further damage and retain its integrity for the future. Capping requires that the location and extent of the site be recorded substantially, that the site and its capping layers would not be damaged by future work in the vicinity, and that appropriate materials would be placed on the surface of the site so that the surface retains its integrity. Capping implies that the site would be available to future researchers; therefore, it may not be an appropriate measure for highways, railways, or other vital features of the county infrastructure that should not be subsequently disturbed.

Impact CR-6: Demolition of Historic Resources

Demolition and removal of historically significant buildings, structures, and sites because of construction of the proposed transportation improvements would affect cultural and historic resources in project areas. Demolition of buildings and sites considered historically significant under CEQA is considered a significant impact. Types of activities related to the proposed project that could cause this impact are described above under “Impact Mechanisms.”

Implementation of the Mitigation Measures CR-6 to CR-8 would reduce this impact to a less-than-significant level. However, if a resource cannot be avoided, the resource could be permanently demolished under project implementation. In this case, the impact would be considered significant and unavoidable.

Mitigation Measure CR-6: Avoid Historic Resources

Avoidance is the preferred mitigation measure for all historic resources, but it is often not feasible. When a project has sufficient flexibility, STA should consider avoidance as the primary mitigation measure.

Mitigation Measure CR-7: Conduct Additional Study of Affected Historic Resources

Another potential mitigation measure is to gather additional information about a historic resource. This measure is particularly helpful if the resource is a property type that is not well understood or has not been intensively researched previously. This measure may include additional archival research and field work regarding the resource and other properties of the same type. This type of mitigation ideally would contribute to other measures, such as Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) documentation and public interpretation.

Mitigation Measure CR-8: Record Photographic and Written Documentation to Historic American Building Survey/Historic American Engineering Record Standards

The HABS and HAER are programs to formally document historic resources through the use of large-format photography, measured drawings, written architectural descriptions, and historical narratives. Such documentation

packages are entered into the Library of Congress, and a second copy is generally archived in the regional information centers of the California Historic Resources Information System. (This mitigation measure is solely applicable to historic resources and is not appropriate for archaeological resources.)

Impact CR-7: Relocation of Historic Resources

Relocation of historically significant buildings and structures can result in a substantial adverse change to historical resources if specific efforts are not made to maintain historical integrity. Relocation of cemeteries or individual human remains can result in a substantial adverse change. This impact is considered significant. Implementation of Mitigation Measures CR-9 to CR-11 would reduce this impact to a less-than-significant level.

Mitigation Measure CR-9: Conduct Records Searches, Background Research, and Field Surveys, and Prepare Technical Reports for All Proposed Projects

Some areas within the CTEP project area are densely populated with older residential and commercial buildings; others comprise agricultural properties or rural landscapes. Before beginning projects in areas that contain structures over 50 years old, reconnaissance surveys should be conducted and evaluations prepared to determine which resources are historically significant.

It is also necessary to attempt to identify and evaluate archaeological resources in areas that would be affected by specific projects. These investigations should comply with all applicable federal, state, and local laws and regulations. These studies should be conducted as early in the planning stages as possible and always by a qualified archaeologist and architectural historian. It is also important to allocate sufficient time to allow for consideration of a full range of mitigation alternatives, if mitigation is necessary.

At a minimum, archaeological identification and sensitivity assessment studies require that a qualified archaeologist conduct:

- a record search at the official state archive for Solano County, which is located at the NWIC;
- research of other appropriate materials, including historical maps and local documents;
- a pedestrian survey or examination of exposed ground surface;
- written documentation of the methods and results of the study, an assessment of the sensitivity of the project area for the presence of archaeological resources, and recommendations for further work.

The archaeological sensitivity assessment may be based on the presence of artifacts or features on the ground surface, similarities in topography or geography to other archaeologically sensitive areas, reports of previous discoveries in the area, or evidence revealed during archival or other

documentary research. Consultation with various state and federal agencies, NAHC or other Native American individuals or groups, local historical societies, and other interested or knowledgeable parties may also be required.

If archaeological resources are discovered or if the potential for them to exist in the project area is considered significant, additional work to determine their nature, extent, and significance may be necessary. Such work is conducted to establish whether the archaeological resources appear to meet the criteria for inclusion in the NRHP or CRHR. This work should be conducted according to applicable federal or state guidelines and regulations, in consultation with the lead agency and other appropriate agencies and individuals, and by a qualified archaeologist. Evaluations of the significance of archaeological sites usually include, but are not limited to:

- additional archival research;
- preparation of a research design and treatment plan for any discovered resources;
- excavation or other types of fieldwork;
- analysis of artifacts and other data;
- special studies, such as obsidian hydration, geomorphological, or palynological studies;
- preparation of a technical report; and
- appropriate archival curation of the artifacts and accompanying data.

The technical report should document the methods and findings of the archival and field research; evaluate the ability of the site to meet the criteria for inclusion in the NRHP or CRHR; and make recommendations, if necessary, for mitigation of project impacts on any significant sites.

Archaeological sites are most often determined eligible for inclusion in the NRHP or CRHR based on data recovered during excavation, not solely on the basis of surface finds or archival research.

Mitigation Measure CR-10: Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation

Ensuring that any alterations to historic buildings or structures conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings can mitigate potential changes to historic resources. This measure is generally combined with design review to ensure compliance. (This mitigation measure is solely applicable to historic resources and is not appropriate for archaeological resources.)

Mitigation Measure CR-11: Review Project Design

Redesign or modification of project designs often can reduce potential impacts, particularly when the impacts are visual- or noise-related (e.g., maximizing the distance between new construction and historic resources, using soundwalls with

vegetative screening, and limiting the height of a new building or structure). Reviewers may include agency officials or a local landmarks commission, depending on the project and the affected resource. Local Native American groups are usually consulted when sacred or traditional cultural properties, or sites containing human remains would be affected.

Impact CR-8: Changes to Appearance of Historic Resources with Implementation of Transportation Improvements

Transportation-related projects, especially those involving construction of new facilities, may result in visual changes to the environment that adversely impact historic resources. In particular, when viewsheds are character-defining elements, such as historic landscapes and traditional cultural properties, visual changes must be taken into account. This impact is considered significant. Implementation of Mitigation Measures CR-9 to CR-11 would reduce this impact to a less-than-significant level.

Mitigation Measure CR-9: Conduct Records Searches, Background Research, and Field Surveys, and Prepare Technical Reports for All Proposed Projects

Mitigation Measure CR-10: Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation

Mitigation Measure CR-11: Review Project Design

Impact CR-9: Alteration of Integrity of Historical Setting Because of Increased Noise Levels Associated with Transportation Improvements

Transportation-related projects may result in noticeable increases in noise levels. When loud noise (intermittent or constant) is out of character with a historic resource, it may constitute an impact to the integrity of the setting. However, for historic properties at which noise was a normal aspect (e.g., manufacturing plants or railroad resources), increases in noise levels may not be an impact. This impact is considered significant. Implementation of Mitigation Measures CR-10 to CR-12 would reduce this impact to a less-than-significant level.

Mitigation Measure CR-9: Conduct Records Search, Background Research, Field Survey, and Technical Report for All Proposed Projects**Mitigation Measure CR-10: Conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation****Mitigation Measure CR-11: Review Project Design****Impact CR-10: Alteration of or Damage to Historic Resources Resulting from Transportation-Related Growth Inducement**

Transportation-related projects may encourage new urban growth in rural areas or redevelopment in existing urban areas. Such development may include demolition or redevelopment of historic buildings, destruction of or damage to an archaeological site, incompatible in-fill construction, or a multitude of minor changes whose cumulative effects constitute an impact on historic resources. If redevelopment or alterations of a historic building do not conform to the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, such a project would result in a substantial adverse change to the resource. If the impacts damage the eligibility of an archaeological resource for listing in the NRHP or CRHR, the project would result in a substantial adverse change. This impact is considered significant and unavoidable. Implementation of all of the mitigation measures described above would minimize this impact, but would not reduce it to a less-than-significant level.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation such as, repair and maintenance of substandard streets. These improvements would not result in significant impacts on cultural resources.

Chapter 8

Hydrology and Water Quality

This chapter discusses the existing conditions for hydrology and water quality in Solano County. It also provides a program-level evaluation of the potential impacts of the CTEP on hydrology and water quality in the county. A discussion of the measures that would be used to mitigate significant impacts is also presented.

Setting

Regional Hydrology

Surface Water Resources

Solano County generally consists of level topography of alluvial origin within a portion of the Central Valley. The Vaca Mountains, part of the Coast Ranges, are a prominent feature rising immediately west of the county. The county lies within a Mediterranean subtropical climate zone and is typical of central California with cool, wet winters and hot, dry summers. Annual precipitation ranges from 30 inches in the Vaca Mountains to 15 inches on the valley floor. Most rainfall occurs from November through April.

Prominent surface water features in the county are shown in Figure 8-1 and include numerous medium-sized and small streams. The major streams in the county drain in an easterly or southerly direction from the Vaca Mountains to the Delta. Putah Creek forms the northern boundary of the county, eventually flowing through Yolo County to the Yolo Bypass and Sacramento River. Sweeney, Gibson, Ulatis, Alamo Creeks generally flow through the Vacaville area in an easterly direction from the slopes of the Vaca Mountains to Cache Slough, then the Sacramento River. Denverton Creek is the principal drainage channel in the Travis AFB area. The Fairfield area is drained by several small creeks, including Union Avenue, McCoy, Laurel, Pennsylvania Avenue, Ledgewood, Suisun Valley, Dan Wilson, and Green Valley Creeks. Portions of these streams within the Vacaville and Fairfield municipal areas have been physically altered (e.g., channel straightening, detention basins, levees) or otherwise confined within artificial channels to improve flood control. Many of the stream modifications have been constructed at the lower elevations leading to Suisun Marsh to increase flow capacity in channels and reduce flooding.

hazards. The lower Napa River estuary forms a portion of the western county boundary near Vallejo. Several small creeks flow through the Vallejo area to the Napa River and upper San Pablo Bay areas.

The Delta borders the county to the south and varies from freshwater conditions to saline conditions because of tidal exchange with San Francisco Bay. Suisun Bay and Suisun Marsh are large features in the Delta estuary. All water passing through the Delta is conveyed west through Carquinez Strait to San Pablo Bay and beyond to San Francisco Bay.

SCWA is the largest water service utility in the county; it includes a network of constructed waterways that transport water through the county for municipal and agricultural uses. The Putah South Canal traverses the northern portion of the county from northeast to southwest, delivering SCWA water from Lake Berryessa for agricultural and municipal purposes in the Vacaville and Fairfield. The Solano Irrigation District (SID) distributes SCWA water from Lake Berryessa for irrigation of agricultural land water via SCWA's canal system. In addition to SCWA water supplies, the North Bay Aqueduct is part of the State Water Project and conveys water from the Delta near the eastern county boundary to Fairfield. A portion of the water that is imported for municipal uses ultimately drains south to the Delta and Suisun Marsh as treated municipal wastewater or irrigation return flows.

Drainage and Flood Control

Although the streams and watersheds that drain Solano County are relatively small, the steep slopes and clay soils in the upper watershed areas create high runoff rates—stream elevations drop sharply and exhibit high flow velocities and streambank erosion potential. As creeks enter the lowlands, the flow velocities decrease and the creeks widen. Flooding problems occur primarily in lower-lying areas in downstream portions of the creeks. Flooding in the area has usually been a result of overbank flow caused by limited channel capacity and restricted bridge or culvert crossings (California Department of Water Resources 1982). Flooding in some Fairfield area streams is aggravated by backwater from high tides in Suisun Marsh. Another significant factor affecting flooding is the condition of the channels, particularly the amount of sediment buildup and rush and vegetation growth, which reduces channel size and carrying capacity. Debris that collects at crossings also reduces bridge and culvert carrying capacity. Flooding hazards are greater in the urban area because the potential for property damage and loss of human lives is higher.

Flood control facilities and management responsibilities are facilitated by the public works departments of the major Solano County communities (Dixon, Vacaville, Fairfield, Benicia, Suisun City, Vallejo, Benicia). Stormwater drainage systems are designed primarily to convey runoff that occurs during storm events. To a lesser extent, the drainage systems also help to dispose of excess water from urban uses that generate runoff during drier months of the year, such as street sweeping and residential watering. The proper control of

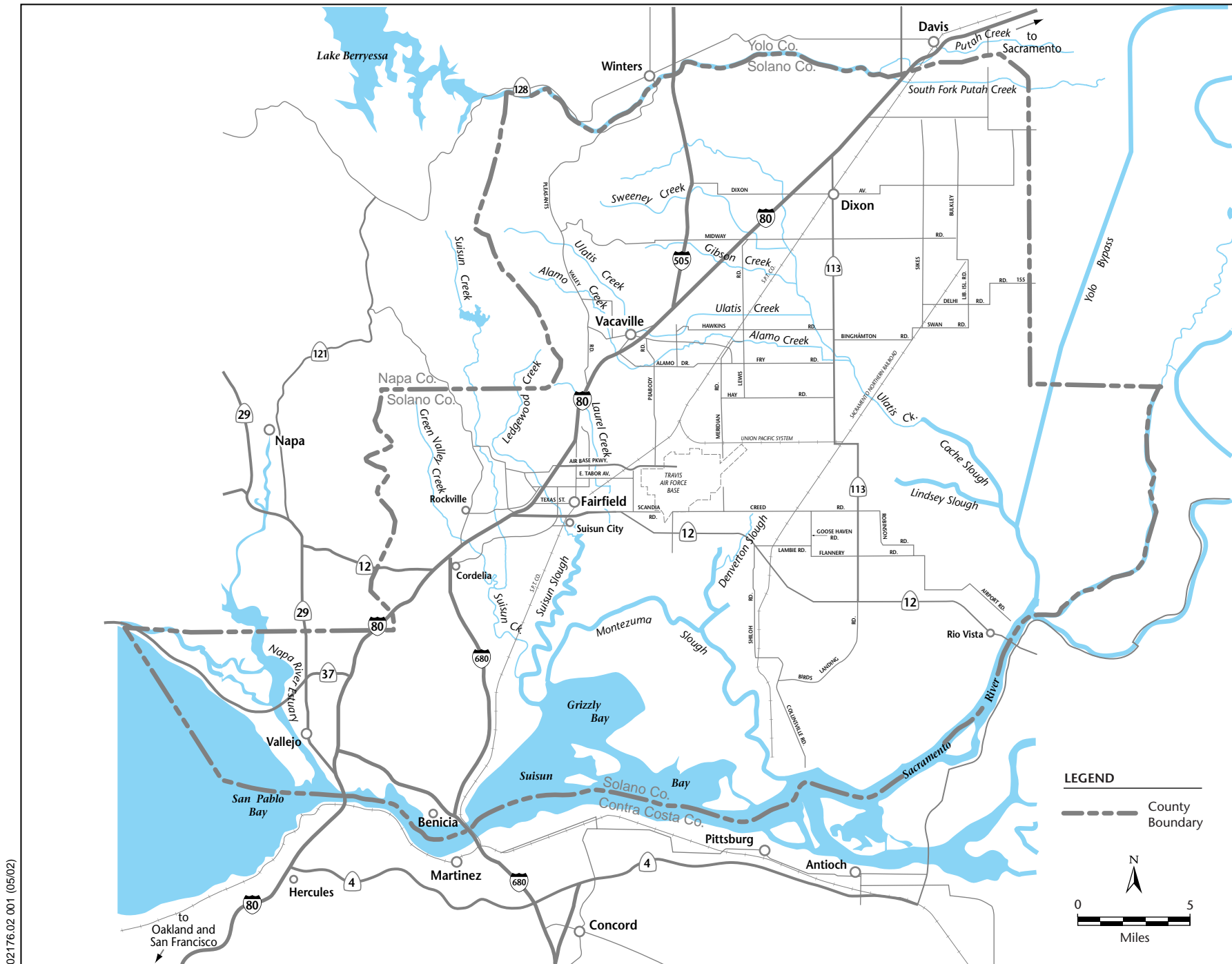


Figure 8-1
Prominent Surface Water Resources of Solano County

stormwater runoff is important to reduce adverse effects from increased flooding, erosion, and transport of pollutants.

SCWA provides flood control services for the unincorporated areas of the county. SCWA's major flood control projects focus on the Ulati Creek watershed in the Vacaville area and the Green Valley area in Fairfield. The Ulati Creek project was designed to provide protection from a flood with a 1-in-10-year recurrence probability; the Green Valley project was designed for the 1-in-40-year event. The municipalities are primarily involved with drainage and flood control through the installation and maintenance of extensive networks of subsurface storm drain pipes and surface channels, detention basins, and pump stations. Within the municipal areas, facilities are generally managed to provide flood protection for the 1-in-100-year event.

Groundwater Resources

The California Department of Water Resources (DWR) recognizes Solano County as overlying two major groundwater basins—the Sacramento Valley and Suisun-Fairfield basins. The basins are physically separated by a folded marine sedimentary bedrock ridge located immediately west of Vacaville that generally trends in a northwest-southeast direction. Most fresh water in the Sacramento Valley basin occurs in alluvium and the Tehama Formation. The permeable and unconsolidated alluvium consists of gravel, sand, and clay and overlies the consolidated Tehama Formation, which consists of finer-grained and less-permeable sediments. The Suisun-Fairfield basin consists of alluvium overlying marine sedimentary deposits and ash and lava flows of Sonoma Volcanics origin. The most important water-bearing formations are the gravel and sand deposits within the older alluvium, which are up to 200 feet thick.

Groundwater flow in both basins is generally southerly towards the Delta. Suisun Marsh depends on groundwater discharge of fresh water to preserve its long-term salt balance condition. Fairfield does not use groundwater for municipal water supply. The estimated groundwater use from private wells throughout the Fairfield area and areas served by SID is relatively small, about 6,500 acre-feet (California Department of Water Resources 1982). Area wells average 100 feet in depth, but some are over 800 feet deep (California Department of Water Resources 1994). Groundwater has historically been used for crop irrigation because of water quality limitations for municipal uses. By the 1950s, groundwater levels had dropped significantly because pumping throughout the project area, particularly in the area southwest of Fairfield (California Department of Water Resources 1994). However, the importing of surface water supplies for domestic use resulted in significant recovery of natural groundwater levels. Imports began in 1961 with construction of the Putah South Canal and expanded in 1980 with construction of the North Bay Aqueduct. The groundwater basins can now safely augment surface water supplies during times of drought without exhibiting significant reductions in groundwater levels.

Regional Water Quality

Surface Water Quality

Background water quality monitoring data for area streams is limited, but water quality conditions in the small rural streams typical of Solano County primarily reflect mineral composition of the soils and associated parent materials within a watershed, hydrologic characteristics, and sources of contaminants in the watershed. During summer low-flow conditions, the water quality characteristics of most importance to aquatic life are temperature, dissolved oxygen, turbidity, biostimulatory nutrients (e.g., nitrogen and phosphorus), nuisance algae growth, and toxic constituents such as heavy metals or unionized ammonia. In summer, streams tend to have higher concentrations of dissolved inorganic salts measured as total dissolved solids (TDS), salinity, and electrical conductivity compared to winter runoff conditions, when salts tend to be more diluted in the larger flow volumes. During the higher winter streamflow conditions, water quality is influenced more by rainfall and stormwater runoff and associated pollutants that can be mobilized and transported, such as eroded soil, nutrients from concentrated livestock grazing areas, or oil and grease from paved roadways.

A previous investigation of streams near Fairfield found high levels of nutrients and pesticides and low levels of heavy metals in most streams (U.S. Army Corps of Engineers 1975). The nutrient levels were attributable to agricultural runoff. Pesticides stemmed primarily from urban runoff. Oxygen content and acidity were within acceptable ranges for aquatic life. Total suspended solids were high, possibly indicating upstream erosion problems. Suspended solids act as carriers for other pollutants, such as bacteria and heavy metals, and increase stream turbidity and sedimentation.

More recently, the Fairfield-Suisun Sewer District (FSSD) has conducted monitoring in McCoy, Laurel, Ledgewood, Green Valley, and American Canyon Creeks for its urban runoff management program (URMP) (EOA 2000). Dry season monitoring of total and dissolved metals, total suspended solids, coliform bacteria, and two pesticides (diazanone and chlorpyrifos) was conducted on four dates during the summers of 1999 and 2000. The monitoring indicated that water quality was very good, considering the urban environment through which the streams flow. Arsenic was elevated in McCoy Creek, but this was hypothesized to result from extended detention of the flows in a large upstream detention basin that allowed sufficient time for natural arsenic to leach from the soil into the water.

Suisun Marsh has been protected by state law (Suisun Marsh Preservation Act of 1977) in recognition of its irreplaceable value as a wildlife and aquatic habitat. The water quality in Suisun Marsh is influenced mainly by temperature, turbidity, contaminants, and salinity. Salinity is steadily increasing because fresh water is being diverted from the Delta; this increases the importance of local freshwater inflow from groundwater, runoff, and wastewater discharge (California Department of Water Resources 1991). DWR, in accordance with the Suisun Marsh Preservation Act, installed control structures on Montezuma

Slough to control salinity intrusions into Suisun Marsh. Treated wastewater from the Vacaville and Fairfield treatment plants is discharged to Suisun Marsh but must comply with strict water quality standards.

A number of streams within the county, Suisun Bay, Suisun Marsh, and the Napa River are identified as water quality limited, pursuant to CWA Section 303 (refer to “*Relevant Plans, Policies, and Regulations*” below). Ledgewood and Laurel Creeks are specifically identified as impaired from the pesticide diazanon. Suisun Marsh is impaired by trace metals, nutrients (e.g., nitrogen and phosphorus), organic enrichment, and salinity. The Delta and Suisun Bay are listed as being impaired by several chlorinated pesticides, trace metals (copper, mercury, nickel), selenium, dioxin and furan compounds, polychlorinated biphenyl compounds (PCBs), exotic species, and diazinon. The Napa River is listed for nutrients, pathogens, and sedimentation. San Pablo Bay is listed for several organochlorine pesticides, diazinon, dioxin and furan compounds, PCBs, copper, mercury, nickel, and selenium.

Groundwater Quality

Groundwater quality in Solano County is generally considered to have a moderate to high TDS content dominated by sodium bicarbonate ions (U.S. Geological Survey 1985). TDS varies from 300 to 6,000 milligrams per liter (mg/l), with average values above 900 mg/l (City of Fairfield 2000). The state secondary drinking water standard for TDS is 500 mg/l to protect taste if other drinking water sources are available. Salt content should be below 1,000 mg/l for agricultural purposes (San Francisco Bay Regional Water Quality Control Board 1995).

Relevant Plans, Policies, and Regulations

Federal

Hydrology

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities complying with FEMA regulations that limit development in floodplains. FEMA issues flood insurance rate maps for communities participating in the NFIP. These maps delineate flood hazard zones in the community.

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It requires:

- avoidance of incompatible floodplain development,
- consistency with the standards and criteria of the NFIP, and

- restoration and preservation of the natural and beneficial floodplain values.

Water Quality

EPA) has primarily an oversight role for implementation of provisions of the CWA by the State Water Resources Control Board (SWRCB) and applicable Regional Water Quality Control Boards (RWQCB).

State

Hydrology

The municipalities of Solano County manage stormwater and flood protection improvement programs pursuant to city municipal code ordinances. In general, new developments must ensure that the rate of offsite stormwater runoff from construction of impervious surfaces does not increase impacts on downstream properties.

Water Quality

The responsibility for state water quality regulations in Solano County is divided geographically, with the Central Valley RWQCB covering the eastern portion of the county that drains to the Sacramento River and Delta, and the San Francisco Bay RWQCB covering those areas that generally drain to the Delta, Suisun Bay, and Suisun Marsh. Beneficial uses and water quality objectives for surface water and groundwater resources in the project area are established in the water quality control plans (basin plans) of each RWQCB as mandated by the state Porter-Cologne Act and CWA (San Francisco Bay Regional Water Quality Control Board 1995, Central Valley Regional Water Quality Control Board 1998). The RWQCBs also implement the CWA Section 303(d) total maximum daily load (TMDL) process, which consists of identifying candidate water bodies where water quality is impaired by the presence of pollutants. The TMDL process is implemented to determine the assimilative capacity of the water body for the pollutants of concern and to establish equitable allocation of allowable pollutant loading within the watershed. CWA Section 401 requires an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant to obtain a water quality certification (or waiver) from the applicable RWQCB.

The RWQCBs primarily implement basin plan policies through issuing waste discharge requirements for waste discharges to land and water. The RWQCBs are also responsible for administering the National Pollutant Discharge Elimination System (NPDES) permit program, which is designed to manage and monitor point and nonpoint source pollution. NPDES stormwater permits for general construction activity are required for projects that disturb more than 5 acres of land. Municipal NPDES stormwater permits are required for urban areas with populations greater than 100,000. FSSD administers municipal NPDES

permitting for both Fairfield and Suisun City (EOA 2000). The City of Vallejo administers its own municipal NPDES permit. Major development projects within the County must ensure compliance with the permit requirements of these municipal NPDES permits.

The general NPDES stormwater permits for general construction activities require the applicant to file a notice of intent (NOI) to discharge stormwater with the RWQCB and to prepare and implement an SWPPP. The SWPPP would include a site map, description of stormwater discharge activities, and BMPs that will be employed to prevent water pollution. It must describe BMPs that will be used to control soil erosion and discharges of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. It must demonstrate compliance with local and regional erosion and sediment control standards, identify responsible parties, provide a detailed construction timeline, and implement a BMP monitoring and maintenance schedule. In addition, projects that involve Caltrans are required to comply with the Caltrans statewide NPDES permit and its associated storm water management plan (SWMP) (California Department of Transportation 2001). Caltrans implements the SWMP in coordination with the RWQCBs.

California Fish and Game Code Section 1601 regulates lake and streambed alterations, including the release of materials into streams.

Local

The Solano County General Plan and the general planning policies of the local municipal governments contain resource protection policies that affect the design and implementation of large projects with regional significance. Policies may support or conflict with proposed project improvements. In general, these policies stipulate water conservation protocols for urban development, adherence to floodplain management policies, protection of existing water quality, and preservation of vegetation to protect waterways from bank erosion and siltation.

Impacts and Mitigation Measures

Methods and Assumptions

This assessment was limited to a qualitative evaluation of environmental impacts with respect to hydrology and water quality. The assessment did not include site-specific data review, laboratory analysis, or inspection of potential project sites.

Criteria for Determining Significance

The CTEP would have a significant effect on hydrology and water quality if it would:

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- substantially alter the existing drainage pattern of the site or area;
- create or contribute runoff that would exceed the capacity of a existing or planned stormwater management system;
- degrade surface or groundwater quality;
- place structures within a 100-year floodplain;
- expose people or structures to significant risk from flooding; or
- increase the likelihood of inundation by seiche, tsunami, or mudflow.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact H-1: No Impact on Hydrology and Water Quality from Distribution of Operational Subsidies

Allotment of operational subsidies for the following specific projects would not have any direct effects on hydrologic or water quality conditions within the project area: senior and disabled transit services; express bus service along I-80/I-680/I-780; Baylink Ferry Service; and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs and provide extra service routes.

Impact H-2: No Impact on Hydrology and Water Quality from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact H-3: Temporary Impairment of Water Quality Associated with Construction of Roadway Projects

Several specific projects under the CTEP have the potential to cause temporary water quality impacts. These projects include the I-80/I-680/SR 12 interchange, I-80 corridor improvements, westbound SR 12 widening, commuter rail to BART, pedestrian and transit friendly downtowns, commuter rail (Sacramento), expansion of the Capitol Corridor service, construction of bicycle/pedestrian trails in urban areas, park-and-ride lots, and SR 113 improvements.

Construction activities associated with these types of projects can temporarily impair water quality because disturbed and eroded soil, petroleum products, and miscellaneous wastes may be discharged to receiving waters. Soil and associated contaminants that enter stream channels can increase turbidity, stimulate the growth of algae, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Construction materials such as fuels, oils, paints, and concrete are potentially harmful to fish and other aquatic life if released into the environment. The extent of potential effects depends on the erodibility of soil types encountered, type of construction practice, extent of the disturbed area, duration of the disturbance, timing of precipitation, and proximity to drainage channels. Potential temporary impacts on water quality from construction are considered significant. Implementation of Mitigation Measure H-1 would reduce the impact to a less-than-significant level.

Mitigation Measure H-1: Prepare a Storm Water Pollution Prevention Plan

STA and member agencies would require the project proponents and general contractors to prepare and implement a SWPPP pursuant to the applicable NPDES general construction activity permit system or the Caltrans SWMP prior to construction of any of the listed specific projects under the CTEP. The NPDES permit system requires standard erosion control measures (e.g., management, structural, and vegetative controls) to be implemented for all construction activities that expose soil during the winter storm season. Adopted erosion control measures would be required to be implemented before predicted rain events. Erosion in disturbed areas would be controlled through grading operations that eliminate direct routes for conveying runoff to drainage channels, construction of erosion control barriers such as silt fences and mulching material, and reseeding disturbed areas with grass or other plants. These standard erosion control measures are expected to reduce the potential for soil erosion and sedimentation of drainage channels. The general contractor conducting the work would be responsible for constructing or implementing the measures, inspecting them regularly, and maintaining the measures in good working order.

Impact H-4: Long-Term Impacts Resulting in Impaired Water Quality Associated with the Operation of New Facilities

Newly constructed facilities (e.g., those proposed under the Baylink Ferry Service and local transit projects) could result in releases of hazardous substance from maintenance yards and refueling areas that may violate water quality standards or waste discharge requirements, or otherwise degrade surface or groundwater quality. Although the project proponents would follow an approved business plan that includes hazardous material response and notification procedures, the impact is considered potentially significant. Implementation of Mitigation Measure H-1, described above, would reduce the impact to a less-than-significant level because the NPDES permit systems require implementation of permanent water quality BMPs and long-term maintenance procedures.

Mitigation Measure H-1: Prepare a Storm Water Pollution Prevention Plan

Impact H-5: Substantial Depletion of Groundwater Supplies or Interference with Groundwater Recharge

Widened highways, new or improved interchanges, and other highway projects may result in an increase of paved (impermeable) surfaces. Any such increase within a groundwater recharge area could reduce the amount of water that percolates into underlying aquifers. Although the average contribution to groundwater from percolating rainwater is considered minimal, this impact is considered significant. Implementation of Mitigation Measure H-2 would reduce this impact to a less-than-significant level.

Mitigation Measure H-2: Design and Install Infiltration Devices

STA and member agencies should encourage project proponents to design and implement drainage plans that include considerations for installing appropriate stormwater infiltration devices to reproduce the natural recharge rates of the soil that would be paved.

Impact H-6: Substantial Alteration of the Drainage Pattern of the Project Site

The specific projects proposed under the CTEP are not expected to substantially alter existing drainage patterns. Grades within specific project areas would be restored to pre-project conditions to the extent practicable. In addition, any required stormwater management system would be designed to mimic existing drainage patterns to the extent practicable. Therefore, the impact is considered less than significant. No mitigation is required.

Impact H-7: Increase in Runoff Peak Flows and Volumes or Exceedance in the Capacity of the Stormwater Management System

The increase in impervious surfaces associated with construction of new roadways is expected to increase runoff in peak flows and volumes compared to existing conditions. If post-construction flows are not controlled, scouring of local creek channels and localized flooding of areas where specific projects would be located could occur. This is considered a significant impact. Implementation of Mitigation Measure H-3 would reduce this impact to a less-than-significant level.

Mitigation Measure H-3: Design and Implement Stormwater Management Measures

STA and member agencies should require the project proponent to design and implement a drainage plan for stormwater management measures. The stormwater management measures should be designed such that they result in the runoff peak flows and volumes being similar to those under pre-project conditions.

Impact H-8: Placement of Structures in the 100-year Floodplain and Exposure of People or Structures to Significant Risk from Flooding

Construction of new roadway facilities may be located within the designated 100-year floodplain or floodway. Construction within a floodplain or floodway can alter floodplain storage and conveyance capacity of existing channels. This impact is considered potentially significant. Implementation of Mitigation Measure H-4 would reduce the impact to a less-than-significant level.

Mitigation Measure H-4: Restrict Floodwater Conveyance under Bridges and Other Facilities

Executive Order 11988 requires projects to prepare a location hydraulic study to assess whether floodflows would pass through bridges or other project-related facilities. Culverts and bridges would be sized to prevent additional flooding or restrict floodwater conveyance.

Impact H-9: Increased Likelihood of Inundation by Seiche, Tsunami, or Mudflow

The specific projects proposed under the CTEP are located away from large inland waterbodies and the Pacific Ocean. Therefore, potential impacts from seiche and tsunami are highly unlikely. The projects would also take place in relatively flat areas. Potential impacts from mudflows are also highly unlikely. Therefore, the impact is assumed to be less than significant. No mitigation is required.

Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on hydrology and water quality.

