# State Route 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan

*Prepared for:*

Solano Transportation Authority

*Prepared by:*

Questa Engineering Corporation

April 2011

# State Route 12
# Jameson Canyon Corridor
# Bicycle and Pedestrian Connections Plan

*Prepared for*


Solano Transportation Authority
One Harbor Center, Suite 130
Suisun City, CA 94585
Tel: 707.424.6075
Fax: 707.424.6074
www.solanolinks.com


*Prepared by*


Questa Engineering Corporation
1220 Brickyard Cove Road, Suite 206
Point Richmond, California 94801
Tel: 510.236.6114
Fax: 510.236.2423
www.questaec.com

In Association with:

Bicycle Solutions



*The State Coastal Conservancy funded this study using Bay Area Conservancy funds dedicated to completing The Bay Ridge Trail.*


April 2011

# Produced in Collaboration with:

Bay Area Ridge Trail Council (BARTC)
Caltrans
Napa County Transportation and Planning Agency (NCTPA)
Napa County Regional Park and Open Space District (NCRPOSD)
Solano County
Solano County Parks Department
City of Fairfield

# Technical Working Group Members

Sara Woo - STA
Dee Swanhuyser-BARTC
Matt Tuggle – Solano County Public Works
Dan Sykes – Solano County Parks
Brian Miller - Fairfield
Eliot Hurwitz - NCTPA
Keith Wayne - Caltrans
Mick Weninger –STA Bicycle Advisory Committee
Carol Day–STA Pedestrian Advisory Committee
Mark Lucas - NCTPA Bicycle Advisory Committee
Rick Warren- NCTPA Bicycle Advisory Committee
John Woodbury - NCRPOSD
Harry Englebright – BARTC, Napa County
Maureen Gaffney, ABAG San Francisco Bay Trail

## CONSULTANTS

Questa Engineering Corp
Jeff Peters
Margaret Henderson

Bicycle Solutions
John Ciccarelli

# TABLE OF CONTENTS


1. EXECUTIVE SUMMARY ..... 1
   - 1.1 OVERVIEW OF PLAN CONTENTS ..... 2
   - 1.2 PLAN PURPOSE AND GOALS ..... 3
   - 1.3 RELATED PROJECTS ..... 3
   - 1.4 JAMESON CANYON STUDY SEGMENTS ..... 4
   - 1.5 OPPORTUNITIES AND CONSTRAINTS ..... 4
   - 1.6 MOST FEASIBLE ALIGNMENT ..... 7
   - 1.7 TRAIL DESIGN GUIDELINES ..... 8
   - 1.8 COST ANALYSIS FUNDING AND IMPLEMENTATION STRATEGY ..... 9
   - 1.9 CONCLUSION AND NEXT STEPS ..... 11
2. INTRODUCTION ..... 13
3. SR 12 CORRIDOR BICYCLE AND PEDESTRIAN PARTNERSHIP ..... 15
4. GOALS, OBJECTIVES AND POLICIES ..... 16
5. BICYCLE AND PEDESTRIAN PLANS/PROJECTS INVENTORY ..... 19
   - 5.1 SOLANO TRANSPORTATION AUTHORITY (STA) ..... 20
     - *5.1.1 Comprehensive Transportation Plan, Alternative Modes Element ..... 20*
     - *5.1.2 STA Bicycle Plan (2004) ..... 21*
     - *5.1.3 STA Pedestrian Plan ..... 23*
     - *5.1.4 North Corridor TLC Concept Plan ..... 23*
     - *5.1.5 Solano Bikeway Extension Feasibility Study (2003) ..... 24*
   - 5.2 SOLANO COUNTY ..... 25
     - *5.2.1 Solano County General Plan, Transportation and Circulation (Chapter 7), 2008 ..... 25*
     - *5.2.2 Solano County General Plan, Resources (Chapter 4), 2008 ..... 25*
     - *5.2.3 Solano County Park and Recreation Element, 2003 ..... 25*
   - 5.3 CITY OF FAIRFIELD ..... 26
     - *5.3.1 Fairfield Circulation Element ..... 26*
     - *5.3.2 Fairfield Master Trails Plan (1998) ..... 27*
   - 5.4 NAPA COUNTY ..... 27
     - *5.4.1 Napa County General Plan Circulation Element, 2008 ..... 27*
     - *5.4.2 Napa County General Plan Recreation and Open Space Element, 2008 ..... 28*
   - 5.5 NAPA COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT ..... 30
     - *5.5.1 Napa County Regional Park and Open Space District Master Plan 2008 — 2013 ..... 30*
   - 5.6 NAPA COUNTY TRANSPORTATION PLANNING AGENCY (NCTPA) ..... 31
     - *5.6.1 Napa Countywide Bicycle Plan (2003) ..... 31*
     - *5.6.2 Napa Valley Greenway Feasibility Study (2008) ..... 31*
     - *5.6.3 Napa/Solano Passenger/Freight Rail Study (2003) ..... 32*
     - *5.6.4 Strategic Transportation Plan (1999) ..... 32*
   - 5.7 BAY AREA RIDGE TRAIL ..... 32
   - 5.8 ASSOCIATION OF BAY AREA GOVERNMENTS--SAN FRANCISCO BAY TRAIL ..... 34
     - *5.8.1 Bay Trail Plan (1989) ..... 34*
   - 5.9 CALTRANS ..... 34
     - *5.9.1 California Cross State Bicycle Route Study ..... 34*

*5.9.2 Caltrans Rail Right of Way and Abandoned Corridors Study, Final Report ..... 35*
5.10 SOLANO LAND TRUST ..... 35
5.11 NAPA VALLEY VINE TRAIL ..... 35
5.12 GREAT CALIFORNIA DELTA TRAIL ..... 35

6. OPPORTUNITIES AND CONSTRAINTS ..... 37

6.1 BICYCLE ROUTE AND PEDESTRIAN PROJECT OPPORTUNITIES ..... 37
6.2 LAND USE OPPORTUNITIES AND CONSTRAINTS ..... 38
*6.2.1 Circulation Opportunities and Constraints ..... 40*
*6.2.2 Railroad Opportunities and Constraints ..... 47*
*6.2.3 Water/Utility Easements ..... 50*
6.3 ENVIRONMENTALLY SENSITIVE ZONES AND CONSTRAINTS ..... 51
*6.3.1 Topography and Slopes ..... 51*
*6.3.2 Geology and Slope Stability ..... 52*
*6.3.3 Hydrology and Flooding Potential ..... 53*
*6.3.4 Biological Resources ..... 53*
6.4 JAMESON CANYON CONSERVATION & PROTECTION DESIGNATIONS ..... 56
*6.4.1 ABAG Priority Conservation Area ..... 56*
*6.4.2 Habitat Conservation Plan ..... 56*
*6.4.3 Critical Habitat Designation ..... 57*
6.5 REGULATORY AGENCY/PERMITTING ISSUES ..... 57
*6.5.1 Local Agencies ..... 57*
*6.5.2 State Agencies ..... 58*
*6.5.3 Federal Agencies ..... 60*
6.6 ADA ACCESSIBILITY ..... 61
6.7 OPPORTUNITIES AND CONSTRAINTS SUMMARY MAP ..... 63
6.8 BICYCLE AND PEDESTRIAN PROJECT OPPORTUNITIES ..... 65
6.9 SEGMENTS NOT CONSIDERED FEASIBLE ..... 66

7. CONCEPT DESIGN AND ALIGNMENT OPTIONS ..... 68

7.1 ALIGNMENT OPTIONS ..... 68
7.2 FEASIBILITY ANALYSIS AND CONCEPTUAL DESIGN ..... 69
7.3 PRELIMINARY RECOMMENDED ALIGNMENT ..... 71

8. TRAIL DESIGN GUIDELINES ..... 72

8.1 TRAIL WIDTH, SURFACE, TYPE AND USE ..... 72
8.2 ACCESSIBILITY ..... 75
8.3 DESIGN AND IMPLEMENTATION PROTOCOLS FOR SENSITIVE HABITAT AREAS ..... 75
8.4 GEOTECHNICAL CONSIDERATIONS ..... 75
8.5 SIGNAGE AND WAYFINDING ..... 76
8.6 TRAILHEADS AND ACCESS POINTS ..... 78
8.7 FENCES, GATES AND BOLLARDS ..... 79
8.8 MAINTENANCE AND MANAGEMENT CONSIDERATIONS ..... 79

9. COST ANALYSIS, FUNDING AND IMPLEMENTATION ..... 81

9.1 PRELIMINARY PROJECT COSTS ..... 81
*9.1.1 Trail Construction Cost Groups ..... 81*
*9.1.2 Preferred Alignment Construction Cost ..... 86*

*9.1.3 Right of Way and Easement Acquisition Costs ..... 86*
*9.1.4 Operations and Maintenance ..... 90*
9.2 COST EFFECTIVENESS ..... 91
*9.2.1 Relative Cost Comparison ..... 91*
*9.2.2 Benefit Cost Analysis ..... 91*
*9.2.3 Online Benefit Cost Analysis of Bicycle Facilities Tool ..... 92*
*9.2.4 Notes Regarding Online Bicycle Facilities Tool Use in Jameson Canyon Benefit Cost Analysis. 93*
*9.2.5 Online Benefit/Cost Model Results ..... 94*
*9.2.6 Present Day Value of Costs and Benefits, & Benefit/Cost Ratio ..... 96*
*9.2.7 Benefit/Cost Analysis Limitations ..... 96*
*9.2.8 Recommendations ..... 97*
9.3 PRIORITY PROJECT LIST ..... 98
9.4 FUNDING SOURCES ..... 99
*9.4.1 Local and Regional Funding Sources ..... 99*
*9.4.2 State Funding Programs ..... 102*
*9.4.3 Federal Funding Programs ..... 104*
9.5 NEXT STEPS ..... 104
10. REFERENCES ..... 106

## LIST OF TABLES

Table 6-1: Open Space and Potential Trail Access South of Jameson Canyon ..... 39
Table 6-2: Railroad Grade Separation/Crossing Guidelines ..... 48
Table 6-3: Trail Alignment Options and Segments ..... 64
Table 6-4: Summary of Constraints ..... 65
Table 7-1: Trail Alignment Options – Advantages and Issues ..... 69
Table 8-1: Bay Area Ridge Trail Design and Construction Standards ..... 73
Table 8-2: Bay Trail Design Guidelines ..... 74
Table 9-1: Construction Cost Summary ..... 83
Table 9-2: ROW Costs ..... 88
Table 9-3: Trail Use Demand as Predicted by Online Bicycle Benefit Cost MODEL ..... 94
Table 9-4: Trail Use Demand (including Pedestrian/Equestrian use) needed to have a Positive Benefit Cost Ratio ..... 95
Table 9-5: Desired Present Day Value of Costs & Benefits for Scenario with Positive Benefit Cost Ratio .. 96

## LIST OF FIGURES

5-1 Planned and Existing Bicycle and Pedestrian Projects
6-1 Land Ownership
6-2 Slope Constraints
6-3 Landslide Constraints
6-4 Flood Hazards
6-5 Plant Communities
6-6.1 Wetlands and Waters of the US; Western/Confluence Segment
6-6.2 Wetlands and Waters of the US; Confluence/Central Segment
6-6.3 Wetlands and Waters of the US; Canyon/Eastern Segment
6-7 Special Status Species
6-8 Opportunities and Constraints; Overview
6-8.1 Opportunities and Constraints; Western/Confluence Segment
6-8.2 Opportunities and Constraints; Confluence/Central Segment
6-8.3 Opportunities and Constraints; Canyon/Eastern Segment
7-0 Concept Design Overview
7-0.1 Concept Design; Western/Confluence Segment
7-0.2 Concept Design; Confluence/Central Segment
7-0.3 Concept Design; Canyon/Eastern Segment
7-1 Preferred Alignment

## APPENDICES

Appendix A: Meeting and Workshop Notes
Appendix B: Special-Status Species
Appendix C: Detailed Analyses of Trail Route Options
Appendix D: Construction Cost Methodology
Appendix E: Benefit Cost Analysis Methodology and Background Information

# 1. EXECUTIVE SUMMARY

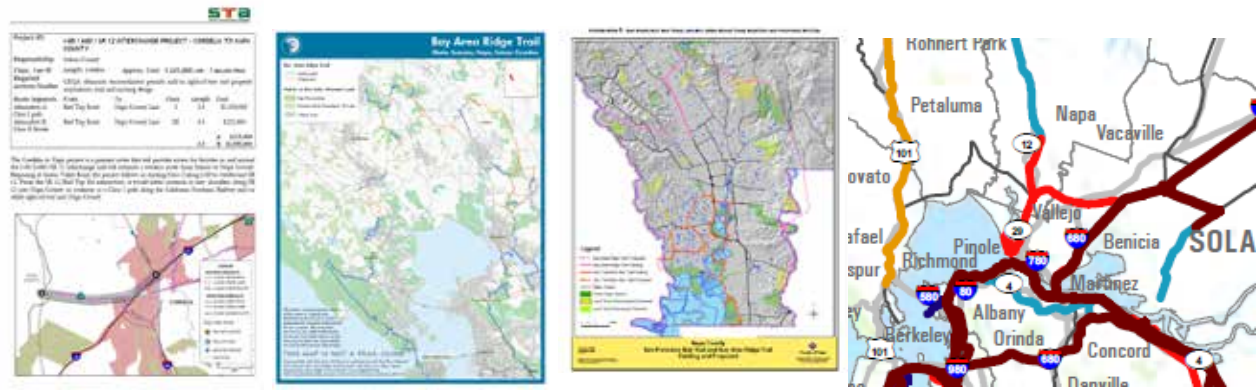
Safe and more efficient ways to travel between Solano and Napa Counties, including the Jameson Canyon corridor, will be developed and implemented over the next several years. Caltrans will widen State Route (SR) 12 between I-80 and SR 29 from two to four lanes, including construction of Class II bicycle lanes. This Plan provides a framework for further study and evaluation by stakeholder agencies beyond the Class II route that will be constructed within the 6-mile corridor by Caltrans.

The *Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* explores the opportunities, Right-of-Way (ROW) considerations and design constraints associated with construction of an off-highway shared use path in Jameson Canyon connecting, SR 29 in Napa County with Red Top Road in the City of Fairfield. This area is bisected by SR 12, Jameson Canyon Road. This study focuses on options for a separate shared-use path (also called a multi-use or Class I path) to be located outside the SR 12 lanes of travel. Figure 1 shows a regional map of the primary existing and planned connections in the Jameson Canyon corridor.

Solano Transportation Authority (STA), as lead agency for this study, has partnered with the following agencies for completion of the *Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan:*

- Bay Area Ridge Trail Council
- Caltrans
- Napa County Transportation and Planning Agency
- Napa County Regional Park and Open Space District
- Solano County
- City of Fairfield

A Technical Working Group (TWG), comprised of representatives of each agency and associated Bicycle, Pedestrian and Bicycle/Pedestrian Advisory Committees, participated in project planning, including collaboration on the project Purpose Statement, Goals, Objectives and Policies, selection of the Preferred Alignment and project priorities. In addition, a public workshop and outreach to interested stakeholders was completed. Each of these agencies, as well as various regional planning agencies, nonprofit organizations, and other stakeholders have existing adopted or endorsed non-motorized trail networks within the study area, with applicable goals, objectives and implementation priorities. These are discussed in detail in Chapter 4 of the Plan.




A shared use path through Jameson Canyon and at both ends of Jameson Canyon is a component of many adopted plans.

## 1.1 Overview of Plan Contents

Chapter 1: Executive Summary summarizes the Study contents and public process

Chapter 2: Introduction provides the project history and decision-making framework for the Plan

Chapter 3: SR 12 Corridor Bicycle and Pedestrian Partnership describes the partner agencies who helped guide Plan development and will be responsible for Plan adoption and implementation

Chapter 4: Goals, Objectives and Policies for the Plan outlines project goals and objectives as well as policies to facilitate Plan implementation.

Chapter 5: Bicycle and Pedestrian Plans/Projects Inventory describes the 21 adopted agency plans and programs that identify Jameson Canyon as a bicycle and pedestrian route. This chapter also describes regional trail routes that have potential connections to Jameson Canyon.

Chapter 6: Opportunities and Constraints describes the existing conditions in the Canyon, including physical and biological challenges and opportunities for a trail route.

Chapter 7: Concept Design and Alignment Options identifies the most feasible alignments for an accessible bicycle and pedestrian route, and recommends a preferred alignment.

Chapter 8: Trail Design Guidelines outlines design elements of a Class I or separated trail system, including trail surface and width, design for accessibility, signage and interpretive elements, site furnishings and trailhead components, and management strategies.

Chapter 9: Cost Analysis Funding and Implementation Strategy presents the preliminary planning level cost estimates for implementing the trail, project priorities, potential funding sources and next steps for implementation. Costs were developed for follow up planning, environmental review and permitting, and engineering, design, and construction, as well as Right of Way acquisition costs and annual maintenance and operations costs. This chapter also includes a Benefit Cost Analysis for the trail.

*Conclusion and Next Steps*, contained in Chapter 9, outlines the study recommendations and steps and proceedures for moving forward.

Chapter 10: References- provides a list of references and citations used in preparing the Study.

## 1.2 Plan Purpose and Goals

The SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan achieves each of the goals identified at the outset of development of the plan:

Purpose: *Create a joint vision for a connected trail system within the Jameson Canyon corridor to facilitate implementation of bicycle and pedestrian facilities, including links to the San Francisco Bay Trail and Bay Area Ridge Trail. The purpose of the Plan is to provide regional connections for non-motorized multimodal access, including (but not limited to) pedestrians, bicyclists, mountain bicyclists, and equestrians.*

Goals:

1. Strengthen existing partnerships between STA, NCTPA, local and regional stakeholders, and partner agencies to develop a vision for bicycle and pedestrian connections within the SR 12 Jameson Canyon corridor.
2. Define potential routes for bicycle and pedestrian facilities within the SR 12 Jameson Canyon corridor, including those at either end of the corridor.
3. Provide connections to the existing and planned facilities of partner agencies.
4. Identify potential locations for safe crossings of SR 12.
5. Identify and minimize environmental impact(s), and where possible, enhance the environmental resources, constraints, and amenities of the corridor, which is a designated ABAG Priority Conservation Area.
6. Develop design guidelines for trail location, use, width, materials, safety, accessibility and associated facilities.
7. Develop the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* to serve as a master plan or foundation for local and regional agencies to implement projects for non-motorized access within the SR 12 Jameson Canyon corridor.
8. Identify and recommend an implementation strategy that considers land acquisition needs, construction costs, and potential funding strategies.
9. Address long-term management and maintenance of the trail system.

## 1.3 Related Projects

With the completion of the continuous Class II bikeway on SR 12 through the Jameson Canyon corridor and improvements to the eastern endpoint of the segment through the I-80/I-680/SR 12 Interchange project improvements, many opportunities for connectivity exist. For example, a potentially safe crossing of SR 12 has been identified with the Caltrans SR 12 widening project's large mammal undercrossing.

Caltrans's widening of SR 12 will include completion of bicycle lanes/widened shoulders to facilitate bicycle travel through the Canyon. The bicycle lanes and widened shoulder will accommodate bicycle use, and will also be available for pedestrian use, although specific pedestrian accommodations are not included in the project, nor are facilities for equestrians. Completion of these improvements is anticipated by 2014.

Other planned Caltrans projects include completion of a grade-separated intersection of SR 12 and SR 29 in Napa County, and completion of the I-80/I-680/SR 12 Interchange which will realign Red Top Road, connect Business Center Drive in Fairfield, and provide grade separation of traffic over SR 12. While these improvements are environmentally cleared, funding for these projects has not been secured.

## 1.4 Jameson Canyon Study Segments

The Jameson Canyon Corridor was divided into segments, based on topography and land use, to aid in the analysis of trail route alternatives, test their feasibility, and to help guide the selection of the recommended or preferred feasible alternative trail alignment. To assist in the analysis, the corridor was divided into five segments, as follows:

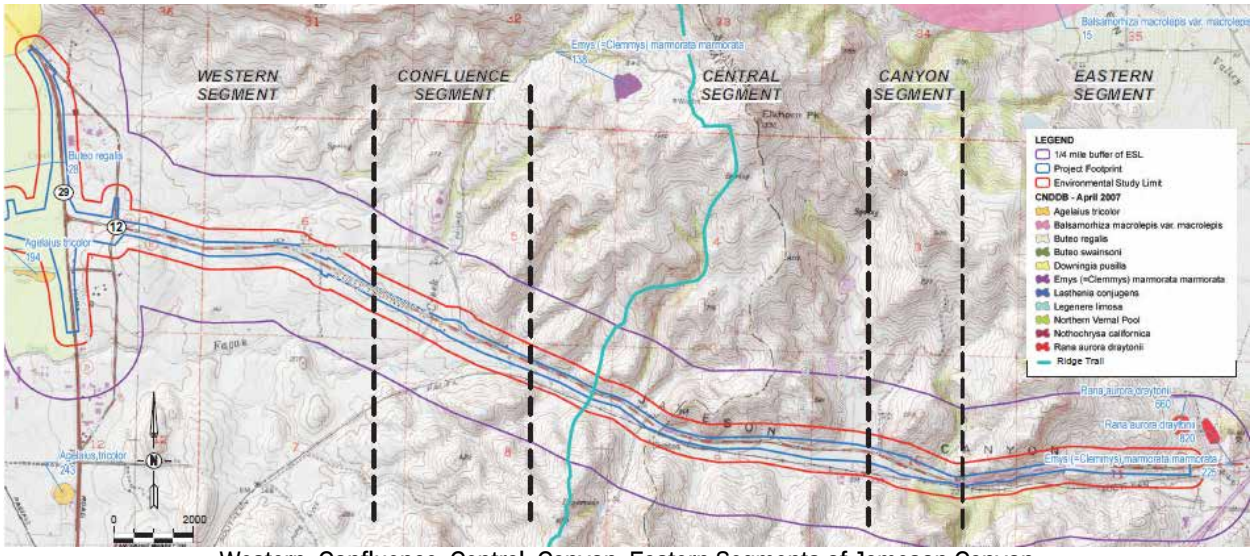
The Western segment includes the SR 12/SR 29 intersection east to the area east of Kirkland Ranch Road, where the canyon narrows. In this segment, the corridor is generally flat and open.

The Confluence segment occurs where SR 12 and the railroad converge east of Chardonnay Country Club, roughly where hills south of the railroad come close to the right of way.

The Central segment is characterized by steep hills north of SR 12, with agriculture and residential development in a narrow band between SR 12 and the railroad/creek corridor on the south.

The Canyon segment begins approximately 1.8 miles to the east of Kirkland Ranch Road, where Jameson Canyon is severely constrained on both sides by topography and the highway and railroad.

The Eastern segment is east of the canyon, which includes the Red Top Road intersection.




Western, Confluence, Central, Canyon, Eastern Segments of Jameson Canyon

## 1.5 Opportunities and Constraints

Developing a shared use trail corridor through Jameson Canyon is constrained by many physical and environmental characteristics. There are also land ownership and land use issues that provide both opportunities and constraints for trail placement. Opportunities and constraints identified include:

- Bicycle Route and Pedestrian Project Opportunities. A trail corridor through the canyon is a component of many agency plans. As development occurs, individual trail segments can be incorporated into projects. However, development in the canyon is limited.

- Land Use Opportunities and Constraints. There are several publicly owned parcels where trail placement could be considered. These include lands owned by Napa Sanitation District, Cities of Napa and American Canyon, and Caltrans right of way. In addition, there are several Conservation Easements on private lands held by the Land Trusts, which potentially allow construction of trails. Most of the corridor is privately owned and would require purchase or easement for the trail. Many of these privately owned lands include vineyards, which could pose as a more of a constraint than an opportunity.

- Circulation Opportunities and Constraints. Planned widening of SR 12 will include completion of bike lanes as well as a creek-level crossing of sufficient size to accommodate pedestrians, bicyclists and equestrians under the Highway. Other crossing opportunities will occur at signalized or grade-separated intersections at SR 29, Kirkland Ranch Road and Red Top Road. Farm roads, parallel roads and other traveled ways were evaluated to identify potential routes.

- Railroad Opportunities and Constraints. The Union Pacific Railroad (UPRR)-owned rail corridor is generally 100 feet wide throughout the corridor and is locally used for freight transport on a single track. This provides an excellent opportunity for a rail-with-trail project, as recommended by a recent Caltrans study. However, UP has indicated opposition for this use. Crossing the rail tracks for north-south connections is also problematic due to the lack of public at-grade crossings in the corridor.

- Water/Utility Easements. There are two primary utility corridors through the Canyon, a California Department of Water Resources water distribution line, and a water transmission easement owned by the City of Vallejo. These subsurface easements do not include public access, and cross multiple private lands.

- Environmentally Sensitive Zones and Constraints. The Canyon is challenged by steep slopes, landslides, creeks and sensitive biological resources. There are also areas with gentle terrain and relatively few physical challenges. ABAG has designated the canyon as a Priority Conservation Area, which recognizes its unique biological characteristics as well as acknowledging opportunities to provide environmental education associated with public access. Environmental constraints include:

    - Topography and Slopes
    - Geology and Slope Stability
    - Hydrology and Flooding Potential
    - Biological Resources
    - Jameson Canyon Conservation & Protection Designations

- Regulatory Agency/Permitting Issues. Trail implementation is subject to review and permit approval from many entities, depending on location and type of improvement. This ranges from cities and regional agencies which have construction review and approval authority, to state and federal agencies such as California Department of Fish and Game and US Fish and Wildlife Service, who have regulatory authority over creeks, wetlands and sensitive habitat areas, and the California Public Utilities Commission, which regulates rail crossings.

- Americans with Disabilities Act (ADA) Accessibility. Trails that provide access to pedestrians must comply with accessibility regulations that are planned for implementation in 2012. This includes regulations for maximum trail gradient, width, surface, signs and site furnishings. Depending on the partner agency or source of funding (state or federal), additional regulations may apply to trail design and construction.

Opportunities and Constraints were summarized on various maps in Chapter 7, keyed according to ease or difficulty of trail implementation in each segment (Western, Confluence, Central, Canyon, and Eastern).

| Constraint level | Description |
|---|---|
| Low | Few or no constraints; trail alignment likely to be feasible |
| Medium | Moderate challenges but trail alignment probably feasible |
| High | Significant challenges and likely costly |
| Very High | Trail alignment determined to be infeasible |
| | Alignment Option is not present in this segment, or in this relative (south...north) position in this segment |

## 1.6 Most Feasible Alignment

The Plan's Working Group analyzed a combination of five potential alignments for a Class I multi-use path. Each alignment presented significant challenges due to steep canyon slopes including landslide deposits and the sensitive creek riparian corridor. The existing City of Vallejo water pipeline and the State Aqueduct pipeline also do not have available surface easements within which it is possible to construct a trail. Representatives of Union Pacific (UP) Railroad were contacted and are currently unwilling to consider a Class I trail within their Right of Way. UP Railroad representatives indicated their preference to reserve any un-used right of way for possible future rail expansion.

Given the challenges and a detailed analysis of potential opportunities and constraints, the Plan identifies a "most feasible" route for recreational travel that implementing agencies can use as a foundation for further study. This route runs along the south side of SR 12 from Kelly Road in Napa County to the vicinity of the Solano/Napa County line, crossing to the south side of the railroad in the vicinity of the existing private at-grade rail crossing, and continuing east to realigned Red Top Road. The most feasible route has an estimated high cost of $8.8 million in construction cost; this cost does not include Right of Way acquisition.

At least six separate bike/pedestrian planned facilities intersect with the recommended route:

- Class II bike lane on SR 12 Jameson Canyon Road
- Business Center Drive Extension Improvements at Red Top Road
- Ridge Trail to pursue permit approval of large mammal undercrossing for human use
- Pedestrian improvements at Kirkland Ranch Road to connect to potential alignments for the Ridge Trail north
- Class I improvements associated with a new SR 12/29 interchange between Kelly Road and Airport Road
- Ridge Trail connections to the south near the county line

These connections are discussed further in Chapter 5.

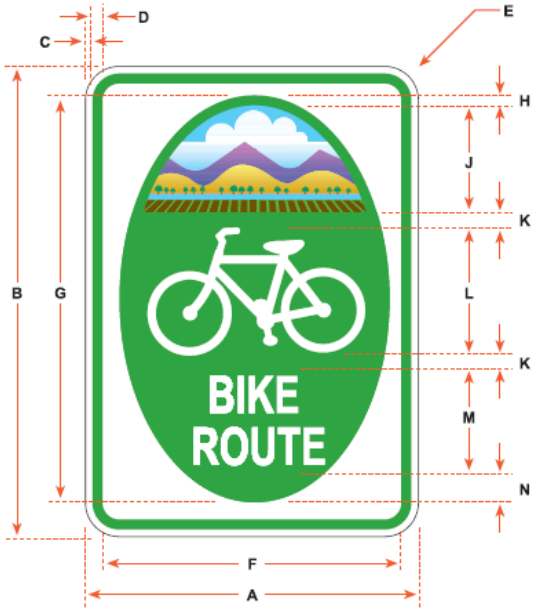
## 1.7 Trail Design Guidelines

Chapter 8 of the Plan provides recommendations for trail implementation so that the recommended route can be seamlessly implemented by multiple entities over an extended period, if needed. Design and construction of trail components is guided by recommendations for:

- Trail Width, Surface, Type and Use
- Accessibility
- Design and Implementation Protocols for Sensitive Habitat Areas
- Geotechnical Considerations
- Signage
- Trailheads and Access Points
- Fences, Gates and Bollards
- Maintenance and Management Considerations

Wayfinding Signage. The following signage is recommended for the trail or related projects in the corridor:

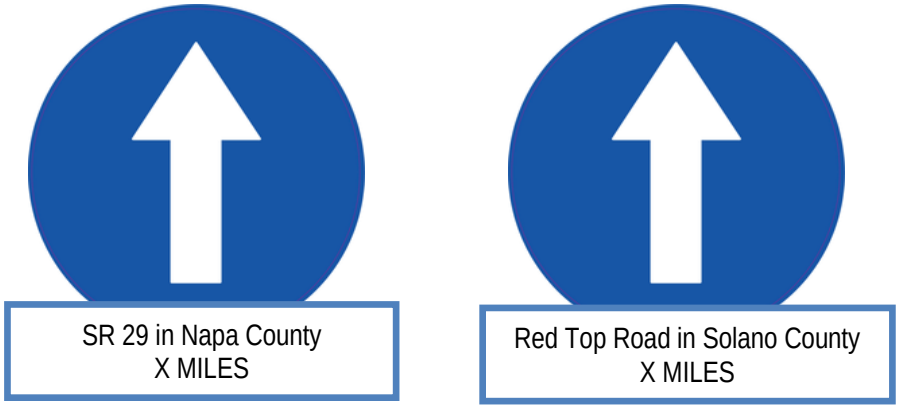
**State of California - Department of Transportation**
**Code : SG45**
**MUTCD Number: None**




| Sign Size | Dimensions (inches) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N |
| 12 x 18 | 12 | 18 | 1/4 | 1/4 | 1-1/2 | 10 | 16 | 1/4 | 4 | 3/4 | 4-1/2 | 4D | 1-3/4 |
| 18 x 24 | 18 | 24 | 3/8 | 1/2 | 1-1/2 | 15 | 21 | 1/2 | 5 | 1 | 6 | 5D | 2-1/2 |

**Colors**
**Border and Legend - Green (Reflective)**
**Background - White (Reflective)**

In addition to the Solano County Bike Route symbol, a Ridge Trail logo with directional symbology for Napa and Solano County should be included below the sign specifications above as follows:




## 1.8 Cost Analysis Funding and Implementation Strategy

Planning level costs estimates were developed for all of the feasible trail alignment alternatives within the Jameson Canyon corridor trail The Preferred Alignment consists of Option 2S (Highway South) through the Western, Confluence, and Central segments with a new undercrossing of the railroad at the Creston Station private crossing; continue east using Option 4 (South Foothills) to Red Top Road and I-80. The total cost for implementation of the Preferred Alignment would be approximately $8.8 million dollars ($6,502,870 in construction, and $2,276,005 for planning, design and environmental costs), excluding right of way or land acquisition costs. Right of Way acquisition costs for the preferred alignment, if Right of Way purchase is required, were estimated to be approximately $550,000. Annual operations and maintenance costs were estimated to be about $56,000.00.