Chapter 9

Geology, Soils, and Seismicity

Environmental Setting

This chapter provides a description of the geology, soils, and known geologic and seismic hazards in Solano County. The discussion provided in this chapter is based on a review of the following information:

- USGS' most recent maps and earth resource information,
- recent publications from the California Geological Survey (CGS) (formerly the California Division of Mines and Geology [CDMG]),
- recent publications from the NRCS (formerly the USDA SCS), and
- professional knowledge and experience of Jones & Stokes earth scientists.

Countywide Setting

Geology

Solano County includes portions of the Sacramento and San Joaquin Valleys (which compose the Central Valley) and a small part of the Coast Ranges. The main geologic units located in the county are shown in Figure 9-1.

The Delta is underlain primarily by intertidal deposits, consisting of the remains of hydrophytic vegetation and predominantly fine-textured mineral deposits. The Montezuma Hills, in the southeastern corner of the county, are underlain by the poorly consolidated clayey sand of the Montezuma Formation. The nearby Potrero Hills are underlain by Markley Sandstone, Nortonville Shale, and marine sandstone of the Capay Formation. The narrow valleys scattered throughout the county and the large alluvial plain located north of the Delta and west of the Vaca Mountains are underlain primarily by unconsolidated Quaternary alluvium and sedimentary rocks. The Vaca Mountains and other portions of the Coast Ranges uplands in the county are composed primarily of Markley Sandstone, sedimentary and metasedimentary rocks of the Upper Cretaceous Great Valley Sequence and Lower Cretaceous-Upper Jurassic Great Valley Sequence, and Sonoma Volcanics. (Wagner and Bortugno 1987, Wagner et al. 1987.)

Soils

Solano County soils were mapped and described by USDA SCS (Bates 1977). The general soil map produced from this effort indicates that there are 17 soil associations in the county (Figure 9-2). Each association comprises one or more major soil components, which typically characterize the association, and at least one minor soil component. Bates (1977) categorized each association as one of four groups (described below) based on slope gradient, drainage class, and landscape position.

- **Soils on nearly level to moderately sloping alluvial fans:** This group comprises the Yolo-Brentwood, Yolo-Sycamore, and Rincon-Yolo soil associations, which occur throughout Solano County (Figure 9-2). The dominant soil components are typically very deep, well drained to somewhat poorly drained loams to silty clay loams formed from mixed alluvium. Slope gradients typically range from 0–9%. Runoff is typically slow to medium. The erosion hazard is slight largely because of the low slope gradients that prevail in these areas. The shrink-swell potential associated with the dominant soil components typically ranges from moderate to high.
- **Soils on nearly level to gently sloping basin rims, alluvial fans, and deltas, and in basins, dredge spoil areas, and salt water marshes:** This group comprises the Capay-Clear Lake, Sacramento, Egbert-Ryde, Valdez, Joice-Suisun, and Reyes-Tamba soil associations, which occur primarily in and adjacent to the Delta (Figure 9-2). The dominant soil components are generally fine-textured mineral soils and organic soils formed from mixed alluvium or hydrophytic plant remains. Slope gradients typically range from 0–5%. Runoff is typically slow. The erosion hazard ranges from nonexistent to slight largely because of the low slope gradients that prevail in these areas. Except for some organic soils, the shrink-swell potential associated with the dominant soil components typically ranges from moderate to high.
- **Soils on nearly level to moderately steep alluvial terraces and in basins:** This group comprises the San Ysidro-Antioch, Corning, and Solano-Pescadero soil associations, which occur primarily in the central and north-central portions of Solano County (Figure 9-2). The dominant soil components are typically somewhat poorly drained to well drained gravelly loams to clays formed from alluvium derived mostly from sedimentary rocks. Slope gradients typically range from 0–30%. Runoff ranges from very slow to medium. The erosion hazard ranges from nonexistent to moderate. The shrink-swell potential associated with the dominant soil components typically ranges from low to high.
- **Soils on gently sloping to very steep alluvial terraces and mountainous uplands:** This group comprises the Altamont-Diablo, Dibble-Los Osos, Millsholm, Maymen-Los Gatos, and Hambright-Toomes soil associations, which occur primarily in the westernmost and southernmost portions of Solano County (Figure 9-2). The dominant soil components of these soil associations are typically somewhat excessively drained to well drained stony loams to clays formed from weakly consolidated sediments, sandstone, and basic igneous rocks. Slope gradients range from 2–75%. Runoff ranges

SEDIMENTARY AND METASEDIMENTARY ROCKS

QUATERNARY	Q	Alluvium
	Qa	Natural levee and channel deposits
	Qb	Basin deposits
	Qls	Landslide deposits
	Qi	Intertidal deposits (peaty mud)
	Qt	Terrace deposits
	Qo	Older alluvium
	Qmr	Modesto-Riverbank Formations (arkosic alluvium)
	Qmz	Montezuma Formation (poorly consolidated clayey sand)

TERTIARY	Tt	Tehama Formation (sand, silt, and volcaniclastic rocks)
	Emk/Tmk	Markley Sandstone (marine)
	Tn	Nortonville Shale (marine)
	Ed	Domengine Sandstone (marine)
	Tc	Capay Formation (marine sandstone)
	Tmz	Martinez Formation (marine quartzose sandstone)

CRETACEOUS	Ku	Upper Cretaceous (undifferentiated marine rocks)
	Kg	Guinda Formation (marine sandstone and mudstone)
	Kf	Funks Formation (marine shale and sandstone)
	Ks	Sites Formation (marine sandstone)
	KJu	Lower Cretaceous – Upper Jurassic Great Valley Sequence (marine mudstone, siltstone, sandstone, and conglomerate)
JURASSIC	Jgd	Gabbro and diabase (Coast Range Ophiolite)

Great Valley Sequence

VOLCANIC ROCKS

Psv	Sonoma Volcanics (b-basalt; a-andesite; r-rhyolite; t-tuff and other pyroclastic rocks)
-----	---

MAP SYMBOLS

- ?-----?

Contact

(Observed or approximately located; queried where gradational or inferred.)
- ?-----?-----?

Fault

(Solid where well located; dashed where approximately located or inferred; dotted where concealed by younger rocks or water; queried where continuation or existence is uncertain. U, upthrown side; D, downthrown side, relative or apparent.)
- ?-----?

Anticlinal fold

(Dotted where concealed by younger rocks or water.)
- ?-----?

Synclinal fold

(Dotted where concealed by younger rocks or water.)
- ?-----?

Overturned fold
- ?-----?

Strike and dip of beds

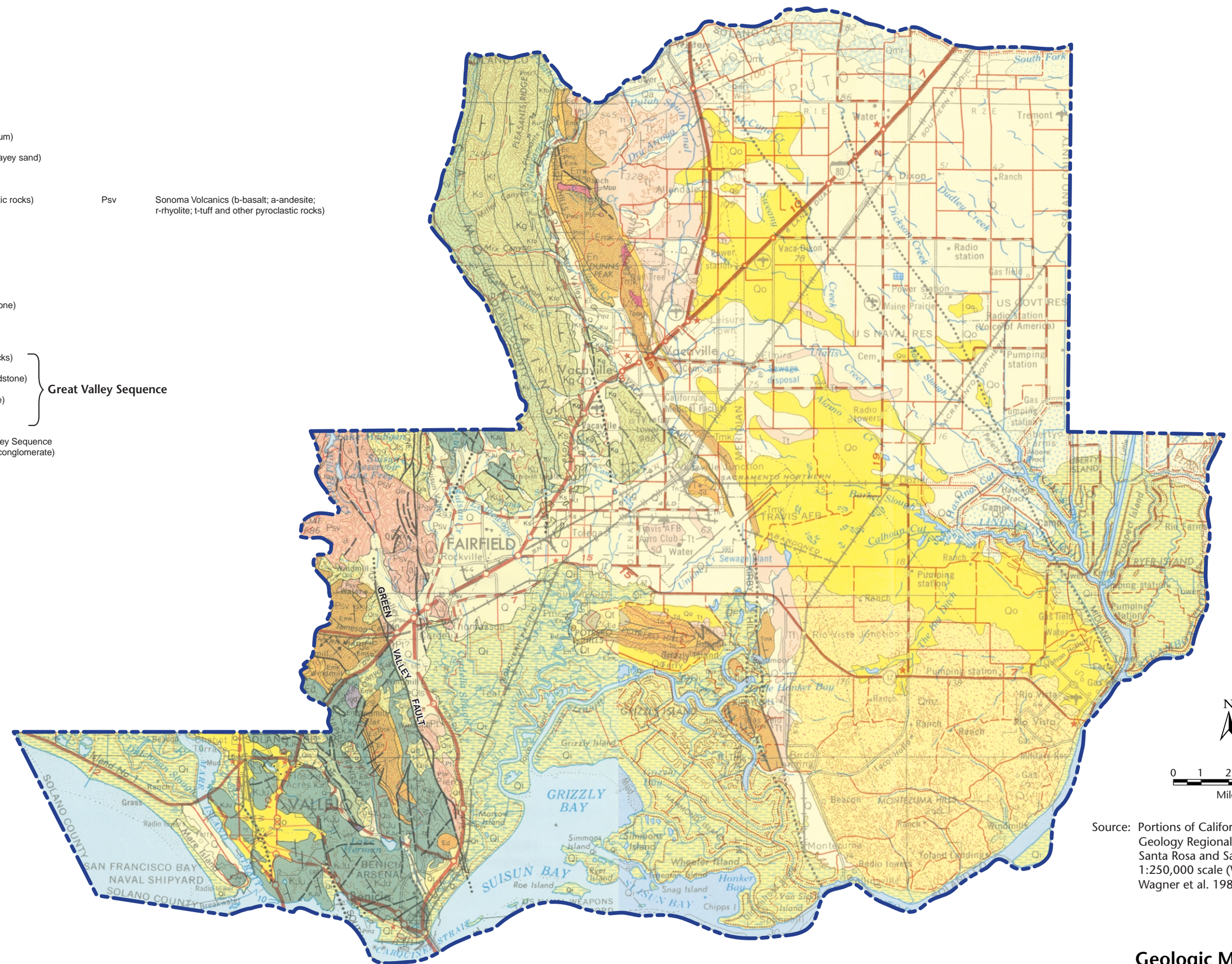
(General strike and dip of stratified rocks.)
- ?-----?

Strike and dip of foliation

(General strike and dip of foliation in metamorphic rocks.)
- ?-----?

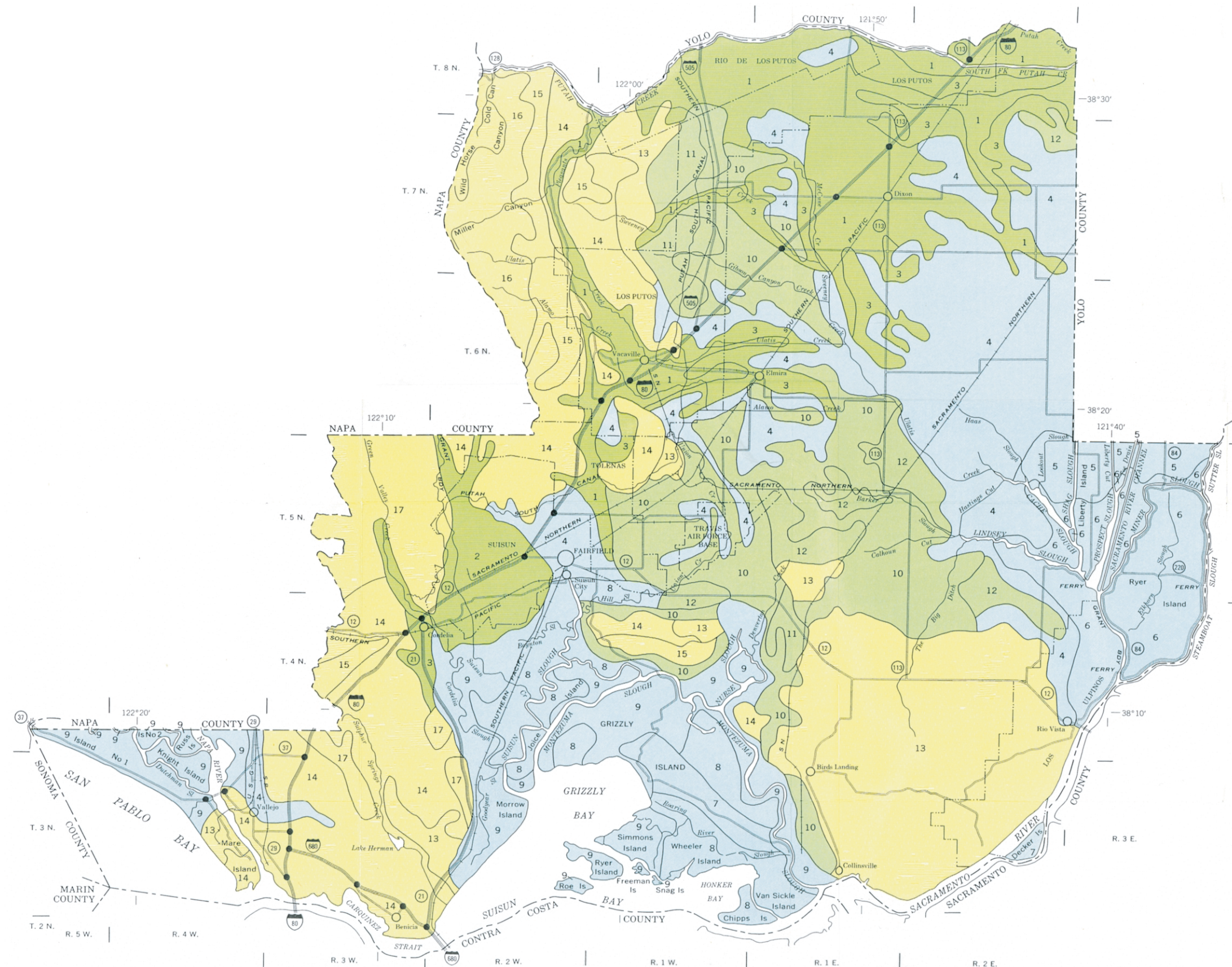
Joints

(Prominent joints in granitic and metamorphic rocks of the high Sierra.)



Source: Portions of California Division of Mines and Geology Regional Geologic Map Series, Santa Rosa and Sacramento Quadrangles, 1:250,000 scale (Wagner et al. 1981; Wagner et al. 1982).

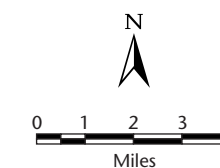
Figure 9-1
Geologic Map of Solano County



SOIL ASSOCIATIONS

- NEARLY LEVEL TO MODERATELY SLOPING, WELL-DRAINED TO SOMEWHAT POORLY DRAINED SOILS ON ALLUVIAL FANS**
- 1** Yolo-Brentwood association: Nearly level to moderately sloping, well-drained loams to silty clay loams; on alluvial fans
 - 2** Yolo-Sycamore association: Nearly level, well-drained and somewhat poorly drained silty clay loams; on alluvial fans
 - 3** Rincon-Yolo association: Nearly level to moderately sloping, well-drained loams and clay loams; on alluvial fans
- NEARLY LEVEL TO GENTLY SLOPING, MODERATELY WELL DRAINED TO VERY POORLY DRAINED SOILS ON BASIN R.M.S, ALLUVIAL FANS, AND DELTAS, AND IN BASINS, DREDGE SPOIL AREAS, AND SALT WATER MARSHES**
- 4** Capay-Clear Lake association: Nearly level to gently sloping, moderately well drained and poorly drained silty clay loams to clays; on basin rims and in basins
 - 5** Sacramento association: Nearly level, poorly drained silty clay loams and clays; in basins
 - 6** Egbert-Ryde association: Nearly level, poorly drained silty clay loams and clay loams that are high in organic matter; in basins and on deltas
 - 7** Valdez association: Nearly level, somewhat poorly drained silt loams and silty clay loams; on alluvial fans and in dredge spoil areas
 - 8** Joice-Suisun association: Nearly level, very poorly drained mucks and peaty mucks; in salt water marshes
 - 9** Reyes-Tamba association: Nearly level, poorly drained and very poorly drained silty clay loams, silty clays, and mucky clays; in salt water marshes
- NEARLY LEVEL TO MODERATELY STEEP, WELL-DRAINED TO SOMEWHAT POORLY DRAINED SOILS ON TERRACES AND IN BASINS**
- 10** San Ysidro-Antioch association: Nearly level to moderately sloping, moderately well drained sandy loams and loams; on terraces
 - 11** Corning association: Gently sloping to moderately steep, well-drained gravelly loams; on terraces
 - 12** Solano-Pescadero association: Nearly level, somewhat poorly drained loams to clays; on terraces and in basins
- GENTLY SLOPING TO VERY STEEP, WELL-DRAINED AND SOMEWHAT EXCESSIVELY DRAINED SOILS ON DISSECTED TERRACES AND MOUNTAINOUS UPLANDS**
- 13** Altamont-Diablo association: Gently sloping to steep, well-drained clays formed from weakly consolidated sediments; on dissected terraces
 - 14** Dibble-Los Osos association: Gently sloping to steep, well-drained loams and clay loams formed from sandstone; on mountainous uplands
 - 15** Millsholm association: Moderately steep to very steep, well-drained loams formed from sandstone; on mountainous uplands
 - 16** Maymen-Los Gatos association: Moderately steep to very steep, somewhat excessively drained and well-drained loams formed from sandstone; on mountainous uplands
 - 17** Hambright-Toomes association: Strongly sloping to very steep, well-drained and somewhat excessively drained loams and stony loams formed from basic igneous rocks; on mountainous uplands

*The terms for texture used in the descriptive heading of the association apply to the surface layer.



Source: Bates 1977.

Figure 9-2
General Soil Map of Solano County

from slow to very rapid. The erosion hazard ranges from slight to very high. The shrink-swell potential associated with the dominant soil components in these soil associations typically ranges from low to high.

Geologic and Seismic Hazards

The known geologic and seismic hazards in Solano County, as identified in the Health and Safety Element of the Solano County general plan (Sedway/Cooke 1977), are discussed below.

Slope Instability

Slope stability is a function of many factors, including, but not limited to, rainfall, slope gradient, rock and soil type, slope orientation, vegetation, seismic conditions, and human activities. The Health and Safety Element of the Solano County general plan contains a map showing those portions of county where slope failures (landslides, debris flows, and mudslides) are most likely to occur based on available geologic information on geologic units, the location and extent of past slope failures, and mapping criteria developed by USGS. In general, areas rated as potentially unstable, unstable, and highly unstable (slope instability categories 3, 4, and 5, respectively) are located on geologic units that are known to be susceptible to landsliding or have slopes greater than 15%; these areas are located almost entirely in the uplands that compose the western third of the county (e.g., Vaca Mountains) and in the Montezuma and Potrero Hills. The remaining portions of the county have slopes that are less than 15% and show no evidence of landslide activity; accordingly, these areas are considered to have greater relative stability. These findings are generally consistent with a more recent slope stability analyses conducted by USGS (Ellen et al. 1997, Wentworth et al. 1997).

Land Subsidence and Settlement

Land subsidence is the gradual lowering or downward sinking of the ground surface. It can be induced by natural processes or certain human activities. The most common causes of subsidence are groundwater withdrawal, oil and natural gas withdrawal, and the oxidation of peat soils. The peat soils of the Delta are generally susceptible to subsidence and represent a potential hazard for road construction and development in southern Solano County.

Land settlement is a gradual lowering of the ground surface that results from the compression or consolidation of soft, poorly consolidated fine-textured deposits (clays and silts). Settlement can be induced by dewatering and placing heavy loads on potentially compressible soils and sediments. Many of fine-textured bay mud deposits that exist in and adjacent to the Delta are susceptible to settlement and present a potential hazard for road construction and development in southern Solano County. (Sedway/Cooke 1977.)

Expansive Soils and Sediments

High shrink-swell (expansive) soils typically contain a high percentage of expansive phyllosilicate clay minerals (e.g., montmorillonite). Expansive soils swell when wet and shrink when dry; in the process, they can cause substantial damage to structures and roadways. However, most damage resulting from expansive soils and sediments can be avoided through proper foundation and roadway design.

As described above, soils with moderate to high shrink-swell potential occur throughout Solano County. Sedway/Cooke (1977) indicate that perhaps as much as 20–30% of the flat land in the county is underlain by soils that have high shrink-swell potential.

Surface Fault Rupture

The California State Geology and Mining Board has established policies and criteria for the classification of known faults in California based on the presence or absence of a detectable fault trace and the recency of fault displacement (Hart and Bryant 1997). The categories are described below.

- **Active faults:** Detectable fault traces that show evidence of displacement during the last 10,000–11,000 years (i.e., Holocene faults) are defined as “active” and are considered to have the greatest potential for surface rupture.
- **Potentially active faults:** Detectable fault traces that show evidence of displacement 10,000–1.6 million years ago (i.e., Quaternary faults) are defined as “potentially active” and are considered to have less potential for surface rupture.
- **Other faults:** The board has not established an official category for faults that show no evidence of displacement during the last 1.6 million years (i.e., pre-Quaternary faults). Although such faults are not deemed “inactive,” they are considered to have a relatively low potential for surface rupture.

Solano County contains several known faults (Figure 9-1). The Green Valley fault is the only one classified as active (Jennings 1994). It trends northwest along the eastern front of the Benicia Hills and shows abundant evidence of recent activity (Sedway/Cooke 1977). Because of this recent activity, the Green Valley fault has been zoned under Alquist-Priolo Fault Zoning Act, meaning that development in the immediate vicinity of the fault trace must be preceded by detailed fault investigations (Hart and Bryant 1997).

Seismic Ground Shaking

In 1996, CDMG released a probabilistic seismic hazard assessment for California (Open-File Report 96-08) to aid in the assessment of seismic ground shaking hazards in the state (Peterson et al. 1996). The report contains a probabilistic

seismic hazard map that depicts the peak horizontal ground acceleration values exceeded in a given region of California at a 10% probability in 50 years (i.e., a 0.2% probability in 1 year). The peak horizontal ground acceleration values represent probabilistic estimates of the ground shaking intensity likely to occur in different regions of California as a result of characteristic earthquake events on active and potentially active faults in California; the values can be used to assess the relative seismic ground shaking hazard for a given region.

The probabilistic peak horizontal ground acceleration values for Solano County area range from 0.0–0.9 g (g = acceleration due to gravity), suggesting that the ground shaking hazard in the county ranges from very low to severe; the most severe ground shaking hazards are located in the western half of the county. The findings of the report are generally consistent with the findings of the shaking hazard assessment conducted by ABAG (1995), which also indicated that the most intense seismic ground shaking in Solano County is likely to result from an earthquake on the Concord-Green Valley fault.

Liquefaction

Liquefaction is a process by which soils and sediments lose shear strength and fail during episodes of intense seismic ground shaking. The susceptibility of a given soil or sediment to liquefaction is primarily a function of local groundwater conditions and inherent soil properties such as texture and bulk density. Poorly consolidated, water-saturated fine sands and silts located within 50 feet of the surface are typically considered the most susceptible to liquefaction. Soils and sediments that are not water-saturated and that consist of coarser or finer materials are generally less susceptible to liquefaction.

The most recent seismic hazard maps published by ABAG (2001) indicate that the susceptibility of soils and sediments in Solano County to liquefaction ranges from very low in areas such as the Montezuma Hills, which are underlain by clayey sand, to very high in areas such as the Delta and the large alluvial plain south of Dixon, which are underlain by unconsolidated sediments of variable composition and/or shallow groundwater.

Regulatory Setting

Federal Regulations

Clean Water Act Section 402

CWA Section 402 mandates that certain types of construction activity comply with the requirements of EPA's NPDES stormwater program. Phase I of the NPDES stormwater program regulations, which are currently in effect, requires that construction activities disturbing 5 or more total acres obtain coverage under the NPDES general construction activity storm water permit, which is issued by SWRCB. Phase II goes into effect in March 2003 and will require that

construction activities disturbing 1–5 acres also obtain coverage under the NPDES general construction activity storm water permit.

Obtaining coverage under the NPDES general construction activity storm water permit generally requires that the project applicant complete the following steps:

1. file a NOI with SWRCB that describes the proposed construction activity *before* construction begins;
2. prepare an SWPPP that describes BMPs that will be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction, and
3. file a notice of termination with SWRCB when construction is complete and the construction area has been permanently stabilized.

In 1999, SWRCB issued the NPDES statewide stormwater permit and waste discharge requirements for Caltrans (CAS000003, Order No. 99-06-DWQ) that covers construction activity conducted by Caltrans. Under the conditions of this permit, Caltrans is required to implement a year-round program in all parts of state to control erosion and stormwater and nonstormwater discharges of sediment and other pollutants from Caltrans construction sites. Like the NPDES general construction activity permit, this permit requires preparation of erosion, sediment, and pollutant control plans for all Caltrans construction projects (SWPPPs for large construction projects, water pollution control plans [WPCPs] for smaller ones).

Proposed CTEP projects that involve ground-disturbing activities would need to obtain coverage under one of these two NPDES general permits. The San Francisco Bay RWQCB administers both permits in Solano County.

Local Regulations

Grading Ordinances

Proposed CTEP projects involving ground-disturbing activities would need to comply with the conditions and requirements of the grading and/or erosion and sediment control ordinances of all affected jurisdictions.

Uniform Building Code

Proposed CTEP projects that involve construction must comply with the Uniform Building Code (UBC).

Impacts and Mitigation Measures

Methods of Analysis

Potential impacts relating to geology, seismicity, and soils associated with the implementation of the proposed CTEP projects were evaluated qualitatively based on a review of relevant maps, reports, and other literature published by CGS, USGS, and NRCS, and on the professional opinion of Jones & Stokes earth scientists.

Criteria for Determining Significance

The CTEP would have a significant impacts relating to geology, seismicity, and soils. A significant impact would result if a CTEP project would:

- expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving rupture of a known earthquake fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landslides;
- result in substantial soil erosion or loss of topsoil;
- be located on a geologic unit or soil that is unstable or would become unstable as result of the project, potentially resulting in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- be located on an expansive soil that would create substantial risks to life or property; or
- have soils that are incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact AG-1: No Impact on Agricultural Resources from Distribution of Operational Subsidies for Buses and Ferry Services

Allotment of operational subsidies for the following specific projects would neither result in the direct or indirect conversion of farmland to nonagricultural uses nor conflict with existing zoning for agricultural use or a Williamson Act contract: senior and disabled transit services, express bus service along I-80/I-

680/I-780, Baylink Ferry Service, and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs, and provide extra service routes. Therefore, such projects would not affect geology, soils, and seismicity in Solano County.

Impact AG-2: No Impact on Agricultural Resources from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore there is no impact.

Impact G-1: Potential Substantial Adverse Effects Resulting from Surface Fault Rupture Associated with Transportation Improvement Projects

Several proposed transportation improvement projects, including the I-80 corridor improvements, the western widening of SR 12, and I-680/I-80/SR 12 interchange improvements, may be located in the vicinity of the active Green Valley fault, which is currently zoned under the Alquist-Priolo Earthquake Fault Zoning Act. In such instances, displacement along the Green Valley fault could cause substantial damage to project-related facilities and result in injury to people using these facilities. This is considered a potentially significant impact. Implementation of Mitigation Measure G-1 would reduce this impact to a less-than-significant level.

Mitigation Measure G-1. Conduct Project-Level Fault Investigations and Design all Project Facilities to Avoid or Minimize Fault-Related Impacts

STA should conduct site-specific fault investigations during the preliminary and/or final design stage of all proposed CTEP projects. These investigations may range from limited screening investigations to identify obvious indicators of recent fault displacement, to very detailed, quantitative fault investigations. If it is determined at the project-level that fault displacement poses a substantial threat to any of the proposed CTEP project facilities, the affected projects would be designed to avoid or minimize the potential for damage resulting from surface fault rupture. The exact measures that would be used to avoid or minimize damage resulting from fault-rupture are not currently known, but could include reinforcing project-related structures or relocating certain project facilities to avoid active fault traces.

Impact G-2: Potential Substantial Adverse Effects Resulting from Seismic Ground Shaking Associated with Transportation Improvement Projects

Several proposed transportation improvement projects, including the I-80 corridor improvements, the SR 12 west widening, and I-680/I-80/SR 12 interchange improvements, may be located in portions of the county where the seismic ground shaking hazard is substantial. Ground shaking caused by an earthquake on the Concord-Green Valley fault or other active and potentially active faults in the region could cause substantial damage to improperly designed and constructed project facilities and result in injury to people using these facilities. This is considered a potentially significant impact. Implementation of Mitigation Measure G-2 would reduce this potential impact to a less-than-significant level.

Mitigation Measure G-2: Conduct Project-Level Seismic Hazard Evaluations and Design All Proposed Project Facilities According to Appropriate UBC Standards

STA and/or member agencies would evaluate seismic ground shaking hazards for all proposed CTEP projects at the project level. Based on these evaluations, STA would design and construct all proposed project facilities according to the most appropriate UBC standards to minimize the potential for damage to project-related facilities.

Impact G-3: Potential Substantial Adverse Effects Resulting From Earthquake-Induced Liquefaction Associated with Transportation Improvement Projects

Several proposed transportation improvement projects, including the I-80 corridor improvements, the eastern widening of SR 12, the I-680/I-80/SR 12 interchange improvements, may be located in portions of Solano County where the hazard of liquefaction is high or very high. Liquefaction induced by an earthquake on the Concord-Green Valley fault or other active and potentially active faults in the region could cause substantial damage to improperly designed and constructed project facilities and result in injury to people using these facilities. This is considered a potentially significant impact. Implementation of Mitigation Measure G-3 would reduce this potential impact to a less-than-significant level.

Mitigation Measure G-3: Conduct Site-Specific Geotechnical Investigations for Liquefaction and Implement Appropriate, Proven Geotechnical Methods

STA and/or member agencies would conduct site-specific geotechnical investigations before or during the preliminary and/or final design stages of the proposed CTEP projects to identify and characterize areas that may be susceptible to liquefaction. These site-specific investigations may range from limited screening investigations to identify obvious liquefaction hazards, to very detailed subsurface investigations. The findings of these site-specific

investigations would serve as the basis for the final design of the proposed projects and ensure that appropriate geotechnical methods are used to avoid or minimize the potential for liquefaction to damage project-related facilities. The exact measures that would be used to reduce the liquefaction hazard are not currently known, but the measures may include standard practices such as:

- removal or treatment of potentially liquefiable soils and sediments,
- construction of edge containment structures (e.g., berms, dikes, retaining structure, compacted soil zones),
- installation of drainage structures to lower the groundwater table,
- in-situ ground densification, and
- other types of ground improvement (California Division of Mines and Geology 1997).

Impact G-4: Potential Adverse Effects Resulting from Landslides and/or Other Types of Slope Failures Associated with Transportation Improvement Projects

Some of the transportation improvement proposed under the CTEP may be located in portions of Solano County where slopes are potentially unstable and susceptible to failure under certain conditions. In these areas, the construction and operation of the improvements could induce on- or off-site slope failures. In addition, slope failures induced by project construction or operation, earthquakes, high rainfall, human activities, or other means could cause substantial damage to improperly designed and constructed project facilities and result in injury to people using these facilities. This is considered a potentially significant impact. Implementation of Mitigation Measure G-4 would reduce this potential impact to a less-than-significant level.

Mitigation Measure G-4: Conduct Site-Specific Geotechnical Investigations for Slope Stability and Implement Appropriate, Proven Geotechnical Methods

STA and/or member agencies would conduct site-specific geotechnical investigations before or during the preliminary and/or final design stages of the proposed CTEP projects to identify and characterize potential slope failure hazards. These site-specific investigations may range from limited screening investigations to identify obvious slope failure hazards, to very detailed subsurface investigations. The findings of these investigations would serve as the basis for the final design of the proposed projects and ensure that appropriate geotechnical methods are used to avoid or minimize the potential for slope failures and associated damage. The exact methods that would be used to address potential slope failure hazards are not currently known, but would likely involve avoiding the failure hazard by relocating the project in question, protecting susceptible areas from the failure by constructing protective structures, and reducing the hazard to an acceptable level by stabilizing unstable slopes (California Division of Mines and Geology 1997).

Impact G-5: Potential Construction-Related Soil Erosion and Sedimentation Associated with Transportation Improvement Projects

Nearly all of the proposed improvement projects proposed under the CTEP would involve some land clearing, mass grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of a substantial amount of nonrenewable topsoil and could adversely affect water quality in nearby surface waters (see detailed discussion in *Chapter 8*). This is considered a potentially significant impact. Implementation of Mitigation Measure G-5 would reduce this impact to a less-than-significant level.