*A Benefit Cost Analysis* was also completed for the preferred alignment using the procedures of National Cooperative Highway Research Program for Benefit Cost Analysis of Bicycle Facilities. Annual facility use using these procedures was estimated to be about 10,700 persons, with annual benefits for recreation use, improved health and mobility, and decreased automobile use of $125,132. Using a 30 year facility life and putting all costs and benefits for the 30 year summation period in present day dollars, costs were about $9.4 million dollars and benefits were $2.8 million, resulting in a negative Benefit Cost Ratio. The Benefit Cost Analysis conservatively used the low range of estimated facility use and corresponding low range of annual benefits. If the medium range of facility use and benefits were used in the analysis, annual facility use would be 92,265 and the Benefit Costs would be positive.

The plan provides a framework for further study to stakeholder agencies. If implementation agencies have an opportunity in the future, completion of a continuous Class I trail through Jameson Canyon will likely be done in segments, depending on the implementation of adjacent projects, agency jurisdiction, successful grant funding, easement acquisition, capital improvement allocations, and community support. Effective partnerships with the project stakeholders will be a key to project success. In addition, ongoing transportation and land use planning within Jameson Canyon should include project review to ensure that transportation and rail improvement projects maximize opportunities for trail connections and implementation of applicable trail segments. Specific implementation strategies are discussed in detail in Chapter 9.

With the completion of the plan, the aforementioned Goals were accomplished as described below to build the foundation for further planning in the corridor:

1. Strengthen existing partnerships between STA, local and regional stakeholders, and partner agencies to develop a vision for bicycle and pedestrian connections within the SR 12 Jameson Canyon corridor.

*A Technical Working Group consisting of the representatives from the Bay Area Ridge Trail, Caltrans, City of Fairfield, Napa County Regional Park and Open Space District, Napa County Transportation Planning Agency, Solano County, Solano County Parks Department, and Solano Transportation Authority was formed to develop the plan and overall coordination strategy.*

2. Define potential routes for bicycle and pedestrian facilities within the SR 12 Jameson Canyon corridor.
   *Routes were identified by review of existing plans and projects from each agency as shown in Chapter 2. This was followed by review of environmental documents from the SR 12 Road Widening Project and analysis of topography detailed in Chapter 6. Separate meetings with agency staff were also held to discuss the potential routes. Despite many identified constraints, the Plan also identifies a "most feasible route" (recommended route) based on an in-depth analysis of topography and potential land ownership that implementing agencies can use as a foundation for further study.*

3. Provide connections to the existing and planned facilities of partner agencies.
   *Existing connections at SR 29 on the west end and Red Top Road at the east end are limited. The Plan identifies planned and existing connections at the SR 12 interchange at the west end, the Ridge Trail, and future improvements to the SR 12/Red Top Road interchange at the east end. At SR 12 and Red Top Road, future improvements from the I-80/I-680/SR 12 Interchange will enhance the ability to cross over SR 12 at the western end of the corridor. These existing and planned connections are discussed further in Chapter 5.*

4. Identify potential locations for safe crossings of SR 12.
   *The Plan identifies potential crossings at Kirkland Ranch Road, future improvements at Red Top Road, and a large mammal undercrossing approximately 2.5 miles west of Red Top Road as opportunities to cross SR 12 safely. This is discussed in detail in Chapter 7.*

5. Identify and minimize environmental impact(s), and where possible, enhance the environmental resources, constraints, and amenities of the corridor, which is a designated ABAG Priority Conservation Area.
   *With the review of the Natural Environmental Study of the SR 12 Road Widening Project, riparian species, red-legged frog, and vernal pools were identified near the outer limits of the study area. These considerations were outside of the plan study area, however, it should be noted the potential for findings within the vicinity of the corridor could be identified as part of more specific studies and should be mitigated for any impacts. This is discussed in Chapter 6.*

6. Develop design guidelines for trail location, use, width, materials, safety, accessibility and associated facilities.
   *Chapters 7 and 8 provide specific guidelines based on the Federal Highway Administration (FHWA) Manual on Uniform Traffic and Control Devices (MUTCD) and Caltrans Highway Design Manual (HDM) Chapter 1000 as well as compliance with State and Federal trail accessibility design guidelines.*

7. Develop the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* to serve as a master plan or foundation for local and regional agencies to implement projects for non-motorized access within the SR 12 Jameson Canyon corridor.
   *Opportunities for local and regional stakeholder/implementing agencies to continue further study is compiled in Chapter 7 based on the Opportunities and Constraints analysis. Local agencies will be encouraged to adopt the Plan.*

8. Identify and recommend an implementation strategy that considers land acquisition needs, construction costs, and potential funding strategies.
   *The implementation strategy was developed through a consideration of project constraints, public comments received at public outreach Open House, a meeting with the Solano Land Trust, and with the*

*Napa Land Trust, and a cost analysis completed for of each aspect of trail development , including potential land acquisition opportunities and costs. This is discussed further in Chapter 9.*

9. Address long-term management and maintenance of the trail system.
   *Guidelines for long-term management and maintenance of the trail system are encouraged to be included as a requirement of future specific studies in the corridor.*

## 1.9 Conclusion and Next Steps

The planned Caltrans *SR 12 Road Widening Project* (Caltrans project) will provide Class II bicycle lanes along SR 12 for commuting and utilitarian bicycle-pedestrian travel through the corridor. With the expected construction of Class II bicycle lanes as part of the Caltrans Project, the ability for bicyclists to travel through the 6 mile corridor will be acceptable to meet the bicycle transportation need.

To accommodate pedestrian travel, a separated Class I path or trail route for pedestrian transportation between the two counties was evaluated. Based on this evaluation, a "most feasible" route along the south side of SR 12 with an estimated construction cost of $8.8 million (not including ROW acquisition costs) is identified for further study to provide a path beyond the Class II bicycle lanes on SR 12. This route is technically the most feasible of five alternative routes considered, but still has considerable challenges.

A Benefit/Cost Analysis was completed, adapted from a model developed for bicycle-only facilities. Based on this model, although the most feasible alignment will be relatively expensive to construct, given physical, environmental and ROW challenges, the project provides a benefit cost ratio of 0.30 at 25 users per day. A positive benefit cost ratio of 1.02 could be achieved at about 90 users per day (32,850 trail users/visitor days annually). Alternatively, the trail could be designed and constructed to a lower standard initially, potentially greatly reducing construction costs. For instance the trail could be designed with an 8 foot wide natural surface tread instead of a 10 foot paved tread, with shoulders, significantly reducing grading, drainage, and paving costs. A positive benefit cost ratio could then be achieved with much lower daily use levels. The trail could then be upgraded at some time in the future when use levels dictate a higher standard is warranted.

In terms of project prioritization, there are relatively fewer ROW, environmental, and engineering issues on the west end of the corridor, where Segment 2 (identified in Chapter 6) could be cost effectively built, and eventually tie into the bicycle/pedestrian improvements that are planned for the SR 12 interchange at the west end. Although less people live in this immediate area of southern Napa County, this trail segment would connect to be the planned construction of the Vine Trail and the Napa River and Bay Trail, which might be in place within the next five to seven years. Completion of Segment 2S as a relatively high priority to link the Kelly Road area with Creston Station could also provide connections to Newell Ranch and Lynch Creek Open Space areas when the Ridge Trail is completed in this area. In addition, completion of Segment 4 on the east end of the corridor also should be considered to be a high priority, as it also provides Bay Trail and Ridge Trail connections and could be constructed associated with Solano County's I-80/I-680/SR 12 Interchange Improvement projects.

Since the trail will predominantly be located on or adjacent to private farm and ranch lands, follow-up planning/engineering work should be completed in addition to discussions with key property owners, possibly in cooperation with the Solano Land Trust and the Napa Land Trust and the Ridge Trail. Coordination with the California Department of Fish and Game and the U.S. Fish and Wildlife Service will also be important next steps.

Major Recommendations/Next Steps

Partner agencies are encouraged to adopt the plan and incorporate its recommendations into future planning efforts, so that it becomes a blueprint for trail efforts within the Jameson Canyon area. Next steps in implementing the trail include:

- Incorporate the Study into the guiding planning documents of each partner agency
- Encourage discussions with Land Trusts, Ridge Trail and local landowners to secure trail access
- Refine the precise trail alignment and prepare conceptual engineering plans
- Pursue fulfilling the Caltrans requirements to make the large mammal crossing acceptable for human use
- Study an interim treatment to improve safety when crossing SR 12 at Red Top Road
- Complete I-80/I-680/SR 12 Interchange Improvements in project study area
- Identify project costs and benefits based on projected use and regional recreational values
- Complete environmental evaluation, permitting and design for selected trail segments as funding and adjacent projects are completed.

# 2. INTRODUCTION

The Jameson Canyon Corridor Connections Plan explores the opportunities, Right-of-Way (ROW) considerations and design constraints associated with construction of an off-highway shared use path in Jameson Canyon connecting SR 29 in Napa County with Red Top Road in the City of Fairfield. This area is bisected by SR 12, Jameson Canyon Road, which is scheduled to be widened to a four-lane route with Class II bicycle lanes beginning in late 2010. This Plan focuses on options for a separate shared-use path to be located outside the SR 12 lanes of travel.

## Background

The Bay Area Ridge Trail Council received a grant from the California Coastal Conservancy in 2008 to study the feasibility of a bicycle and pedestrian trail corridor as well as potential connections to the Ridge Trail in the 6-mile SR 12 Jameson Canyon corridor. Working in partnership with the Solano Transportation Authority (as Lead Agency) the Plan has been prepared in collaboration with the Bay Area Ridge Trail Council (Ridge Trail Council), Caltrans, Napa County Transportation and Planning Agency (NCTPA), Napa County Regional Park and Open Space District, Solano County, and the City of Fairfield to create a joint vision for how bicycle and pedestrian facilities would be planned, designed, and constructed in the Jameson Canyon Road corridor. Currently, the STA's Solano Countywide Bicycle Plan and Solano Countywide Pedestrian Plan (as well as the adopted plans of many partner agencies) identify conceptual Class I and Class II paths along the corridor; however, the concepts do not fully take into account each of the other agency's plans for future bicycle and pedestrian facilities. The Jameson Canyon Corridor Plan provides the Inter-agency coordination needed for a successful regional Connection Plan in the southern Napa County and southern Solano County areas. In addition, the Ridge Trail Council is interested in opportunities for equestrian access.

## Purpose Statement

*Create a joint vision for a connected trail system within the Jameson Canyon corridor to facilitate implementation of bicycle and pedestrian facilities, including links to the San Francisco Bay Trail and Bay Area Ridge Trail. The purpose of the Plan is to provide regional connections for non-motorized multimodal access, including (but not limited to) pedestrians, bicyclists, mountain bicyclists, and equestrians.*

## Outcome

A goal of this Plan is to serve as a master plan or foundation for local and regional agencies to implement projects for non-motorized access within the SR 12 Jameson Canyon corridor. This includes recommending the adoption of the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* by all partner agencies, incorporation of recommended projects into applicable plans and programs, such as Bicycle and Pedestrian Plans, General Plans, and Capital Improvement Programs by partner agencies, and encouraging partner agencies to use the SR 12 *Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* when evaluating new development projects, transportation facilities, or other projects within the SR 12 Jameson Canyon corridor.

# 3. SR 12 CORRIDOR BICYCLE AND PEDESTRIAN PARTNERSHIP

The Solano Transportation Authority (STA) is a Joint Powers Authority comprised of members including the cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo, and the County of Solano. The STA serves as the Congestion Management Agency for Solano County and is responsible for countywide transportation planning and programming of State and Federal funding for transportation projects within the county and through its SolanoLinks Transit Consortium, coordinates various fixed route and Solano Paratransit Services.

STA, as lead agency, has partnered with the following agencies for completion of this Jameson Canyon Bicycle and Pedestrian Corridor Connections Plan:

- Bay Area Ridge Trail Council
- Caltrans
- Napa County Transportation and Planning Agency
- Napa County
- Solano County, and
- City of Fairfield

A Technical Working Group (TWG) comprised of representatives of each partner agency participated in project planning, including collaboration on the project Purpose Statement, Goals, Objectives and Policies, coordination of adopted agency plans and ongoing related projects, review of opportunities and constraints, identification of project alternatives, selection of the Preferred Alignment and project priorities.

## Public Participation

In addition to participation by the TWG, public participation included representatives from the STA Bicycle Advisory Committee, STA Pedestrian Advisory Committee, and NCTPA Bicycle Advisory Committee. A public workshop was held October 19, 2010 to solicit input from interested community members, other agency stakeholders, and neighborhood residents. Further input was solicited on the STA website.

Minutes from the TWG meetings and public workshop are included in Appendix A.

# 4. GOALS, OBJECTIVES AND POLICIES

PURPOSE STATEMENT: Create a joint vision for a connected transportation system for non-motorized travel within the Jameson Canyon corridor to facilitate the development of bicycle and pedestrian facilities, including links to the San Francisco Bay Trail and Bay Area Ridge Trail. These facilities will provide regional connections for non-motorized multimodal access, including (but not limited to) pedestrians, bicyclists, mountain bicyclists, skaters, and equestrians.

GOALS: Goals are the milestones by which achievement of the Purpose Statement are measured. In order to implement the Purpose of the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan*, the following goals are/will be established:

GOALS:

1. Strengthen existing partnerships between STA, local and regional stakeholders, and partner agencies to develop a vision for bicycle and pedestrian connections within the SR 12 Jameson Canyon corridor.
2. Define potential routes for bicycle and pedestrian facilities within the SR 12 Jameson Canyon corridor.
3. Provide connections to the existing and planned facilities of partner agencies.
4. Identify potential locations for safe crossings of SR 12.
5. Identify and minimize environmental impact(s), and where possible, enhance the environmental resources, constraints, and amenities of the corridor, which is a designated ABAG Priority Conservation Area.
6. Develop design guidelines for trail location, use, width, materials, safety, accessibility and associated facilities.
7. Develop the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* to serve as a master plan or foundation for local and regional agencies to implement projects for non-motorized access within the SR 12 Jameson Canyon corridor.
8. Identify and recommend an implementation strategy that considers land acquisition needs, construction costs, and potential funding strategies. Address long-term management and maintenance of the trail system.

OBJECTIVES: Objectives are the actions by which achievement of the Goals are measured.

Goal #1: Strengthen existing partnerships between STA, local and regional stakeholders, and partner agencies to develop a vision for bicycle and pedestrian connections within the SR 12 Jameson Canyon corridor.

Objective 1 – Form a working group with representatives from partner agencies (STA, Bay Area Ridge Trail Council, Caltrans, Napa County Transportation and Planning Agency, Napa County, Solano County, and City of Fairfield to provide input on the Plan.

Objective 2 – Encourage public participation in the planning process through workshops and other means

Goal #2: Define potential routes for an off-street Class I bicycle and pedestrian facility within the SR 12 Jameson Canyon corridor.

Objective 3 – Identify and map potential routes based on applicable plans, environmental considerations, and input from partner agencies.

Objective 4 – Identify project opportunities and constraints, including existing and planned projects, physical conditions, environmental features, land use and safety issues within the corridor.

Objective 5 – Consider existing and planned bikeway and pedestrian facilities within the corridor to determine route location and appropriate connections.

Objective 6 – Identify individual segments, project components and trail links suitable for implementation by each partner as lead agency as part of a coordinated trail system.

Objective 7 – Try to accommodate all forms of non-motorized travel within a single corridor or alignment. If necessary, provide a parallel route to serve trail users.

Goal #3: Provide connections to existing and planned facilities of the partner agencies.

Objective 8 – Be consistent with other bicycle and pedestrian plans.

Objective 9 – Ensure compatibility with ongoing state and federal projects, including the Caltrans I-80/I-680/SR 12 project.

Goal #4: Identify potential locations for safe crossings of SR 12.

Objective 10 – Identify locations for safe, grade-separated or controlled crossings of SR 12 by pedestrians, bicyclists and where feasible, equestrians.

Goal #5: Identify and minimize environmental impact(s), and where possible, enhance the environmental resources, constraints, and amenities of the corridor, which is an Association of Bay Area Governments (ABAG) Priority Conservation Area (PCA).

Objective 11 – Identify existing environmental resources, constraints, and amenities, based on existing information about the corridor.

Objective 12 – Consult with appropriate state and federal regulatory agencies such as California Department of Fish and Game and US Fish and Wildlife Service to identify state/federal-regulated environmental issues associated with trail location, design, and construction.

Objective 13 – Include design considerations and implementation protocols to reduce or avoid trail-related environmental impacts, as well as enhance or improve environmental conditions.

Goal #6: Develop design guidelines for trail use, width, materials, safety, accessibility, and associated facilities.

Objective 14 – Identify standards for trail width, surface, type and usage that are consistent with the guidelines of the partner agencies and management entities.

Objective 15 – Comply with state and federal design and accessibility guidelines to facilitate funding opportunities.

Objective 16 – Identify each partner agency's signage policies, and provide guidelines for coordinated and consistent trail identification.

Objective 17– Incorporate equestrian facilities where appropriate, including potential locations for staging areas, trail segments appropriate for use by equestrians and typical section and design details for equestrian-oriented trail segments.

Objective 18 – Include environmental amenities, wayfinding, and interpretive elements.

Goal #7: Develop the SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan to serve as a master plan or foundation for local and regional agencies to implement projects for non-motorized access within the SR 12 Jameson Canyon corridor.

Objective 19 – Recommend the adoption of the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* by all local partner agencies and that they incorporate recommended projects into applicable plans and programs, such as Bicycle and Pedestrian Plans, General Plans, and Capital Improvement Programs.

Objective 20 – Encourage partner agencies consider using the *SR 12 Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* when evaluating new development projects, transportation facilities, or other projects within the SR 12 Jameson Canyon corridor.

Goal #8: Identify and recommend an implementation strategy that considers land acquisition needs, construction costs, and potential funding strategies. Address long-term management and maintenance of the trail system.

Objective 21 – Create a list of priority projects for implementation within the corridor.

Objective 22 – Identify local, state and federal funding sources for pedestrian and bikeway improvements that can be received by partner agencies:

a. Identify current local, regional, state, and federal funding programs, along with funding requirements and deadlines.
b. Encourage coordinated multi-jurisdictional funding applications for trails within the corridor.
c. Encourage the local jurisdictions/partner agencies to identify and include SR 12 Jameson Canyon corridor improvements in Capital Improvement Programs.
d. Develop maintenance strategies to be adopted by partner agencies.

Objective 23 – Require trail segments and connections as part of current and future transportation improvements and/or development projects, such as road widening, interchanges, land development or facilities improvements within the corridor.

Objective 24 – Work with other public entities and private landowners to acquire easements, dedications and/or maintenance agreements for trails within the SR 12 Jameson Canyon corridor.

Objective 25 – Identify a long-term management and maintenance needs of the trail system and develop a strategy to address the needs identified.

# 5. BICYCLE AND PEDESTRIAN PLANS/PROJECTS INVENTORY

There are many project stakeholders, governmental agencies with regulatory jurisdiction, advisory bodies, nonprofit organizations and publicly regulated landowners (utility companies, railroads, etc) within the project corridor. These include:

Solano County
Solano Transportation Authority
Solano County
City of Fairfield

Napa County
Napa County
Napa County Regional Park and Open Space District
Napa County Transportation Planning Agency

Regional/State Project Stakeholders
Bay Area Ridge Trail
San Francisco Bay Trail
Caltrans
Solano Land Trust
Napa Land Trust
Napa Valley Vine Trail
Great California Delta Trail

Rail Planning
NCTPA Passenger/Freight Rail Study
Caltrans Rail Corridor Study

Most of these stakeholders have an adopted Plan with a designated trail route, goals, objectives, policies or other programs applicable to the Jameson Canyon corridor. This section discusses the twenty-one applicable plans and policies of these entities as they relate to planning for a non-motorized alignment in Jameson Canyon.

Sections 5.1 through 5.12 are excerpts and summaries from each of the plans from the above agencies with identified potential projects in the corridor. The ultimate goal of this study is to consolidate the various plans for the corridor into one vision as a resource to all partner agencies.

Figure 5-1 shows the bicycle and pedestrian routes that have been identified as part of agency adopted plans. Chapter 6 provides feasible options based on these plans and an analysis of opportunities and constraints.

## 5.1 Solano Transportation Authority (STA)

STA serves as the Congestion Management Agency for Solano County and serves the jurisdictions of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, Vallejo and the County. STA's mission is *to improve the quality of life in Solano County by delivering transportation projects to ensure mobility, travel safety, and economic vitality.* STA has adopted several planning documents with relevance to the Jameson Canyon Plan. They include:

- Solano Comprehensive Transportation Plan Alternative Modes Element (in progress)
- Solano Countywide Bicycle Plan (2004)
- Solano Countywide Pedestrian Plan (2004)
- North Connector TLC Concept Plan (2008)
- Solano Bikeway Extension Feasibility Study (2003)
- Jameson Canyon/Caltrans Projects (see Caltrans discussion)

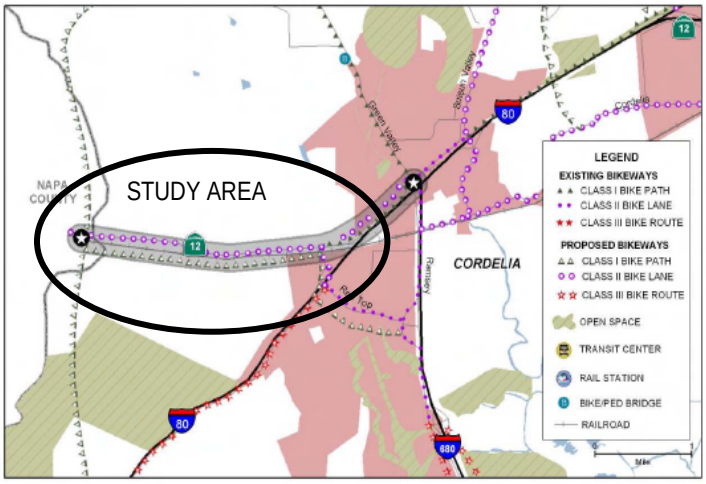
### *5.1.1 Comprehensive Transportation Plan, Alternative Modes Element*

The Solano Comprehensive Transportation Plan will contain an Alternative Modes Element to identify long-term and sustainable transportation system to provide mobility, reduce congestion, and ensure travel safety and economic vitality to Solano County.

The purpose of the Plan is to establish programs and facilities for the transition toward sustainable transit-oriented communities with integrated multimodal transportation choices to ensure accessible, convenient, healthy, safe, efficient and cost-effective travel options to enhance connectivity, and be compatible with local land use planning.

| | | | | | |
|---|---|---|---|---|---|
| *Project #5:* | ***I-80 / 680 / SR 12 INTERCHANGE PROJECT - CORDELIA TO NAPA COUNTY*** | | | | |
| *Responsibility:* | Solano County | | | | |
| *Class: I or III* | *Length: 3 miles* | *Approx. Cost: $ 225,000 LOW - 1 MILLION HIGH* | | | |
| *Required Actions/Studies* | CEQA clearance, encroachment permits and/or right-of-way and property acquisitions, trail and crossing design | | | | |
| *Route Segments* | *From* | *To* | *Class* | *Length* | *Cost* |
| Alternative A: Class I path | Red Top Road | Napa County Line | I | 3.0 | $1,050,000 |
| Alternative B: Class II Route | Red Top Road | Napa County Line | III | 3.0 | $225,000 |
| | | | | | A $225,000 |
| | | | | 3.0 | B $1,050,000 |

The Cordelia to Napa project is a primary route that will provide access for bicycles in and around the I-80/I-680/SR 12 interchange and will enhance a western route from Solano to Napa County. Beginning at Green Valley Road, the project follows an existing Class I along I-80 to westbound SR 12. From the SR 12/Red Top Rd intersection, it would either continue as new shoulders along SR 12 into Napa County or continue as a Class I path along the California Northern Railway and/or utility right-of-way into Napa County.




Applicable Goals

*Bicycle, Pedestrian, & Ridesharing*

*1. Develop an intermodal transportation system that serves the transportation needs of Solano County's residents, workers, and visitors in a manner that is compatible with characteristics of natural, economic, and social resources*

*2. Improve the connectivity of transit facilities to existing and proposed bicycle and pedestrian facilities*

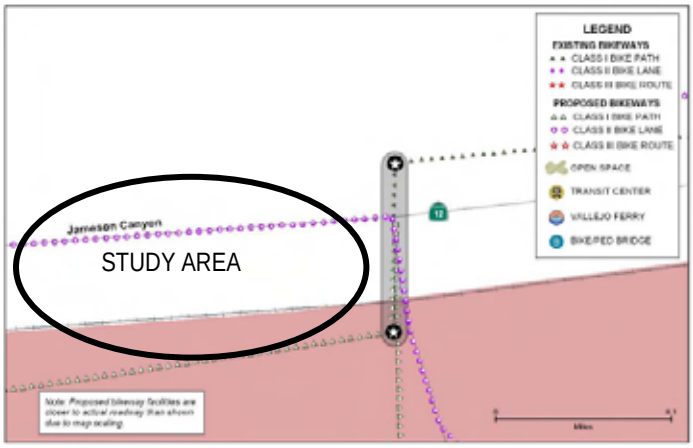
*3. Plan, design, construct, maintain, and operate multimodal transportation projects to accommodate bicycles, pedestrians, handicap individuals, except maintenance projects.*

*4. Identify and work with the stakeholders who will benefit from improved bicycle and pedestrian facilities connectivity and access (i.e. local users, visitors, merchants, etc.)*

*5. Develop and implement plans to improve awareness of the location and function of bicycle and pedestrian facilities.*

| | | | | | |
|---|---|---|---|---|---|
| *Project #18:* | *STATE ROUTE 12 OVERCROSSING* | | | | |
| *Responsibility:* | Solano County | | | | |
| *Class: I* | *Length: 0.1 Miles* | *Approximate Cost: $ 1,500,000* | | | |
| *Required Actions/Studies* | CEQA clearance, intersection design, bridge design, and trail crossing design | | | | |
| *Route Segments* | *From* | *To* | *Class* | *Length* | *Cost* |
| Bike/Ped Overcrossing | Red Top Road | North Connector | I | 0.1 | $1,500,000 |
| | | | | 0.1 | $1,500,000 |

This project calls for the construction of a bicycle and pedestrian facility as part of proposed interchange improvements at the intersection of SR 12 and Red Top Road. The construction of a new dedicated bicycle and pedestrian overcrossing will provide a safe overcrossing that will serve commuters traveling through this portion of the Central County on multiple bikeways including the Solano Bikeway, the Ridge Trail, SR 12, Green Valley Road, and Suisun Valley Road.




*6. Develop and maintain partnership and good relations with local and regional bicycle and pedestrian planning agencies such as the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), and the Sacramento Area Council of Governments (SACOG).*

*7. Fund and implement bicycle and pedestrian systems defined in STA plans. Periodically review and prioritize bicycle and pedestrian projects identified in STA plans based on ability to close system gaps and available funding*

*8. Increase the connectivity of bicycle and pedestrian facilities to all modes of travel including public transit and park-and-ride lots.*

*9. Encourage end-user focused bicycle and pedestrian facilities planning*

*10. Improve safety for cyclists and pedestrians through development and implementation of programs such as Safe Routes to School (SR2S) and Safe Routes to Transit (SR2S) Communications/Education*

*11. Maximize collaboration among member agencies through all available technology*

*Funding Priorities*

*12. Develop a comprehensive network of funding resources for project sponsors to utilize when pursuing the planning and delivery of alternative modes projects*

*13. Assist project sponsors with obtaining funding for the planning and delivery of alternative modes projects*

*14. Ensure that alternative modes plans and facilities connect to underserved communities Transportation for Livable Communities (TLC) & Priority Development Area (PDA)*

*15. Facilitate transportation and land use planning by sustainably utilizing Transportation Planning and Land Use Solutions (T-PLUS) funding on TLC, PDA, and/or Transit- Oriented Development projects*

### *5.1.2 STA Bicycle Plan (2004)*

The Countywide Bicycle Plan provides the blueprint for a unified bicycle system throughout Solano County, and is a component of the Comprehensive Transportation Plan. Specific objectives and policies that relate to the Jameson Canyon corridor include:

*Objective 1.0: Maximize the increased use of bicycles and the development of a comprehensive regional bikeway system as a viable alternative to the automobile.*

*1.1 Develop a Countywide Bikeway Plan, which identifies existing and future needs, and provides specific recommendations for facilities and programs to be phased in over the next 25 years.*

*Objective 2.0: Maximize the amount of state and federal funding for bikeway improvements that can be received by Solano County.*

*2.2 Encourage multi-jurisdictional funding applications of the countywide bikeway system.*

*Objective 3.0: Build upon the existing bikeway facilities and programs in Solano County.*

*3.1 Identify existing and proposed bike paths, lanes, and routes, and design the regional system to maximize use to the extent feasible.*
*3.2 Encourage the use of existing natural and manmade corridors such as creeks, railroad rights of way, and corridors for future bike path alignments.*
*3.5 Strive for the inclusion of bicycle facilities in the development of all new road, and roadway improvement projects.*
*3.6 Ensure that new roadways, transportation projects, and developments improve bicycle travel and system continuity.*

*Objective 4.0: Develop a countywide bikeway system that meets the needs of commuter and recreation bicyclists, helps reduce vehicle trips, and links residential neighborhoods with destinations countywide.*

*4.1 Develop a commuter bikeway system that provides direct routes between residential neighborhoods and regional employment areas, schools, and universities.*
*4.2 Develop a recreational bikeway system that uses lower volume streets, off-street bike paths, and serves historic and natural destinations countywide.*
*4.4 Develop a bikeway network that balances the need for directness with concerns for safety and user convenience. Where needed, develop a dual system that serves both the experienced and inexperienced bicyclist.*

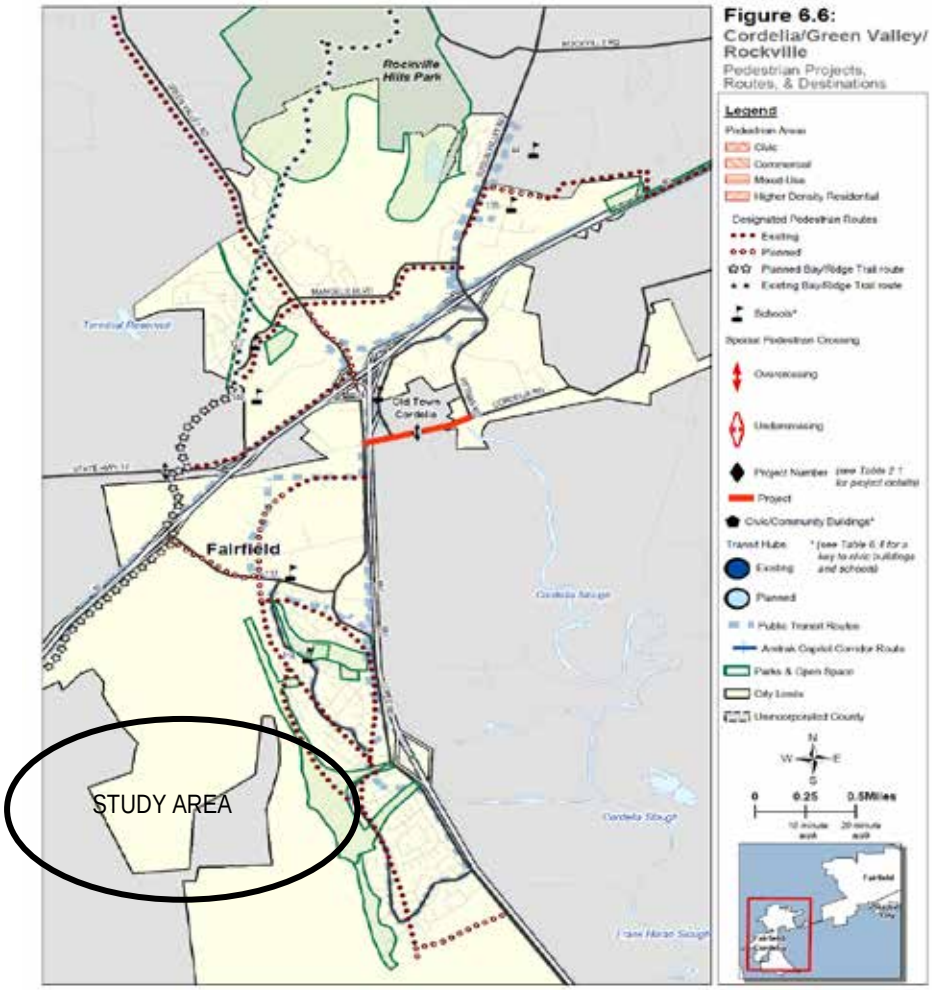



**Figure 6.6:** Cordelia/Green Valley/ Rockville Pedestrian Projects, Routes, & Destinations

STA Pedestrian Plan. 2004

*4.5 Strive to develop Class II (bike lanes) and Class I (bike paths) over Class III (bike routes) wherever feasible.*
*4.6 Develop a network of off-road mountain bicycling facilities that offer a variety of experiences for the bicyclist while minimizing conflicts with hikers and equestrian and environmental impacts.*