Mitigation Measure G-5. Prepare and Implement an Erosion and Sediment Control Plan, Storm Water Pollution Prevention Plan, or Water Pollution Control Plan at the Project Level

STA and/or member agencies should prepare and implement an erosion and sediment control plan (ESCP), SWPPP, or WPCP for improvement projects as needed. Each of these documents would contain details and specifications for a variety of standard BMPs, such as those recommended by Caltrans (Camp Dresser & McKee 2000), that would be implemented to control erosion, stormwater runoff, sediment, and other construction-related pollutants during project construction. The ESCP would remain in effect until all areas disturbed during construction are permanently stabilized. The specific BMPs that would be incorporated into the ESCP would be determined during the final design phase of the selected alternative. They would likely include, but not be limited to, one or more of the following:

- **Time and sequence construction activities to minimize ground disturbance:** The project proponent may develop a construction schedule prior to the commencement of construction to help avoid or minimize ground disturbing activities during the rainy season (October 15–April 15), sequence construction activities in a manner that would minimize the amount of ground disturbed at any given time, and allow for the timely and proper implementation of appropriate erosion and sediment control BMPs.
- **Stage construction equipment and materials away from surface water.** All equipment and construction materials may be staged away from existing stream channels and other surface water bodies. To the extent possible, equipment and materials would be staged in areas that have already been disturbed.
- **Minimize ground disturbance and preserve existing vegetation.** The project proponent may minimize ground disturbance and the destruction of existing vegetation during project construction. This would be accomplished in part through the establishment of designated equipment staging areas, ingress and egress corridors, and equipment exclusion zones before the any land clearing, grubbing, or grading operations begin.
- **Apply mulch and seed:** The project proponent may apply mulch and seed mixtures hydraulically or using other appropriate methods to all graded and

otherwise disturbed areas to reestablish vegetative ground cover and stabilize all graded and otherwise disturbed surfaces once construction is complete. Mulch and seed may also be applied to temporarily stabilize areas that would need to be re-disturbed after an extended period of inactivity. Hydraulic mulch and seed application may be used in conjunction with other erosion and sediment control BMPs and supplemented with the planting of native or ornamental trees and shrubs.

- **Install erosion control blankets:** The project proponent may install erosion control blankets or other suitable materials to protect graded and otherwise disturbed surfaces from raindrop impact and wind erosion. Erosion control blankets are particularly well-suited and appropriate for areas where slope gradients are steep, the hazard of erosion is high, or vegetation is likely to reestablish slowly because of harsh postconstruction soil conditions.
- **Intercept and divert stormwater run-on:** If appropriate, the project proponent may construct temporary earthen dikes, lined drainage swales, or slope drains to intercept and divert stormwater run-on away from areas with high erosion hazard (e.g., steep fill slopes) and toward stable outlets and watercourses. It may be necessary to use other erosion control methods, such as check dams or energy dissipater structures, to prevent the scouring and erosion of newly graded diversion structures.
- **Install silt fences or fiber rolls:** The project proponent may install silt fences or fiber rolls in the construction area to slow and filter sediment from construction area runoff.
- **Install storm drain inlet protection:** The project proponent may install filter fabric fence, drop inlet sediment traps, sandbag barriers, or other similar devices at storm drain inlets to detain and filter sediment-laden runoff from the construction area before it is discharged into drainage systems or natural watercourses.
- **Stabilize grading spoils:** Grading spoils generated during the construction may be temporarily stockpiled in stable areas located away from stream channels and other surface water bodies. Silt fences and fiber rolls may be installed around the base of the temporary stockpiles to intercept runoff and sediment draining from the stockpiles. If necessary, temporary stockpiles may also be covered with an appropriate geotextile to provide protection from wind and water erosion.

Impact G-6: Potential Adverse Effects Resulting from Expansive Soils and Sediments Associated with Transportation Improvement Projects

The soil survey of Solano County indicates that soils with high shrink-swell potential (i.e., potentially expansive soils) occur throughout the county. Transportation improvements proposed under the CTEP may be located in portions of Solano County where expansive soils and sediments are present. If located at or near the finished grade of the proposed improvements, expansive soils could cause substantial damage to improperly designed and constructed

project facilities and result in injury to people using these facilities. This is considered a potentially significant impact. Implementation of Mitigation Measure G-6 would reduce this potential impact to a less-than-significant level.

Mitigation Measure G-6: Conduct Site-Specific Geotechnical Investigations for Expansive Soils and Implement Appropriate, Proven Geotechnical Methods

STA and/or member agencies would conduct site-specific geotechnical investigations before or during the preliminary and/or final design stages of the proposed CTEP projects to identify areas with expansive soils. The findings of these site-specific investigations would serve as the basis for the final design of the proposed projects and ensure that appropriate, proven geotechnical methods are used to avoid or minimize the potential for expansive soils and sediments to damage project-related structures. The exact methods that would be used to address potential expansive soil issues are not currently known, but are likely to include the selective placement of expansive fill materials; the use of imported, non-expansive fill materials; or other methods of ground improvement.

Impact G-7: Potential Adverse Effects Resulting from Land Subsidence or Settlement Associated with Transportation Improvement Projects

Some of the proposed transportation improvement projects including the SR 12 west widening and the I-680/I-80/SR 12 interchange improvements, may be located on soft, compressible soils and sediments in the Delta region. These areas are potentially susceptible to subsidence and settlement, which could cause substantial damage to improperly designed and constructed project facilities and result in injury to people using these facilities. This is considered a potentially significant impact. Implementation of Mitigation Measure G-7 would reduce this potential impact to a less-than-significant level.

Mitigation Measure G-7: Conduct Site-Specific Geotechnical Investigations for Settlement and Subsidence and Implement Appropriate, Proven Geotechnical Methods

STA and/or member agencies would conduct site-specific geotechnical investigations before or during the preliminary and/or final design stages of all proposed CTEP projects to identify areas with the potential for settlement and subsidence. The findings of these investigations would serve as the basis for the final design of the proposed projects and ensure that appropriate, proven geotechnical methods are used to avoid or minimize the potential for settlement and subsidence to damage project-related facilities. The exact methods that would be used to address potential land subsidence and settlement issues are not currently known, but would likely involve the improvement of ground conditions by removing or replacing problematic soils and sediments.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on geology, soils, or seismicity.

Environmental Setting

Countywide Setting

STA is responsible for transportation planning and coordination for Solano County and the cities that lie within its jurisdiction: Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo (Figure 10-1). STA provides oversight for Solano County and partners with a variety of counties and agencies in the area to advance regional projects, including MTC, FHWA, California Transportation Commission, BAAQMD, YSAQMD, Solano Economic Development Corporation, Contra Costa Transportation Authority, Napa County Transportation Planning Agency, and Yolo County. The countywide transportation system is discussed below.

Street and Highway System

The routes of regional significance in Solano County include the state highway system and local arterials that provide major points of access to the state highway system or provide regional connections between communities and key transportation facilities (Figure 10-1). There are six different functional classifications for these routes, which are described below. Roadways under each classification that are located in Solano County are also listed below.

- *An urban interstate freeway* is a limited-access interregional roadway. A freeway may be defined as a divided highway with full control of access and two or more lanes for the exclusive use of high volumes of traffic in each direction. These facilities do not provide direct access to land and, in general, access is restricted and provided only at interchanges with arterials. These types of facilities serve primarily regional through trips and connect to other regional and interregional facilities.
- *An urban freeway or expressway* is a limited-access regional roadway. An urban freeway or expressway serves through trips for both regional and local purposes, but provides limited access to land uses via local streets.
- *An urban major arterial* is an access-controlled roadway that emphasizes mobility between communities and connections to freeways. Arterials are

designed to carry high volumes of local traffic and allow direct service to land uses.

- *An urban minor arterial* is a roadway that emphasizes mobility within urbanized communities and connections to freeways. Arterials are designed to carry high volumes of local traffic and allow direct service to land uses.
- *A rural major arterial* is a roadway that emphasizes mobility between urbanized and rural communities and connections to freeways. Arterials are designed to carry high volumes of local traffic and allow direct service to land uses.
- *A major collector* is a roadway that emphasizes access to major employment, shopping, or freeways. Collectors distribute traffic from residential or local roadways to facilities that are designed to carry higher volumes of traffic, such as arterials. Collectors carry light to moderate traffic and serve adjacent land uses.

Urban Interstate Freeway

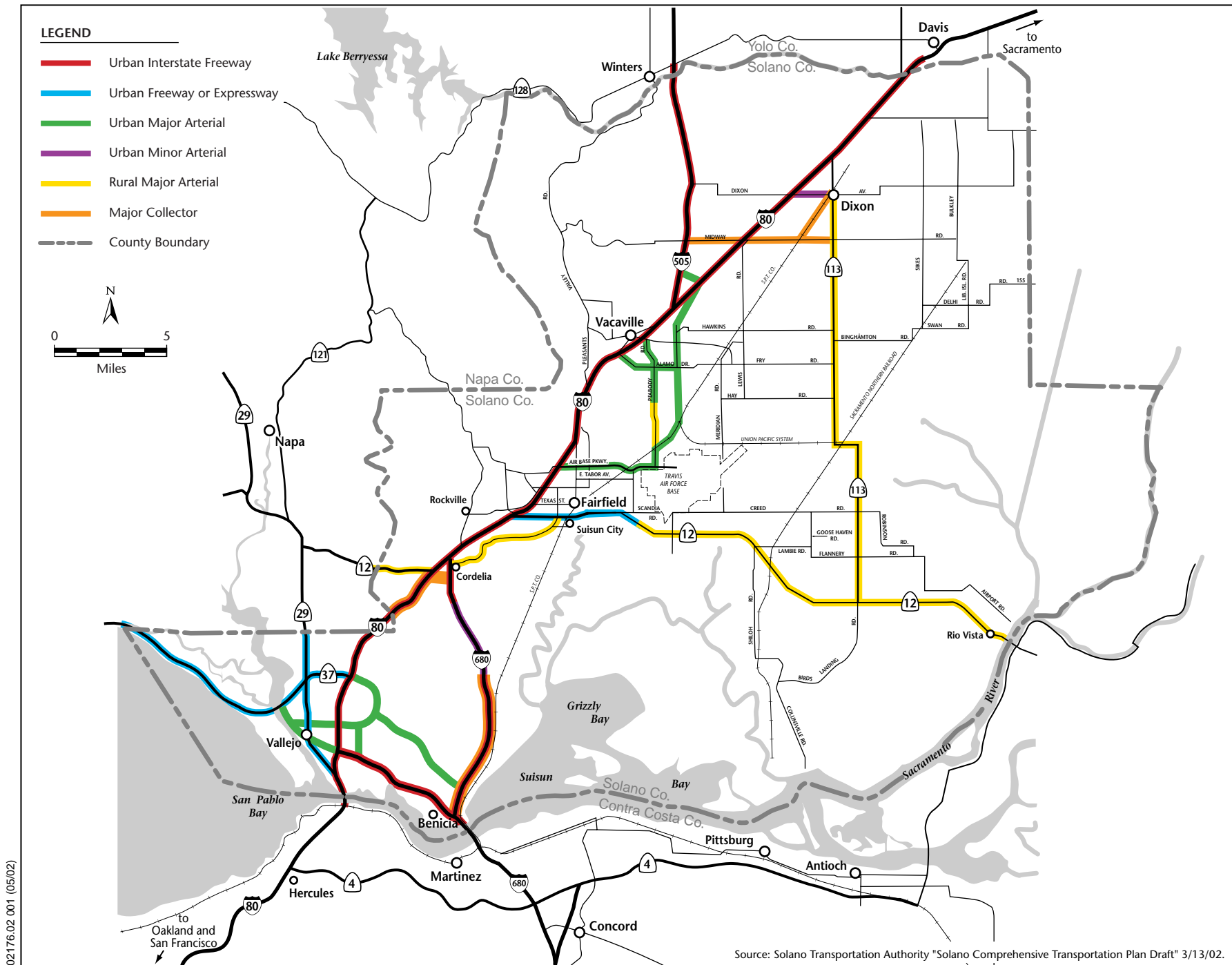
Four urban interstate freeways traverse Solano County (Figure 10-1). The total mileage for these routes is approximately 88 miles. A brief description of each route follows.

- **I-80** is a major freeway and the largest in the project area. It runs west-east through Solano County and traverses many cities, including Vallejo, Fairfield, Vacaville, and Dixon. I-80 begins in San Francisco and continues beyond Reno, Nevada.
- **I-505** is a multilane freeway that runs north to south. It begins near Vacaville at I-80 and terminates near Dunnigan at I-5.
- **I-680** is a multilane freeway with a north-south alignment that runs through the southern portion of Solano County. It begins in San Jose and ends at I-80 in Fairfield.
- **I-780** is a multilane freeway that runs from east to west and connects I-680 to I-80. It begins just after the Benicia Bridge and ends in Vallejo.

Urban Freeway or Expressway

Three urban freeways or expressways (state routes) are located in Solano County (Figure 10-1). The total mileage for these routes is approximately 23 miles. A brief description of each route follows.

- **SR 12** has been named an urban freeway of regional significance from Suisun City to I-80. The freeway runs east to west.
- **SR 29** runs north to south at the western end of Solano County through Vallejo. It begins just north of the Carquinez Bridge and continues into Napa and Colusa Counties.



- **SR 37** is a two- to four-lane roadway that runs east to west at the western end of Solano County. SR 37 connects I-80 to U.S. Highway 101 in Marin County.

Urban Major Arterial

Urban major arterials total approximately 41.5 miles in Solano County.

Examples of urban major arterials that have been determined to need improvement include Jepson Parkway, Air Base Parkway in Fairfield, Peabody Road in unincorporated Solano County, Vaca Valley Parkway in Vacaville, and Columbus Parkway in Vallejo.

Urban Minor Arterial

Urban minor arterials total approximately 5.5 miles in Solano County. Examples of urban minor arterials with improvement needs include West A Street in Dixon and arterials along I-680 in southern Fairfield.

Rural Major Arterial

Rural major arterial routes of regional significance include SR 12, Cordelia Road, and SR 113. The total mileage within the county is approximately 51 miles.

- **SR 12** is classified as a rural major arterial from the western border east to I-80, and east from Suisun City's eastern border to Rio Vista and the county line.
- **Cordelia Road** runs east to west and acts as a connector to SR 12. The road begins near the I-80/I-680 interchange and continues to its terminus at Suisun City.
- **SR 113** runs north to south through Solano County, connecting SR 12 to I 80 in Dixon.

Major Collector

Major collector roads total approximately 19.5 miles in Solano County. These routes include Midway Road in Dixon, Porter Street south of Dixon in unincorporated Solano County, and collector roads along I-680 between Fairfield and Benicia.

Alternative Transportation

Public Transit

Public transit service is provided through a network of local and interregional carriers. Bus transit, paratransit, ferry transit, and commuter rail operate throughout Solano County. The specific projects proposed in the CTEP would enhance these services.

Bus Transit

Local bus service in Solano County is provided by six providers: Benicia Transit, Dixon Redit Ride, Fairfield-Suisun Transit, Rio Vista Transit, Vacaville City Coach, and Vallejo Transit. Local fixed route service is provided in Benicia, Fairfield, Suisun City, Vacaville, and Vallejo.

Intercity bus service is provided by Benicia Transit, Fairfield-Suisun Transit, and Vallejo Transit. These operators provide a total of nine intercity bus routes. Fairfield-Suisun Transit manages three intercity routes that are jointly funded by YSAQMD; Dixon, Fairfield, Suisun City, and Vacaville; Solano County; and STA. These three routes provide service along the I-80 corridor between the participating agencies.

Benicia Transit operates two intercity bus routes that provide connections to the Pleasant Hill BART station, the Vallejo Ferry Terminal, and downtown Vallejo's Transit Center. Vallejo Transit operates four intercity bus routes with service to the El Cerrito del Norte BART station, Fairfield, Suisun City, Solano College, and Vacaville.

Paratransit

Intercity paratransit service is provided by Solano Paratransit in the northern part of Solano County and by Vallejo Transit in the southern part. Subsidized taxi service is also available for the senior and disabled in unincorporated county areas and Fairfield, Suisun City, Vacaville, and Vallejo. Figure 10-2 shows the daily paratransit ridership for various transit services within Solano County.

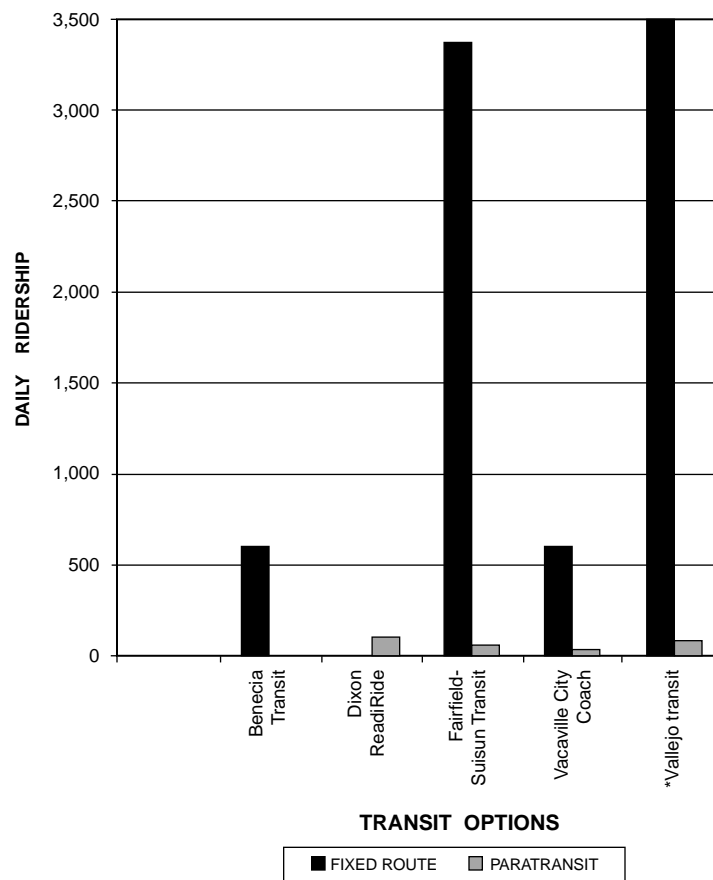
Ferry Transit

The Vallejo Baylink Ferry Service currently provides 11 round trips on weekdays between the Vallejo Ferry Terminal and the San Francisco Ferry Building or Pier 41 at Fisherman's Wharf. Ferry trips are made every hour during peak periods and every other hour during off-peak periods. Because demand for the ferry service exceeds vessel capacity during peak commute times, Vallejo initiated supplemental bus service in 1998; currently, two morning and two afternoon bus trips are made. Figure 10-3 summarizes the level of ferry ridership from 1996–97 to 2000–01.

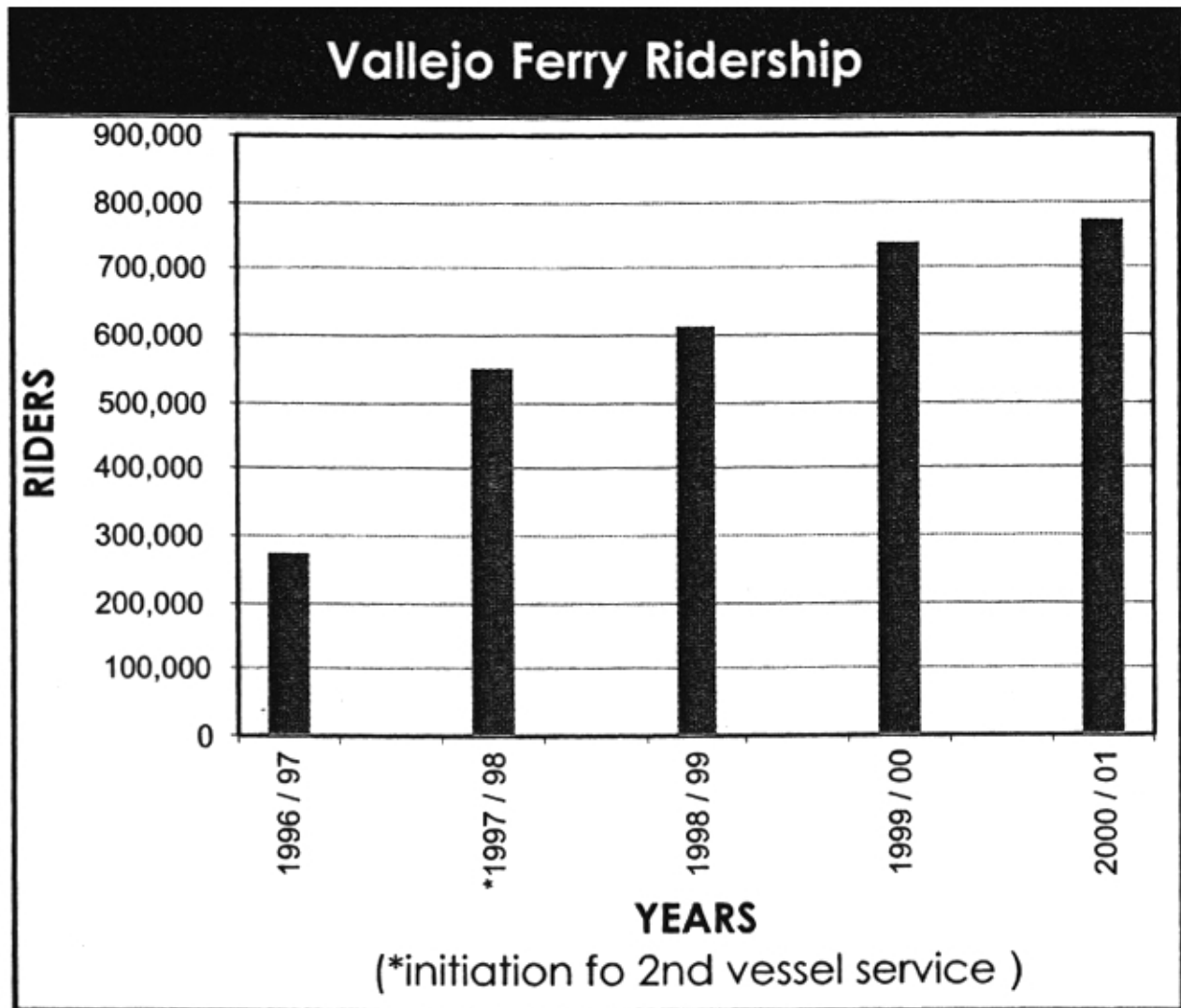
Commuter Rail

Passenger rail service in Solano County is provided by the Capitol Corridor service, which is administered by the Capitol Corridor Joint Powers Authority. Capitol Corridor intercity rail service carries passengers between the Bay Area

Year 2000 Bus Ridership



*Vallejo Transit exceeds scale and has a daily fixed route ridership of 11,000.



and Sacramento. The Suisun City Train Station provides the only access to the Capitol Corridor service in Solano County. Train frequencies have increased from three to nine daily round trips over the past decade. Figure 10-4 summarizes annual ridership at the station from 1990–2000.

Bicycle Network

Solano County provides approximately 13 miles of off-street bike paths, 31 miles of bike lanes, and 1.1 miles of bike routes. The first phase of the Solano Bikeway, a regional route linking Vallejo and Fairfield was recently completed. It is estimated that over 5,000 students commute to school by bicycle every day within the county.

Ridesharing

Ridesharing is defined as two or more persons traveling together to work in a carpool or vanpool. Solano County has the highest carpooling and vanpooling rate among Bay Area counties, with 24% of commuters traveling by this mode.

Park-and-Ride Lots

There are 10 formal park-and-ride lots in Solano County and a number of informal lots. The formal lots are in Benicia, Cordelia, Fairfield, Suisun City, Vacaville, and Vallejo. These lots provide a total of 1,480 parking spaces. Transit connections are provided at seven of the lots.

Surveys conducted in 2000 indicated that the Green Valley lots in Fairfield; the Suisun City Train Station lots in Suisun City; the Regional Transportation Center in Vacaville; and the Ferry Terminal and Curtola lot in Vallejo were full with spillover parking on adjacent streets. The primary regional destinations for park-and-ride lot users were San Francisco (55%), Oakland (14%), Berkeley (7%), and Sacramento (5%).

Existing Traffic Conditions (Levels of Service)

The quality of service provided by a roadway is measured by its level of service (LOS). This measurement method uses a letter rating to describe the peak period driving conditions for a particular facility. The ratings range from LOS A, which represents free-flow traffic conditions with little or no delay experienced by motorists, to LOS F, which describes congested conditions where traffic flows exceed design capacity.

STA has adopted a minimum LOS standard of E for arterials and highways in the Solano County (Solano Transportation Authority 2001). Several cities have adopted LOS standards of their own. Dixon has adopted a LOS standard of C for

existing and proposed street configurations and highway networks. Suisun City has a LOS standard of E for public streets. Benicia has a minimum threshold of LOS D on all city roads, street segments, and intersections.

Based on a review of STA's 2000 daily LOS levels, I-80 had a LOS rating ranging from C to F. Several segments of I-80 in Fairfield, and Vallejo had rating of F. I-680 had LOS ratings of C and D in unincorporated Solano County and Benicia. SR 12 had segments with LOS ratings ranging from A in portions of Suisun City to F in Rio Vista. Other major transportation routes and corridors LOS estimates are available in the CTP Arterials, Highways, and Freeways Element or on the STA Web site (Solano Transportation Authority 2002a).

Projected Transportation Supply and Demand Changes

Person Trip, Vehicle Trip, and Vehicle Mile Increases

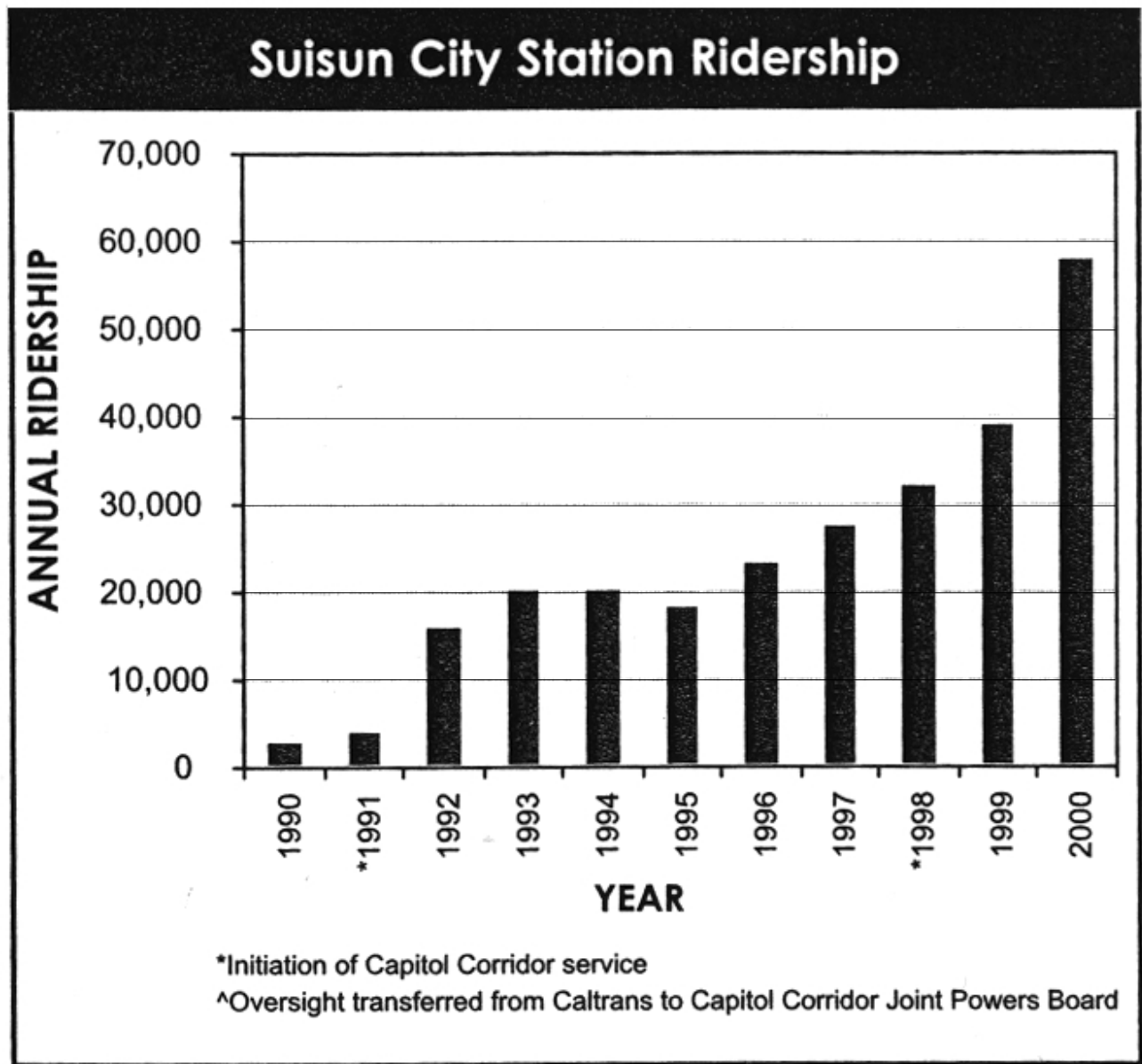
Solano County is projected to be the fastest-growing county in the Bay Area through 2025. The population is expected to grow by 45% between 2000 and 2025. The fastest growth within the county is expected to occur in Rio Vista and unincorporated portions of the county.

The total number of jobs in Solano County is expected to grow by 52% between 2000 and 2025. The highest rate of job growth is projected to occur in the unincorporated portions of the county, which would more than triple the job base by 2025. Within the county, employment growth rates include a doubling of jobs in Suisun City and a 50–70% increase for Dixon, Fairfield, and Rio Vista.

The increases in population and employment opportunities will likely result in an increased number of person trips and vehicle trips. With this increased traffic volume and congestion, increases in vehicle miles traveled are anticipated. (Solano Transportation Authority 2002b.)

Transportation Needs

Solano County's population is projected to age significantly over the next 20 years. Significant increases are expected in the proportion of the population aged 55–64 years and over 65 years. The over-65-years group will increase from 10% of the county population in 2000 to nearly 18% by 2025. This increase will likely be accompanied by changing transportation needs; a substantial increase in the demand for transit service is likely for the senior and disabled (paratransit) and for those who need transportation to health care and other human services .



Regulatory Setting

STA is responsible for planning, coordinating, and financing transportation projects in Solano County for Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, Vallejo, and Solano County. This section lists transportation policies that could affect or be affected by the CTEP; these policies include state regulations and county and city regulations and policies.

State

California Rail Passenger Program Report

The California Rail Passenger Program Report, prepared by Caltrans, examines intercity passenger rail transportation in California. It reviews the current operations of state-supported intercity passenger rail service and outlines 10-year plans (for 1999–2009) for capital improvements and service expansions. The report outlines an “intercity rail program vision” that encompasses the following relevant policies.

- **Policy 1:** Provide a rail transportation alternative to other travel modes.
- **Policy 2:** Provide relief to highway and airway congestion.
- **Policy 3:** Improve air quality, conserve fuel, and contribute to efficient and environmentally superior land use.

Local

Solano County

- **Circulation and Transportation Goal:** Develop a comprehensive transportation and circulation system which is efficient, safe, environmentally sound, aesthetically pleasing, and compatible with the goals and plans of state, regional, and other local agencies.
- **Circulation and Transportation Objective 1:** Provide and maintain a safe, economical and efficient system of roads, streets, and highways to ensure adequate multi-modal movement of people and goods within, to and from the County, while incurring the least social, economic, and environmental harm to existing or planned activities and land use.
- **Circulation and Transportation Objective 2:** Develop an efficient, safe, convenient, and economical county-wide transit system designed to reduce the dependence on the automobile and to serve the transit needs of the population.
- **Circulation and Transportation Objective 3:** Establish a system of trails, bikeways, and walkways as an alternate mode of travel which would provide convenient and safe movement of non-motorized traffic.

- **Circulation and Transportation Proposals Policy 2:** Develop a transportation system that encourages concentration of major employment and activity centers in proximity to residential areas to facilitate shorter travel distances and non-auto modes of travel.
- **Circulation and Transportation Proposals Policy 3:** Develop the transportation system to promote the planned pattern of land uses; limit transportation improvement to those necessary to serve existing and planned future land uses.
- **Circulation and Transportation Proposals Policy 5:** Improve current air and noise quality by discouraging utilization of the auto, and encouraging alternative transportation services.
- **Circulation and Transportation Streets and Roads Policy 3:** Maintain and improve the existing street, road, and highway system to meet design standards, especially streets which also carry transit and non-motorized traffic.
- **Circulation and Transportation Streets and Roads Policy 4:** Conduct a continual evaluation of existing segments of the street and highway network in order to correct safety and/or congestion problems for better circulation.
- **Circulation and Transportation Transit Service Policy 1:** Coordinate existing and planned county-wide public and private transit systems.
- **Circulation and Transportation Transit Service Policy 2:** Encourage the development of transit systems along major corridors to connect the county with surround major population, commercial, industrial, and cultural areas.
- **Circulation and Transportation Non-Motorized Facilities Policy 1:** Develop a trail and bikeway system along selected routes to provide intercity and inter-county access.