*Objective 6.0: Improve bicycle safety conditions in Solano County.*

*6.5 Include lighting and emergency call boxes along Class I bike paths carrying high numbers of commuters as they are eligible for a variety of regional, state, and federal funding sources.*
*6.6 Identify bicycle routes located in agricultural spraying zones, and warn bicyclists through signing about the potential hazard and the typical spraying periods.*

### 5.1.3 STA Pedestrian Plan[1]

The Countywide Pedestrian Plan was developed as a tool kit for developing a framework for individual jurisdictions to develop strategies and policies for pedestrian improvements within Solano County. The Plan provides background information, policies and programs for use in use in grant applications or outreach and marketing materials. The STA Pedestrian Plan objectives and policies include: *Complete a safe and enjoyable system of pedestrian routes and zones in the places people need and want to go in Solano County, providing a viable alternative to use of the automobile, through connection to transit, and employment, health, commercial, recreational and social centers.*

The Plan contains concepts for specific pedestrian enhancement projects, including:

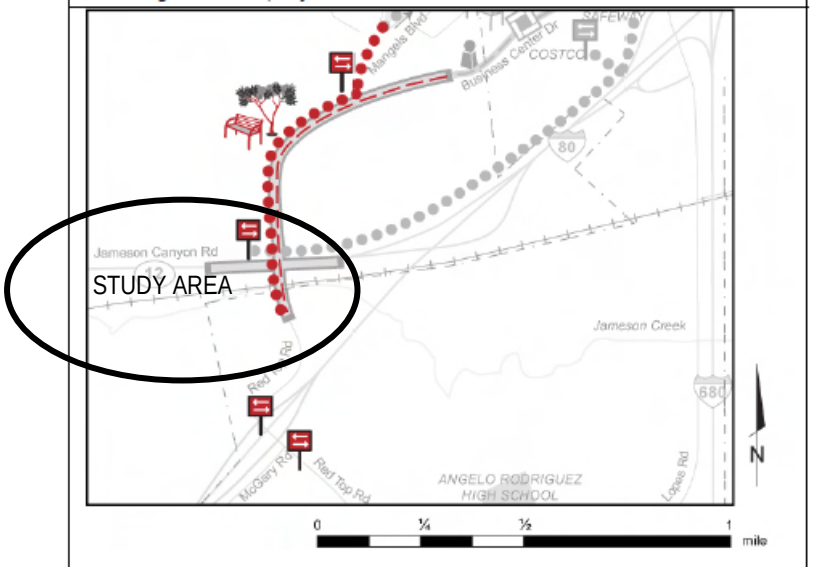
- Pedestrian overcrossing of SR 12 at Red Top Road;
- Connection from Red Top Road to McGary to connect with Lynch Creek Open Space;
- Street and path connection from Red Top Road north to Green Valley.

### 5.1.4 North Corridor TLC Concept Plan

STA initiated the North Connector Corridor Transportation for Livable Communities (TLC) Concept Plan, in partnership with staff at Solano County and the City of Fairfield, to comprehensively address the multi-modal opportunities along the North Connector corridor by identifying improvements to bicycle, pedestrian, and transit facilities. Goal 3 states:

*Enhance the multi-modal function of the corridor.*

| Project Name: North Connector West Segment Pedestrian and Bicycle Facilities | | |
|---|---|---|
| Project #: K | Time Frame: Long-term | Location: West Section |
| Sponsoring Agency: Solano County | | Approximate Cost: $1 - $5 million |
| Partner Agencies: STA, City of Fairfield | | |




- *Improve existing and future connections between neighborhoods and bicycle, pedestrian, and transit networks linked to the corridor;*
- *Enhance intersections to improve bicycle and pedestrian crossing safety, comfort and convenience;*
- *Develop pedestrian and bicycle networks suitable for different types of users;*
- *Identify locations for local bus transit, intercity bus transit stops and supporting facilities; and*
- *Enhance site plans to facilitate circulation along the corridor.*

*One of the proposed projects is the North Connector West Segment Pedestrian and Bicycle Facilities Project, described below:*

[1] The Bay Area Ridge Trail alignment (not shown on the map) is shown incorrectly on this map.
The Ridge Trail would utilize the existing bike path along I-80 to Green Valley Road and then north along the planned and existing pedestrian path along Green Valley Road to power lines and open space path. At this location, the existing dedicated Ridge Trail route begins and goes north along the power lines and open space path into Rockville Hills Park. The planned alignment shown on the map from SR 12 along the extension of Mangels Blvd. to the power lines and north along the power lines and open space path to Green Valley Road is shown incorrectly as being dedicated RT.

*Description: This project is contingent upon the construction of the west segment of the proposed North Connector. This Concept Plan recommends that a paved multi-use trail be provided to connect from Mangels Boulevard to Red Top Road. Specific improvements include:*

- *Paved trail from the existing terminus of Mangels Boulevard, to a point where it joins the west segment of the North Connector, then along the North Connector west and south past SR 12 along Red Top Road*
- *Designated bicycle route from the existing terminus of Business Center Drive west to Red Top Road*
- *Wayfinding signage at the intersection of the paved trail from Mangels Boulevard and Business Center Drive*
- *Rest stop at some point along the west segment*
- *Wayfinding signage at the intersection of SR 12 and Red Top Road*
- *Wayfinding signage along Red Top Road and at the intersection of Red Top Road and McGary Road*

*This project is part of a long-term solution for providing regional access. It would allow the North Connector corridor to link Vallejo and Napa to downtown Fairfield using a combination of bicycle lanes and paved trails. The Bay Area Ridge Trail would also be extended from this portion to the existing trail segment at Rockville Park. In concert with an improved intersection at SR 12 and Red Top Road, the trail along Interstate 80 with its awkward accessibility and unpleasant environment could be bypassed.*

### *5.1.5 Solano Bikeway Extension Feasibility Study (2003)*

The Solano Bikeway Extension Feasibility Study examined options for developing bicycle facilities between the existing Solano Bikeway and Solano Community College, with a goal to provide a continuous bikeway between two major existing off-street bike paths in Solano County: the Solano Bikeway and the Fairfield Linear Park Bike Path.

The project study area included the terminus of the existing Solano Bikeway (McGary Road west of American Canyon Road) northeast to Solano Community College (on Suisun Valley Road), and included areas north and south of I-80.

Alignment options include on-street bike lanes along Red Top Road and the north connector, as well as a potential continuation of an off-street path on the UPRR ROW east of Hwy 80.

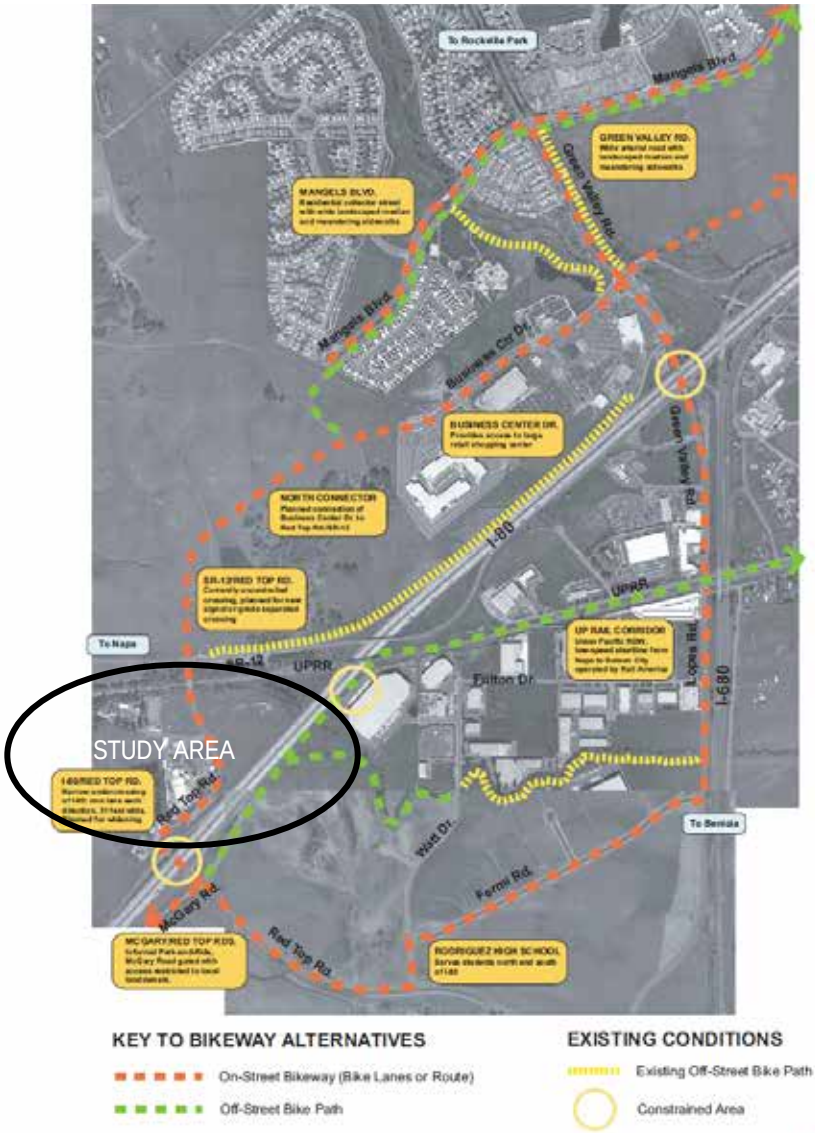



Figure 3-2
Alignment Alternatives: Segment 2
Solano Bikeway Extension Feasibility Study

## 5.2 Solano County

Approximately two-thirds of the project area is within unincorporated Solano County. The County General Plan contains related to trail implementation within the study area. Following are applicable goals, objectives, policies and programs as they relate to a trail within the Jameson Canyon area. These include Transportation and Circulation goals, policies and implementation programs related to trails, as well as a commitment to recreational trails, including Ridge Trail policies in the Resources chapter of the Plan.

### *5.2.1 Solano County General Plan, Transportation and Circulation (Chapter 7), 2008*

*TC.G-4: Encourage the use of alternative forms of transportation such as transit, walking and bicycling to alleviate congestion and promote recreation*

*TC.P-24: In collaboration with other agencies and cities, continue to plan, design, and create additional bikeways and bikeway connections to provide intercity and intercounty access and incorporate system needs when approving adjacent developments.*

*TC.P-25: Encourage access to open space and recreation through the development of safe, convenient, and connected walking paths, trails, bikeways, and neighborhood-based parks and recreation options.*

*TC.P-26: Accommodate pedestrians and bicyclists in the design and construction of roadway improvements on County facilities.*

*TC.I-21: Design, construct, and maintain bicycle routes as described in the Countywide Pedestrian and Bicycle Plan and ensure that adequate signs and pavement markings are provided.*

### *5.2.2 Solano County General Plan, Resources (Chapter 4), 2008*

*RS.G-1: Manage and preserve the diverse land, water, and air resources of the county for the use and enrichment of the lives of present and future generations.*

*RS.P-41: Provide trail links and an integrated trail system to connect people to accessible open spaces and to regional trail routes.*

*RS.P-42: Encourage the use of existing natural and human-made corridors such as creeks, railroad rights of way, and corridors when creating future bike path and trail alignments.*

*RS.P-43: Support countywide recreation planning.*

*RS.P-44: Support the provision of public lands for use in a trail network and where private land is necessary for creating connections for bike path or trail alignments. Work collaboratively with property owners to secure easements across private lands.*

*RS.P-45: Support the completion of regional trails that link destinations within Solano County and beyond, including the San Francisco Bay Trail, the Bay Area Ridge Trail and Carquinez Trust Trail Plan.*

*RS.P-47: Require recreational uses to be established in a manner compatible with agricultural activities or that minimizes an adverse impact on agriculture.*

### *5.2.3 Solano County Park and Recreation Element, 2003*

*Goals:*
*1. Preserve and manage a diverse system of regional parks and natural resources for the enjoyment of present and future County residents and park visitors.*

*2. Promote, develop and manage diversified recreational facilities to meet the regional recreation needs of the County.*

*Objective 7: Provide for the regional recreation needs of the County.*

*A. The County shall provide sites and opportunities for recreational activities that cannot be accommodated within urban areas, as funds and sites are available.*
*B. The County shall encourage development of linkages (such as riding, hiking and biking trails) between population centers and regional recreation facilities. Any trail system which links parklands cannot conflict with agriculture and other land uses.*

*C. Recreational needs of rural residents shall be considered in the design and development of rural residential subdivisions and parklands. Appropriate buffers will be provided to protect agriculture.*

## 5.3 City of Fairfield

City of Fairfield lands are located on the east side of the project corridor in the vicinity of Red Top Road. STA's *North Connector Corridor Transportation for Livable Communities Concept Plan* outlines concepts for connecting Class I facilities in the area via a new extension of Red Top Road to Business Center Drive.

The Fairfield *General Plan* includes policies and programs within the *Land Use, Open Space and Recreation* as well as the *Circulation Element (June 2002)* to provide the blueprint for the City's circulation system. It is not limited to automobile-related transportation, but addresses the development of a balanced, multi-modal circulation system for the City.

The City of Fairfield has also adopted a Master Trails Plan that sets forth specific goals and objectives for trails and paths to serve the City's recreational and circulation related needs. Following are applicable goals, objectives, policies and programs as they relate to a trail within the Jameson Canyon area.

### *5.3.1 Fairfield Circulation Element*

*Objective CI 9 Promote maximum opportunities for biking by continuing to develop and maintain a safe, convenient bikeway system which facilitates bicycle travel for commuting, recreation or other purposes.*

*Policy CI 9.1 Expand the City's north-south and east-west bikeway network through the use of Class I, II and III bikeways in accordance with the factors outlined in Table CI-1.*
*Policy CI 9.2 Provide bikeways which link residential areas with major employment centers, parks, open space areas and other recreational amenities, educational facilities, and commercial areas.*
*Program CI 9.2 A Continue to implement the Master Trails Plan. (See Policies OS 11.2, OS 11.3, and OS 11.8 and Programs OS 11.5 A, OS 11.5 B, and OS 11.7 A)*
*Policy CI 9.3 New arterial streets should provide adequate right-of-way width for Class I Bike Paths or Class II Bike Lanes where appropriate.*
*Policy CI 9.5 Continue to provide multi-use trails which accommodate pedestrian and bicycle use where appropriate and work toward providing separate trail facilities for pedestrian and bicycle use. (See Policy OS 11.2)*
*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. (See Policy OS 11.5 and Objective LU 5)*
*Policy CI 9.8 Minimize bicycle/pedestrian/motor vehicle conflicts by providing proper trail, street and intersection design and separation.*

*Objective CI 10 Provide pedestrian facilities throughout the City to encourage walking as an alternative to short-distance vehicle travel.*

*Policy CI 10.1 Provide pedestrian facilities that are safe and pleasant to use. (See Policy UD 3.2)*

*Policy CI 10.3 Consider using landscaping or physical barriers on high-capacity arterials to separate vehicles and pedestrians. (See Policy UD 3.2)*
*Policy CI 10.4 Consider constructing pedestrian overpasses where heavily traveled pedestrian routes cross busy intersections.*
*Policy CI 10.7 Encourage existing facilities and require future facilities to provide access to disabled persons.*

### *5.3.2 Fairfield Master Trails Plan (1998)*

The City of Fairfield adopted a Master Trails Plan in December 1998. The Plan includes a network of off-street trails (paved, improved, and natural), bike lanes, and bike routes within the City. Proposed trails and bike lanes that are in the Jameson Canyon vicinity include:

- North Connector/Mangels Boulevard from SR 12 to Suisun Valley
- Red Top from McGary to SR 12
- Red Top Road from McGary to Lopes
- Lopes from Red Top Road to Cordelia Road
- Cordelia Road from Lopes eastward
- Suisun Valley Road from I-80 northward

The Master Trails Plan also included design guidelines, goals and policies for implementation of a Citywide trails network.

## 5.4 Napa County

The western portion of the project area is within unincorporated Napa County. The County General Plan contains related to trail implementation within the study area. Following are applicable goals, objectives, policies and programs of the General Plan as they relate to a trail within the Jameson Canyon area.

### *5.4.1 Napa County General Plan Circulation Element, 2008*

The General Plan Circulation Element contains goals, objectives and policies related to circulation and non-motorized transportation in Napa County. Specific goals and objectives that relate to the project include:

*Policy CIR-13: The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is both safe and efficient in terms of providing local access. The following list of improvements, illustrated as the County's ultimate road network in Figure CIR-1, has been supported by policy makers within the County and all five incorporated cities/town, and will be implemented over time by the County and other agencies to the extent that improvements continue to enjoy political support and funding becomes available:*

*Widen Jamieson Canyon Road (Route 12) by adding one additional vehicular travel lane and room for a class II bike lane in each direction. Construct a safety median barrier in the centerline, straighten unsafe curves, lower the grade where possible, install turn lanes for safety and to allow for parcel access as appropriate, and allow a Ridge Trail crossing for pedestrian, equestrian, and bicycle use.*

*Install safety improvements on rural roads and highways throughout the county including but not limited to new signals, bike lanes, bikeways, shoulder widening, softening sharp curves, etc.*

*Goal CIR-3: The County's transportation system shall encompass the use of private vehicles, local and regional transit, paratransit, walking, bicycling, air travel, rail, and water transport.*

*Policy CIR-25: Preserve rail corridors and the navigable sections of the Napa River as regional transportation assets, encouraging and not precluding their future use for recreational travel as well as for the movement of passengers and goods.*

*Policy CIR-26: Increase the attractiveness and use of energy-efficient forms of transportation such as public transit, walking, and bicycling through a variety of means, including promoting transit-oriented development in existing municipalities and urbanized areas and the use of transit by visitors to Napa County.*

*Objective CIR-3: The County shall work with Caltrans and other agencies to construct or designate approximately 40 miles of additional bicycle lanes in Napa County by 2030, consistent with priorities identified in the Napa Countywide Bicycle Master Plan.*

*Policy CIR-31: The County shall work with the Napa County Transportation and Planning Agency and other transit agencies in adjoining counties to develop effective connections between public transit in Napa County and regional transportation networks (BART, Baylink ferry, airports, etc.) via rail, bus, bicycle, and other means to serve the needs of local residents, commuters, and visitors.*

*Policy CIR-34: Where they are not needed for other transportation purposes and where such use would implement the Napa Countywide Bicycle Plan or other County-adopted master plan, newly abandoned rail rights-of-way shall be used for alternative uses such as public transit routes, bicycle paths, or pedestrian/hiking routes, provided that they are compatible with adjacent uses and sufficient funding is available for right-of-way acquisition, construction, and long-term maintenance.*

*Policy CIR-35: The County shall work with the Napa County Transportation and Planning Agency, the incorporated cities and town, other agencies, and development projects to work toward implementation of the Napa Countywide Bicycle Plan.*

*Policy CIR-36: The needs of pedestrians and bicyclists shall be routinely considered and, where possible, accommodated in all roadway construction and renovation projects.*

*Policy CIR-37: Where sufficient right-of-way is available, bicycle lanes shall be added to county roadways when repaving or upgrading of the roadway occurs, provided that the bicycle facility would implement the Countywide Bicycle Master Plan. Additional paving shall be provided only where the facility meets the "Regional Assessment System" adopted by the Napa County Transportation and Planning Agency. The County shall encourage Caltrans to follow these same guidelines on state highways in Napa County.*

### *5.4.2 Napa County General Plan Recreation and Open Space Element, 2008*

Recreation and open space are integral components of Napa County. The Recreation and Open Space Element describes the current needs in the County for open space, the supply and demand of open and space, the formation of the Park and Open Space District, open space ownership, locations of trails and open spaces, and a series of goals, policies, objectives, and actions. Napa County has approximately 70 miles of completed non-motorized trails, with almost 200 miles of proposed trails. The Plan includes implementation of the Ridge Trail across Jameson Canyon as a priority.

*Goal ROS-2: To create and maintain a high-quality system of parks, trails, and recreational, interpretive, and environmental education facilities.*

*Policy ROS-11: Increase by 2030 the amount of dedicated open space available, improved, and managed for nature-based recreation by the general public by improving access to existing public lands and by selective public acquisition from willing landowners of fee title ownership, easements, and/or license agreements over high priority open space lands.*

*Policy ROS-12: By 2030, increase the number and length of non-motorized, off-street trails available for walkers, joggers, bicyclists, and equestrians.*

*Action Item ROS-12.1: In partnership with the Napa County Regional Parks and Open Space District, establish numeric objectives for increased off-street trails and acreage of dedicated open space accessible to the public.*

*Policy ROS-12.5: Prior to abandoning public rights of way, consider their potential suitability for recreational use. (See also Policy CIR-25).*

*Policy ROS-10: Trails: To ensure compatibility with agriculture and private property, the following approaches and criteria will guide the location and design of trails:*

- *Utilize a range of solutions tailored to individual circumstances;*
- *Locate trails to take advantage of natural and visual barriers and buffers to discourage trespass onto private property and maintain the privacy of private property owners and their residences;*
- *Educate trail users through signage and printed materials on the "what" and "why" of good behavior as it relates to natural resources, agriculture, and private property, including ethics such as "leave no trace" and respect for others;*
- *As appropriate, combine trails with fire breaks and design trails to facilitate access for control of wildfires; Provide notice generally, as well as specifically, to property owners adjacent to proposed trails prior to their being constructed and/or opened to the public, and seek to address concerns in a spirit of cooperation;*
- *Minimize the spread of exotic invasive weeds, pathogens, and other pests through public education, eradication programs, installation of shoe and tire cleaning equipment where needed, requirements for weed-free horse feed, and similar techniques;*
- *Utilize temporary and seasonal trail closures, and type and intensity of use restrictions as appropriate during periods of high wildfire risk and to protect sensitive species and habitats and avoid conflict with agricultural operations. Provide notice generally, as well as specifically, to property owners adjacent to proposed trails prior to their being constructed and/or opened to the public, and seek to address concerns in a spirit of cooperation.*

*Policy ROS-15: The County, in coordination with and generally by working through the Napa County Regional Park and Open Space District, shall plan for and reserve land for recreational facilities and encourage non-commercial recreational development, including both parks and a comprehensive system of trails, in a manner and to the extent consistent with agricultural, water quality, and natural resource protection goals and the Trails Policy contained in this Element (Policy ROS-10). The following recreational opportunities are the County of Napa's priorities (not necessarily in the order shown), which shall be addressed in greater detail in a park and recreation master plan to be prepared by the Napa County Regional Park and Open Space District:*

- *Implement sections of the proposed Bay Area Ridge Trail, with the ultimate objective of a continuous regional trail.*
- *Focus on improving public access to and recreational facilities on existing public lands, such as watershed lands owned by water districts, and state and federal lands located primarily in the eastern parts of the county.*
- *Connect scattered, landlocked, and discontinuous public lands through selective acquisitions from and/or land exchanges with willing landowners to provide habitat corridors, facilitate a connected system of trails, and improve the effective use and stewardship of existing public lands.*

*Policy ROS-16: Recreational uses on lands designated for agriculture should be encouraged only where those uses will not deplete or degrade natural resources on which nearby or on-site agriculture depends, and will not adversely affect the commencement, intensification, or continuation of local agricultural activity.*

*Policy ROS-18: Financial and other incentives that support the provision of parks and recreational trails through the voluntary donation of important open space lands, trail easements, or license agreements to appropriate public agencies and/or non-profit land conservation organizations should be encouraged.*

*Policy ROS-19: Federal, state, regional, and local programs that provide grants for protecting, improving, and maintaining significant open spaces should be supported and utilized where feasible.*

*Policy ROS-20: Partnerships with other public agencies, non-profit organizations, and the private sector should be used where feasible to enhance recreational opportunities and appropriate nature-based recreation, including but not limited to:*

- *The Napa County Regional Park and Open Space District to manage public access and steward resources on open space lands owned by the County as well as other public agencies and to acquire additional open space lands for outdoor recreation and resource protection.*

- *The Napa County Transportation Planning Agency to implement the Napa County Bike Plan and other bike and trail plans, with the goal of establishing a comprehensive and seamless network of non-motorized paths and trails connecting population centers to each other and to outdoor recreation opportunities.*
- *The Land Trust of Napa County and other land conservation organizations that own or hold easements on open space lands appropriate for public use.*

*Goal ROS-3: To make recreational, cultural, interpretive, and environmental education opportunities available to all county residents.*

*Objective ROS-1: By 2030, ensure that the majority of Napa County residents live within proximity of parks offering a variety of nature-based recreation opportunities by increasing the acreage of publicly accessible open space within a 15-minute or less driving time of each of the county's four cities and one town.*

*Policy ROS-23: A system of scenic roads, bicycle routes, and hiking trails should connect existing cities, town and other local population centers to outdoor recreation and open space resources and facilities.*

## 5.5 Napa County Regional Park and Open Space District

This special district was approved by Napa County voters in 2006. The District is authorized to plan, improve and operate a system of public parks, trails, outdoor recreational facilities, and outdoor science and conservation education programs, as well as to protect and preserve natural areas, wildlife habitat and other open space resources. Its jurisdiction includes all of Napa County. Applicable goals, objectives, policies and programs of the District (as they relate to a trail within the Jameson Canyon area) are contained in the Recreation Element of the General Plan.

### *5.5.1 Napa County Regional Park and Open Space District Master Plan 2008 — 2013*

In October 2008, the District released a Draft Master Plan that outlines acquisition and implementation goals for 2008-2013. Of relevance to the Jameson Canyon area, the District plans to explore acquisition of City of Vallejo's surplus lakes properties north of the canyon, which would become part of Skyline Park and provide additional opportunities for trail connections. The District has adopted four goals for park and open space in Napa County, with specific projects for associated implementation of these goals:

*Goal A: Provide opportunities for outdoor recreation through the development of a system of parks, trails, water resources, open space and related facilities*

*A.16 Napa Crest Trail Development*
*A.18 San Francisco Bay Trail Completion in Napa County*
*A.19 Bay Area Ridge Trail Completion in Napa County*

*Goal B: Preserve, restore and protect open space lands, natural resources and habitat areas*

*B.4 Vallejo Lakes Area Acquisition*

*Goal C: Provide for recreational, cultural, environmental and working landscapes education*

*Goal D: Provide for District management and partnerships*

## 5.6 Napa County Transportation Planning Agency (NCTPA)

NCTPA serves as the countywide transportation planning body for the Cities of American Canyon, Calistoga, Napa, St. Helena, Yountville and Napa County. The agency coordinates planning and funding of intermodal transportation. NCTPA Plans with goals, objectives, policies and programs relevant to the Jameson Canyon Plan include:

- Napa Countywide Bicycle Plan (2003)
- Napa Valley Greenway Feasibility Study (2008)
- Strategic Transportation Plan (1999)
- Napa/Solano Passenger/Freight Rail Study (2003) (See discussion under (Railroad Issues")

### *5.6.1 Napa Countywide Bicycle Plan (2003)*

The NCTPA Countywide Bicycle Plan is intended to integrate consistent bicycle facilities across Napa's cities and unincorporated areas, enable agencies to apply for funding, and lead into the County's Strategic Transportation Plan. It contains goals and policies for the implementation of bikeway projects throughout the county, as well as specific projects including a Class I path through Jameson Canyon.

This plan recommends connections between Napa and Solano County, including Highway 29 (Class III bike route), American Canyon Road (recommended Class II bike lanes), and on SR 12 (Jameson Canyon Road). The Jameson Canyon project is identified as a Class I bike path on either the existing water easement or the Union Pacific Railroad right-of-way.

> *PATH 2: Highway State Route 12/Jameson Canyon to Solano County*
> *The Jameson Canyon path will provide a direct, off-road connection from State Route 29 into Solano County. The Jameson Canyon [path] will follow either an existing water easement or the Union Pacific Right of Way along the south side of State Route 12 from State Route 29 to the Solano County line.*
>
> *Among potential issues to be considered are:*
> - *Ownership and restrictions related to the easement and rail right of way*
> - *Design of a path linkage from State Route 29 to the beginning of the water easement or rail right-of-way.*
> - *The transition between on-road and off-road bicycle facilities; minimizing conflict at the transition points.*
> - *Consistency with Solano County bikeway and path connections.*
> - *Path width.*
> - *Provision of adequate shoulders and recovery area outside the paved path.*
>
> *Benefits of this path:*
> - *Provides a direct linkage to facilities planned by Solano County.*
> - *Provides a connection to the proposed Bay Trail at State Route 29.*
> - *Uses existing easement or rail right-of-way.*
> - *Will have high visibility, parallel to the roadway.*
> - *Is set back a substantial distance from the roadway.*
> - *Has minimal cross-traffic and other traffic conflicts.*

### *5.6.2 Napa Valley Greenway Feasibility Study (2008)*

The Napa Valley Greenway Feasibility Study was prepared to determine the feasibility of a north-south non-motorized route through the Napa Valley to provide transportation and recreation opportunities to residents and visitors. Its goals include:

1. *Improve north-south access for bicyclists and pedestrians.*
2. *Improve the safety of bicyclists and pedestrians.*
3. *Provide maximum benefits to the public.*
4. *Minimize the negative impacts to the environment and local visitors.*

5. *Minimize trail impacts to private lands and operations including agricultural, residential, transportation and other land uses.*
6. *The project should be consistent with adopted policies, standards and goals.*

The nearest study segment to the Jameson alignment would utilize Devlin and Green Island roads and provide Class II bike lanes, with an option for a Class I shoreline trail along the Napa River shoreline. Neither of these routes would provide a direct connection to the Jameson trail.

### *5.6.3 Napa/Solano Passenger/Freight Rail Study (2003)*

This study was commissioned to determine the economic feasibility of introducing passenger rail and/or increased freight along rail routes within Napa and Solano Counties, including the Jameson Canyon segment. The study concluded that while technically feasible, there is not strong demand for commuter-based passenger rail service in the area, and there is limited demand for tourist-based rail to justify the extensive rehabilitation and improvement costs. Freight is primarily utilized by three entities, one of which, (Napa Pipe) is currently exploring options for redevelopment of the site into residential uses, which could possibly lessen the demand for freight service. There is some opportunity for increased wine shipping in the area. According to the study, the rail ROW is owned by UPRR but leased to Rail America (formerly California Northern Railroad) for freight service only. Cal Northern is responsible for at-grade crossings, while UPRR maintains longitudinal easements throughout the corridor, although none are listed within the study area. The study also concluded that UPRR would consider sale of the lines, subject to the terms of its freight lease.