Benicia

- **Circulation Policy 2.14.1:** Discourage street widenings and the removal of on-street parking to ease traffic flow.
- **Circulation Goal 2.15.1:** Provide a comprehensive system of pedestrian and bicycle routes which link the various components of the community: employment centers, residential areas, commercial areas, schools, parks, and open space.
- **Circulation Policy 2.15.1:** Make pedestrian and bicycle circulation, and safety improvements a high priority for transportation funding, utilizing locally generated revenues and State and federal grants.
- **Circulation Goal 2.16.1:** Ensure access to needs of individuals with disabilities.
- **Circulation Policy 2.16.1:** Provide for adequate public access in all forms (walks, buildings, transportation) in conformance with the American for Disabilities Act (ADA).

- **Circulation Goal 2.17.1:** Provide an efficient, reliable, and convenient transit system.
- **Circulation Policy 2.17.1:** Continue to provide transit service to all – and subsidized paratransit service to all qualified – potential users, including youth, the elderly and the disabled, modifying routes and schedules as demand changes.
- **Circulation Policy 2.17.3:** Coordinate transit service and trip reduction efforts with other agencies.
- **Circulation Goal 2.18.1:** Encourage the provision of convenient rail service to Benicia with a station near the Benicia Bridge.
- **Circulation Policy 2.18.1:** Work with BART, Caltrans, BCDC, the Solano Transportation Authority, and MTC in planning a rail station near the Benicia-Martinez Bridge.
- **Circulation Goal 2.20:** Provide a balanced street system to serve automobiles, pedestrians, bicycles, and transit, balancing vehicle flow improvements with multi-modal considerations.
- **Circulation Policy 2.20.2:** Seek alternatives to road widenings.
- **Circulation Policy 2.21.1:** Provide and promote a range of travel alternatives to the use of the private automobile.
- **Circulation Goal 2.26:** Ensure that scenic and environmental amenities of I-680 and I-780 are not compromised.

Dixon

- **Transportation and Circulation Goal 1:** To maintain existing levels of service along the local circulation network.
- **Transportation and Circulation Goal 2:** To provide a safe and efficient circulation system that provides access to residential, commercial, industrial and recreational area by all modes of travel.
- **Transportation and Circulation Policy 1:** The City shall ensure that Dixon’s existing and proposed street configuration and highway network maintains traffic operations at Level of Service “C” or better, while acknowledging that this objective may be difficult to achieve in those locations where traffic currently operates at LOS below C for limited periods of time. Achieving this policy requires a variety of traffic improvements including improving existing arterials, construction of arterials and collector streets in newly developing areas, and intersection improvements.
- **Transportation and Circulation Policy 2:** The City shall provide additional transportation alternatives to the private automobile (an improved transit system, park-and-ride lots, bicycle facilities, etc.)
- **Transportation and Circulation Policy 3:** The City shall encourage the continued development and expansion of local public bus/van transit

systems, if it can be demonstrated that the service can be financially supported.

- **Transportation and Circulation Policy 4:** The City shall support cycling as a transportation mode which promotes personal health, recreation and enjoyment while minimizing energy consumption and air pollution. The City shall improve and expand existing bikeway facilities in accordance with the Bikeways Master Plan, and shall provide connections to newly developed areas, where feasible.
- **Transportation and Circulation Policy 8:** The City shall explore the possibility of establishing a railroad station within the Planning Area.
- **Transportation and Circulation Policy 9:** The City shall explore the possibility of improving I-80 ramp connections.
- **Transportation and Circulation Policy 12:** The City shall cooperate with Caltrans and other agencies to ensure that transportation facilities are constructed and maintained to appropriate standards.
- **Transportation and Circulation Policy 13:** The City shall provide adequate capacity on arterials and collectors to discourage diversion to local streets.

Fairfield

- **Circulation Objective CI 2:** Achieve a coordinated regional and local transportation system that minimizes traffic congestion and efficiently serves users.
- **Circulation Policy CI 2.1:** Local circulation system improvements shall be consistent with the goals and objectives stated in the Metropolitan Transportation Commission Regional Transportation Plan.
- **Circulation Policy CI 2.4:** Work with Caltrans and adjacent jurisdictions to improve the operational performance of I-80, I-680 and State Route 12 as regional facilities.
- **Circulation Policy CI 3.1:** Prioritize transportation projects based on reducing traffic congestion and improving traffic circulation.
- **Circulation Policy CI 5.4:** Work with the various government agencies to provide secure parking at park-and-ride lots and transit stations.
- **Circulation Policy CI 6.4:** Work with Caltrans to implement the use of high-occupancy vehicle lanes on I-80 through Fairfield and to study the use of reduced tolls or license fees for carpools and vanpools on highway/interstate facilities.
- **Circulation Objective CI 7:** Develop a transit network capable of satisfying both local and regional travel demand.

- **Circulation Policy CI 7.2:** Design transit stops that provide good access to major public facilities and employment centers within the City.
- **Circulation Policy CI 7.6:** Integrate regional transit with local transit to make the entire system more user-friendly. Coordinate the integration of local and regional transit with the Solano County Transportation Authority and other cities.
- **Circulation Policy CI 7.8:** Encourage the development of a conventional rail system for interregional traffic, e.g. to Sacramento and the Bay Area.
- **Circulation Objective CI 9:** Promote maximum opportunities for biking by continuing to develop and maintain a safe, convenient bikeway system which facilitate bicycle travel for commuting, recreation or other purposes.
- **Circulation Policy CI 9.6:** Cooperate with surrounding jurisdictions and regional agencies to establish a countywide bikeway network throughout Solano County which provides linkages with regional networks.
- **Circulation Objective CI 10:** Provide pedestrian facilities throughout the City to encourage walking as an alternative to short-distance vehicle travel.
- **Circulation Objective CI 12:** Contribute towards improving the air quality of the region through more efficient use of private vehicles and increased use of alternative transportation modes.

Rio Vista

- **Circulation and Mobility Policy 8.1.C:** The City shall ensure that highway expansion is implemented in a manner that preserves as much as possible of the rolling hillsides and views, even if design speeds will be lower than similar state highways.
- **Circulation and Mobility Policy 8.2.A:** The City shall improve traffic controls and pedestrian access on Highway 12.
- **Circulation and Mobility Policy 8.2.C:** The City shall ensure that new and upgraded arterial streets and their intersections are designed and built to function at least at level of service “D” during peak traffic periods.
- **Circulation and Mobility Policy 8.2.L:** Where feasible, the City shall improve safety and traffic flow for both cars and pedestrians on existing streets and congested intersections.
- **Circulation and Mobility Policy 8.2.Q:** The City shall ensure that the first priority of improvements is at intersections, followed by segment (lane) expansion.
- **Circulation and Mobility Goal 8.3:** To develop a comprehensive pedestrian and bicycle system over time that is coordinated with the City’s Roadway system.
- **Circulation and Mobility Goal 8.6:** To provide fast, convenient, comprehensive, and dependable transit and paratransit service as Rio Vista grows.

- **Circulation and Mobility Policy 8.6C:** As population growth and circumstances warrant, the City shall provide reliable bus service to Rio Vista residents.
- **Circulation and Mobility Policy 8.6E:** Where needed, the City shall supplement the future public transit system with continued availability of paratransit services.
- **Circulation and Mobility Goal 8.7:** To support the development and maintenance of transportation facilities that are aesthetically pleasing with minimal adverse environmental effects.
- **Circulation and Mobility Goal 8.10:** To effectively manage regional traffic growth.
- **Circulation and Mobility Policy 8.10A:** The City shall actively participate in regional planning efforts and programs at the Bay Area, County, and subregional level to reduce regional traffic growth.

Suisun City

- **Circulation and Transportation Goal 1:** To develop a street and highway system which provides for both local and regional vehicular circulation needs while maintaining a level of service “E” on public streets wherever feasible.
- **Circulation and Transportation Goal 4:** To provide opportunities for bicycle and pedestrian travel.
- **Circulation and Transportation Goal 5:** To provide efficient and viable public transportation choices for all segments of the community, especially those for which private automobile transportation is not feasible.
- **Circulation and Transportation Goal 6:** To increase opportunities for and access to regional public transportation including passenger rail service, intercity busy service commuter bus, rail and transit, and paratransit.
- **Circulation and Transportation Objective 6:** Establish a bikeway system which follows all major routes, especially connecting likely destinations for bicyclists.
- **Circulation and Transportation Objective 8:** Provide residents with a variety of public transit options, better fixed route connections and more frequent service, and provide a more cost-effective operation of the transit system.

Vallejo

- **Circulation and Transportation Mobility Goal:** To have mobility for all segments of the community with a transportation system that minimizes pollution and conserves energy and that reduces travel costs, accidents and congestion.

- **Circulation and Transportation Mobility Policy 1:** When evaluating future expansion of streets and highways, consider incorporation of public transit, bicycle and pedestrian rights-of-way, and distribution of goods and services as a system to maintain the citizenry, rather than as a system devoted solely to the accommodation of the private automobile.
- **Circulation and Transportation Mobility Policy 2:** All residents, especially the elderly, the handicapped, the young and the low-income individual, should be served by the transportation system.
- **Circulation and Transportation Mobility Policy 3:** The transportation system should not unnecessarily pollute the environment with excessive noise, air pollution, and signing.
- **Circulation and Transportation Street and Highway System Goal:** To have a functional street and highway system that provides appropriate access to the industrial, commercial and residential areas of the city.
- **Circulation and Transportation Compatibility with Adjoining Land Uses Goal:** To have a street and highway system that services all land uses with a minimum adverse impact.
- **Circulation and Transportation Compatibility with Adjoining Land Uses Policy 4:** Street widening should not be approved in existing neighborhoods where there is significant opposition from the immediate residents.. Alternative mitigation should be initiated prior to such widening, including modification of street signalization, rerouting of cross town traffic, creating one-way streets and eliminating on-street parking. Street widening should include street planting to give an immediate landscaped appearance.
- **Circulation and Transportation Transit Policy 1:** Local and regional transit systems should be given a priority equal to that of the private automobile when developing the future street system and when reviewing specific development proposals.
- **Circulation and Transportation Transit Policy 3:** All major community facilities should be made accessible from public transportation; all uses that are, by nature, transit dependent, e.g., senior citizen housing, should be readily accessible to transit.
- **Circulation and Transportation Non-Motorized Transportation Policy 1:** As evidence of the community's desire to encourage healthy and safe alternative modes of travel replacing the auto, the City shall give high priority to implementing the Vallejo Bicycle Route Plan.

Vacaville

- **Transportation Policy 6.2-G 1:** Coordinate, to the extent feasible, transportation system improvements with neighboring jurisdictions.
- **Transportation Policy 6.2-G 3:** Provide adequate capacity on arterial roadways to meet LOS standards and to avoid traffic diversion to local roadways or the freeway. Frontage roads, or parallel roadway facilities,

should be provided adjoining the freeways wherever possible in order to avoid traffic diversions on the freeways.

- **Transportation Policy 6.3-G 2:** Design new collector roadways and implement traffic-control measures where feasible to maintain LOS C on these new collector roadways.
- **Transportation Policy 6.4-G 4:** Cooperate with public agencies and other entities to promote local and regional public transit serving Vacaville.
- **Transportation Policy 6.4-I 5:** Encourage construction of regional rail facilities, including a regional rail stop that will serve Vacaville. Encourage the expansion of an intercity public transit/bus system to link Vacaville with neighboring communities.
- **Transportation Policy 6.4-I 7:** Design local transit to plan for local bus routes that improve service for potential riders. This includes improvements such as bus turnouts and shelters and related facilities.
- **Transportation Policy 6.4-I 10:** Continue to designate bike lanes and construct cross-city bike routes designated in this General Plan to facilitate non-motorized home-to-work trips.
- **Transportation Policy 6.5-G 1:** Establish a comprehensive network of on- and off-roadway bike routes to encourage the use of bikes for commute, recreational, and other trips.
- **Transportation Policy 6.5-G 3:** Develop bike and pedestrian routes that provide access to schools, historic sites, governmental services, major commercial centers, parks and regional open space.
- **Transportation Policy 6.5-G 4:** Ensure safe, pleasant and convenient pedestrian paths, sidewalks, and trails to accommodate all segments of the population.
- **Transportation Policy 6.5-G 6:** Designate new bike routes only where necessary to connect Vacaville's bikeway system with existing bike routes designated by Solano County.

Impacts and Mitigation Measures

Methods of Analysis

State regulations and the transportation and circulation elements of the county and city general plans were reviewed for consistency with the specific projects of the CTEP. Demographic, growth projections, and ridership information for the county were obtained from the CTP and used in the evaluation of impacts of transportation and circulation resulting from the proposed CTEP. A more detailed transportation and circulation impact analysis would be required during development of plans for individual specific projects.

Criteria for Determining Significance

The specific projects in the CTEP would have significant environmental impacts on the street and highway system or on alternative modes of transportation if they would:

- cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);
- exceed, either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways;
- substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- result in inadequate emergency access;
- result in inadequate parking capacity; or
- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact T-1: Impacts from Operational Subsidies

The allotment of operational subsidies for the following specific projects would not have any adverse effects on transportation and circulation within the project area: senior and disabled transit services, express bus service along I-80/I-680/I-780, Baylink Ferry Service, and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs, and provide extra service hours, all of which would have a beneficial impact.

Impact T-2: Impacts from Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP would involve conceptualizing areas where habitat could be set aside to compensate for the loss of sensitive habitats that results from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact T-3: Substantial Increase in Traffic Relative to the Existing Traffic Load and Capacity of Roadways

Projections of future employment and growth in employment indicate that vehicle trips would increase in the future. This new growth would likely exceed the capacity of the existing roadway system. The following specific projects in the CTEP, although developed to address this increase in traffic, could contribute additional traffic to the roadways if the anticipated growth does not occur: the I-80/I-680/SR 12 interchange reconstruction, I-80 corridor improvements, and SR 12 west widening. HOV lane improvements would be part of the I-80/I-680/SR 12 interchange reconstruction and I-80 corridor improvement projects, which would strive to minimize traffic congestion when completed. However, because vehicle trips would likely increase with the projected population, housing, and employment growth over the next 18 years, this impact is considered significant and unavoidable. There is no mitigation available to reduce this impact to a less-than-significant level.

Impact T-4: Violation (Individually or Cumulatively) of an LOS Standard Established by County Congestion Management Agency for Designated Roads or Highways

STA is the congestion management agency for Solano County. In the 2001 Solano Congestion Management Program, STA adopted a minimum LOS standard of E for arterials and highways in the Solano County. This standard is generally consistent with concept LOS set by Caltrans for the state highway system. Based on STA's 2000 daily LOS estimates, many of the transportation corridors currently meet or exceed the STA LOS standard, although segments of I-80 and SR 12 are at LOS F. Highway improvement projects proposed under the CTEP, such as the I-80/I-680/SR 12 interchange construction, the I-80 corridor improvements, and SR 12 west widening, are expected to reduce congestion and improve access. Therefore, implementation of the improvements proposed under the CTEP would not contribute to a violation the STA LOS standard.

Construction activities could temporarily result in a violation of STA's LOS standard because of temporary lane or road closures, detours, and an overall reduction in carrying capacity. However, construction activities are temporary in nature.

This impact is considered less than significant. No mitigation is required.

Impact T-5: Creation of Need for Capacity-Enhancing Alterations to Existing Facilities

The I-80/I-680/SR 12 interchange reconstruction, I-80 corridor improvements, and SR 12 west widening include road widening and construction or reconstructing interchanges. Although these specific projects are intended to

provide improvements to the state highway and roadway system, they would require alterations to existing facilities in the county and could increase the carrying capacity of these facilities to accommodate more vehicle trips than necessary to accommodate current and projected capacity needs. This impact is considered significant. Implementation of Mitigation Measure T-1 would reduce the impact, but not to a less-than-significant level. Therefore, this impact is considered is significant and unavoidable.

Mitigation Measure T-1: Refine Scope and Schedule of the Interstate 80/Interstate 680/State Route 12 Interchange Reconstruction, Interstate 80 Corridor Improvements, and State Route 12 West Widening Projects

STA should conduct corridor studies and/or feasibility studies to refine the scopes and schedules of the I-80/I-680/SR 12 interchange reconstruction, I-80 corridor improvements, and SR 12 west widening. Because the above projects could increase capacity, thereby increasing vehicle trips, STA should support the use of alternative modes of transportation by reviewing local and state design standards to ensure that provisions are made for alternative travel modes.

Impact T-6: Potential Alteration of Present Patterns of Vehicular Circulation, Increased Traffic Delay, and Increased Traffic Hazards During Construction of Specific Projects

Construction of several specific projects could result in lane or road closures, detours, open trenches on bikeway facilities or closure of bikeway facilities, and addition of construction trucks and equipment on the surrounding roadway system. These projects include the I-80/I-680/SR 12 interchange reconstruction, I-80 corridor improvements, SR 12 west widening and SR 12 corridor improvements, bicycle/pedestrian trails, and SR 113 safety improvements.

Construction within state highway rights-of-way would require an encroachment permit from Caltrans. Similarly, construction in Solano County and the seven incorporated cities would require an encroachment permit from the relevant jurisdiction. As part of obtaining an encroachment permit, a detailed traffic control plan would need to be developed that would address the methods of traffic control during construction. All construction should follow the local jurisdiction's standard construction specifications. In addition, construction within railroad rights-of-way (if applicable) would require an encroachment permit from the railroad operator. Although these required permits would be obtained, this impact is considered significant because construction could lead to traffic delays, temporary reductions in LOS, damage to property, or injury. Implementation of Mitigation Measure T-2 would reduce these impacts, but not to a less-than-significant level.

Mitigation Measure T-2: Develop and Implement a Traffic Control Plan for Construction of Specific Projects

STA should require project proponents to develop, in coordination with Solano County and local public works departments, a traffic control plan for construction projects to reduce the effects of construction of the roadway system in the project area throughout the construction period. Project proponents should submit the plan for approval at least 30 working days before work begins, and should implement the plans.

Impact T-7: Conflicts Among Bicycles, Pedestrians, and Automobiles

Specific projects with potential user conflicts include pedestrian- and transit-friendly downtowns and bicycle/pedestrian trails. Bikeway facilities would likely be located on roads, and would therefore operate alongside automobiles and pedestrians, as well as among trucks, transit, and other elements of the traffic stream. This close proximity could result in conflict among bicycles, pedestrians, and automobiles. Implementation of Mitigation Measure T-3 would reduce this impact to a less-than-significant level.

Mitigation Measure T-3: Integrate Bicycle and Pedestrian Facilities and Amenities into Local Road and Applicable Improvement Projects on Regionally Significant Roadways

STA and/or member agencies should require project proponents to integrate bicycle and pedestrian facilities and amenities into local road projects and applicable improvement projects on regionally significant roadways. To minimize the potential for conflicts among bicycles, pedestrians, and automobiles on local roads, STA should prepare a countywide bicycle/pedestrian plan that identifies key activity centers that can be improved to encourage bicycle and pedestrian travel, and should identify the routes of regional significance that serve these centers. STA and/or member agencies should require project proponents to incorporate bicycle and pedestrian facilities, safety improvements, and attractive landscaping into the design and development of projects as a condition of funding approval.

Impact T-8: Generation of Transit Demand that Current and Planned Systems Cannot Accommodate

Major improvements to passenger rail and ferry services are proposed by the CTEP. Projects include commuter rail to BART, Baylink Ferry Service, commuter rail and expanded Capitol Corridor service. Although demand for these services has been forecast, the actual future demand could exceed patronage forecasts, particularly for services that are designed to maximize speed and convenience for passengers while minimizing travel times. If regional demand exceeds planned capacity, the impact would be considered significant. Implementation of the Mitigation Measure T-4 would reduce this impact to a less-than-significant level.

Mitigation Measure T-4: Support Local Transit Operators and Caltrans in Developing Short- and Long-Range Regional Transit Plans to Facilitate the Use of Public Transportation

To ensure that the region's transit services are able to accommodate future transit demand, STA and/or member agencies should ensure that a countywide transit corridor study is completed in cooperation with local transit operators and Caltrans. In addition, STA should aid these services in procuring funding and assist in preparing long-range transit plans for each transit operator in Solano County. STA should ensure that the recommendations of the completed countywide transit corridor study are incorporated into these long-range transit plans.

Impact T-9: Inadequate Parking Capacity

Major improvements to passenger rail, ferry services, and park-and-ride lots are proposed by the CTEP. Specific projects include commuter rail to BART, Baylink Ferry Service, commuter rail, expanded Capitol Corridor service, and park-and-ride lot/rideshare program. If the demand for rail, ferry, or park-and-ride lots increases or exceeds patronage forecasts, parking demand at these facilities could exceed available capacity. This impact is considered significant. Implementation of Mitigation Measure T-5 would reduce this impact to a less-than-significant level.

Mitigation Measure T-5: Promote the Integration of Public Transportation Systems with Other Modes of Travel

To help reduce parking demand at rail, ferry, and park-and-ride lots, STA should evaluate the ability of transit users to access public transportation by other means (i.e., without needing parking space). STA should conduct a study to evaluate the ability of the regional transportation system to accommodate automobile, bus, bicycle, and pedestrian connections to and between transit services and park-and-ride lots. STA should incorporate the study recommendations into the CTEP and work with local jurisdictions to incorporate the recommendations into local general plans.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on transportation.

Environmental Setting

Topography and Climate

The concentration of a given pollutant in the atmosphere is determined by the amount of the pollutant released and the atmosphere's ability to transport and dilute it. Air pollution transport and dilution are mostly determined by wind, atmospheric stability, terrain, and insolation.

Solano County's topography varies geographically. The western quarter of the county extends into the foothills of the Coast Ranges, characterized by steep slopes becoming more gently rolling hill to the east. The remainder of the county is part of the Sacramento Valley basin and is relatively flat, except for isolated areas of low rolling hills in the southeast portion. The southern is bounded by the Sacramento River, Suisun Bay and Suisun Marsh, San Pablo Bay, Napa Sonoma Marsh and associated sloughs.

Solano County has a semi-arid temperate climate, with average annual temperatures in the mid-60s°F. Temperatures can reach below 20°F in winter and can exceed 100°F in summer. The region averages approximately 20 inches of rain per year, most of which falls during winter. In addition, fog is often common during winter because of the nearby marshes and bays. Between late spring and early fall, inversions often occur as a layer of warm air overlays a layer of cool air from the Delta and San Francisco Bay.

In general, the prevailing wind in the region is from the southwest and west-southwest resulting from marine breezes flowing through the Carquinez Strait. During summer, wind speeds average 10–20 mph. During winter, marine breezes generally diminish and winds from the north occur more frequently. However, winds are more variable during winter; gale forces are more common and can reach 45–50 mph.

Air Pollutant Standards and Concentrations

Ambient Air Quality Standards

The air pollutants of greatest concern in Solano County are inhalable particulate matter less than 10 microns in diameter (PM₁₀), carbon monoxide (CO), and ozone. The State of California and the federal government have each established ambient air quality standards for air pollutants (Table 11-1). For some pollutants, different standards have been set for different periods. Most standards are set to protect public health, but others are based on values such as protection of crops, protection of materials, or avoidance of nuisance conditions.

Existing Concentrations

The existing air quality conditions within Solano County are characterized by air quality monitoring data collected in the region. Ozone, CO, and PM₁₀ concentrations are measured at several countywide monitoring stations; these pollutants and recent monitoring data are described below and in Table 11-2.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials. Ozone causes extensive damage to plants by leaf discoloration and cell damage.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen (NO_x), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_x, are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 part per million (ppm), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period. Table 11-2 indicates that the state and federal ozone standards have been exceeded occasionally during the three most recent years for which data are available (1998–2000).

Table 11-1. Ambient Air Quality Standards Applicable in California

Pollutant	Average Time	Standard (ppm)		Standard ($\mu\text{g}/\text{m}^3$)		Violation Criteria	
		California	National	California	National	California	National
Ozone (O_3)	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon monoxide (CO)	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
	1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
Carbon monoxide (Lake Tahoe only)	8 hours	6	—	7,000	—	If equaled or exceeded	—
Nitrogen dioxide (NO_2)	Annual average	—	0.053	—	100	—	If exceeded
	1 hour	0.25	—	470	—	If exceeded	
Sulfur dioxide (SO_2)	Annual average	—	0.03	—	80	—	If exceeded
	24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
Hydrogen sulfide (H_2S)	1 hour	0.25	—	655	—	—	—
	1 hour	0.03	—	42	—	If equaled or exceeded	—
Vinyl chloride ($\text{C}_2\text{H}_3\text{Cl}$)	24 hours	0.010	—	26	—	If equaled or exceeded	—
Inhalable particulate matter (PM_{10})	Annual geometric mean	—	—	20	—	If exceeded	—
	Annual arithmetic mean	—	—	—	50	—	If exceeded
	24 hours	—	—	50	150	If exceeded	If average 1% over 3 years is exceeded
Inhalable particulate matter ($\text{PM}_{2.5}$)	Annual geometric mean	—	—	12	—	If exceeded	—
	Annual arithmetic mean	—	—	—	15	—	If exceeded
	24 hours	—	—	—	65	—	If average 2% over 3 years is exceeded
Sulfate particles (SO_4)	24 hours	—	—	24	—	If equaled or exceeded	—

Table 11-1. Continued

Pollutant	Average Time	Standard (ppm)		Standard ($\mu\text{g}/\text{m}^3$)		Violation Criteria	
		California	National	California	National	California	National
Lead particles (Pb)	Calendar quarter	—	—	—	1.5	—	If exceeded no more than 1 day per year
	30 days	—	—	1.5	—	If equaled or exceeded	—

Notes: All standards are based on measurements at 25°C and 1 atmosphere pressure; national standards shown are the primary (health effects) standards.

— = not applicable.

Table 11-2. Ambient Air Quality Monitoring Data from Solano County Monitoring Stations

Pollutant Standards	1998	1999	2000
Ozone: Fairfield			
Maximum 1-hour concentration (ppm)	0.121	0.129	0.096
Days standard exceeded ^a			
CAAQS (1-hour) > 0.09 ppm	9	9	1
NAAQS (1-hour) > 0.12 ppm	0	1	0
Ozone: Vacaville (Elmira Road)			
Maximum 1-hour concentration (ppm)	0.137	0.140	0.100
Days standard exceeded ^a			
CAAQS (1-hour) > 0.09 ppm	10	8	2
NAAQS (1-hour) > 0.12 ppm	2	1	0
Ozone: Vallejo (304 Tuolumne Street)			
Maximum 1-hour concentration (ppm)	0.119	0.113	0.079
Days standard exceeded ^a			
CAAQS (1-hour) > 0.09 ppm	3	4	0
NAAQS (1-hour) > 0.12 ppm	0	0	0
Carbon Monoxide: Vallejo (304 Tuolumne Street)			
Maximum 8-hour concentration (ppm)	5.3	5.49	5.11
Maximum 1-hour concentration (ppm)	7.2	6.6	6.5
Days standard exceeded ^a			
CAAQS (8-hour) \geq 9.0 ppm	0	0	0
NAAQS (8-hour) \geq 9.0 ppm	0	0	0
CAAQS (1-hour) \geq 20 ppm	0	0	0
NAAQS (1-hour) \geq 35 ppm	0	0	0
PM10: Vallejo (304 Tuolumne Street)			
Maximum 24-hour concentration ($\mu\text{g}/\text{m}^3$)	71.3	83.7	53.0
Second-highest 24-hour concentration ($\mu\text{g}/\text{m}^3$)	40.9	62.0	45.8

Table 11-2. Continued.

Pollutant Standards	1998	1999	2000
Average geometric mean concentration ($\mu\text{g}/\text{m}^3$)	14	16	13
Average arithmetic mean concentration ($\mu\text{g}/\text{m}^3$)	17	19	15
Days standard exceeded ^a			
CAAQS (24-hour) > 50 $\mu\text{g}/\text{m}^3$	6	18	6
NAAQS (24-hour) > 150 $\mu\text{g}/\text{m}^3$	0	0	0
PM10: Vacaville (Merchant Street)			
Maximum 24-hour concentration ($\mu\text{g}/\text{m}^3$)	56.0	66.0	47.0
Second-highest 24-hour concentration ($\mu\text{g}/\text{m}^3$)	46.0	62.0	44.0
Average geometric mean concentration ($\mu\text{g}/\text{m}^3$)	15	17	16
Average arithmetic mean concentration ($\mu\text{g}/\text{m}^3$)	17	19	18
Days standard exceeded ^a			
CAAQS (24-hour) > 50 $\mu\text{g}/\text{m}^3$	6	18	0
NAAQS (24-hour) > 150 $\mu\text{g}/\text{m}^3$	0	0	0

^a Calculated exceedances based on measurements taken every 6 days.

Source: California Air Resources Board 2002 and U.S. Environmental Protection Agency 2002.

Carbon Monoxide

CO is essentially inert to plants and materials, but it can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for 1- and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both the state and federal standards for the 8-hour averaging period are 9 ppm. Table 11-2 indicates that the state and federal CO standards have not been exceeded during the three most recent years for which data are available (1998–2000).

Particulate Matter

Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates can damage human health and retard plant growth. They also reduce visibility, soil buildings and other materials, and corrode materials.

PM10 emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

The state PM10 standards are 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) as a 24-hour average and 30 $\mu\text{g}/\text{m}^3$ as an annual geometric mean. The federal standards are 150 $\mu\text{g}/\text{m}^3$ as a 24-hour average and 50 $\mu\text{g}/\text{m}^3$ as an annual arithmetic mean. Table 11-2 indicates that the state PM10 standard has been exceeded occasionally and the federal PM10 standard has not been exceeded during the three most recent years for which data are available (1998–2000).

Attainment Status

The western portion of Solano County lies within the San Francisco Bay Area Air Basin (SFBAAB), while the eastern portion of the county lies within the Sacramento Valley Air Basin (SVAB). The SFBAAB and SVAB are classified as “attainment” or “nonattainment” with respect to federal and state ambient air quality standards (Table 11-3). These classifications are determined by comparing monitored air pollutant concentrations to state and federal standards.

As shown in Table 11-3, the pollutants of greatest concern in these basins are ozone and PM10.

Table 11-3. Solano County Attainment Status for State and Federal Standards

Air Basin	Attainment Status					
	State Standards			Federal Standards		
	Ozone	CO	PM10	Ozone	CO	PM10
SFBAAB	serious nonattainment	attainment	nonattainment	not classified/ moderate/other attainment*	unclassified/ attainment	unclassified
SVAB	serious nonattainment	attainment	nonattainment	severe nonattainment	unclassified/ attainment	unclassified

* Attainment deadline of 2006.

Regulatory Setting

Air Quality Management Programs

The Bay Area Air Quality Management District (BAAQMD) has jurisdiction over air quality issues within the SFBAAB portion of Solano County (western), while the Yolo-Solano Air Quality Management District (YSAQMD) has similar jurisdiction within the SVAB portion of the county (eastern). BAAQMD and YSAQMD administer air quality regulations developed at the federal, state, and local levels within Solano County.

Air pollution control programs were established in California before federal requirements were enacted. However, federal Clean Air Act (CAA) legislation in the 1970s resulted in a gradual merging of state and federal air quality programs, particularly those relating to industrial sources. Air quality management programs developed by California since the late 1980s have generally responded to requirements established by the federal CAA.

The enactment of the California CAA in 1988 and the federal CAA Amendments of 1990 has produced additional changes in the structures and administration of air quality management programs. The California CAA requires preparation of an air quality attainment plan for any area that violates state standards for CO, sulfur dioxide (SO₂), nitrogen dioxide (NO₂), or ozone. Locally prepared attainment plans are not required for areas that violated the state standards for PM10, but the California Air Resources Board (CARB) is currently addressing PM10 attainment issues.

San Francisco Bay Area Air Basin

BAAQMD recently prepared two air quality plans designed to bring the SFBAAB into attainment with ozone standards. The 1999 ozone attainment plan for SFBAAB (1999 SFBAAB OAP) was designed to bring the SFBAAB into attainment with federal ozone standards. BAAQMD also adopted the 2000 clean air plan for SFBAAB on December 20, 2000 (Bay Area Air Quality Management District 2000). It contains additional rules and regulations designed to bring the SFBAAB into attainment with state ozone standards.

The SFBAAB did not attain the federal ozone standard by the 2000 deadline stipulated in the 1999 SFBAAB OAP. Therefore, EPA disapproved the 1999 SFBAAB OAP and required preparation of a new plan that provided for an updated volatile organic compounds (VOC) and NO_x emissions inventory and new transportation conformity budgets. In response, BAAQMD developed a 2001 OAP for SFBAAB for the 1-hour national ozone standard (2001 SFBAAB OAP). BAAQMD, the Metropolitan Transportation Commission (MTC), and ABAG formally adopted the 2001 SFBAAB OAP on October 26, 2001. In November 2001, CARB approved the 2001 SFBAAB OAP and submitted it to EPA for review and approval; EPA is currently reviewing the plan (California Air Resources Board 2002).