### *5.6.4 Strategic Transportation Plan (1999)*

The NCTPA Strategic Transportation Plan is the policy document for the Metropolitan Transportation Commission's Regional Transportation Plan, and sets forth transportation priorities for a twenty year period. It sets forth the priorities for funding and implementation of the Bicycle Plan and other projects within the County. It includes the following goals:

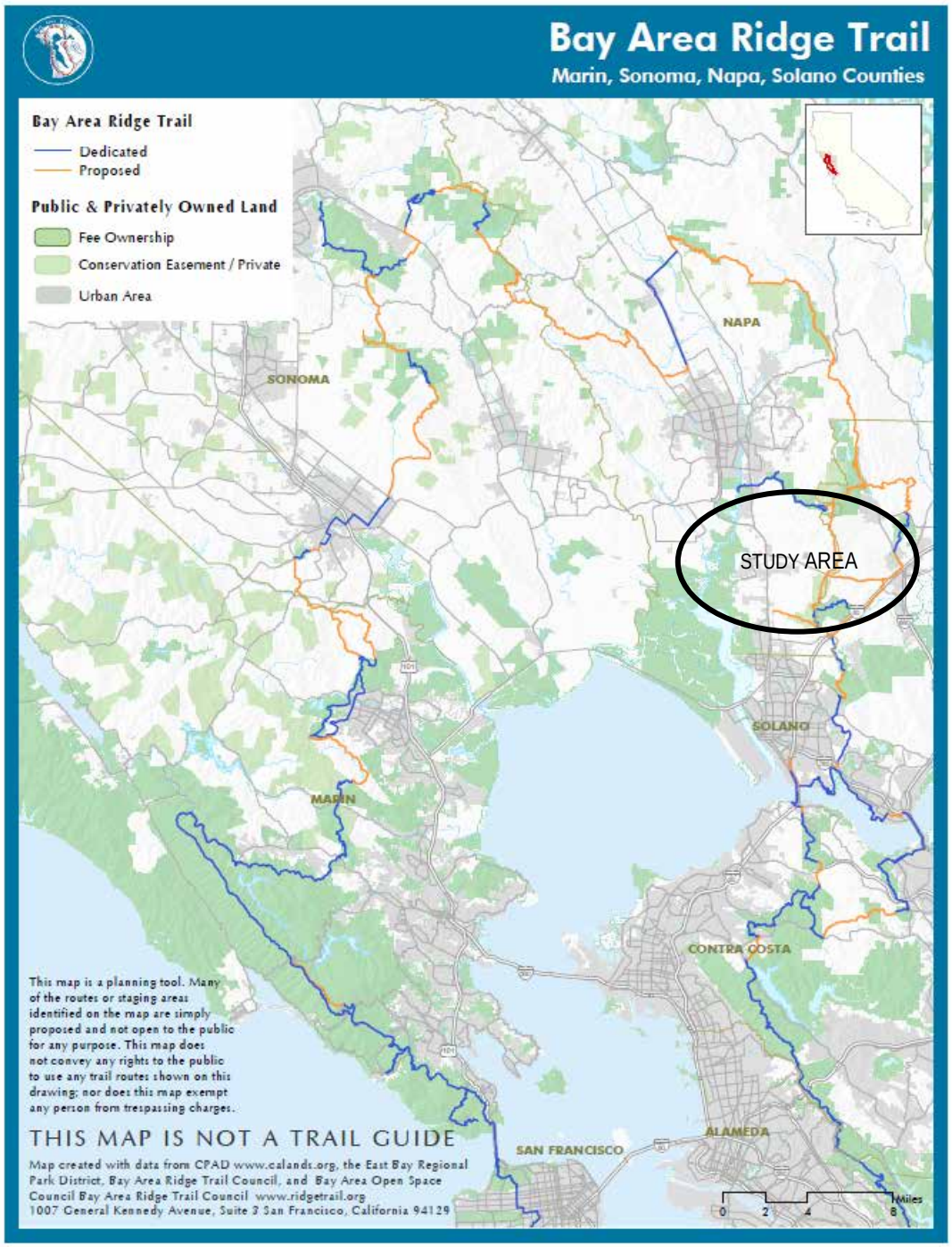
*8. Increase bicycle use for commute as well as recreational trips.*
*9. Preserve the existing rail corridor as a regional asset.*
*10. Improve the efficiency and effectiveness of travel corridors by considering all modes in the planning, design and construction process.*

*For the Jameson study area, the Plan calls for widening SR 12 from two to four lanes. Plan objectives are to enhance road and intersection capacities to accommodate future travel demand for commuter, visitor and freight related trips, and reduce accidents by implementation of operational and safety improvements.*

## 5.7 Bay Area Ridge Trail

The Bay Area Ridge Trail Council is a nonprofit organization that plans, builds and supports implementation of the Bay Area Ridge Trail, a proposed 550+ mile trail encircling the San Francisco Bay generally following the ridgelines within sight of the Bay. Part of their vision is to preserve open space by creating managed public access to a trail along the ridge tops. Much of their work involves partnering with public agencies and other nonprofits to plan and implement individual trail segments, including the Jameson Canyon Plan. More than half of the trail is completed and has been dedicated for use by the public.

In the Jameson Canyon area, the trail is currently proposed to connect from the vicinity of Skyline Park in Napa, along a north-south route to Solano County at the Newell Preserve in American Canyon, and to Lynch Canyon Open Space in Solano County. McGary Road and Green Valley Roads also contain proposed BART segments. Providing a safe crossing of SR 12 in Jameson Canyon is critical to implementation of this trail segment.




*Source: Bay Area Ridge Trail/GreenInfo Network, 2010*

## 5.8 Association of Bay Area Governments--San Francisco Bay Trail

### *5.8.1 Bay Trail Plan (1989)*

The Bay Trail Plan proposes the development of a regional hiking and bicycling trail around the perimeter of San Francisco and San Pablo Bays. Approximately one-half of the trail already exists, either as hiking-only paths, hiking and bicycling paths, or as on-street bicycle lanes or routes. The Bay Trail designated a "spine" for a continuous through-route around the Bay and "spurs" for shorter routes to Bay resources. The goals of the Plan include providing connections to existing park and recreation facilities, creating links to existing and proposed transportation facilities, and preserving the ecological integrity of the Bays and their wetlands. The Plan calls for spine and spur alignments along Solano County's shoreline through Benicia and Vallejo as well as Bay-to-Ridge Trail connections adjacent to SR 12 along Jameson Canyon Road, I-80 along McGary Road, I-680 along Goodyear Road on to Ramsey Road, and to Cordelia Road into Suisun City. The Jameson Canyon route was not evaluated in the 2005 ABAG Gap Analysis, as it is not considered a primary Bay Trail "spine" route, but would be implemented as a Bay to Ridge connector trail.

## 5.9 Caltrans

STA is the lead agency coordinating Caltrans SR 12 improvements within the study corridor. This local implementation effort is important to ensure that the project meets strict federal implementation deadlines. There are three separate projects underway: SR 12 widening in Solano County, SR 12 widening in Napa County, and the proposed I-80/I-680/SR 12 Interchange project. Caltrans also sponsored the California Cross State Bicycle Study and a Rail Right of Way Study. The SR 12 improvement projects have been made a priority and moved forward by many agencies. These projects will greatly enhance alternative modes in the corridor.

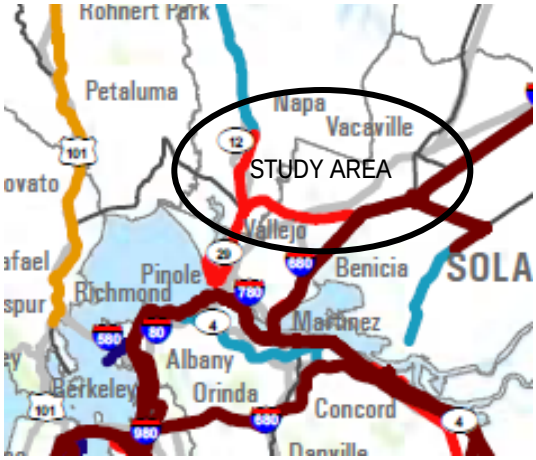
### *5.9.1 California Cross State Bicycle Route Study*

*The California Cross State Bicycle Study: Bay Area to Lake Tahoe* (2004) was completed as a joint effort under the direction of the El Dorado County Transportation Commission, with participation from a variety of municipal, regional and state agencies including STA. The Study, for Caltrans District 3, was prepared to provide guidance and recommendations for the development of a seamless interregional bicycle network that extends from the San Francisco Bay Area to Lake Tahoe. Goals of the Study include identifying existing conditions and gaps in the system, to assist jurisdictions in implementing a Cross Tate Bicycle Route, and to help facilitate an interstate bike route across California. The Study is intended to facilitate access to federal implementation funding for bicycle facilities. In the Jameson Canyon corridor, the route is along SR 12, with a recommended upgrade to a Class I Bike Path, as referenced in the Solano Countywide Bicycle Plan and the Napa Countywide Bicycle Plan. The Study states:

> *"The Jameson Canyon path will provide a direct, off-street connection from State Route 29 into Solano County. The path will either follow an existing water easement or the Union Pacific Railroad right-of-way along the south side of State Route 12 from State Route 29 to the Solano County line.*
>
> *The Jameson Canyon path is considered to be an important element of the regional bicycle transportation network for the Solano and Napa area for the following reasons:*
>
> - *Provides a direct linkage to facilities planned by Solano County.*
> - *Provides a connection to the proposed Bay Trail at State Route 29.*
> - *Uses existing easement or rail right-of-way.*
> - *Will have high visibility, parallel to the roadway.*
> - *Is set back a substantial distance from the roadway.*
> - *Has minimal cross-traffic and other traffic conflicts.*

In this Study, SR 29 is shown for recommended upgrade to Class II bike lanes, and Red Top Road is shown for recommended upgrade to Class I Bike Path.

### *5.9.2 Caltrans Rail Right of Way and Abandoned Corridors Study, Final Report*




This 2005 study inventoried and examined potential non-motorized transit corridors along active and abandoned rail corridors. The purpose of the study was to inventory existing and abandoned rail corridors, to evaluate the feasibility of combining passenger rail with freight, and to identify opportunities for joint use with non-motorized trails (rails-with-trails):

> *As opportunities for roadway and highway expansion continue to diminish, it is imperative to continue to seek opportunities to improve mobility in other ways to ensure the continued economic and social health of California. This study provides a high level, state-wide assessment of the potential uses for rail right-of-way in California.*

The Jameson Canyon rail ROW within the study area was identified as active (not abandoned) with High Potential (high demand and high feasibility) for passenger rail service, as well as High Potential for non-motorized and public access transit linkage, defined as *In-operation railroad right-of-way with potential joint use for non-motorized transport and public transit links (with current and proposed service).*

## 5.10 Solano Land Trust

The Solano Land Trust owns the Lynch Canyon Open Space area, consisting of approximately 10,000 acres of land on the north and south sides of I-80 between American Canyon Road and Jameson Canyon Road. The area is currently managed cooperatively by Solano County Parks. Primary access to the Lynch Canyon Open Space is via an undercrossing of I-80 at Lynch Road, off McGary Road. The Lynch Canyon Open Space is located within the Tri-City & County Cooperative Planning Area (a collaboration of the cities of Fairfield, Vallejo, and Benicia, as well as Solano County), which comprises 10,000 acres on the south side of I-80. There is a dedicated Ridge Trail segment within the Lynch Canyon Open Space, with a future connection planned to Newell Open Space in American Canyon. Lands within the Tri City planning area include agriculture and open space lands, as well as opportunities for recreational activities, including trails. Lynch Canyon was the first piece of property purchased to fulfill the Tri-City Plan. Lynch Road provides the primary entry to this area.

## 5.11 Napa Valley Vine Trail

The Napa Valley Vine Trail is a volunteer-led grass roots effort to implement a multi-use trail from Calistoga to Vallejo. The route is generally based on the Napa Valley Greenway Feasibility Study, with both a riverfront and inland route currently under consideration. At this time, it is anticipated that the Vine Trail and a Jameson Canyon trail would connect at or near the planned overpass at SR 29/12, however, potential trail linkages could also occur along Kelly Road south to Newell Ranch in American Canyon, if such a route is identified.

## 5.12 Great California Delta Trail

The Great California Delta Trail was approved by the state legislature in 2006 to provide a continuous trail system through the Sacramento-San Joaquin delta and shoreline areas, including Solano County, linking this region with the San Francisco Bay Trail as well as planned trails in Sacramento and Yolo counties. Trail planning is currently in the "blueprint" stage, developing a process for identification and selection of trail routes, beginning with Contra Costa County, and anticipated to occur in 2011 in Solano County. Although not directly within the Jameson corridor,

opportunities for linking with this trail system should be explored as the Delta Trail routes are identified and implemented in the future.

# 6. OPPORTUNITIES AND CONSTRAINTS

An Opportunities/Constraints assessment was completed for the Jameson Canyon Corridor to aid in the analysis of trail route alternatives, test their feasibility, and to help guide the selection of the recommended or preferred feasible alternative trail alignment. To assist in the analysis, the corridor was divided into five segments, as follows:

The Western segment includes the SR 12/29 intersection east to the area east of Kirkland Ranch Road, where the canyon narrows. In this segment, the corridor is generally flat and open.

The Confluence segment occurs where SR 12 and the railroad converge east of Chardonnay Country Club, roughly where hills south of the railroad come close to the right of way.

The Central segment is characterized by steep hills north of SR 12, with agriculture and residential development in a narrow band between SR 12 and the railroad/creek corridor.

The Canyon segment begins approximately 1.8 miles to the east, where Jameson Canyon is severely constrained on both sides by topography and the highway and railroad.

East of the Canyon is the Eastern segment, which includes the Red Top Road intersection.

## 6.1 Bicycle Route and Pedestrian Project Opportunities

The previous bicycle and pedestrian plans that address the Jameson Canyon corridor have suggested several potential path alignments between SR 12 and the railroad, including:

- Along SR 12 within or immediately adjacent to the Caltrans ROW
- Within or adjacent to the nearby Union Pacific Railroad alignment
- Within the City of Vallejo water pipeline's existing right of way or easement area (These utility easements parallel SR 12 and are generally located between the railroad ROW and SR 12.)
- Within the California Aqueduct right of way (California Department of Water Resources)

Each of these previously suggested possibilities were evaluated as a part of this opportunities and constraints analysis. This included a review of ownership maps and available policy documents, and discussions with representatives of landowners and utilities, including Ridge Trail, Vine Trail, Napa Regional Park and Open Space District and Solano Land Trust. These represent Land Use Issues and Policy Constraints. The above listed alignment possibilities, along with additional alignment alternatives that have been identified as a part of this Plan, are discussed in this section.

Environmental constraints were evaluated to determine if a trail alignment could be placed within either public lands or on adjacent private lands while avoiding the most environmentally sensitive and constrained areas. This evaluation examined environmentally sensitive zones such as wetlands, riparian corridors, and sensitive wildlife habitat; and areas of physical constraints, such as flood-prone areas, steep slopes and landslide masses.

It is recognized here that some or many of the alternatives studied, especially those that may be on private lands, should be considered to be long-term planning goals, and may not be implementable in the near future.

Apart from the corridor-wide and long-term review of alignments that would provide a separated pedestrian and bicyclist pathway between I-80 in Solano County and SR 29 in Napa County, there are several short-term/local route opportunities that may be implementable in the near future. These include:

- Provision of Class I pathways associated with planned improvements to the greater I-80/I-680/SR 12 Interchange area.
- Provision of a Class I pathway associated with planned improvements to the SR 12/29 interchange.
- Improvements to the Large Mammal undercrossing of SR 12 that will be constructed as a part of the Jameson Canyon roadway widening project. These improvements could potentially be made prior to the construction of any planned/approved Class I improvements paralleling SR 12, and, when improvements are in place, would become a component of the Ridge Trail project. (The Large Mammal under-crossing is discussed more fully in the next section of this report).

## 6.2 Land Use Opportunities and Constraints

This section describes land use opportunities and constraints along the Jameson Canyon study area, from west to east. Public and private ownership opportunities are shown on Figure 6-1.

Napa County Airport is located west of SR 29 at the edge of Fagan Marsh, which connects to the lower Napa River. Napa Valley Corporate Park, containing light industrial and warehouse uses, occupies the area between the airport and SR 29, served by Aviation Way / Airport Boulevard / Airport Road (the western extension of SR 12), and Devlin Road. Devlin Road runs north-south at Aviation Way, and has bike lanes to which the westernmost segment of a SR 12 corridor trail will connect. That segment will be constructed by Caltrans along the south side of SR 12 as part of the SR 12/29 interchange project.