The deadline for attainment of the federal ozone standard under the 2001 SFBAAB OAP is 2006. It contains a control strategy that incorporates seven new stationary source measures, five new transportation control measures, and 11 further-study measures. It also includes a commitment to strengthen the smog check program and a new assessment of attainment status based on available data for the SFBAAB. Attainment status will be reevaluated in 2003 using data from the central California ozone study. In 2004, a revised state implementation plan (SIP) incorporating any necessary modifications to the control strategy will be submitted to EPA (California Air Resources Board 2002).

On November 30, 2001, CARB submitted the 2001 SFBAAB OAP to EPA for approval as a revision to the SIP. To support the on-road motor vehicle emission inventory and transportation conformity budgets in the 2001 SFBAAB OAP, CARB also transmitted the San Francisco Bay Area-EMFAC2000 model to EPA for approval for the Bay Area. EPA has not yet taken action on the plan as a whole; only the mobile source emissions budgets have been approved for conformity.

Sacramento Valley Air Basin

In 1994, CARB, in cooperation with the Sacramento Area Council of Governments and the five air districts of the Sacramento nonattainment area of the SVAB, fulfilled the 1990 CAA Amendments' specific planning requirement by preparing the Sacramento Area Regional OAP (SAR OAP). The SAR OAP was required to identify a detailed comprehensive strategy for reducing emissions to the level needed for attainment and to show how the area would make expeditious progress toward meeting this goal. It set "rate-of-progress," or

“milestone,” emission reduction targets and dates to gauge whether the nonattainment area was making reasonable further progress toward reaching the goal of attainment.

The five regional air districts, including YSAQMD, adopted the SAR OAP, and it became part of the overall 1994 SIP. The SIP consists of adopted measures, commitments to adopt new measures, emission inventories, air quality modeling results, contingency measures, and a demonstration of emission reductions sufficient for attainment and rate-of-progress milestones. The new measures proposed in the plan SAR OAP build on the existing state and local air quality programs. Milestone reports SAR OAP were to be prepared starting in 1996 and every 3 years thereafter until the attainment deadline 2005. The SIP was submitted to EPA on November 15, 1994.

The 1999 milestone report prepared by the 5 regional air districts evaluated the planned control measures that were committed to in the 1994 SIP. The report determined the Sacramento nonattainment area of the SVAB has achieved the necessary emission reductions for meeting the 1999 rate-of-progress targets and demonstrated reasonable further progress toward attainment status. (The air districts are now in attainment for CO and PM10 and have requested attainment status.)

In 2002, another milestone report will be prepared by the 5 regional air districts to determine whether the Sacramento area is on schedule to reach attainment of the 1-hour ozone standard in 2005. 2003 will mark the beginning of a 3-year period during which attainment of the standard needs to be demonstrated. If it can be shown that we have achieved attainment by 2005, a maintenance plan will be submitted. If attainment cannot be demonstrated by 2005, the nonattainment area has the option of applying for a 1-year extension to the attainment deadline if (1) the nonattainment area has complied with all SIP requirements and commitments, and (2) no more than one exceedance of the ozone standard has occurred in the preceding year. A nonattainment area may obtain a maximum of two 1-year extensions.

Diesel Exhaust Control Program

In August 1998, CARB designated air particulate emissions from diesel-fueled engines (diesel PM) as toxic air contaminants based on their potential to cause cancer and other adverse health effects. CARB then conducted a risk management evaluation to identify whether further control of diesel PM was warranted. (California Air Resources Board 2001.)

As part of this process, CARB developed two documents titled *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines, and Vehicles* and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines*. CARB approved these documents on September 28, 2000. (California Air Resources Board 2001.)

CARB approval paved the way for the next step in the regulatory process: the control measure phase. During the control measure phase, specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles are to be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions. The regulations will be developed in an open and public process where availability, applicability, and cost of technology will all be evaluated. Interested members of the public, manufacturers, and other stakeholders will be asked to participate in the development of all proposed regulations. (California Air Resources Board 2001.)

Currently, CARB is still in the process of developing air toxics control measures for diesel engines. A public hearing for CARB's diesel emission control strategy verification procedure for on-road, off-road, and stationary diesel-fueled vehicles and equipment has been scheduled to take place in Sacramento on May 16, 2002. Some of the diesel control measures identified by CARB that will be addressed at the public hearing include diesel oxidation catalysts, diesel particulate filters, fuel additives, alternative diesel fuels, and NO_x control strategies. The diesel control measures identified by CARB are further discussed in *Appendix D*. (California Air Resources Board 2002.)

Conformity Rules

As required by the 1990 CAA Amendments, EPA enacted two separate federal conformity rules. Those rules (incorporated as 40 CFR 51 and 93) are designed to ensure that federal actions do not cause or contribute to air quality violations in areas that do not meet federal standards. The two rules are "transportation conformity," which applies to transportation plans, programs, and projects, and "general conformity," which applies to all other nontransportation-related projects. Federal actions that would be subject to the transportation conformity rule include federal funding for transportation projects. In the event that the individual projects listed under the CTEP were to be funded using federal funds, a conformity analysis would need to be completed before project funding, approval, or implementation. Federal agencies that could provide funding to projects listed in the CTEP include FHWA and FTA. A conformity analysis is not required for the CTEP.

Impacts and Mitigation Measures

Methods of Analysis

CTEP projects located within the BAAQMD portion of Solano County are assessed using BAAQMD significance criteria; likewise, projects located within the YSAQMD portion of the county are assessed using YSAQMD significance criteria.

On December 19, 2001, MTC adopted the 2001 RTP for the Bay Area. In March 2002, MTC determined that the plan was in conformity with federal air quality regulations. Because of this finding, projects that are addressed in the RTP are not expected to result in significant impacts on air quality and are not considered to require project-level air quality impact assessments. The following projects proposed in the CTEP were included in the 2001 RTP, and therefore are not anticipated to have significant impacts on air quality:

- park-and-ride lots/rideshare program,
- express bus service (I-80/I-680/I-780),
- I-80 corridor improvements (Vallejo to Dixon),
- I-80/I-680/SR 12 interchange reconstruction,
- bicycle/pedestrian trails in urbanized areas,
- pedestrian and transit friendly downtowns (TLC),
- development of commuter rail facilities (Dixon; Fairfield/Vacaville; Benicia stations),
- senior and disabled transportation services, and
- local road maintenance and rehabilitation.

The CTEP would generally have an overall increase in traffic capacity as a result of the proposed roadway and highway extensions. This increase would subsequently increase vehicle hours and miles traveled (VHT and VMT), which would directly result in increase pollutant emissions. However, the CTEP would also result in a reduction of traffic congestion as a result of the proposed interchange and transit improvements. This reduction would subsequently reduce vehicle hours of delay and the number of vehicle trips; promote conversion from the use of major transportation facilities by single-occupancy vehicles to use by HOVs; and increase rail and ferry transit usage, which would lead to reduced air pollutant emissions.

Projects that are not included within the 2001 RTP and/or have the potential to result in significant impacts on air quality and are addressed below. This analysis evaluates the potential sources of air pollutant emissions resulting from implementation of the CTEP that have not already been addressed by the RTP. In addition, this analysis cannot estimate a quantitative measure of air pollutant emissions resulting from implementation of the CTEP because of the lack of availability of a countywide air quality model with VMT for the CTEP.

Criteria for Determining Significance

State CEQA Guidelines

The proposed CTEP would result in a significant impact on air quality if it would:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

In addition to the above criteria, additional criteria are contained in the BAAQMD's *CEQA Guidelines for Assessing the Air Quality Impacts of Projects and Plans* (Bay Area Air Quality Management District 1999) and YSAQMD's *Air Quality Handbook: Guidelines for Determining Air Quality Thresholds of Significance and Mitigation Measures for Proposed Development Projects that Generate Emissions from Motor Vehicles* (Yolo-Solano Air Quality Management District 1999). These criteria are summarized below.

Bay Area Air Quality Management District

For a project located within the BAAQMD, a project is considered significant if it would:

- cause a net increase in pollutant emissions of 80 pounds per day (ppd) or 15 tons per year (tpy) of ROG, NO_x, or PM₁₀; or
- cause a net increase in CO emissions exceeding 550 pounds per day, reduce roadway LOS of intersections operating at LOS E or F, cause a reduction of intersection LOS to E or F, or increase traffic volumes on nearby roadways by 10% or more, and violate state CO concentration standards as determined by the modeling of CO emissions. (The level of significance of CO emissions from mobile sources is determined by modeling the ambient CO concentration under project conditions and comparing the resultant 1- and 8-hour concentrations to the respective state CO standards of 20.0 and 9.0 ppm.)

BAAQMD does not require construction emissions to be quantified. Instead, it requires implementation of effective and comprehensive feasible control measures to reduce PM₁₀ emissions (Bay Area Air Quality Management District

1999). PM10 emitted during construction activities varies greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, and weather conditions. Despite this variability in emissions, experience has shown that there are a number of feasible control measures that can be reasonably implemented to reduce PM10 emissions during construction. These control measures are aimed at controlling PM10 emissions and are summarized in Table 11-4. According to BAAQMD (1999), if all control measures indicated in Table 11-4 are implemented (as appropriate, depending on the size of the project area), air pollutant emissions from construction activities are considered less-than-significant.

Yolo-Solano Air Quality Management District

Recently, YSAQMD, in conjunction with the four other air districts within the Sacramento region, established new regional significance criteria for air quality that supercede the significance criteria of the individual air districts and create uniform significance criteria for the Sacramento region. These criteria are listed below in Table 11-5.

Table 11-5. YSAQMD Significance Thresholds

Emission Type	ROG (ppd)	NO _x (ppd)	CO (ppd)	PM10 (ppd)
Construction (short-term)	0	85	state standard*	state standard*
Operational (long-term)	65	65	state standard*	state standard*

* Refer to Table 11-1 for applicable state CO and PM10 standards.

Source: Covell pers. comm.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact AQ-1: No Impact on Air Quality from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Table 11-4. BAAQMD Feasible Control Measures for Construction Emissions of PM10

Basic Control Measures: The following controls should be implemented at all construction sites.
<ul style="list-style-type: none">▪ Water all active construction areas at least twice daily.▪ Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least 2 feet of freeboard.▪ Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.▪ Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
Enhanced Control Measures: The following measures should be implemented at construction sites greater than 4 acres in area.
<ul style="list-style-type: none">▪ Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).▪ Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.)▪ Limit traffic speeds on unpaved roads to 15 miles per hour (mph).▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways.▪ Replant vegetation in disturbed areas as quickly as possible.
Optional Control Measures: The following control measures are strongly encouraged at construction sites that are large in area, located near sensitive receptors, or which for any other reason may warrant additional emissions reductions.
<ul style="list-style-type: none">▪ Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.▪ Install wind breaks or plant trees/vegetative wind breaks at windward side(s) of construction areas.▪ Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.▪ Limit the area subject to excavation, grading and other construction activity at any one time.

Source: Bay Area Air Quality Management District 1999.

Impact AQ-2: Construction-Related Impacts on Air Quality Associated with the Proposed Transportation Improvements

The construction of facilities for bus and ferry services has the potential to result in ROG, NO_x, CO, and PM₁₀ emissions in excess of the thresholds indicated above and result in significant impacts on air quality for the portion of Solano County located within YSAQMD jurisdiction. These emissions would be generated during construction from earthmoving activities, operation of construction equipment, and worker commute trips.

Within YSAQMD jurisdiction, implementation of the Mitigation Measures AQ-1 and AQ-2 listed below may reduce the impact to less-than-significant levels. If these mitigation measures are not sufficient to reduce the impacts to less-than-significant levels, Mitigation Measure AQ-3 should be implemented.

As noted above, BAAQMD does not require the quantification of construction emissions and considers construction-related impacts less than significant if the PM₁₀ control measures listed in Table 11-4 are implemented. Therefore, the impact resulting from construction activities occurring within the portion of Solano County located within BAAQMD jurisdiction would be less than significant.

Construction activities, by nature, are generally short-term and transitional. Although emissions from construction activities have the potential to result in significant impacts on air quality, construction activities (and construction-related emissions) would cease on completion of a project.

Mitigation Measure AQ-1: Implement BAAQMD PM₁₀ Control Measures

The project proponent should implement the PM₁₀ control measures described in Table 11-4 to minimize PM₁₀ levels associated with construction-related emissions within YSAQMD or BAAQMD jurisdiction as deemed applicable.

Mitigation Measure AQ-2. Implement NO_x-Reducing Construction Practices

The project proponent should implement the following NO_x-reducing construction practices during construction within YSAQMD or BAAQMD jurisdiction as deemed applicable:

- require use of Purinox in lieu of diesel fuel, where practicable;
- install high-pressure injectors on all vehicles, where feasible;
- use Caterpillar prechamber diesel engines or equivalent, together with proper maintenance and operation;
- use electric equipment, where feasible;
- maintain equipment according to manufacturers' specifications, except as specified above;

- restrict the idling of construction equipment to 10 minutes;
- install catalytic converters on gasoline-powered equipment;
- use only diesel equipment or diesel vehicles with engines built in 1996 or later;
- purchase emissions offsets; and
- during construction, when not in use, trucks and vehicles in loading and unloading queues should be kept with their engines off to reduce vehicle emissions, and construction emissions should be phased and scheduled to avoid emissions peaks and discontinued during second-stage smog alerts.

Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis

A detailed air quality analysis should be undertaken as part of the project specific environmental review to determine a specific project's significance and identify appropriate mitigation measures.

Impact AQ-3: Construction-Related Impacts on Air Quality Associated with the Interstate 80 Corridor Improvements

Allocation of funds for improvements along the I-80 corridor has the potential to result in ROG, NO_x, CO, and PM₁₀ emissions in excess of the thresholds indicated above and result in significant impacts on air quality for the portion of Solano County located within YSAQMD jurisdiction. The emissions would be generated during construction activities from earthmoving activities, operation of construction equipment, and worker commute trips.

Within YSAQMD jurisdiction, implementation of the Mitigation Measures AQ-1 and AQ-2 listed below may reduce the impact to less-than-significant levels. If these mitigation measures are not sufficient to reduce the impacts to less-than-significant levels, Mitigation Measure AQ-3 should be implemented.

As noted above, BAAQMD does not require the quantification of construction emissions and considers construction-related impacts less than significant, provided the PM₁₀ control measures listed in Table 11-4 are implemented. Therefore, construction activities occurring within the portion of Solano County located within BAAQMD jurisdiction would be less than significant.

Construction activities, by nature, are generally short-term and transitional. Although emissions from construction activities have the potential to result in significant impacts on air quality, construction activities (and construction-related emissions) would cease on completion of a project.

Mitigation Measure AQ-1: Implement BAAQMD PM₁₀ Control Measures

Mitigation Measure AQ-2: Implement NO_x-Reducing Construction Practices**Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis****Impact AQ-4: Operation-Related Impacts on Air Quality Associated with Interstate 80 Corridor Improvements**

Improvements along the I-80 corridor have the potential to generate ROG, NO_x, CO, and PM₁₀ emissions in excess of the BAAQMD and YSAQMD significance criteria. The increase in emissions would primarily result from increased traffic flow, which would result from new roadways, expansion of existing roadways, and other roadway/traffic improvements that would increase traffic volumes. This impact is considered potentially significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis**Impact AQ-5: Construction-Related Impacts on Air Quality Associated with Construction of Pedestrian and Nonmotorized Facilities**

Allocation of funds for construction of pedestrian and nonmotorized facilities has the potential to result in ROG, NO_x, CO, and PM₁₀ emissions in excess of the thresholds indicated above and result in significant impacts on air quality for the portion of Solano County located within YSAQMD jurisdiction. These emissions would be generated during construction activities from earthmoving activities, operation of construction equipment, and worker commute trips.

Within YSAQMD jurisdiction, implementation of the Mitigation Measures AQ-1 and AQ-2 listed below may reduce the impact to less-than-significant levels. If these mitigation measures are not sufficient to reduce the impacts to less-than-significant levels, Mitigation Measure AQ-3 should be implemented.

As noted above, BAAQMD does not require the quantification of construction emissions and considers construction-related impacts less than significant, provided the PM₁₀ control measures listed in Table 11-4 are implemented. Therefore, construction activities occurring within the portion of Solano County located within BAAQMD jurisdiction would be less than significant.

Construction activities, by nature, are generally short-term and transitional. Although emissions from construction activities have the potential to result in significant impacts on air quality, construction activities (and construction-related emissions) would cease on completion of a project.

Mitigation Measure AQ-1: Implement BAAQMD PM10 Control Measures**Mitigation Measure AQ-2: Implement NO_x-Reducing Construction Practices****Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis****Impact AQ-6: Operation-Related Impacts on Air Quality Associated Construction of Pedestrian and Nonmotorized Facilities**

The operation of pedestrian and nonmotorized facilities through implementation of the CTEP is not expected to result in any significant impacts on air quality. Pedestrian and nonmotorized facilities are transportation control measures (TCMs) designed to reduce overall traffic, and the generation of air pollutants is generally not associated with these types of facilities.

Impact AQ-7: Construction-Related Impacts Associated with the Construction Commuter Rail Facilities

The operation of commuter rail facilities has the potential to result in ROG, NO_x, CO, and PM10 project emissions in excess of the thresholds indicated above and result in significant impacts on air quality for the portion of Solano County located within YSAQMD jurisdiction. These emissions would be generated during construction activities from earthmoving activities, operation of construction equipment, and worker commute trips.

Within YSAQMD jurisdiction, implementation of the Mitigation Measures AQ-1 and AQ-2 listed below may reduce the impact to less-than-significant levels. If these mitigation measures are not sufficient to reduce the impacts to less-than-significant levels, Mitigation Measure AQ-3 should be implemented.

As noted above, BAAQMD does not require the quantification of construction emissions and considers construction-related impacts less than significant, provided the PM10 control measures listed in Table 11-4 are implemented. Therefore, construction activities occurring within the portion of Solano County located within BAAQMD jurisdiction would be less than significant.

Construction activities, by nature, are generally short-term and transitional. Although emissions from construction activities have the potential to result in significant impacts on air quality, construction activities (and construction-related emissions) would cease on completion of a project.

Mitigation Measure AQ-1: Implement BAAQMD PM10 Control Measures**Mitigation Measure AQ-2: Implement NO_x-Reducing Construction Practices****Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis****Impact AQ-8: Operation-Related Impacts on Air Quality Associated with Development of Commuter Rail Facilities**

The operation of commuter rail facilities is not expected to result in any significant impacts on air quality. Commuter rail facilities are TCMs designed to reduce overall traffic; accordingly, operation of commuter rail facilities is expected to reduce overall traffic volumes in the plan area.

If the proposed commuter rail facility improvements result in increased traffic volumes at new stations, however, there is the potential for significant impacts on air quality. Projects that reduce traffic volumes or decrease congestion generally improve local air quality. Conversely, projects that increase traffic volumes or increase congestion generally reduce local air quality; therefore, any project that could result in an increase in traffic volumes has the potential to result in an air quality impact. This impact is considered potentially significant. Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure AQ-3: Conduct a Detailed Site-Specific Air Quality Analysis**Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects**

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on air quality.

Environmental Setting

Terminology

The following are brief definitions of terminology used in this analysis:

- *Sound* is a vibratory disturbance created by a vibrating object that, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism such as the human ear or a microphone.
- *Noise* is sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- *Ambient noise* is the composite of noise from all sources near and far in a given environment exclusive of particular noise sources to be measured.
- A *decibel (dB)* is a unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-Pascals.
- An *A-weighted decibel (dBA)* is an overall frequency-weighted sound level in dB that approximates the frequency response of the human ear.
- The *equivalent sound level (L_{eq})* is the equivalent steady-state sound or vibration level that in a stated period of time would contain the same acoustical or vibration energy.
- The *maximum sound level (L_{max})* is the highest instantaneous sound level measured during a specified period.
- The *day-night level (L_{dn})* is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m.–7 a.m.
- The *community noise equivalent level (CNEL)* is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7 p.m.–10 p.m. and 10 dB added for the period from 10 p.m.–7 a.m.

In general, human sound perception is such that a 3-dB change in sound level (either louder or quieter) is generally perceived as being just noticeable, a 5-dB change is clearly noticeable, and a 10-dB change is perceived as a doubling or halving of sound level.

Existing Noise Sources

The principal noise sources in the project area are airports, freeways, arterial roadways, and railroads. Additional noise generators include industrial manufacturing facilities and construction sites. Local collector and residential streets are not considered a significant source of noise because traffic volumes and speeds are generally much lower than on freeways and arterial roadways.

Airports

Airport operations play a significant role in the noise environment of many communities within the plan area. The airports of concern are the Nut Tree Airport in Vacaville, Travis AFB in Fairfield, and the Rio Vista Municipal Airport. University Airport, a utility airport owned and operated by the University of California, Davis, is located within Yolo County on the border of Yolo and Solano Counties; operations from the airport could affect noise environments in the adjacent Solano County area.

Freeways and Arterial Roadways

Major sources of roadway noise in the project area includes traffic on freeways and arterial roadways. The primary sources of roadway noise are Interstates I-80, I-505, I-680, and State Routes SR 12 and SR 113. Other major arterial roadways within the county may also contribute to roadway noise (Figure 10-1).

Railroads

Railroad activity in the project area includes freight and passenger traffic on the Union Pacific Railroad (UPRR) and California Northern Railroad Company tracks and limited activity on the Bay Area Electric Railroad tracks.

Regulatory Setting

Most jurisdictions have noise ordinances that serve as enforcement mechanisms to control noise and also have general plan noise elements that are used as planning guides to ensure that adjacent land uses are compatible from a noise perspective. The project area encompasses Solano County and its seven

incorporated cities. These jurisdictions each have their own noise ordinances and general plan noise elements. Based on analysis of the noise ordinances and noise elements, generalized mitigation thresholds have been developed to evaluate noise impacts of the proposed project. The following is a brief discussion of noise ordinances and noise elements.

Solano County

The noise element of the Solano County general plan has one primary goal: to protect the citizens of the county from exposure to excessive noise. The element states that any major land use proposal (major residential subdivisions and other uses for human occupancy) for lands within a designated Travis AFB noise level contour shall comply with specific noise compatibility guidelines. The noise compatibility guidelines contain noise level criteria for different land use categories (Table 12-1).

The element further states that:

The introduction of any fixed point, permanent, non-residential, noise-emitting land use (industrial, commercial, public utility, etc.) shall be prohibited if the projected noise emission level will exceed one or more of the following:

- a. 50 dBA CNEL as measured at the boundary of a nearby residential zone.
- b. 60 dBA CNEL as measured at the boundary of a nearby commercial zone, business zone (personal service, offices), or noise-sensitive industrial or manufacturing zone (research, communications, etc.)

Areas zoned as agricultural do not have any noise criteria.

Benicia

Benicia has established maximum allowable noise exposure levels from transportation noise sources (Table 12-2) and maximum allowable noise exposure levels from stationary (nontransportation) noise sources (Table 12-3).

Benicia also has a noise ordinance. It stipulates that no person shall generate any noise that would disturb the peace or quiet of any neighborhood or that would cause discomfort or annoyance to a reasonable person of normal sensitivity in the area. Further, the ordinance prohibits the operation of any machinery that would create any noise that would result in noise levels at the property line of any property that exceed the ambient noise level by more than 5 dB. Where ambient noise levels are less than those indicated in Table 12-4, the noise levels in Table 12-4 shall be used.

Table 12-4. City of Benicia Ambient Noise Levels

Zone	Time of Day	Very Quiet (Rural, Suburban)	Quiet (Suburban)	Slightly Noisy (Suburban, Urban)
R1 and R2	10 p.m.–7 a.m.	40	45	50
R1 and R2	7 p.m. to 10 p.m.	45	50	55
R1 and R2	7 a.m. to 7 p.m.	50	55	60
R3 and R4	10 p.m.–7 a.m.	45	50	55
R3 and R4	7 a.m.–10 p.m.	50	55	60
Commercial	10 p.m.–7 a.m.	55	60	
Commercial	7 a.m.–10 p.m.	60	65	
M1	Anytime	70	70	
M2	Anytime	75	75	

The city's municipal code further stipulates that no construction equipment shall be operated within a residential zone or within a radius of 500 feet from any residence between the hours of 10 p.m. of any one day and 7 a.m. of the next day causing discomfort or annoyance, unless a permit to construct has been obtained from the city manager.

Dixon

Dixon has established acceptable levels of noise exposure for land uses within the city (Table 12-5). Areas in which noise levels currently exceed or, as a result of future development, will exceed these levels are deemed inappropriate for the development in question.

Dixon also has a noise ordinance. The ordinance stipulates maximum sound levels that may be generated by various land uses. Table 12-6 summarizes Dixon's standards; correction factors applicable to Table 12-6 are listed in Table 12-7. The ordinance exempts temporary construction and demolition work from the standards in the noise ordinance.





Table 12-6. City of Dixon Maximum Land Use Sound Levels

Zoning District	Maximum Sound Pressure Level
Residential	55 dB
Medical	55 dB
Multi Family Residential	60 dB
"C" Districts	70 dB
"M" Districts	75 dB

Exterior Noise Level Ranges (CNEL)
and Related Land Use Policies
(see legend, opposite page)

Land Use Category	Measured, Estimated, or Projected dBA									
	50	55	60	65	70	75	80	85	90	
Residential. All dwellings incl. single-family, multi-family, group quarters, mobile homes, etc.										
Transient lodging. Hotels, motels										
School classrooms, libraries, churches										
Hospitals, convalescent homes, etc.										
Auditoriums, concert halls, amphitheaters, music shells										
Playgrounds, neighborhood parks										
Golf courses, riding stables, water-based recreation										
Office buildings. Personal business and professional services										
Commercial. Retail, movie theaters, restaurants										
Commercial. Wholesale, industrial, manufacturing, utilities, etc.										
Noise-sensitive manufacturing and communications										

Land Use Policies Legend

-  Acceptable land use. No special noise insulation requirements.
-  New construction or development allowed only after detailed noise analysis of construction requirements is made and needed noise-abatement features are included in design.
-  New construction or development should generally be avoided. If development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise-abatement features included in design.
-  New construction or development generally not allowed.

Source: County of Solano 1976

Table 12-2. City of Benicia Maximum Allowable Noise Exposure to Transportation Noise Sources

Land Use	Outdoor Activity Areas ^a L _{dn} /CNEL	Interior Spaces	
		L _{dn}	L _{eq} ^b
Residential	60 ^c	45	—
Transient lodging	65 ^d	45	—
Hospitals, nursing homes	60 ^c	45	—
Theaters, auditoriums, music halls	—	—	35
Churches, meeting halls	60 ^c	—	40
Office buildings, commercial uses, industrial, manufacturing, utilities ^e	—	—	45
Schools, libraries, museums	60 ^c	—	45
Playgrounds, neighborhood parks	65	—	—

Notes: — = not applicable.

^a Where the location of outdoor activity areas is unknown or does not exist, the exterior noise-level standard will be applied to the property line of the receiving land use.

^b As determined for a typical worst-case hour during periods of use.

^c Where it is not possible to reduce noise in outdoor activity areas to 60 db L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 db L_{dn}/CNEL may be allowed provided that available exterior noise-level reduction measures have been implemented and interior noise levels are in compliance with this table. If these noise levels cannot be complied with, this will constitute a significant impact.

^d In the case of hotel/motel facilities or other transient lodging with no proposed outdoor activity areas, such as pool areas, only the interior noise level criterion will apply.

^e Standards would only apply to areas requiring good speech intelligibility, such as offices and conference rooms.

Source: City of Benicia 1999.

Table 12-3. City of Benicia Noise-Level Performance Standards for Noise-Sensitive Land Uses Affected by Stationary (Nontransportation) Sources

Land Use	Exterior Noise-Level Standard (Applicable at Property Line)		Interior Noise-Level Standard	
	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Residential	55	50	40	35
Transient lodging	55	50	40	35
Hospitals	—	—	40	35
Nursing homes	55	50	40	35
Theaters, auditoriums	—	—	35	35
Churches	55	50	40	40
Schools	55	50	45	45
Libraries	55	50	45	45

Notes: Stationary noise sources include industrial operations, outdoor recreation facilities, HVAC units, loading docks, etc.

The above standards may be adjusted upwards to allow for an increase in the existing ambient hourly L_{eq} caused by a proposed project. An increase of less than 3 dB is permitted, even if the standards above in are exceeded; an increase of 3 dB or greater constitutes a significant environmental impact, unless the increase does not cause the standards above to be exceeded.

The noise levels standards contained above shall be applied to a typical hour of operation. When a peak hour of operation is expected to occur consistently during daily or weekly operations, the standards shall be applied to those operations.

Each of the noise standards specified above shall be lowered by five dB for tonal noises (humming, high-pitched tones, speech music, or recurring impulsive noises). This lowering of the standard does not apply to residential units established in conjunction with industrial or commercial caretaker dwellings.

The City may choose to apply the noise level performance standards at designated outdoor activity areas, in lieu of the property line.

The above standards do not apply to safety signals or warning devices.

For noise sources that occur on an infrequent basis and are considered to be safety equipment (such as flaring or pressure relief valves), a maximum noise level of 75 dB is acceptable, as measured from the receiver's property line. Noise levels which are projected to exceed this maximum are considered a significant environmental impact.

Where outdoor activity areas do not exist and/or are not expected to be affected, the City may choose to only apply the interior noise level criteria. For example, in the case of single family residences which do not have second story patios or outdoor activity areas, the City may choose to only apply an interior noise level standard at the second story interior spaces.

Source: City of Benicia 1999.

Table 12-5. Land Use Compatibility Standards for Community Noise Environments

Land Use Category	Community Noise Exposure - L_{dn} or CNEL (db)						
	55	60	65	70	75	80	85
Residential – low-density single-family, duplex, mobile home	■	■	■	■	■	■	■
Residential – multi-family	■	■	■	■	■	■	■
Transient lodging – motel, hotel	■	■	■	■	■	■	■
Schools, libraries, churches, hospitals, nursing homes	■	■	■	■	■	■	■
Auditorium, concert hall, amphitheaters	■	■	■	■	■	■	■
Sports arena, outdoor spectator sports	■	■	■	■	■	■	■
Playgrounds, neighborhood parks	■	■	■	■	■	■	■
Golf courses, riding stables, water recreation, cemeteries	■	■	■	■	■	■	■
Office buildings, business commercial and professional	■	■	■	■	■	■	■
Industrial, manufacturing, utilities, agriculture	■	■	■	■	■	■	■

■	Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
■	Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice.
■	Normally Unacceptable: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
■	Clearly Unacceptable: New construction or development generally should not be undertaken.

Noise Source Characteristics: The land use/noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single-noise events than auto traffic, but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment.

Suitable Interior Environments: One objective of locating (both single and multi-family) residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL or L_{dn} . This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

Sources: City of Dixon 1993

Table 12-7. City of Dixon Correction Factors to Maximum Land Use Sound Levels

Time and Operation of Type of Noise	Correction (Maximum Permitted dB)
Emission only between 7 a.m. and 10 p.m.	+5 dB
Noise of unusual impulsive character such as hammering or drill pressing	-5 dB
Noise of unusual periodic character such as hammering or screeching	-5 dB

Fairfield

Fairfield has established maximum allowable noise exposure levels from ground transportation noise sources (Table 12-8) and maximum allowable noise exposure levels from nontransportation noise sources (Table 12-9).

The applicable health and safety element policy that directly relates to the CTEP is listed below.

- **Policy HS 9.1**, which addresses ground transportation noise, states that any proposed projects with existing and future noise levels resulting from ground transportation noise sources shall be evaluated accordingly to the standards stated in Table 12-8. If these levels are determined to exceed the standards listed in Table 12-8, they shall be mitigated to the levels shown in Table 12-8.

Fairfield also has a noise ordinance. The ordinance does not set explicit noise limits, but it prohibits the generation of noise that would cause annoyance or discomfort to a reasonable person of normal sensitivity in the area.

Rio Vista

Rio Vista has established maximum allowable noise exposure levels from transportation and airport noise (Table 12-10) and maximum allowable noise exposure levels from stationary (nontransportation) noise sources (Table 12-11).

Rio Vista also has a noise ordinance. It stipulates that construction equipment may not generate noise greater than 70 dBA more than 25 feet from the source, except in emergency cases. Also, construction activities may not occur in a residentially zoned area or within a radius of 500 feet from a residence between the hours of 8 p.m. and 8 a.m. or on Sundays, unless a permit has been obtained from the city.

Suisun City

Suisun City uses the Solano County's noise guidelines. The city has also established 65 dB CNEL as the maximum noise level to protect residential land uses from nonresidential noise sources. For residences adjacent to SR 12, along

arterial streets, within the proximity of the UPRR, or near any other circulation-related source of noise that may exceed the recommended exterior noise level of 65 dB CNEL, setbacks and/or other noise mitigation are required.

Suisun City does not have an explicit noise ordinance that limits noise levels, but the city's code prohibits ruckus behavior and noise from animals.

Vacaville

Vacaville has established 60 dB L_{dn} as the maximum exterior noise level from transportation sources at sensitive land uses. Table 12-12 summarizes the land use compatibility for noises from transportation sources. However, exceptions may be made where 65 dB L_{dn} is acceptable in unique situations (e.g. where soundwalls greater than 8 feet in height adjoin arterial streets or would obstruct pedestrian paths between a subdivision and an arterial street). In these exceptions, the 60 dB L_{dn} standard should be applied where outdoor use is a major consideration (e.g. backyards in single-family housing developments and recreation areas in multifamily housing projects).

For noises from nontransportation sources, Vacaville has established 50 dB L_{eq} and a peak of 70 dB as the maximum exterior noise levels at sensitive land uses. Table 12-13 summarizes the city's land use compatibility for noises from nontransportation sources. The city has also stipulated that new residential developments should be precluded where exterior noise levels exceed 55 dB CNEL because of aircraft noise.

In addition, Vacaville has established various noise policies as guidance for future planning within the city. These policies are summarized below.

- **Policy 10.6-G1** is to require new residential projects and outdoor activity areas in lodging, hospital and nursing/convalescent home projects to meet acceptable exterior noise level standards as given on Tables 12-12 and 12-13. This policy will discourage residential areas from directly abutting Interstate 80 or 505.
- **Policy 10.6-G2** is to reduce outdoor noise levels in existing residential areas where economically and aesthetically feasible.
- **Policy 10.6-G3** is to ensure that noise does not exceed interior noise levels of 45 dB L_{dn} for residential, transient lodging, hospital and nursing/convalescent structures from transportation or fixed-point noise sources.
- **Policy 10.6-G4** is to minimize vehicular noise sources and noise emanating from transportation activities; control noise at its source to maintain existing noise levels, and in no case exceed acceptable levels as established in the Table 12-1.
- **Policy 10.6-G5** is to limit truck traffic in residential areas to designated truck routes.

Table 12-8. City of Fairfield Maximum Allowable Noise Exposure to Ground Transportation Noise Sources

Land Use	Outdoor Activity Areas ^a L _{dn} /CNEL, dB	Interior Spaces	
		L _{dn} /CNEL, dB	L _{eq} , dB ^b
Residential	60 ^c	45	—
Transient lodging	60 ^c	45	—
Hospitals, nursing homes	60 ^c	45	—
Theaters, auditoriums, music halls	—	—	35
Churches, meeting halls	60 ^c	—	40
Office buildings	—	—	45
Schools, libraries, museums	—	—	45
Playgrounds, neighborhood parks	70	—	—

Note: — = not applicable.

^a Where the location of outdoor activity areas is unknown, the exterior noise-level standard shall be applied to the property line of the receiving land use.

^b As determined for a typical worst-case hour during periods of use.

^c Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise-level reduction measures have been implemented and interior noise levels are in compliance with this table.

Source: City of Fairfield 1992.

Table 12-9. City of Fairfield Noise-Level Performance Standards for New Projects Affected by or Including Nontransportation Sources

Land Use	Noise-Level Descriptor	Exterior Noise-Level Standard (Applicable at Property Line) (dB)		Interior Noise-Level Standard (dB)	
		Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)	Daytime (7 a.m.–10 p.m.)	Nighttime (10 p.m.–7 a.m.)
Residential	L _{eq}	50	45	40	35
	L _{max}	70	65	60	55
Transient lodging, hospitals, nursing homes	L _{eq}	—	—	40	35
	L _{max}	—	—	60	55
Theaters, auditoriums, music halls	L _{eq}	—	—	35	35
Churches, meeting halls	L _{eq}	—	—	40	40
Office buildings	L _{eq}	—	—	45	—
Schools, libraries, museums	L _{eq}	—	—	45	—
Playgrounds, parks	L _{eq}	65	—	—	—

Notes: Each of the noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or recurring impulsive noises. These noise-level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwelling)

Source: City of Fairfield 1992.

Table 12-10. Noise Standards for New Uses Affected by Traffic and Airport Noise City of Rio Vista Noise Element

New Land Use	Outdoor Activity Area (L_{dn})	Interior (L_{dn} /Peak Hour L_{eq}) ^a
All residential ^{b, c, d, h}	60–65	45
Transient lodging ^e	65	45
Hospitals and nursing homes ^f	60	45
Theaters and auditoriums	–	35
Churches, meeting halls, schools, and libraries	60	40
Office buildings ^g	65	45
Commercial buildings ^g	65	50
Playgrounds and parks	70	–
Industry ^g	65	50

^a For traffic noise in the City of Rio Vista, L_{dn} and peak-hour L_{eq} values are estimated to be approximately similar. Interior noise level standards are applied in noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

^b Outdoor activity areas for single-family residential uses are defined as backyards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residence.

^c For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as pools, play areas, or tennis courts. Where such areas are not provided in multi-family residential uses, the standards shall be applied at individual patios and balconies of the development

^d Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn} or less using a practical application of the best available noise reduction measures, an exterior noise level of up to 65 dB L_{dn} may be allowed—provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

^e Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas.

^f Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

^g Only the exterior spaces of these uses designated for employee or customer relaxation are considered sensitive.

These standards are consistent with the Solano County Airport Land Use Commission's 1988 Airport/Land Use Compatibility Plan.

Source: City of Rio Vista 2001.

Table 12-11. Noise Standards for New Uses Affected by Nontransportation Noise: City of Rio Vista Noise Element

New Land Use	Outdoor Activity Area (L_{eq})		Interior Daytime and Nighttime (L_{eq})
	Daytime	Nighttime	
All residential ^{a, b, g, h}	50	45	35
Transient lodging ^c	55	–	40
Hospitals and nursing homes ^{d, h}	50	45	35
Theaters and auditoriums	–	–	35
Churches, meeting halls, schools, and libraries	55	–	40
Office buildings ^{e, f}	55	–	45
Commercial buildings ^{e, f}	55	–	45
Playgrounds and parks ^f	65	–	–
Industry ^e	65	65	50

Notes: The standards within this table shall be reduced by 5 dB for sounds consisting primarily of speech or music and for recurring impulsive sounds.

If the existing ambient noise level exceeds the standards in this table, the noise level standards shall be increased at 5-dB increments to encompass the ambient level.

^a Outdoor activity areas for single-family residential uses are defined as backyards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100-foot radius of the residence.

^b For multifamily residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as pools, play areas, or tennis courts. Where such areas are not provided in multifamily residential uses, the standards shall be applied at individual patios and balconies of the development.

^c Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas, and are not commonly used during nighttime hours.

^d Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

^e Only the exterior spaces of these uses designated for employee or customer relaxation are considered sensitive to noise.

^f The outdoor activity areas of office, commercial, and park uses are not typically used during nighttime hours.


^g It may not be possible to achieve compliance with this standard at residential uses located immediately adjacent to loading dock areas of commercial uses while trucks are unloading. The daytime and nighttime noise level standards applicable to loading docks shall be 55 and 50 dB L_{eq} , respectively.


^h The City will apply noise performance standards as outlined in the policies of this Safety and Noise Element to ensure that the noise generated from natural gas pipeline compressors is not intrusive for residents living near these sites. Adopting the recommendations of the State's Model Noise Control Ordinance for rural residential areas, the City will adopt a noise standard of not greater than 45 dBA at the residential property line. This higher-than-usual standard for outdoor noise accounts for the continual generation of "white noise" resulting from the compression in natural gas pipelines.

Source: City of Rio Vista 2001.

Community Noise Exposure
Unmitigated Day/Night Average Noise Level (DNL) in Decibels (dB)

Land Use Category	Noise standard (DNL)		Noise contour									
	Interior	Exterior	40	45	50	55	60	65	70	75	80	
Residential	45	60 ²										
Transient Lodging Motels, Hotels	45	-- ³										
Hospitals, Nursing Homes	45	60 ⁴										
Other uses ⁵	--	--										

 normally acceptable with typical conditions of approval (setbacks, walls, fences and standard building practices).

 conditionally acceptable - subject to noise study to demonstrate noise can be reduced to normally acceptable levels with acceptable mitigation.

 normally unacceptable - regardless of measures implemented to reduce noise.






Footnotes for Table 10-1

1. This table establishes the maximum transportation noise levels that persons should be exposed to and helps determine the type of review necessary when land uses are proposed within existing noise contours. For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight.
2. In multi-family/attached unit projects, applies to courtyards, patios, private areas and activity areas.
3. Areas designed for outdoor activity should be located away from noise sources.
4. Applies to courtyards, patios, private areas and activity areas.
5. Other uses are subject to federal and state OSHA noise exposure standards.

Source: City of Vacaville 1999

**Airport/Land Use
Noise Compatibility Criteria**
As adopted by Solano County Airport Land Use Commission
This table is to be used for aircraft generated noise

Land Use Category	CNEL, dBA					
	50	55	60	65	70	75
Residential						
Schools, Libraries, Hospitals, Nursing Homes						
Churches, Auditoriums, Concert Halls						
Transportation, Parking, Cemeteries						
Offices, Retail Trade						
Service Commercial, Wholesale Trade, Warehousing, Warehousing, Light Industrial						
Extractive Industrial, General Manufacturing, Utilities						
Cropland						
Livestock Breeding						
Playgrounds, Parks, Zoos						
Golf Courses, Riding Stables, Water Recreation						
Outdoor Spectator Sports						
Amphitheaters						

 <p>CLEARLY ACCEPTABLE The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.</p>	<p>The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.</p>	 <p>CLEARLY UNACCEPTABLE Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved</p>
 <p>NORMALLY ACCEPTABLE Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities</p>	<p>NORMALLY UNACCEPTABLE</p>  <p>Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or</p>	<p>involve outdoor activities which would be disrupted by noise should generally be avoided.</p>
 <p>MARGINALLY ACCEPTABLE The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open.</p>		<p>Source: Solano County Airport Land Use Commission, Airport Land Use Compatibility Plan, May 1988 Appendix B</p>

Source: City of Vacaville 1999

Table 12-13. City of Vacaville Noise and Land Use Compatibility Policy for Nontransportation Sources^a

Land Use Category	Noise Level Descriptor	Exterior Noise Levels ^{b,c,d,e}		Interior Noise Levels ^{b,c,d,e}	
		Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Residential	Hourly Leq, dBA	50 ^f	45 ^f	45	35
	Maximum level, dBA	70 ^f	65 ^f	—	—
Transient lodging	Hourly Leq, dBA	— ^g	— ^g	45	35
Hospital, nursing homes	Hourly Leq, dBA	50 ^h	45 ^h	45	35
Other ⁱ	Hourly Leq, dBA	—	—	—	—
	Maximum level, dBA	—	—	—	—

Note: Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

^a This table establishes the maximum non-transportation noise levels that persons should be exposed to. For the purposes of the Noise Element, non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, construction equipment, etc.

^b Compliance with the noise level standards is to be measured at the affected location of the land use category.

^c If the existing noise levels exceed that of a proposed noise generator, these standards would not be applied to the new noise source unless the additional noise generated would increase the projected, combined noise levels a minimum of three decibels.

^d These standards are applicable to land use determinations and entitlements. They are not applicable for nuisance abatement within residential areas.

^e Exceptions to the standards may be approved for public parks or playgrounds upon a finding that the facility has been designed in a manner that practically limits the noise impact upon other land uses.

^f In multi-family/attached unit projects, applies to courtyards, patios, private areas, and activity areas.

^g Areas designed for outdoor activity should be located away from noise sources.

^h Applies to courtyards, patios, private areas, and activity areas.

ⁱ Other uses are subject to federal and state OSHA noise exposure standards.

Source: City of Vacaville 1999.

- **Policy 10.6-G6** is to design subdivisions and plan-lines to minimize the transportation-related noise impacts to adjacent residential areas.
- **Policy 10.6-G7** is to encourage other agencies to reduce noise levels generated by roadways, railways, airports and other facilities.
- **Policy 10.6-G8** states that noise created by transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards of Table 12-12.
- **Policy 10.6-G9** states that noise created by non-transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards of Table 12-13.
- **Policy 10.6-G10** is to allow minor exceptions to the noise level design standards (Tables 12-12 and 12-13) in circumstances where impractical mitigation requirements are not consistent with city standards and policies.

Vacaville also has a noise ordinance. It does not set explicit noise limits; rather, it prohibits the generation of noise that would cause annoyance or discomfort to a reasonable person of normal sensitivity in the area. The noise ordinance prohibits any outdoor construction or repair work on any building, structure, or other building or repair project within 500 feet of any occupied residence between the hours of 10:00 p.m. and 6:00 a.m. the next morning, Monday–Saturday, and 10:00 p.m. and 8:00 a.m. on Sunday. The city’s municipal code further stipulates that no “construction equipment shall be operated nor any outdoor construction or repair work shall be permitted within 500 feet from any occupied residence during the hours of 10:00 p.m. to 6:00 a.m. or until 8:00 a.m. on Sunday mornings.” Interior work that would not create noise or disturbance noticeable to a reasonable person of normal sensitivity in the surrounding neighborhood is not subject to these restrictions.

A request for an exception to the permitted construction hours and days may be granted by the director of community development, or his or her designee, for emergency work, to offset project delays due to inclement weather, for 24-hour construction projects, or other similar occurrences.

The noise ordinance further prohibits the operation of commercial equipment, including, but not limited to, parking lot cleaning and sweeping machines, leaf blowers, and mowing machines within 500 feet of any occupied residence between the hours of 10:00 p.m. and 6:00 a.m. the next morning, Monday–Saturday, and 10:00 p.m. and 8:00 a.m. on Sunday. This section does not prohibit the loading or unloading of commercial vehicles.

Vallejo

Vallejo has established maximum noise levels for various land uses within the city (Table 12-14). The noise element further stipulates that no person should produce noise that exceeds the ambient noise level (L_{50}) by more than 5 dBA at the nearest property line. In addition, Vallejo’s Noise Element limits

construction activities to the hours between 7 a.m. and 6 p.m. and establishes maximum allowable noise levels from construction equipment (Table 12-15).

Table 12-14. City of Vallejo Maximum Noise Levels

Zone	Time	Maximum Sound Level (dBA)			
		Outdoor		Indoor	
		L ₅₀	L ₁₀	L ₅₀	L ₁₀
Rural Residential, Medical	10 p.m.–7 a.m.	45	55	35	45
	7 a.m.–10 p.m.	50	55	40	45
Other Residential	10 p.m.–7 a.m.	50	60	40	50
	7 a.m.–10 p.m.	55	60	45	50
Street-Oriented Commercial	10 p.m.–7 a.m.	65	75	60	65
	7 a.m.–10 p.m.	70	75	60	65
Non-Street Oriented Commercial	10 p.m.–7 a.m.	55	70	45	60
	7 a.m.–10 p.m.	65	70	55	60
Heavy Commercial, Industrial	10 p.m.–7 a.m.	65	75	60	65
	7 a.m.–10 p.m.	70	75	60	65

Source: City of Vallejo 1999.

Table 12-15. City of Vallejo Maximum Allowable Noise Levels from Construction Equipment

Equipment	Peak Noise Level at 50 Feet (dBA)
Earthmoving	
Front loader	75
Backhoe	75
Bulldozer	75
Tractor	80
Grader	80
Truck	80
Scraper	80
Paver	80
Materials Handling	
Concrete mixer	75
Crane	75
Concrete pump	75
Derrick	75
Stationary	
Pumps	75
Generators	75
Compressors	75
Impact	
Pile drivers	95
Jack hammers	75
Rock drills	80
Pneumatic tools	80
Other	
Saws	75
Vibrator	75

Source: City of Vallejo 1999.

Vallejo also has a noise ordinance. It stipulates that no person shall generate any unnecessary and unusual noise that disturbs the peace or quiet of any neighborhood or that would cause discomfort or annoyance to a reasonable person of normal sensitivity in the area. The ordinance stipulates maximum sound levels that may be generated by various land uses. Table 12-16 summarizes Vallejo's standards, while Table 12-17 summarizes correction factors that are applicable to Table 12-16.

Table 12-16. City of Vallejo Maximum Land Use Sound Levels

Zoning District	Maximum Sound Pressure Level
Resource Conservation, Rural Residential, Medical Districts	55 dB
Low, Medium, and High Density Residential Districts	60 dB
Professional Offices, Neighborhood, Pedestrian, Waterfront Shopping and Services Districts	70 dB
Freeway Shopping and Service, Linear Commercial, Intensive Use Districts	75 dB

Table 12-17. City of Vallejo Correction Factors to be Applied to Table 12-16

Time and Operation of Type of Noise	Correction in Maximum Permitted Decibels
Emission only between 7 a.m. and 10 p.m.	+5 dB
Noise of unusual impulsive character such as hammering or drill pressing	-5 dB
Noise of unusual periodic character such as hammering or screeching	-5 dB

Impacts and Mitigation Measures

Methods of Analysis

CEQA requires the significance of noise impacts to be determined for proposed projects. The process of assessing the significance of noise impacts associated with the CTEP involves determining whether traffic-related noise would have the potential to exceed the significance criteria listed below. The analysis also assumes that businesses, industries, and residents will comply with all applicable city and county noise standards.

Criteria for Determining Significance

State CEQA Guidelines

The proposed CTEP would have significant impacts on noise if it would result in:

- exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or
- for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

Federal Highway Administration Noise Abatement Criteria

For improvements along the I-80 corridor, this analysis uses FHWA's noise abatement criteria (NAC) (Table 12-18).

Table 12-18. FHWA Activity Categories and Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level (dBA- $L_{eq}[h]$)	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 Exterior	Developed lands, properties, or activities not included in categories A or B above
D	—	Undeveloped lands
E	52 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

The Code of Federal Regulations (23 CFR 772) contains procedures for conducting noise studies for highway projects and implementing noise abatement

measures to help to protect the public health and welfare, supply NAC, and establish requirements for information to be provided to local officials for use in planning and designing highways. Under this regulation, noise abatement must be considered for a Type 1 project if the project is predicted to result in a traffic noise impact. Such an impact would occur if the project would result in a substantial noise increase or if the predicted noise levels approach or exceed the NAC specified in the regulation. The regulation does not define a “substantial increase” or the term “approach”; it leaves interpretation of these terms to the states.

Noise abatement measures that are reasonable, feasible, and likely to be incorporated into the project, as well as noise impacts for which no apparent solution is available, must be identified before the final environmental document for a project is adopted. Primary consideration is given to exterior areas. In situations where no exterior activities are affected by traffic noise, the interior criterion (Activity Category E) is used as the basis for noise abatement consideration.

Federal Transit Administration Noise Impact Criteria and Vibration Impact Criteria

For commuter rail facilities, this analysis uses the Federal Transit Administration’s (FTA’s) noise and vibration impact criteria (NIC and VIC), described below, which assess the increment of change in the context of the existing noise and vibration exposure. The NIC place noise sensitive land uses into the following categories:

- **Category 1:** buildings or parks where quiet is an essential element of their purpose.
- **Category 2:** residences and buildings where people normally sleep, including residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- **Category 3:** institutional land uses with primarily daytime and evening use, including schools, libraries, churches, and active parks.

L_{dn} is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses, such as outdoor amphitheaters and school buildings (Categories 1 and 3), the maximum 1-hour L_{eq} during the facility’s operating period is used.

There are two levels of impact included in the FTA criteria. The interpretation of these two levels of impact is summarized below:

- **Severe:** Severe noise impacts are considered “significant” as this term is used in the NEPA and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.

- **Impact:** In this range of noise impact, sometimes referred to as moderate impact, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

The noise impact criteria are summarized in Table 12-19. The first column shows the existing noise exposure and the remaining columns show the additional noise exposure from the transit project that would cause either moderate or severe impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the transit project.

Table 12-19 also shows the amount of noise a project can generate, depending on existing noise levels, before an exceedance of FTA noise criteria occurs. Table 12-20 expresses the same criteria in terms of the amount of change (i.e., the cumulative noise, not the amount of project-related noise) that can occur in the overall noise environment before an exceedance occurs.

The VIC are thresholds for groundborne vibration and groundborne noise (i.e. “rumbling” or other noise associated with vibration), depending on the land use category. These thresholds are presented in Table 12-21. Special thresholds (not shown in Table 12-21) apply to particularly sensitive building types, such as concert halls, TV studios, recording studios, auditoriums, and theaters.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact N-1: No Impact on Noise from the Distribution of Operational Subsidies for Buses and Ferry Services

The allocation of funds for operational subsidies for bus and ferry services is not expected to result in any noise impacts. Bus and ferry services are TCMs designed to reduce overall traffic. Therefore, there is no impact.

Impact N-2: No Impact on Noise from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for the loss of sensitive habitats resulting from construction of specific projects

Table 12-19. FTA Noise Impact Criteria

Existing Noise Exposure L_{eq} or L_{dn}	Project Noise Exposure Impact Thresholds, L_{dn} or L_{eq} (dBA)			
	Category 1 or 2 Sites		Category 3 Sites	
	Impact	Severe Impact	Impact	Severe Impact
<43	Amb.+10	Amb.+15	Amb.+15	Amb.+20
43	52	58	57	63
44	52	59	57	64
45	52	59	57	64
46	52	59	57	64
47	52	59	57	64
48	53	59	58	64
49	53	59	58	64
50	53	60	58	65
51	54	60	59	65
52	54	60	59	65
53	54	60	59	65
54	55	61	60	66
55	55	61	60	66
56	56	62	61	67
57	56	62	61	67
58	57	62	62	67
59	57	63	62	68
60	58	63	63	68
61	58	64	63	69
62	59	64	64	69
63	60	65	65	70
64	60	66	65	71
65	61	66	66	71
66	61	67	66	72
67	62	67	67	72
68	63	68	68	73
69	64	69	69	74
70	64	69	69	74
71	65	70	70	75
72	65	71	70	76
73	65	72	70	77
74	65	72	70	77
75	65	73	70	78
76	65	74	70	79
77	65	75	70	80
>77	65	75	70	80

Note: L_{dn} is used for land uses where nighttime sensitivity is a factor; maximum 1-hour L_{eq} is used for land use involving only daytime activities.

Category Definitions:

Category 1: Buildings or parks where quiet is an essential element of their purpose.

Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.

Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches and active parks.

Source: Federal Transit Administration 1995.

Table 12-21. Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Description of Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
		Frequent Events ^a	Infrequent Events ^b	Frequent Events ^a	Infrequent Events ^b
1	Buildings where low ambient vibration is essential to the operations within the building, which vibrations may be well below levels associated with human annoyance. Concert halls, television studios and recording studios are included in this category only for the purpose of applying these screening distances. Always included are vibration-sensitive research and manufacturing, hospitals with vibration-sensitive equipment, certain university research operations, and computer-chip manufacturing facilities where electron microscopes and photolithographic equipment are used.	65 VdB ^c	65 VdB ^c	— ^d	— ^d
2	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels. Theatres and auditoriums are included in this category for the purpose of applying screening distances only.	72 VdB	80 VdB	35 dBA	43 dBA
3	Institutional land uses such as schools, libraries, and churches. Buildings with interior spaces where vibration-sensitive equipment is not present but where excessive vibration could cause activity interference through human annoyance are included (e.g., certain offices).	75 VdB	83 VdB	40 dBA	48 dBA

^a “Frequent Events” is defined as more than 70 vibration events per day. Most transit projects fall into this category.

^b “Infrequent Events” is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

^c This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

^d Vibration-sensitive equipment is not sensitive to ground-borne noise.

Source: Federal Transit Administration 1995.

under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact N-3: Potential for the Exposure of Persons to or Generation of Noise Levels Associated with Roadway Improvements that Exceed Established Local Agency Noise Standards or Applicable Standards of Other Agencies

The allocation of funds for the proposed highway improvements (e.g., I-80, I-680, SR 12) has the potential to expose existing and future noise-sensitive land uses to noise levels exceeding FHWA's NAC (Table 12-18) and applicable local standards listed above. The source of excessive noise levels would primarily be increased traffic flow resulting from new roadways, expansion of existing roadways, and other roadway/traffic improvements. As such, this impact could be considered significant. Implementation of Mitigation Measure N-1 may reduce this impact to a less-than-significant level.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

A detailed noise analysis that uses the appropriate lead agency's significance criteria should be conducted to determine a specific project's impacts (and their significance) and to identify appropriate mitigation measures. The noise analysis should be completed before the implementation of any specific projects proposed under the CTEP.

Impact N-4: Potential Exposure of Persons to or Generation of Excessive Groundborne Vibration or Noise Levels Associated with Roadway Improvements

Project-specific construction activities such as grading and other earthmoving activities may result in minor amounts of ground vibration. These activities are not expected to result in the exposure of persons to or the generation of groundborne vibration or noise levels. Vibration that may occur from these activities would generally be short term and end when construction is completed. Therefore, these impacts are considered less than significant. If high-impact activities such as pile driving occur, however, there is potential for significant groundborne vibration and noise impacts. Implementation of Mitigation Measure N-1 before project implementation may reduce this impact to a less-than-significant level.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impact N-5: Potential Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions Associated with Roadway Improvements

Roadway improvements along the major transportation corridors within the county have the potential to result in permanent increases in ambient noise levels in the plan area relative to without-project conditions, primarily from increased traffic flow resulting from new roadways, expansion of existing roadways, or other roadway/traffic improvements. As such, there is a potential for significant noise impacts. Implementation of Mitigation Measure N-1 before project implementation may reduce this impact, but not to a less-than-significant level. Therefore, this impact is considered significant and unavoidable.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impact N-6: Substantial Temporary or Periodic Increase in Ambient Noise Levels Associated with Roadway Improvements

The allocation of funds for improvements along highway or state route corridors (i.e., I-80, I-680, SR 12) has the potential to result in temporary or periodic increases in ambient noise levels above existing levels, primarily from construction activities. Implementation of the following mitigation measures may reduce these impacts to less-than-significant levels.

Mitigation Measure N-2: Locate Noise-Generating Equipment as Far as Practicable from Noise-Sensitive Receptors

All stationary noise-generating equipment, such as pumps and generators, would be located as far as possible from nearby noise-sensitive receptors as practicable. Where practicable, stationary noise-generating equipment would be shielded from nearby noise-sensitive receptors by noise-attenuating buffers, such as structures or haul truck trailers. Stationary noise-generating equipment located less than 300 feet from noise-sensitive receptors would be equipped with noise-reducing engine housings. Portable acoustic barriers would be placed around stationary noise-generating equipment located within 200 feet of residences. Water tanks and equipment storage, staging, and warm-up areas would also be located as far from noise-sensitive receptors as possible.

Mitigation Measure N-3: Use Sound-Control Devices on Combustion-Powered Equipment

All construction equipment powered by gasoline or diesel engines would be required to use sound-control devices that are at least as effective as those originally provided by the manufacturer. No equipment would be permitted to have an unmuffled exhaust.

Mitigation Measure N-4: Shield or Shroud Impact or Drilling Tools

Any impact or drilling tools used during demolition of existing infrastructure would be shrouded or shielded.

Mitigation Measure N-5: Shut Off Machinery When Not in Use

Mobile noise-generating equipment and machinery would be shut off when it is not in use.

Mitigation Measure N-6: Use Shortest Possible Traveling Routes When Practicable

Construction vehicles accessing the site would be required to use the shortest possible route to and from local freeways, provided the routes do not expose additional receptors to noise, and comply with local roadway ordinances.

Mitigation Measure N-7: Disseminate Essential Information to Residences and Implement a Complaint Response and Tracking Program

Residences within 500 feet of a construction area would be notified of the construction schedule before construction begins. STA and the construction contractor would designate a noise disturbance coordinator who would be responsible for responding to complaints regarding construction noise. The coordinator would determine the cause of a complaint and would ensure that reasonable measures are implemented to correct the problem for valid complaints. A contact telephone number for the noise disturbance coordinator would be conspicuously posted on construction site fences and would be included in the notification to nearby residents.

Mitigation Measure N-8: Implementation of Additional Mitigation Measures, as Needed and/or Required

Throughout a project's construction period, the project contractor would implement additional noise mitigation measures at STA's request to ensure that noise levels at the nearest residences do not exceed the appropriate agency significance criteria. Additional measures may include changing the location of stationary noise-generating equipment, shutting off idling equipment, rescheduling construction activity, installing acoustic barriers around stationary sources of construction noise, using alternative equipment or construction methods that produce less noise, and other site-specific measures.

Impact N-7: Exposure of Persons to or Generation of Noise Levels Exceeding Established Local Noise Standards or Other Applicable Standards Associated with Operation of Commuter Rail Facilities

The development of commuter rail facilities has the potential to expose existing and future noise-sensitive land uses that are located near proposed rail facilities and along rail alignments to noise levels that exceed the FTA transit noise standards through increased traffic flow near rail facilities and rail operations. As such, there is a potential for significant noise impacts. Implementation of Mitigation Measure N-1 (using FTA's NIC and VIC) would reduce this impact to a less-than-significant level.

For existing and future noise-sensitive land uses not located near proposed commuter rail facilities and alignments, development of commuter rail facilities may result in beneficial impacts relating to noise. Commuter rail facilities are TCMs designed to reduce overall traffic; operation of the facilities is expected to reduce overall traffic volumes in the plan area, thereby reducing noise resulting from traffic.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impact N-8: Exposure of Persons to or Generation of Excessive Groundborne Vibration or Noise Levels Associated with the Construction of Commuter Rail Facilities

Construction activities associated with grading and other earthmoving activities associated with construction of commuter rail facilities may result in minor amounts of ground vibration. These activities are not expected to result in the exposure of persons to or the generation of groundborne vibration or noise levels. Vibration that may occur from these activities would generally be short term and end when construction is completed. Therefore, impacts from these activities are considered less than significant. If high-impact activities such as pile driving occur, however, there is potential for significant groundborne vibration and noise impacts. Implementation of Mitigation Measure N-1 would reduce this impact to a less-than-significant level.

The development of commuter rail facilities also has the potential to expose existing and future noise-sensitive land uses located near proposed rail facilities and along rail alignments to excessive groundborne vibration and noise levels through rail operations. As such, there is potential for significant noise impacts. Implementation of Mitigation Measure N-1 (using FTA's NIC and VIC) would reduce this impact to a less-than-significant level.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impact N-9: Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions due to Operation of Commuter Rail Facilities

The operation of commuter rail facilities in the plan area has the potential to result in permanent increases in ambient noise levels relative to without-project conditions. The primary anticipated sources of excessive noise levels are traffic flow near rail facilities and rail operations. This impact is considered significant. Implementation of Mitigation Measure N-1 (using FTA's NIC and VIC) would reduce this impact to a less-than-significant level.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impact N-10: Potential Substantial Adverse Impacts Associated with the Construction of Pedestrian and Nonmotorized Facilities

Construction of pedestrian and nonmotorized facilities is not expected to result in any operational noise impacts. Pedestrian and nonmotorized facilities are TCMs designed to reduce overall traffic. Further, noise is generally not associated with these types of facilities.

Construction of the proposed facilities could result in construction-related noise impacts, however. Construction activities associated with grading and other earthmoving activities may result in minor amounts of ground vibration. These activities are not expected to result in the exposure of persons to or generation of groundborne vibration or noise levels. Vibration that may occur from these activities would generally be short term and end when construction is completed. Therefore, the impacts from these activities are considered less than significant. If high-impact activities such as pile driving occur, however, there is potential for significant groundborne vibration and noise impacts. Implementation of Mitigation Measure N-1 would reduce this impact to a less-than-significant level.

Construction of pedestrian and nonmotorized facilities would also have the potential to result in temporary or periodic increases in ambient noise levels relative to existing levels, primarily from the construction activities themselves. This impact is considered significant. Implementation of the following mitigation measure may reduce noise levels to less-than-significant levels.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impact N-11: Exposure of People Residing or Working near an Airport or in an Airport Land Use Plan Area to Excessive Noise Levels

The allocation of funds for transportation improvements within an airport land use plan area or within 2 miles of a public or public-use airport has the potential to expose people who currently reside or work in the plan area to excessive noise levels. This exposure is expected to result primarily from increased traffic flow from new roadways, expansion of existing roadways, or other roadway/traffic improvements. Therefore, this impact is considered significant. Implementation of Mitigation Measure N-1 would reduce this impact to a less-than-significant level.

Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of existing substandard streets. These improvements would not result in significant impacts on noise because new facilities would not be constructed and projects would consist of maintenance of existing facilities.

Environmental Setting

Public Services

Schools

School facilities in Solano County are provided by eight school districts, which include (Solano County Department of Planning 1980):

- Winters Joint Unified School District,
- Dixon Unified School District,
- Vacaville Unified School District,
- Travis Unified School District,
- River Delta Unified School District,
- Fairfield-Suisun Unified School District,
- Benicia Unified School District, and
- Vallejo City Unified School District.

The River Delta Unified School District covers portions of three counties (Yolo, Solano, and Sacramento). One elementary school is operated by the Solano County Department of Education for children with multiple disabilities (City of Vacaville 1999). There are also three community college districts that serve the residents of the county.

Fire Protection

Fire protection in Solano County is provided by seven fire departments, which are located within Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo. Suisun City also operates a volunteer fire department. These cities have agreed to provide fire protection services to surrounding areas and to provide support when dispatched by the Solano County Sheriff's Department

(Hally pers. comm.). Generally, a given city fire department will provide first response service to the area within the city's sphere of influence or areas immediately adjacent to city limits. This network of fire protective services consists of 23 station houses located throughout the county. The following table details the number of firehouses for each fire department.

Table 13-1. Fire Stations in Solano County

City	Number of Fire Stations
Benicia	2
Dixon	2
Fairfield	5
Rio Vista	1
Suisun City	1
Vacaville	4
Vallejo	<u>8</u>
Total	23

Police Services

Seven police departments, one in each incorporated city, and the Solano County Sheriff's Department provide police protection services for the county. Generally, each department patrols the area within its city limits. The sheriff's department is responsible for police protection in unincorporated areas of the county. There are a total of 487 sworn officers in Solano County: 397 city police officers and 90 sheriff's department officers. Table 13-2 lists the number of sworn officers in the police and sheriff's departments. (City of Dixon 1993, Chavis pers. comm., Dron pers. comm., McFearson pers. comm., City of Suisun City 2002, Stone pers. comm., Sittinger pers. comm.)

Table 13-2. Sworn Officers in Solano County

City	Number of Sworn Officers per Department
Benicia	36
Dixon	17
Fairfield	107
Rio Vista	11
Suisun City	23
Vacaville	46
Vallejo	157
Solano County Sheriff's Department (unincorporated areas)	<u>90</u>
Total	487

Parks

State Parks

The California Department of Parks and Recreation operates two parks in Solano County, both in Benicia. The State Capitol Historic Park was the third site of the State Capitol (1853–1854). The Benicia State Recreation Area is located in western Benicia along the Benicia/Vallejo border. This area is predominantly marshland, but it provides hiking, jogging, biking trails, fishing, and picnic areas (California Department of Parks and Recreation 2002).

County Parks

Solano County currently manages two regional parks covering approximately 550 acres: Lake Solano on Putah Creek, and Sandy Beach. A third regional park (Lagoon Valley Park) is under development on the western edge of Vacaville. Unlike the other two regional parks, Lagoon Valley Park is owned and operated by the City of Vacaville (1999). Activities such as camping, picnicking, fishing, boating, and swimming are typically available at the regional parks. There are few neighborhood and community parks in unincorporated areas of the county. Nearly all urban development in Solano County occurs through city annexation; therefore, the majority of community parks are under city jurisdiction (Solano County Department of Planning 1980).

City Parks

Benicia has over 700 acres of existing parks; Lake Herman Regional Park covers 577 acres. In 1997, Benicia adopted a parks, trails and open space master plan that which seeks to expand the existing network of parks, trails and bikeways (City of Benicia 1999).

Dixon has four parks: Hall Park (65 acres), Northwest Park (22.5 acres), Women's Improvement Club Park (1 acre), and Linear Park (1.4 acres). The city imposes a parkland acquisition and development fee on all new residential developments.

Fairfield contains 13 neighborhood and community parks totaling 144 acres. The Community Services Department is responsible for providing park and recreation programs for Fairfield.

Rio Vista has approximately seven parks covering 15 acres. Because of Rio Vista's proximity to the Sacramento River, water-related recreation facilities, such as a pier and boat launch, are also available for use.

Suisun City has approximately six parks within its city limits. These parks are small and serve the residential community around them.

Vacaville has over 520 acres of parks, in addition to 1,906 acres of urban open space surrounding the city.

Vallejo has approximately 145 acres of neighborhood and community parks. The Greater Vallejo Recreation District oversees the park planning for the city.

Benicia, Fairfield, and Vallejo are currently involved in planning a 10,000-acre park—the Tri-City and County Cooperative Planning Area for Agriculture and Open Space.

Utilities

Electricity and Telephone

All public electrical energy for Solano County is generated outside the county and supplied via transmission lines. The county acts as a major transmission line corridor serving the greater Bay Area. The principal supplier of electricity in the county is the Pacific Gas and Electric Company.

Major telephone transmission lines traverse Solano County. These lines usually follow rights-of-way that parallel county roadways and rail lines. Pacific Bell generally provides local telephone communication service for Solano County, although Citizens Communications provides local telephone service to Rio Vista.

Water

Solano County

A number of major water transport systems traverse the county, serving various cities. The Putah South Canal transports Lake Berryessa water under the Solano Water Project from Putah Creek to Cordelia. The State Water Project is the nation's largest state built water and power system. The North Bay Aqueduct is part of the State Water Project and serves Solano and Napa Counties (California Department of Water Resources 2002). It begins at the Barker Slough Pumping Plant a few miles north of Rio Vista and continues west to the Cordelia Pumping Plant forebay. The Cordelia Pumping Plant has three discharge pipelines.

Incorporated Cities

Benicia's potable water is supplied by the State Water Project via the North Bay Aqueduct. The city operates its own water plants.

Water is supplied to Dixon by the Dixon-Solano Municipal Water Service and the California Water Service Company.

Fairfield provides potable water to users within its corporate limits except for Travis AFB, which receives water from Vallejo. Fairfield's primary water supplies are from the Solano and State Water Projects.

Rio Vista's primary water supply is groundwater from a local aquifer. Because of the purity of the deep aquifer source, Rio Vista does not have a central treatment facility. Rio Vista's supplemental water sources include the Sacramento River and North Bay Aqueduct.

Water is supplied to Suisun City by the Suisun-Solano Water Authority.. It also receives raw water from the Solano Water Project.

Vacaville has three major water supply sources: Solano Water Project, North Bay Aqueduct, and groundwater supply wells. Vacaville also has an agreement with the Solano Irrigation District to supply additional water to the city.

Vallejo manages its own water distribution. The service area includes Mare Island, as well as several small communities in western Solano County. Vallejo has three major sources of raw water: Cache Slough, the Solano Water Project (from Lake Berryessa), and the State Water Project via the North Bay Aqueduct.

Wastewater Treatment

Wastewater treatment services in Solano County are provided by the incorporated jurisdictions. Benicia operates its own treatment plants. Wastewater from Dixon is treated at a plant 2.5 miles south of the city. FSSD provides and operates wastewater treatment for Fairfield and Suisun City. Rio Vista owns and operates two wastewater treatment plants. Vacaville has two wastewater treatment plants: the Industrial Wastewater Treatment Plant and the Easterly Sewage Treatment Plant. In Vallejo, wastewater facilities are operated and managed by the Vallejo Sanitation and Flood Control District.

Solid Waste

Solano County has six landfills; nearly all are located in unincorporated areas—B&J Landfill, Solano Garbage Sanitary Landfill, Rio Vista Landfill, Mare Island Landfill, Aqua Clear Farms, IT Corporation (a Class I hazardous waste disposal site that stopped receiving wastes in 1986), and Potrero Hills Sanitary Landfill.

Dixon Sanitation Service, a private waste disposal company, serves the Dixon area. Solid waste is collected in Dixon and transported to the B&J Landfill in Vacaville. A local franchised hauler under contract with Fairfield operates solid waste management for the city. Solid wastes collected from Fairfield are taken to Potrero Hills Landfill. In Rio Vista, solid waste disposal services are provided by a private company, Rio Vista Sanitation Service. Rio Vista does not have an active landfill; solid waste is currently transported to the Potrero Hills Landfill.

Vacaville Sanitary Service provides garbage collection and recycling services in Vacaville.

Regulatory Setting

The following plans, policies, and regulations are relevant to the CTEP and its potential public services and utilities impacts.

Solano County

- **Public Facilities Land Use Proposals—General Policies 2:** Public and community facilities in the County areas shall be provided in appropriate locations to serve the residents in surrounding rural areas.
- **Public Facilities Proposals—General Policies 2:** Development within the incorporated County shall be primarily self-sufficient requiring only minimal public facilities and services essential for health, safety and welfare.
- **School Facilities Policies 3:** The County, cities and local school districts shall work cooperatively to provide sufficient permanent school facilities to meet the needs of current and projected future enrollment and ensure that there are mechanisms to provide for the timely construction of the facilities.
- **Park and Recreation Goal 1:** Preserve and protect the diverse park, open space and recreational resources of the County for the use and enhancement of the lives of present and future generations.
- **Park and Recreation Goal 2:** Develop and maintain diversified recreational facilities to meet the varied recreational needs of the County.
- **Public Facilities Domestic Water Service Policies 1:** Domestic water for rural development shall be provided principally through on-site individual wells. When individual well systems in an area of the unincorporated County become marginal or inadequate for serving domestic uses, public water service may be permitted in conformance with the General Plan.

Benicia

- **Community Services Goal 2.28:** Improve and maintain public facilities and services.
- **Community Development and Sustainability Goal 2.32:** Ensure adequate school facilities to serve all residential areas.
- **Community Health and Safety Goal 4.15:** Reduce fire hazards.
- **Community Development and Sustainability Goal 2.32:** Expand the City's park system to accommodate future community needs.

- **Community Development and Sustainability Goal:** Ensure an adequate water supply for current and future residents and businesses.
- **Community Development and Sustainability Goal 2.40:** Ensure adequate wastewater treatment capacity to serve all development shown in the General Plan.

Dixon

- **Public Services and Facilities Goal:** Provide an adequate level of public services and facilities to ensure the continued health, education, welfare and safety of all local residents.
- **Public Services and Facilities Policy 34:** Prior to considering or approving any development project, the City shall require a developer to obtain a certification from the Dixon Unified School District that all major requirements imposed by the District, regarding the assurance of adequate school facilities for future residents, have been met.
- **Public Services and Facilities Policy 36:** The City shall ensure that residential growth does not exceed the capabilities or capacities of the Dixon Unified School District to provide adequate educational facilities.
- **Public Services and Facilities Policy 28:** The City shall ensure that new development incorporates street layouts which provide adequate emergency access, distinct street names and visible address markings.
- **Public Services and Facilities Policy 29:** The City shall ensure that new development within the Dixon Planning Area does not exceed the capability of the Dixon Fire Department to provide an adequate level of fire protection.
- **Public Services and Facilities Policy 26:** The City shall ensure that development within the Dixon Planning Area does not exceed the capability of the Dixon Police Department to provide an adequate level of police protection.
- **Public Services and Facilities Policy 27:** The City shall strive to maintain a police staffing level consistent with city needs.
- **Public Services and Facilities Policy 18:** The City shall provide for high-quality neighborhood and community parks to meet the recreational, open space, leisure and play needs and desire of existing and future residents.
- **Public Services and Facilities Policy 10:** The City shall coordinate development activity with the water purveyors to ensure that adequate domestic, commercial/industrial and fire flows are met.
- **Public Services and Facilities Policy 11:** The City shall ensure that the water improvements and service will continue to be financed with impact fees and service charges.
- **Public Services and Facilities Policy 12:** The City shall ensure that development does not exceed the capacity of the local water supply systems.

- **Public Services and Facilities Policy 7:** The City Shall ensure that development does not exceed the capacity of the local wastewater treatment facilities.

Fairfield

- **Public Facilities and Services Goal:** To provide superior levels of public facilities and services, based upon timely planning and adequate funding
- **Public Facilities and Services Objective PF 1:** Provide superior levels of facilities and services prior to or concurrent with planned development.
- **Public Facilities and Services Policy PF 1.1:** New development should be phased according to the capacity of public facilities and services to serve new development.
- **Public Facilities and Services Objective PF 22:** Promote school facilities that meet demand.
- **Public Facilities and Services Objective PF 15:** Insure adequate fire protection.
- **Public Facilities and Services Policy PF 15.1:** Provide enough staffing and substations to maintain an average run time for Priority 1 calls (fire, rescue, and ambulance back-up) of under 5 minutes 80 percent of the time.
- **Public Facilities and Services Objective PF 16:** Insure adequate police protection.
- **Open Space, Conservation and Recreation Objective OS 12:** Develop park areas to serve the needs of all residents.
- **Open Space, Conservation and Recreation Policy OS 12.1:** Develop park lands at the local and community levels to meet the recreational needs of current and future Fairfield residents.
- **Public Facilities and Services Objective PF 12:** Provide adequate public utilities
- **Public Facilities and Services Policy PF 12.1:** The City shall designate adequate, appropriately located land for utility uses.
- **Public Facilities and Services Policy PF 12.2:** The City shall continue to circulate development proposals to local utility providers, including Pacific Gas and Electric, Pacific Bell, and local cable television providers, for their review and comment and to ensure that they can and will provide service to development.
- **Public Facilities and Services Objective PF 5:** Provide adequate water infrastructure.
- **Public Facilities and Services Policy PF 6.3:** Closely coordinate with the FSSD regarding new development projections to allow FSSD to continue to construct sewerage capital improvements in a planned and orderly manner

consistent with the levels of General Plan growth and recommendations in the updated “Sewer Capacity Study.”

- **Public Facilities and Services Objective PF 13:** Support adequate solid waste disposal capacity.

Rio Vista

- **Open Space and Recreation Goal 9.7:** To provide parks in the City, consistent with the rate of residential development.
- **Open Space and Recreation Policy 9.7a:** The City shall provide sufficient acreage of parks needed to meet the active and passive recreation demands of the community.
- **Public Facilities and Services Goal 12.4:** To ensure that adequate gas and electric service is provided in a timely manner for residents and businesses in Rio Vista.
- **Public Facilities and Services Goal 12.5:** To maintain a water system that adequately serves the existing community, to provide water services to all existing and future development, and to ensure that safe drinking water standards are met.
- **Public Facilities and Services Policy 12.5a:** The City shall provide reliable and secure water sources for current and future residents.
- **Public Facilities and Services Policy 12.5b:** The City shall provide adequate water treatment capacity and infrastructure.
- **Public Facilities and Services Goal 12.6:** To provide adequate wastewater services to all existing and future development.
- **Public Facilities and Services 12.7:** To ensure that a healthy, safe and economical solid waste collection system is provided to Rio Vista citizens.

Suisun City

- **Community Facilities and Services—Municipal Services and Facilities Goal:** To provide municipal and school services and facilities to both new development and existing residents and businesses at a level that will maintain and improve the standard of living for the entire community.
- **Community Facilities and Services Objective 3:** To ensure that school capacity is adequate to serve children expected to reside in new residential developments between 1992-2010.
- **Community Facilities and Services—Emergency Services Goal :** To maintain an acceptable level of emergency services for public safety.
- **Community Facilities and Services—Emergency Services Objective 1:** To maintain acceptable ISO fire ratings, water pressure, and emergency response times for police and fire services.

- **Community Facilities and Services—Recreation Objective 1:** To provide sufficient park facilities to accommodate a wide range of active and passive recreation activities according to the standards of the Capital Improvement Program.
- **Community Facilities and Services—Municipal Services and Facilities Objective 1:** To ensure that new development does not exceed the capacity of the city to provide adequate municipal services and does not overly burden the capacity of existing infrastructure and service levels.

Vacaville

- **Public Facilities, Institutions, and Utilities Guiding Policies 5.1-G 1:** Assess the adequacy of utilities in existing developed areas, and program any needed to coordinate with providing facilities to serve developing portions of the Planning Area.
- **Public Facilities, Institutions, and Utilities Guiding Policies 5.3-G6:** Plan educational facilities with sufficient permanent capacity to meet the needs of current (1999) and projected enrollment and ensure that there are mechanisms to provide for the timely construction of the facilities.
- **Parks and Recreation Guiding Policy 4.6-G6:** Distribute public parks and recreational facilities throughout the urban service zone according to service area standards specified in the Parks and Recreation Element.
- **Parks and Recreation Guiding Policy 4.6-G8:** Evaluate the impact of proposed urban development on open space lands in terms of recreational opportunities and consider means of protecting these lands.
- **Parks and Recreation Guiding Policy 4.6-I1:** Maintain a Public Parks Distribution Standard of 4.5 acres of park for every 1,000 residents with a 1.8 acres/1,000 residents of neighborhood park, 1.7 acres/1,000 residents of community park and 1.0 acres/1,000 of city park.
- **Public Facilities, Institutions, and Utilities Implementing Policies 5.1-I12:** Do not approve any development that will not, even with identified mitigation measures, maintain standards for water, sewer, police, and fire services unless there are overriding findings of special circumstances or economic or social benefits and the service standards will be achieved at the time of project occupancy.

Vallejo

- **Other Services Goal 1:** To provide an efficient and financially sound system of urban services to protect the health, safety and general welfare of Vallejo area residents.
- **Educational Facilities Goal 3:** Provide adequate facilities to meet existing and future educational needs.

- **Educational Facilities Policy 1:** Reflect the City's commitment to quality education through mechanisms insuring that the rate of growth and rate of providing new services and facilities are compatible.
- **Parks and Open Space Goal:** To have a park and open space system that is convenient and properly designed to serve the needs of all residents of the community.

Impacts and Mitigation Measures

Methods of Analysis

Impacts were analyzed qualitatively based on the proposed CTEP projects' potential to affect public services and utilities within the county.

Criteria for Determining Significance Criteria

The CTEP would have significant impacts related to public services and utilities if it would:

- have substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered government facilities (the construction of which could cause significant environmental impacts) to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:
 - fire protection,
 - police protection,
 - schools, or
 - parks;
- not be served by a landfill with sufficient permitted capacity to accommodate the project's solid-waste disposal needs, or would result in noncompliance with federal, state, and local statutes and regulations related to solid waste;
- require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities that could cause significant environmental impacts;
- not have sufficient water supplies available to serve the project from existing entitlements and resources, or result in the need for new or expanded entitlements; or
- conflict with existing utilities.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact PS-1: No Impact on Public Services and Utilities from Distribution of Operational Subsidies

Allotment of operational subsidies for the following specific projects would not have any direct effects on public services and utilities within the project area: senior and disabled transit services; express bus service along I-80/I-680/I-780; Baylink Ferry Service; and local transit improvements. These projects involve the use of funds to purchase new vehicles, improve existing facilities, fund operation and maintenance costs, and provide extra service routes. There is no impact.

Impact PS-2: No Impact on Public Services and Utilities from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact PS-3: Increased Demand for Public Services and Public Facilities from Transportation Improvement Projects

Highway widenings, interchange improvements, and creation of HOV lanes (e.g., alteration of the I-680/I-80/SR 12 interchange, the widening of SR 12, and I-80 corridor improvements) in the CTEP area would increase the capacity of the existing circulation system. Increasing roadway capacity could directly affect fire and police protection services by increasing the demand for these services, which could in turn affect service ratios and response times. In addition, transportation improvements proposed under the CTEP could generate the need for additional public facilities to support increased demand of such services.

In *Chapter 5*, the proposed transportation improvements under the CTEP were analyzed for their contribution to indirect growth inducement. Similarly, the indirect growth inducement associated with the CTEP could contribute to an increased demand on the need for public services and facilities. This impact is considered significant. Implementation of Mitigation Measure PS-1 would reduce this impact to less-than-significant level.

Mitigation Measure PS-1: Identify Projected Population Growth and Demand for Public Services and Facilities Associated with CTEP Specific Projects

Before the project implementation, STA should require project proponents to consult with local agencies and jurisdictions to determine the projected population growth associated with a specific project. Based on those projections, STA should require project proponents to determine whether the projected growth would require an increased need for public services and facilities. Projected growth can be identified by using ABAG population projection models and obtaining population estimates and current levels of service from local cities. If it is identified that a specific project would create population growth, the project proponent should work with local cities to ensure that an increased need for public services and facilities would be met before project implementation.

Impact PS-4: Increase in Solid Waste Generation from Transportation Improvement Projects

Construction activities associated with the transportation improvements proposed under the CTEP could significantly increase the amount of solid waste. Waste materials generated might include excavated materials (site soils and sediments), gravel, demolition waste from abandoned buildings, and roadbed fragments. This impact is considered significant. Implementation of Mitigation Measure PS-1 would reduce this impact to less-than-significant level.

Impact PS-5: Increased Need for New Water Supply, or Water or Wastewater Treatment Facilities from Transportation Improvement Projects

Construction activities associated with the transportation improvements proposed under the CTEP would not increase the need for new water supply, or water or wastewater treatment facilities. However, as discussed in *Chapter 5*, the proposed transportation improvements could indirectly induce population growth within Solano County. Similarly, the increase in population could contribute to an increase in the need for new water supply, or water or wastewater treatment facilities. This impact is considered significant. Implementation of Mitigation Measure PS-1 would reduce this impact to less-than-significant level.

Impact PS-6: Conflict with Existing Utilities Because of Transportation Improvement Projects

Project elements could conflict with existing utilities. Construction activities around utility infrastructure could result in a temporary disruption of service or equipment, or the need to relocate utility infrastructure. This impact is considered significant. Implementation of Mitigation Measure PS-2 would reduce this impact to a less-than-significant level.

Mitigation Measure PS-2: Coordinate Relocation and Interruptions of Service During Construction with Service Providers

STA should require the project proponent to coordinate with service providers whose utilities must be relocated to identify specific relocation placement. In addition, the service provider would be notified in advance of all service interruptions and would be given sufficient time to notify customers. The timing of interruptions would be coordinated with the providers to ensure that the frequency and duration of interruptions are minimized.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the countywide priority projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on public services and utilities.

Environmental Setting

This section provides definitions of the concepts used to characterize and evaluate the existing aesthetic setting. Using these concepts, this section describes the regional visual quality and character, visual resources of the county, views from important vantage points, general viewer sensitivity, and existing sources of light and glare. This analysis uses a qualitative, descriptive approach for evaluating the visual resources of the county and the effects on those resources.

Concepts and Terminology

The aesthetic value of an area is a measure of its visual character and quality combined with the viewer response to the area (Federal Highway Administration 1983). The scenic quality component can best be described as the overall impression that an individual viewer retains after driving through, walking through, or flying over an area (U.S. Bureau of Land Management 1980). Viewer response is a combination of viewer exposure and sensitivity. Viewer exposure is a function of the number of viewers, the number of views seen, the distance of the viewers, and the viewing duration. Viewer sensitivity relates to the extent of the public's concern for particular viewsheds. These terms and criteria are described in detail below.

Viewshed

A viewshed is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail) (Federal Highway Administration 1983). Because of the scale of the CTEP, generalized landscape units were assessed instead of viewsheds.

Visual Character

Both natural and artificial landscape features make up the character of a view. Character is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Urban features include those associated with landscape settlement and development, such as roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly seasonally, even hourly, as weather, light, shadow, and the elements that compose the viewshed change. Form, line, color, and texture are the basic components used to describe visual character and quality for most visual assessments (U.S. Forest Service 1974, Federal Highway Administration 1983). The appearance of the landscape is described in terms of the dominance of each of these components.

Visual Quality

Visual quality is evaluated using the well-established approach to visual analysis adopted by FHWA. The approach employs the concepts of vividness, intactness, and unity (Federal Highway Administration 1983, Jones et al. 1975), which are defined below.

- Vividness is the visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as in natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape. (Federal Highway Administration 1983.)

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity, as modified by its visual sensitivity. High-quality views are highly vivid, relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Visual Sensitivity and Viewer Response

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity is based on the visibility of resources in the landscape, the proximity of viewers to the visual resource, the elevation of viewers relative to the visual resource, the frequency and duration of viewing, the number of viewers, and the type and expectations of individuals and viewer groups.

The importance of a view to viewers is related in part to the position of viewers relative to the resource; therefore, visibility and visual dominance of landscape elements are usually described with respect to their placement in the viewshed. Visual sensitivity also depends on the number and type of viewers, the frequency of viewing (e.g., daily or seasonally), and the duration of viewing. Viewer activity, awareness, and visual expectations in relation to the number of viewers and viewing duration also influence visual sensitivity. For example, visual sensitivity is higher for views seen by people who are driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work (U.S. Forest Service 1974, Federal Highway Administration 1983, USDA Soil Conservation Service 1978).

Commuters and nonrecreational travelers have generally fleeting views and tend to focus on commute traffic, not on surrounding scenery; therefore, they are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they generally are considered to have high visual sensitivity. Viewers using recreation trails and areas, scenic highways, and scenic overlooks are usually assessed as having high visual sensitivity.

Judgments of visual quality and viewer response must be made based in a regional frame of reference (USDA Soil Conservation Service 1978). The same type of visual resource in different geographic areas could have a different degree of visual quality and sensitivity in each setting. For example, a small hill may be a significant visual element in a flat landscape but have very little significance in mountainous terrain.

Countywide Setting

Solano County contains a mixture of agricultural and urban/built-up environment. There are seven incorporated cities in the county. Urban development is concentrated along I-80; four of the seven cities are either bounded by I-80 or bisected by it.

The western quarter of the county extends into the foothills of the Coast Ranges, characterized by steep slopes becoming more gently rolling hills to the east. The remainder of the county is part of the Sacramento Valley basin and is relatively flat, except for isolated areas of low rolling hills in the southeast portion. The southern portion of the county is bounded by the Sacramento River, Suisun Bay and Suisun Marsh, San Pablo Bay, Napa Sonoma Marsh, and associated sloughs.

From several locations on major roads and highways throughout the county, electrical towers and telephone poles are noticeable. In the western portion of the county, the foothills are the dominant vertical forms. Because of the relatively flat terrain in the remaining county, mature trees, development, utility structures are highly visible. The prevailing colors of the county are greens and browns associated with agricultural land use. Most new structures are one- or two-story

single-family homes, although exceptions can be found in the downtown commercial and industrial areas of urban and suburban areas.

Visual Resources

Because of the county's size, it was not comprehensively surveyed for this analysis. Instead, a sample cross section of the county was evaluated from major transportation routes (Figure 14-1). The visual resources along the survey route have been mapped and categorized into landscape units—areas composed of similar visual character (line, color, texture, and form) and quality (vividness, intactness, and unity). The qualitative descriptions provided below define the landscape units found in the county.

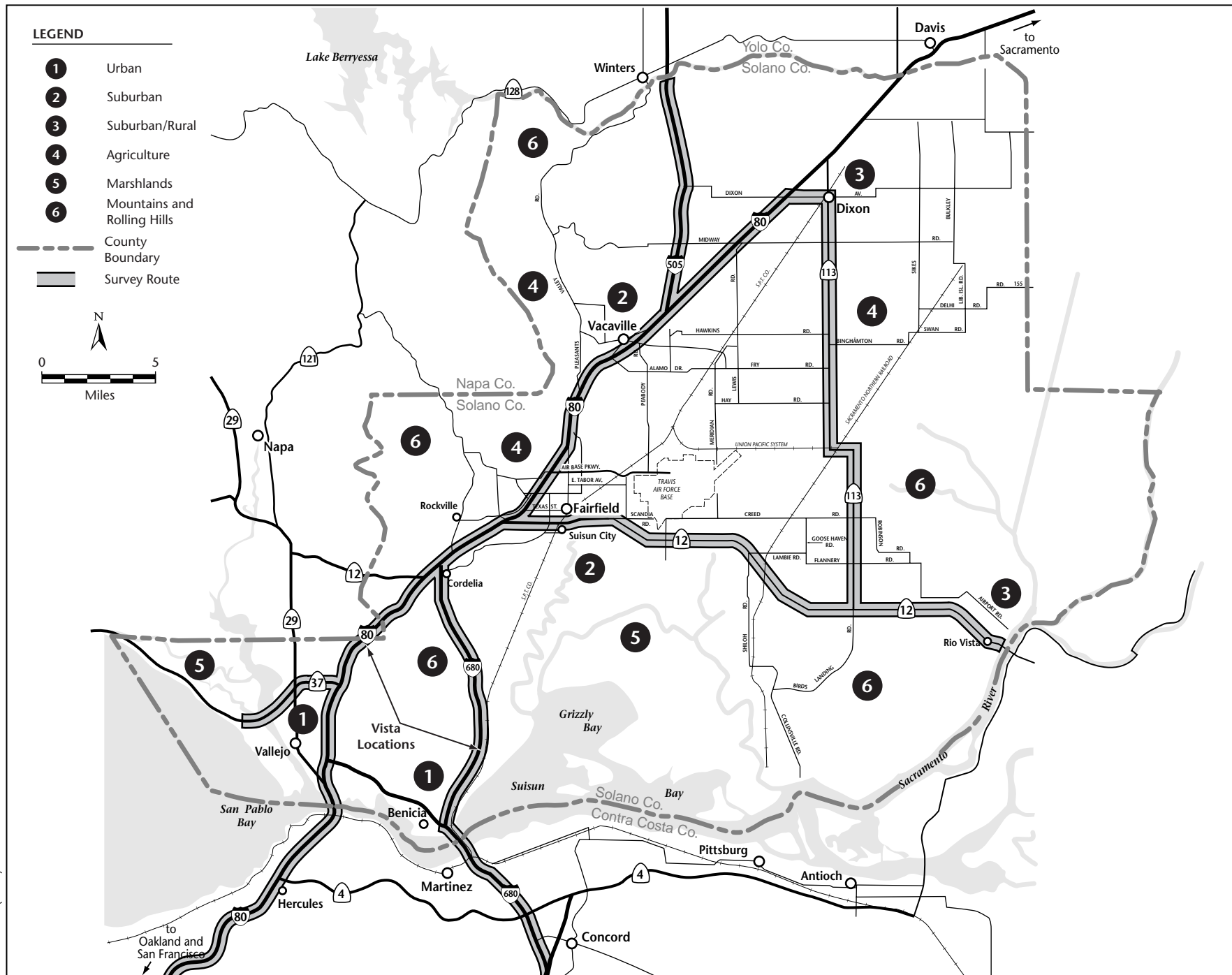
Landscape Units

Urban

Benicia and Vallejo are representative of the urban landscape unit. This unit contains residential, commercial, public, and industrial land uses. The dominant forms in this unit are the built structures, which compose most of the landscape. Residential developments include a mix of older single-family homes and large new tracts of one- and two-story homes. Commercial development includes shopping centers and strip malls. Downtown areas contain multistory buildings. Industrial uses include manufacturing, assembly, wholesale distribution, and office and commercial facilities. In Benicia and Vallejo, industrial uses tend to be clustered along the waterfront. Public uses include schools, parks, churches, and civic buildings. Both Benicia and Vallejo have historic downtown districts of moderate vividness. Overall views associated with this landscape unit are of low visual quality because the area lacks, intactness, and unity.

Suburban

Fairfield, Suisun City, and Vacaville are representative of the suburban landscape unit. Development in this area is less dense than the urban landscape unit. As in the urban landscape unit, land uses are mostly residential, commercial, public, and industrial, but some agricultural and open space uses are also present. Suisun City visual resources include the Suisun Slough, which borders Suisun City to the south. Fairfield and Suisun City each have a historic downtown or old town of moderate vividness. Overall views associated with landscape unit are of low to moderate visual quality because this landscape unit generally has low visual intactness and unity.



Suburban/Rural

Dixon and Rio Vista are representative of the suburban/rural landscape unit category. These areas primarily consist of residential and agricultural uses. Some commercial, public, and agricultural industrial uses are also present. Residential buildings consist of both older single-family homes and newer tract developments. Industrial agricultural buildings are usually one- to two-story, corrugated aluminum structures. Surrounding agriculture is the dominant landscape component.

Overall views of Dixon are of low quality because they lack vividness and do not contain any memorable or striking features. In addition, Dixon has low to moderate intactness and unity because built elements are scattered among agricultural uses.

Overall views of Rio Vista are of moderate quality because of exceptional views of the Sacramento River. The form and line are defined by the expansive water body and the associated riparian corridor. The Sacramento River is one of the most memorable views in the county, but it is not considered striking. Rio Vista has low to moderate intactness and unity because built elements are scattered among agricultural uses.

Agriculture

This landscape unit predominantly contains agricultural land uses, with occasional residential and agricultural industrial buildings scattered throughout. Agricultural uses in this unit are row crops, orchards, pasture, and grazed land. Dominant colors are the greens and browns associated with the crops and trees. The quality of this landscape unit is low to moderate. The unit is representative of a large portion of the county and lacks vividness. The unit has moderate intactness because development and structures generally are lacking. The unity of this landscape is also moderate.

Marshlands

Suisun Marsh and Napa Sonoma Marsh are important visual features of the county. Suisun Marsh is the largest contiguous brackish water marsh remaining on the west coast of North America and encompasses more than 10% of California's remaining natural wetlands (California Department of Water Resources 2002). Napa Sonoma Marsh consists of over 9,000 acres of wetlands and includes impressive views of the Napa River. Both areas remain relatively undeveloped and demonstrate a high degree of visual unity and intactness. The complex hydrology and vegetation dictate the form, line, color, and texture of this unit, which has a moderate to high quality. This unit is considered highly vivid; both areas are considered striking. The marshes are visible from I-680 and SR 37 respectively.

Mountains and Rolling Hills

The western quarter of the county extends into the Coast Ranges foothills, characterized by steep slopes becoming more gently rolling hill to the east. The foothills are a dominant vertical element in the area, contrasting with the flat valley floor. The topography of the southeast corner of the county consists of the rolling Montezuma Hills. Land along these mountains and hills generally is used for grazing. Occasional agricultural buildings can be seen in this landscape unit. Because of the moderate vividness, intactness, and unity of this landscape unit, it is considered to be of moderate visual quality.

Interstate 80

I-80 is the most populated transportation corridor in the county. Views from the freeway include mountains and agricultural land uses, as well as urban development (commercial, residential, and public land uses). A vista point is located on the west, 4 miles north of Vallejo (Figure 14-1). Train tracks, multiple billboards, and electric towers border the highway. Highway dividers include metal railing, concrete barriers, and vegetation. The visual quality of this landscape unit is low because it has low vividness, intactness, and unity. The freeway has low to moderate vividness because views are common of the area, although the scenic overlook is of moderate quality. The surrounding mountains and agricultural uses have low to moderate intactness and unity.

Interstate 505

This landscape unit is a four-lane highway running from north to south starting at I-80 just north of Vacaville. Views include agriculture, mountains and open space. There are no highway barriers between northbound and southbound lanes. Vertical elements include electrical towers and scattered buildings. The visual quality of the landscape is low to moderate because of low vividness and low to moderate unity and intactness.

Interstate 680

I-680 is a four-lane freeway that runs north to south adjacent to Suisun Marsh. Views of the marsh and mountains are visible heading north. A vista point off the Lake Herman exit provides views of the marsh, Suisun Bay, and City of Martinez. Other views include some built elements. Highway barriers obstruct most views of the marsh heading south. The visual quality of the landscape is moderate to high. Vividness of the landscape is considered high and the unity and intactness are considered moderate.

State Route 12

SR 12 is a two-lane highway that runs east to west across the county. Views from the highway include the mountains, agriculture, residential, and commercial uses. Vertical elements include built features, telephone, and utility towers. As the highway approaches developed areas, such as Fairfield and Suisun City, the number of billboards and street lights increase significantly. The visual quality of this unit is considered low to moderate because of the moderate vividness of the mountain views and low to moderate unity and intactness.

State Route 37

SR 37 is state designated scenic state route, which runs east to west starting in Vallejo. The highway provides impressive views of Napa Sonoma Marsh, San Pablo Bay, and the Napa River. Views from the highway also include residential, commercial and industrial uses of urban Vallejo. The quality of this unit is considered moderate. The views of Napa Sonoma Marsh and the Napa River are striking, but overall the view lacks unity and intactness.

State Route 113

SR 113 is a two-lane highway that runs north to south from Dixon to SR 12. Outside Dixon, views from the highway mainly include agricultural and grazed land. Vertical elements include telephone poles, utility towers, and the occasional building. Visual quality of this unit is considered low to moderate because of the low vividness and moderate unity.

Viewer Sensitivity

Viewers Using Transportation Corridors

The majority of people who experience views from I-80, I-505, and I-680 are likely to be commuters and nonrecreational travelers. Commuters are considered to possess low visual sensitivity. Because SR 37 is designated as a state scenic route, people experiencing views when traveling on this freeway may be considered to have high visual sensitivity.

Viewers using other expressways or local roadways, including SR 12, are likely to be local residents or recreational travelers. SR 12 crosses the Sacramento River. Although local residents are accustomed to the views in the area and their sensitivity, recreational travelers will find the views of the river to be low to moderate quality.

Long-Term Viewers of Transportation Corridors

Viewers of proposed CTEP improvements would include people using adjacent land uses. Residents of housing along proposed improvements, as well as employees working nearby, would have long-term views of the project area. Sensitivity for this type of viewer is considered high.

Sources of Light and Glare

The transportation corridors for which improvements are proposed are generally unlit, except local roads and portions of SR 12 and SR 37 located in the urban landscape units. In addition, pockets of light spillage from adjacent commercial uses can occur on the major transportation corridors within the county, such as I-80, I-680, and I-505.

Regulatory Setting

Caltrans Scenic Highway Program

The portion of SR 37 within the county is a state-designated scenic route (California Department of Transportation 1999). Therefore, its scenic corridor (the area of land generally adjacent to and visible from the highway) is subject to protection through methods including regulation of land use, site planning, advertising, earthmoving, landscaping, and the design and appearance of structures and equipment. Relevant examples of visual intrusions that would degrade scenic corridors and create unsightly land uses, as stipulated by Caltrans, include highly reflective surfaces, extensive cut and fill, scarred hillsides and landscape, large slope failures, exposed and unvegetated earth, and dominance of exotic vegetation (California Department of Transportation 1996).

Local Visual Resource Protection Policies

This section presents visual resource and aesthetics policies that could affect or be affected by the CTEP. Policies may either support or conflict with proposed project improvements. The policies listed below were excerpted from the Scenic Roadways, Resource Conservation, and Open Space Elements of the Solano County general plan and from the city general plans.

Solano County

- **Scenic Roadways General Policy:** The established character of narrow, curving scenic roadways on the hilly west sections of the planning area should be preserved.

- **Scenic Roadways General Policy:** The number of man-made interruptions or incidents along a scenic roadway (housing, commercial uses, signs, driveways, etc.) should be limited to maintain the current visual values as the prevalent feature of the route.
- **Resource Conservation Policy:** The diversity of habitats in the Suisun Marsh and surrounding upland areas should be preserved and enhanced wherever possible to maintain the unique wildlife resource.
- **Resource Conservation Policy:** The County shall make special efforts to encourage and assist cities in maintaining their community identities by retaining existing visual corridors and establishing community buffers.
- **Resource Conservation Policy:** The County shall protect and maintain visual corridors and community buffers in the appropriate open space uses.

The Solano County Scenic Roadways Element also provides policies for specific views found in the county. Scenic roadways are listed below (Sedway/Cooke 1977).

Freeways-Expressways

- I-80 from Carquinez Strait at Vallejo to Solano County/Yolo County line in Davis
- I-680 from Carquinez Strait at Benicia to I-80 at Cordelia
- I-505 from I-80 at Vacaville to Solano County/Yolo County line near Winters

Major Thoroughfares

- SR 37 from Solano County/Sonoma County line to I-80 at Vallejo
- SR 12 from Solano County/Napa County line to I-80
- SR 12 from Southern Pacific Railroad at Fairfield to Solano County/Sacramento County line at Rio Vista

Minor Thoroughfares

- Columbus Parkway and Lake Herman Road from I-80 at Vallejo to I-680 at Benicia
- Green Valley Road from I-80 at Cordelia to Rockville Road
- Rockville Road from Green Valley Road to Suisun Valley Road
- Suisun Valley Road from Rockville Road to Solano County/Napa County line
- Oliver Road from I-80 at Fairfield to Mankas Corner Road and Waterman Boulevard

- Mankas Corner Road from Oliver Road and Waterman Boulevard to Suisun Valley Road
- Cherry Glen Road and Pleasants Valley Road from I-80 south of Vacaville to Solano County/Yolo County line
- Putah Creek Road from Pleasants Valley Road along Putah Creek to Stevenson Bridge Road
- SR 13 from I-80 at Dixon to SR 12 between Fairfield and Rio Vista

Rural Roads

- Grizzly Island Road from SR 12 at Suisun City to the end near Montezuma Slough

Benicia

- **Policy 3.7.1:** Ensure that new development is compatible with the surrounding architectural and neighborhood character
- **Goal 3.9:** Protect and enhance scenic roads and highways
- **Policy 3.9.1:** Preserve vistas along I-780 and I-680.
- **Goal 3.13:** Improve urban design qualities of the waterfront and public access to the shoreline.
- **Policy 3.13.1:** Enhance waterfront vistas
- **Policy 3.13.2:** Incorporate public visual areas in new development
- **Policy 3.13.3:** Take advantage of water orientation for recreation and industrial uses

Dixon

- **Urban Growth and Development Policy 20:** The City shall require the undergrounding of utilities in all new developments when appropriate, and shall encourage the removal of overhead utility lines and poles throughout the city.
- **Urban Growth and Development Policy 22:** The City shall ensure that all development which may be built adjacent to Interstate 80 will either present an attractive appearance or not be visible from the freeway at all. To the greatest extent possible, visual separation between developed areas of Dixon and the freeway corridor will be maintained by vegetation, landscaping, berms and devices other than acoustical walls.

Fairfield

- **Open Space, Conservation and Recreation Goal:** Designate, preserve, and protect agricultural, ecological, recreational and scenic lands in Fairfield and surrounding areas for now and future generations.
- **Open Space, Conservation and Recreation Objective OS 6:** Enhance visual resources throughout the City.
- **Open Space, Conservation and Recreation Policy OS 6.5:** Identify and designate scenic features within the General Plan Area that merit preservation as Scenic Vistas. These may include, but not limited to: hilly areas, significant stands of trees, marshlands views, grasslands, roadside creeks, riparian or stream corridors, vineyards, orchards, and areas of wildlife concentration.
- **Open Space, Conservation and Recreation Policy OS 6.7:** Identify, designate, and preserve Scenic Roadways within the General Plan Area
- **Policy OS 6.9:** Maintain the scenic vistas of rolling hills that are seen from urban areas in Fairfield
- **Urban Design Policy UD 3.2:** Promote pedestrian and bicycle orientation through separated sidewalks, bicycle paths, interior walkways, planting canopy trees adjacent to pedestrian paths, etc.
- **Urban Design Objective UD 5:** Preserve the natural scenic quality of the surrounding setting.
- **Urban Design Policy UD 6.1:** Preserve existing significant trees and extensively plant new trees where appropriate.

Rio Vista

- **Resource Conservation and Management Goal 10.11:** To protect the visual and scenic resources of Rio Vista-recognizing their importance in the quality of life for City residents and in promoting recreation and tourism
- **Resource Conservation and Management Policy 10.11.A:** The City shall require new development in scenic areas (e.g., river banks, Highway 12 corridor, Sacramento River waterfront, and hillsides) to use planning, design, construction, and maintenance techniques that:
 - Incorporate design and screening measures to minimize the visibility of structures and graded areas.
 - Maximize views in sensitive viewing areas and corridors
 - Maintain the character and visual quality of the area
- **Resource Conservation and Management Policy 10.11.B:** The City shall require the new development be designed to integrated natural landforms and vegetation in order to minimize alternation of scenic vistas.

- **Resource Conservation and Management Policy 10.11.E:** The City shall require that new roads, parking, and utilities be designed to minimize visual impacts. Unless limited by geological or engineering constraints, utilities shall be installed underground, and roadways and parking areas shall be landscaped and designed to accommodate the natural terrain.

Suisun City

- **Community Character and Design Objective 5:** To preserve and enhance visual and physical interaction of development in Suisun City and Suisun Marsh.

Vacaville

- **Land Use Policy 2.6-G 7:** Ensure that new development is compatible with the character and scale of existing and planned adjoining land uses.

Vallejo

- **Scenic Highway Goal:** To protect and enhance the visual corridors of designated routes.

Impacts and Mitigation Measures

Methods of Analysis

Aesthetics deals with the nature, creation, and appreciation of beauty. Evaluation of aesthetic resources in the landscape requires a process that objectively identifies the visual features (resources) of the landscape, assesses the character and quality of those resources relative to overall regional visual character, and identifies the importance to people (sensitivity) of views of visual resources in the landscape. By establishing these existing (baseline) conditions, a proposed project or another change to the landscape can be systematically evaluated for its degree of impact. The degree of impact depends on the magnitude of change in the visual resource (i.e., in visual character and quality) and on viewers' responses to and concern for those changes. This basic method of evaluating visual impacts follows established federal procedures (Smardon et al. 1986) and is suitable for evaluating nonfederal projects and areas.

The approach for this visual assessment is adapted from FHWA's visual impact assessment system (1983), in combination with other established visual assessment systems. The process involves identifying relevant policies and concerns for protection of visual resources; the region's visual resources (i.e., visual character and quality), the immediate project area, and the project site; important viewing locations (e.g., roads) and the general visibility of the project

area and site from those locations, as documented with descriptions and photographs; viewer groups and their sensitivity; and potential impacts, mitigation, and other recommendations.

A driving survey of Solano County was conducted on June 24, 2002. The purpose of the survey was to identify areas of visual sensitivity, scenic resources, the existing character and quality of the project area, and the proximity of visually sensitive resources to transportation corridors likely to be affected by the CTEP (Figure 14-1). The survey included a sample of the county and areas proposed for major improvements under the CTEP. The approach outlined above was used to evaluate the aesthetic resources of the area. Landscapes with similar visual character were mapped and identified as landscape units. The impact and mitigation measure analysis below assumes that locations not visited on the survey are of a similar visual nature to those viewed during the survey. Not all the proposed CTEP project sites were surveyed, but future project-level environmental documentation would evaluate site-specific visual resources and potential impacts. The Caltrans-designated highways and route list was also reviewed, as well as city and county general plans.

Criteria for Determining Significance

The CTEP would have a significant impact on aesthetics if it would:

- substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- substantially degrade the existing visual character or quality of a project site and its surroundings; or
- create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Impacts and Mitigation Measures of the Proposed County Transportation Expenditure Plan

Impacts Related to Countywide Priority Projects

Impact AES-1: No Impact on Aesthetics from Distribution of Operational Subsidies

Allotment of operational subsidies for the following specific projects would not have any direct effects on aesthetics within the project area: senior and disabled transit services; express bus service along I-80/I-680/I-780; Baylink Ferry Service; and local transit improvements. These projects involve the use of funds to buy new vehicles, improve existing facilities, fund operation, and maintenance costs and provide extra service routes. There is no impact.

Impact AES-2: No Impact on Aesthetics from Implementation of Transportation-Related Environmental Mitigation

The proposed transportation-related environmental mitigation under the CTEP involves conceptualizing areas where habitat could be set aside to compensate for loss of sensitive habitats resulting from construction of specific projects under the CTEP. The CTEP would merely allocate funds for this process. Therefore, there is no impact.

Impact AES-3: Degrade Scenic Resources along a State Scenic Highway Related to Transportation Improvements

Two highways in the county are eligible for listing as scenic state routes: SR 37, and SR 29 from SR 37 north of Vallejo to SR 221 north of Napa. Neither of these routes will be affected by the Countywide Priority Projects. No impact would occur.

Impact AES-4: Changes in Visual Character or Quality Related to Transportation Improvements

Construction activities associated with Countywide Priority Projects that require roadway alterations would include the use of heavy equipment and associated vehicles (e.g., bulldozers, graders, scrapers, and trucks). Construction activities, equipment, and vehicles would be present in the viewshed of nearby roadways and adjacent residences, commercial facilities, and public facilities. Projects such as the alteration of the I-680/I-80/SR 12 interchange could affect visual resources with high visual quality (e.g., Suisun Marsh). Construction activities are considered temporary, and the existing visual characters of each project site would be restored after the completion of projects.

Commuters and residents are the primary viewers within the major transportation corridors (e.g., I-80, SR 12, I-680). Given the low viewer sensitivity of residents and commuters within the project area, this impact is considered less than significant.

Impact AES-5: Creation of New Sources of Light and Glare

Countywide Priority Projects that require roadway alterations, such as the widening of SR 12, widening of I-80, and alteration of interchanges of I-80 and I-680, could create temporary light or glare if nighttime construction is used. Installation of temporary lighting for night construction activities could introduce a source of light during nighttime hours, affecting views and casting light onto adjacent properties. The extension or construction of new facilities under the

Countywide Priority Projects could also require the construction of lighting fixtures that would introduce a new source of light and glare. This impact is considered significant. However, implementation of Mitigation Measure AES-1 would reduce this impact to a less-than-significant level.

Mitigation Measure AES-1: Design Lighting to Meet Minimum Safety and Security Standards

Where lighting is required or proposed, the project proponent shall incorporate lighting design specifications to meet minimum safety and security standards. The following measures shall be incorporated into lighting plans to reduce the impact of introduced light and glare.

- Luminaries shall be cutoff-type fixtures that cast low-angle illumination to minimize incidental spillover of light onto adjacent private properties and undeveloped open space. Fixtures that project light upward or horizontally shall not be used.
- Luminaries shall be directed away from habitat and open space areas adjacent to the project site.
- Luminaries shall provide good color rendering and natural light qualities. Low-pressure sodium and high-pressure sodium fixtures that are not color-corrected shall not be used. Intensity shall be approximately 10 lux for roadway intersections.
- Luminary mountings shall be downcast and the height of the poles minimized to reduce potential for back scatter into the nighttime sky and incidental spillover of light onto adjacent private properties and undeveloped open space. Light poles shall be 20 feet high or shorter. Luminary mountings shall have non-glare finishes.

Impacts Related to Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects

Specific projects associated with Return to Source—Fast Track Congestion Relief and Travel Safety Program Projects would involve local roadway improvements, local interchange improvements, local downtown improvements, local transit projects, and local safety projects. Subsequently, impacts under these projects would be the same as those described above for the Countywide Priority Projects.

Impacts Related to Local Road Rehabilitation Projects

Specific projects associated with Local Road Rehabilitation Projects include local road maintenance and rehabilitation, such as repair and maintenance of substandard streets. These improvements would not result in significant impacts on aesthetics.

Chapter 15

Other Required CEQA Analysis

This chapter discusses the cumulative, and significant and unavoidable impacts of the proposed CTEP. Growth-inducing impacts are summarized in this chapter but are analyzed in detail in *Chapters 3–14*. The potential for the use of nonrenewable resources as a result of the implementation of the CTEP is also discussed.

Cumulative Analysis

Requirements for Analysis

State CEQA Guidelines Section 15130 requires that an EIR include a reasonable analysis of the significant cumulative impacts of a proposed project. The analysis may be less detailed than the analysis of the individual impacts. (The EIR should not discuss impacts that do not result in part from the proposed project.)

A cumulative impact is defined in State CEQA Guidelines Section 15355 as “the change in the environment which results from the incremental impact of the [proposed] project when added to other closely related past, present, and reasonably foreseeable future projects.” The section further states that cumulative impacts “can result from individually minor but collectively significant projects taking place over a period of time.”

When a lead agency determines that an incremental effect is not cumulatively considerable, the agency must briefly describe its basis for that determination, but does not need to consider that impact significant.

Approach to Cumulative Impacts

For this analysis, the county and city general plans and the draft EIR for the 2001 RTP were reviewed. Each of the CTEP projects has been previously described or proposed as future transportation improvements in these documents. Several of the CTEP projects (e.g., I-80/I-680/SR 12 reconstruction, SR 12 widening, Vallejo Intermodal Station, and TLC projects) have also been previously evaluated by MTC as part of the regional transportation improvements proposed

for the Bay Area. The allocation of funds under the CTEP would accelerate the implementation of some of the CTEP projects, representing a contribution to cumulative impacts. The actual intensity of the cumulative impacts would not be affected because the projects have been previously listed or proposed; however, the timing of when the projects would be implemented creates potential incremental cumulative impacts that otherwise may not occur without the CTEP. Therefore, this section lists the impacts resulting from CTEP implementation that would be considered cumulative relative to the impacts under the regional transportation developments proposed in the city and county general plans and the draft EIR for the 2001 RTP.

As discussed in *Chapters 3–14*, impacts resulting from Local Improvement—Return to Source projects would be the same as those described for Countywide Priority Projects. Therefore, cumulative impacts identified in this chapter apply to both types of projects. Potholes—Return To Source projects include minor local road maintenance and rehabilitation of substandard streets. The work will be completed by local governments using their established best management practices. These projects are unlikely to contribute to cumulative impacts.

For each resource topic, cumulative impacts associated with the CTEP would be identical to some of the specific impacts described in *Chapters 3–14*. These impacts are listed below. Mitigation measures that could reduce each impact to a less-than-significant-level are also listed as applicable.

Land Use

The following impacts would contribute to cumulative impacts on land use if the CTEP is implemented.

- Impact LU-3: Physical Division of an Established Community by Transportation Improvement Projects
 - Mitigation Measure LU-1: Conduct Site-Specific Review of Project Design Improvements to Determine Effects on Established Communities
 - Mitigation Measure LU-2: Design Project Improvements to Avoid or Minimize Physical Division of an Existing Community
- Impact LU-4: Conflicts between Transportation Improvement Projects and Applicable Open Space/Agricultural Land Use Preservation Policies
 - Mitigation Measure LU-3: Design Project Improvements to Minimize Impacts on Open Space and Agriculture
 - Mitigation Measure LU-4: Organize and Participate in Working Groups for all CTEP Major Infrastructure Projects

Agriculture

The following impacts would contribute to cumulative impacts on agriculture if the CTEP is implemented.

- Impact AG-3: Direct Conversion of Important Farmland to Nonagricultural Uses
 - Mitigation Measure AG-1: Evaluate the Potential for Direct Farmland Conversion at the Project Level and Avoid, Minimize, and Compensate for Loss of Farmland
- Impact AG-6: Reduction of Farmland Productivity and Efficiency
 - Mitigation Measure AG-3: Evaluate and Avoid or Minimize Potentially Significant Agricultural Land Use Conflicts at the Project Level

Population and Housing

The following impacts would contribute to cumulative impacts on population and housing if the CTEP is implemented.

- Impact PH-4: Potential for Displacement of Substantial Numbers of Existing Housing or People Resulting from Transportation Improvement Projects
 - Mitigation Measure PH-2: Develop and Implement a Relocation Plan
- Impact PH-5: Introduction or Creation of Infrastructure Not Included in a General Plan Resulting from Transportation Improvement Projects
 - Mitigation Measure PH-3: Consult with Local Planning Staff to Reduce or Avoid Potential Introduction or Creation of Infrastructure Not Evaluated in a General Plan

Biological Resources

The following impacts would contribute to cumulative impacts on biological resources if the CTEP is implemented.

- Impact BIO-3: Potential Disturbance or Loss of Special-Status Plant Populations Resulting from Transportation Improvement Projects
 - Mitigation Measure BIO-1: Document Special-Status Plant Species Populations
 - Mitigation Measure BIO-2: Avoid or Minimize Impacts on Special-Status Plant Species Populations by Redesigning the Project, Protecting Populations, and Developing a Transplantation Plan (If Necessary)
- Impact BIO-5: Loss or Disturbance of Riparian Habitats Associated with Transportation Improvement Projects

- ☐ Mitigation Measure BIO-5: Identify and Document Riparian Habitat
- ☐ Mitigation Measure BIO-6: Avoid or Minimize Disturbance of Riparian Habitats
- ☐ Mitigation Measure BIO-7: Compensate for the Loss of Riparian Habitat
- Impact BIO-6: Disturbance or Loss of Waters of the United States, Including Wetlands, Associated with Transportation Improvement Projects
 - ☐ Mitigation Measure BIO-8: Identify and Delineate Waters of the United States, Including Wetlands
 - ☐ Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities
 - ☐ Mitigation Measure BIO-10: Compensate for the Loss of Wetland Habitat
- Impact BIO-7: Potential Disturbance or Loss of Special-Status Wildlife Species and Their Habitat Associated with Transportation Improvement Projects
 - ☐ Mitigation Measure BIO-6: Avoid or Minimize Disturbance of Riparian Habitats
 - ☐ Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities
 - ☐ Mitigation Measure BIO-11: Document Special-Status Wildlife Species and Their Habitats
 - ☐ Mitigation Measure BIO-12: Avoid or Minimize Impacts on Special-Status Wildlife Species by Redesigning the Project, Protecting Special-Status Wildlife Habitat, and Developing a Mitigation Monitoring Plan (If Necessary)
 - ☐ Mitigation Measure BIO-13: Coordinate with Resource Agencies and Develop Appropriate Compensation Plans for State- and Federally-Listed Wildlife Species
- Impact BIO-9: Potential Direct and Indirect Impacts on Special-Status Fish Species Associated with Transportation Improvement Projects
 - ☐ Mitigation Measure BIO-7: Compensate for the Loss of Riparian Habitat
 - ☐ Mitigation Measure BIO-9: Avoid or Minimize Disturbance of Waters of the United States, Including Wetland Communities
 - ☐ Mitigation Measure BIO-14: Assess and Document Habitat for Special-Status Fish Species
 - ☐ Mitigation Measure BIO-15: Avoid or Minimize Impacts on Special-Status Fish Species and Their Habitat
 - ☐ Mitigation Measure BIO-16: Consult with NMFS or USFWS when Listed Fish Species May Be Affected, and Initiate Essential Fish Habitat consultation with NMFS when Chinook Salmon May Be Affected

Cultural Resources

The following impacts would contribute to cumulative impacts on cultural resources if the CTEP is implemented.

- Impact CR-5: Potential Damage to Previously Unidentified Buried Archaeological Resources or Human Remains Associated with the Proposed Transportation Improvements
 - Mitigation Measure CR-3: Comply with State Laws Pertaining to the Discovery of Human Remains
 - Mitigation Measure CR-4: Perform Archaeological Monitoring
 - Mitigation Measure CR-5: Covering (“Capping”) Archaeological Resources
- Impact CR-6: Demolition of Historic Resources
 - Mitigation Measure CR-6: Avoid Historic Resources
 - Mitigation Measure CR-7: Conduct Additional Study of Affected Historic Resources
 - Mitigation Measure CR-8: Record Photographic and Written Documentation to Historic American Building Survey/Historic American Engineering Record Standards
- Impact CR-7: Relocation of Historic Resources
 - Mitigation Measure CR-9: Conduct Records Search, Background Research, Field Survey, and Technical Report for All Proposed Projects
 - Mitigation Measure CR-10: Conform to the Secretary of the Interior’s Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings in the Event of Relocation
 - Mitigation Measure CR-11: Review Project Design

Hydrology and Water Quality

The following impacts would contribute to cumulative impacts on hydrology and water quality if the CTEP is implemented.

- Impact H-4: Long-Term Impacts Resulting in Impaired Water Quality Associated with the Operation of New Facilities
 - Mitigation Measure H-1: Prepare a Storm Water Pollution Prevention Plan
- Impact H-5: Substantial Depletion of Groundwater Supplies or Interference with Groundwater Recharge
 - Mitigation Measure H-2: Design and Install Infiltration Devices

- Impact H-6: Substantial Alteration of the Drainage Pattern of the Project Site
- Impact H-7: Increase in Runoff Peak Flows and Volumes or Exceedance in the Capacity of the Stormwater Management System
 - Mitigation Measure H-3: Design and Implement Stormwater Management Measures
- Impact H-8: Placement of Structures in the 100-Year Floodplain and Exposure of People or Structures to Significant Risk from Flooding
 - Mitigation Measure H-4: Restrict Floodwater Conveyance under Bridges and Other Facilities

Geology, Soils, and Seismicity

The following impacts would contribute to cumulative impacts on geology, soils, and seismicity if the CTEP is implemented.

- Impact G-4: Potential Adverse Effects Resulting from Landslides and/or Other Types of Slope Failures Associated with Transportation Improvement Projects
 - Mitigation Measure G-4: Conduct Site-Specific Geotechnical Investigations for Slope Stability and Implement Appropriate, Proven Geotechnical Methods
- Impact G-6: Potential Adverse Effects Resulting from Expansive Soils and Sediments Associated with Transportation Improvement Projects
 - Mitigation Measure G-6: Conduct Site-Specific Geotechnical Investigations for Expansive Soils and Implement Appropriate, Proven Geotechnical Methods
- Impact G-7: Potential Adverse Effects Resulting from Land Subsidence or Settlement Associated with Transportation Improvement Projects
 - Mitigation Measure G-7: Conduct Site-Specific Geotechnical Investigations for Settlement and Subsidence and Implement Appropriate, Proven Geotechnical Methods

Transportation

The following impacts would contribute to cumulative impacts on transportation if the CTEP is implemented.

- Impact T-5: Creation of Need for Capacity-Enhancing Alterations to Existing Facilities
 - Mitigation Measure T-2: Refine Scope and Schedule of the Interstate 80/Interstate 680/State Route 12 Interchange Reconstruction,

Interstate 80 Corridor Improvements, and State Route 12 West Widening Projects

- Impact T-7: Conflicts among Bicycles, Pedestrians, and Automobiles
 - Mitigation Measure T-4: Integrate Bicycle and Pedestrian Facilities and Amenities into Local Road and Applicable Improvement Projects on Regionally Significant Roadways
- Impact T-8: Generation of Transit Demand that Current and Planned Systems Cannot Accommodate
 - Mitigation Measure T-5: Support Local Transit Operators and Caltrans in Developing Short- and Long-Range Regional Transit Plans to Facilitate the Use of Public Transportation

Air Quality

The following impacts would contribute to cumulative impacts on air quality if the CTEP is implemented.

- Impact AQ-4: Operation-Related Impacts on Air Quality Associated with Interstate 80 Corridor Improvements
 - Mitigation Measure AQ-3. Conduct a Detailed Site-Specific Air Quality Analysis
- Impact AQ-8: Operation-Related Impacts on Air Quality Associated with the Development of Commuter Rail Facilities
 - Mitigation Measure AQ-3. Conduct a Detailed Site-Specific Air Quality Analysis

Noise

The following impacts would contribute to cumulative impacts on noise if the CTEP is implemented.

- Impact N-3: Exposure of Persons to or Generation of Noise Levels that Exceed Established Local Agency Noise Standards or Applicable Standards of Other Agencies
 - Mitigation Measure N-1: Conduct a Detailed Noise Analysis
- Impact N-4: Potential Exposure of Persons to or Generation of Excessive Groundborne Vibration or Noise Levels
 - Mitigation Measure N-1: Conduct a Detailed Noise Analysis
- Impact N-5: Potential Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions
 - Mitigation Measure N-1: Conduct a Detailed Noise Analysis

Public Services and Utilities

The following impacts would contribute to cumulative impacts on public services and utilities if the CTEP is implemented.

- Impact PS-3: Increased Demand for Public Services and Public Facilities from Transportation Improvement Projects
 - Mitigation Measure PS-1: Identify Projected Population Growth and Demand for Public Services and Facilities Associated with CTEP Specific Projects

Growth Inducement

Growth-inducing impacts are discussed in *Chapters 3–14*. In general, the implementation of the CTEP would have significant growth-inducing impacts on the following resources:

- land use,
- population and housing,
- cultural resources,
- hydrology and water quality,
- transportation,
- air quality,
- noise, and
- public services.

Significant and Unavoidable Impacts

Implementation of the proposed CTEP would result in several significant and unavoidable impacts (impacts that would not be reduced to less-than-significant levels, even with the implementation of mitigation measures). These impacts are discussed in detail in *Chapters 3–14* and are summarized below.

- Impact AG-3. Direct Conversion of Important Farmland to Nonagricultural Uses
- Impact AG-4: Conversion of Important Farmland to Nonagricultural Uses through Unplanned Urban Growth (Indirect Farmland Conversion)
- Impact PH-3: Potential for Growth Inducement or Acceleration of Development Resulting from Transportation Improvement Projections
- Impact PH-4: Potential for Displacement of Substantial Numbers of Existing Housing or People Resulting from Transportation Improvement Projects.

- Impact BIO-3: Potential Disturbance or Loss of Special-Status Plant Populations Resulting from Transportation Improvement Projects
- Impact BIO-6: Disturbance or Loss of Waters of the United States, Including Wetlands, Associated with Transportation Improvement Projects
- Impact BIO-7: Potential Disturbance or Loss of Special-Status Wildlife Species and Their Habitat Associated with Transportation Improvement Projects
- Impact CR-4: Restriction of Access to Native American Traditional or Religious Sites
- Impact CR-6: Demolition of Historic Resources
- Impact CR-10: Alterations or Damage to Historic Resources Resulting from Transportation Related Growth Inducement
- Impact T-3: Substantial Increase in Traffic Relative to the Existing Traffic Load and Capacity of Roadways
- Impact T-5: Creation of Need for Capacity-Enhancing Alterations to Existing Facilities
- Impact T-6: Potential Alteration of Present Patterns of Vehicular Circulation, Increased Traffic Delay, and Increased Traffic Hazards during Construction of Specific Projects
- Impact N-5: Potential Substantial Permanent Increase in Ambient Noise Levels Relative to Without-Project Conditions

Irreversible Commitment of Resources

Section 15126(f) of the State CEQA Guidelines requires an EIR to discuss significant irreversible changes that would result from implementation of the project analyzed therein. Implementation of the proposed CTEP would result in an irreversible commitment of nonrenewable energy resources (e.g., petroleum products, natural gas, and electricity) and materials (e.g., wood, concrete, metal, and plastic) associated with implementation of the individual projects. Although the proposed CTEP would result in the irreversible commitment of these resources, it would provide several public benefits (e.g., traffic congestion relief, local road rehabilitation, increased transit services, and increased incorporation of transit-friendly living in the county). None of the above irreversible environmental changes constitutes a significant impact as defined by CEQA.

Chapter 16

Report Preparation

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Chapter 17

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