Kelly Road runs north-south approximately ¼ mile east of SR 29; it connects to SR 29 both north and south of SR 12. West of its southern junction with SR 29, it connects to the south end of Devlin Road. Light industrial and warehouse uses, an auction yard, and several other small businesses occupy the area between SR 29 and Kelly Road.

On the north side of SR 12 between North Kelly Road and Kirkland Ranch Road, Napa Sanitation District owns irrigated pastures that are used for disposal of wastewater from the City of Napa and surrounding areas. Both the City of Napa and the City of American Canyon operate water filtration plants that are located on Kirkland Ranch Road west of Polson Road. Water pipelines along SR 12 connect the plants to their respective cities to the west.

Two golf courses lie south of SR 12 east of Kelly Road, behind a strip of vineyards along the highway. Eagle Vines, a public course, adjoins and has its entrance on Kelly Road. Chardonnay Country Club, a private course, is adjacent to the east. Its driveway forms the south leg of the SR 12: Kirkland Ranch Road signal. Chardonnay currently has 27 holes but is redesigning its course to 18 holes. Fagan Creek runs westward through both courses, roughly bisecting them.

A short distance east of Chardonnay Country Club, a single-track rail line approaches from American Canyon to the south, continuing eastward roughly parallel to SR 12 through Jameson Canyon to I-80. Union Pacific Railroad owns the railroad right of way, which is currently used for daily freight operations by the California Northern Railroad (CFNR). UPRR has indicated that they are reserving this ROW for possible future expansion, and that none of this ROW width would be available for a public access trail.

SR 12 runs along the north side of Jameson Canyon. The rail line is approximately ½ mile south of SR 12 at the golf course, and comes closer as the canyon narrows to the east, at some point close enough that no usable land lies between the two. Fagan Creek (flowing westward) and Jameson Creek (flowing eastward) run between SR 12 and the railroad; Jameson Creek switches back and forth across the railroad in the narrow segment of the canyon.

Most of the Jameson Canyon corridor between Chardonnay Country Club and Red Top Road is privately owned, and is used for viticulture, farming and ranching. Vineyards along the highway and railway constrain potential trail alignments, but many vineyards have service roads along their perimeter that could potentially be considered for joint trail use. This would need to be discussed individually with each vineyard owner, but a precedent is being considered by the "Vine Trail," a planned recreational trail that would traverse Napa Valley.

Lands north of SR 12 are generally hilly and suitable only for ranching, except for relatively flat areas near the highway within Napa County. Several vineyards occupy valley bottom lands and lower side slopes on both sides of the canyon from Kelly Road east to Kirkland Ranch Road and near the center of the corridor at Creston Station. Lands south of the railroad are predominantly used for cattle grazing and as open space.

Several farm houses and ranch buildings have driveways on SR 12 between Kirkland Ranch Road and Miner's Trail. Small rural residential areas are located away from SR 12, served by Spurs Road, Miner's Trail, and Kirkland Ranch Road/Polson Road. Because of SR 12's existing high traffic volume and the planned addition of a median barrier, pedestrian and bicycle access between these homes and the opposite side of the highway is a connectivity issue.

Between the eastern end of the canyon's narrow segment and Red Top Road, the land north of SR 12 is hilly and mainly suitable for ranching. The highway diverges north from the railroad east of the canyon. One ranch and its house and outbuildings occupy the area between the two, with a driveway on Red Top Road between SR 12 and the railroad. The railroad continues eastward over I-80 into Cordelia.

At Red Top Road, a paved path begins along the north side of SR 12 and continues north along the west (southbound) side of I-80 to the southbound on-ramp at the next interchange, Green Valley Road / Lopes Road. The Green Valley suburban residential area lies north of I-80 in this area; this area and an adjacent business strip are served by Business Center Drive. Both areas are accessed by Green Valley Road, with no current connection to Red Top Road or to SR 12 to the west. There are planned Ridge Trail segments along Green Valley Road, and a connection between SR 12 and Red Top Road is being designed and will be implemented as part of the I-80/I-680/SR 12 Interchange project.

Red Top Road intersects SR 12 at grade just west of I-80, crosses the UP rail line at grade, and passes under I-80 at its interchange south of where the rail line crosses under I-80. Red Top Road serves as an I-80 frontage road, serving a Jack-In-The-Box and several other small commercial uses, including Red Top Dairy. East of I-80, McGary Road continues south to Vallejo, and was recently dedicated as a segment of the Ridge Trail.

Open Space Lands North and South of Jameson Canyon

Hilly ranch land occupies the areas to the north of Jameson Canyon, and to the south extending to I-80. Three large parcels south of SR 12 are strategic from an open space and trails perspective:

Table 6-1: Open Space and Potential Trail Access South of Jameson Canyon

| Parcel | Location | Notes |
|---|---|---|
| Newell Ranch Open Space* | Napa County, between American Canyon and the Napa/Solano county line | A narrow corridor at the western end connects to American Canyon |
| Lynch Canyon Open Space | Solano County, between Newell Ranch Open Space and I-80 | Includes Lynch Road, which has an interchange on I-80 (1.75 miles southwest of Red Top Road). Lynch Road connects under I-80 to McGary Road. |
| Creston Station Ranch (private) | Mostly in Napa County, along the county line between the CNRR railroad and Newell Ranch Open Space | Owners may support Bay Area Ridge Trail access through their property to Newell Ranch Open Space |

** Full name: The Jack and Bernice Newell Open Space*

### *6.2.1 Circulation Opportunities and Constraints*

This section describes roadways, paths, intersections, interchanges, and related planned projects in the Jameson Canyon study area.

#### Highway and Railroad Coordinates

Because several potential trail segments run along or near either SR 12 or the Union Pacific Railroad, descriptions in this section use established roadway or railroad milepost as reference coordinates. Caltrans maintains "postmile" (PM) values along state highways. Postmiles identify the state highway number, the county (abbreviated and capitalized), and the distance from the highway's zero point in that county. Because SR 12 is the only state highway whose postmiles are referenced, this document omits the highway number for brevity and states SR 12 postmiles as follows:

| County | Postmile example | Zero reference point |
|---|---|---|
| Napa | [NAP 1.23] | SR 29 |
| Solano | [SOL 1.23] | Napa/Solano county line |

The east end of the study area – the western terminus of the path along I-80 connecting Red Top Road to Green Valley Road -- is located at approximately [SOL 2.45].

The Union Pacific Railroad line also has mileposts through the study area. Near the east end of the study area, the grade crossing of Red Top Road is at UPRR milepost 55.5 (DOT 751317P). Toward the southwest end of the study area, the grade crossing of Watson Lane is at milepost 62.2.

#### State Route 12 (SR 12), Jameson Canyon Road)

SR 12 (Jameson Canyon Road) within the study area is a 2-lane high-volume rural highway. Its western end is a major signal at SR 29 [NAP 0.00]. The eastern end of the study area is just east of Red Top Road [SOL 2.45]; east of this point the SR 12 designation continues on I-80 north past the Green Valley Road and I-80/I-680 interchanges before SR 12 diverges eastward from its own I-80 interchange toward Suisun City and Rio Vista. Within the study area, SR 12 has no traffic signals or stop signs between I-80 and Kirkland Ranch Road. Because of the high motor traffic volume in both directions, safe two-direction gaps are extremely rare, making it generally unsafe and impractical for pedestrians or bicyclists to cross the highway, despite it currently having no median barrier.

#### SR 12 Widening, Napa and Solano Counties

SR 12 is planned to be widened beginning in late 2010. Right of way acquisition for the project is anticipated to commence in April 2010. According to Mark Thomas Company (MT&Co) project designers, their preliminary work included evaluation of providing a Class I facility within the Caltrans ROW, but it was considered to be too costly and not within original scope agreed to by Caltrans. The SR 12 widening project will allow the shoulders to be used as Class II bike lanes. MT staff thought it would be very difficult and expensive to include a Class I trail within the Caltrans ROW. Acquisition of additional ROW to accommodate a trail is highly constrained (both by steep slopes and probably by adjacent private landowners who may not be willing sellers in several places).

This SR 12 project will widen the existing roadway between SR 29 and I-80 to two lanes each way, adding the following features:

- Wide (8') Class II bike lanes for the entire distance, also usable as breakdown shoulders

- A continuous median barrier except at the Kelly Road and Kirkland Ranch Road signals and at two U-turn areas, one at Lynch Road and one approximately 600 feet east of Ranch Road/1800 feet west of Spurs Trail, just east of the Napa/Solano county line. At the easterly u-turn location, a separate 1600 ft. private access road is planned along the north side of the highway. This separated access road could potentially serve as an off-highway segment of the Ridge Trail connector route if access rights were obtained.
- Two unsignalized U-turn areas, one at Lynch Road [NAP 2.02] and one approximately midway between the Napa/Solano county line and I-80. Through traffic will not stop at these locations. A deceleration and storage lane along the median divider will enable drivers making U-turns to safely await a gap in opposing traffic. No crosswalks or other support for pedestrian crossings are planned at these locations.
- A Large Mammal Crossing under the highway at Cattle Creek east of the Napa/Solano county line [SOL 0.8]. This could potentially also be used by pedestrians, equestrians and dismounted bicyclists (see below).

Because the widening project will add a median barrier, crossing the highway will become physically impossible except at signals (Kirkland Ranch Road, Kelly Road, and SR 29). There will also be a vehicular U-turn opening between SR 29 and I-80, but this will not include signals to enable pedestrians to cross. For these reasons, SR 12 is an existing and future barrier to crossing by nonmotorized users except at signals and potentially at a proposed Large Mammal Undercrossing at Cattle Creek.

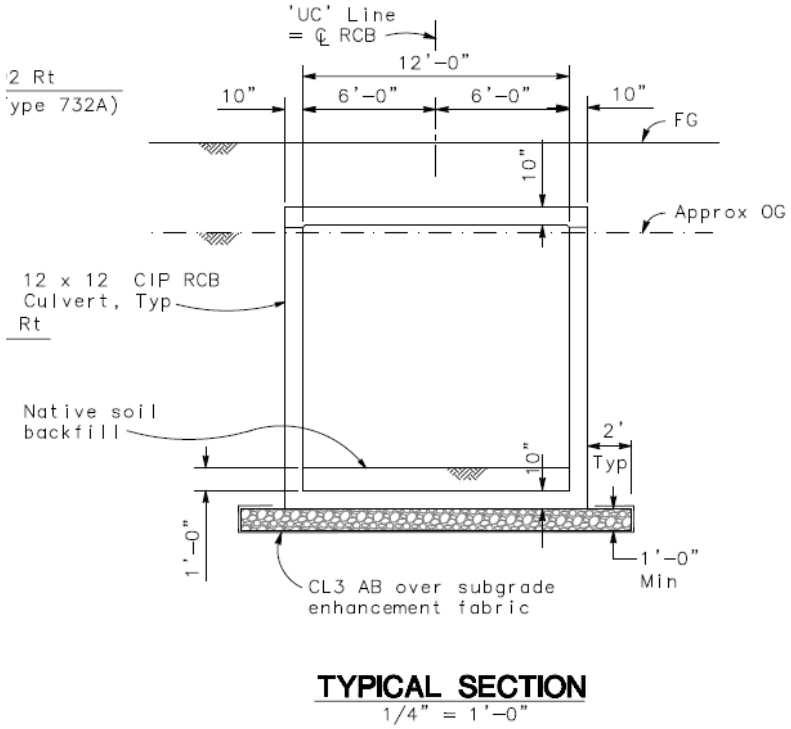
The tentative construction schedule is as follows:

| County | Construction start | Construction end |
|---|---|---|
| Napa | Fall 2011* | December 2013 |
| Solano | Fall 2011* | December 2014 |

*delayed due to State Budget crisis; estimated start date

## SR 12 Large Mammal Crossing

The large mammal crossing will consist of a 12 ft by 12 ft. box culvert under the highway. The SR 12 project does not include transitions to grade or extension of the trail beyond the area of roadway lanes. Design of this crossing has been coordinated with the United States Fish and Wildlife Service (USFWS). USFWS is aware that the large mammal culvert may be used in the future as part of a pedestrian/bicycle/equestrian facility. USFWS requested upsizing all the culverts and storm drains to facilitate small mammals, and this will be completed as part of the project. The large mammal crossing will be located in a separate structure from the drainage culvert. To develop an undercrossing that would accommodate pedestrians, bicyclists and equestrians, we studied FHWA's recommendations on trail design as well as requirements for ADA compliance. Caltrans findings are as follows:




- To accommodate equestrians, such an undercrossing must be at least 10 feet in height.
- To accommodate bicycles, such an undercrossing must be at least 10 feet wide.
- The minimum slope and surface must meet the requirements for ADA compliance and State issued DIB 82-03.
- And, the undercrossing must be lighted.

## SR 12 / 29 Interchange

This project would grade separate SR 29 over SR 12, replacing the existing major signal. As part of this project a shared-use path would be constructed along the south side of SR 12 between Devlin Road and Kelly Road. This project is in the early planning stages.

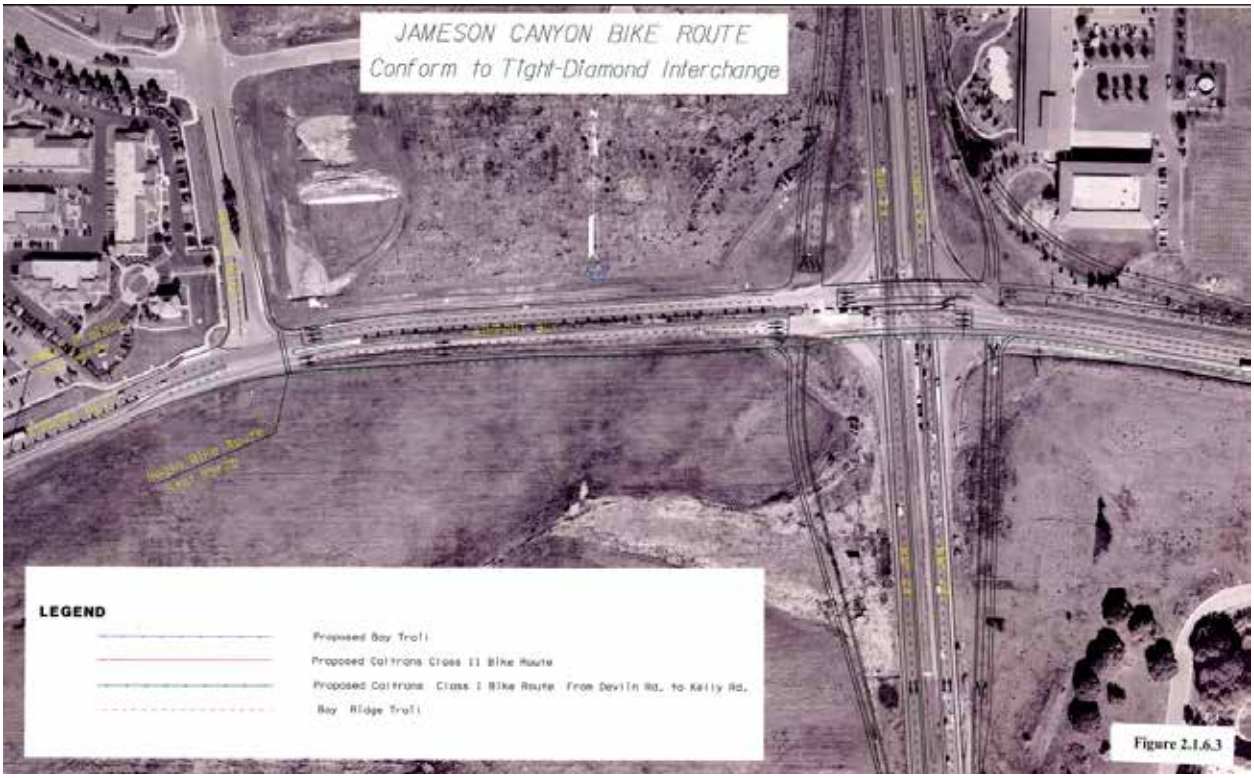


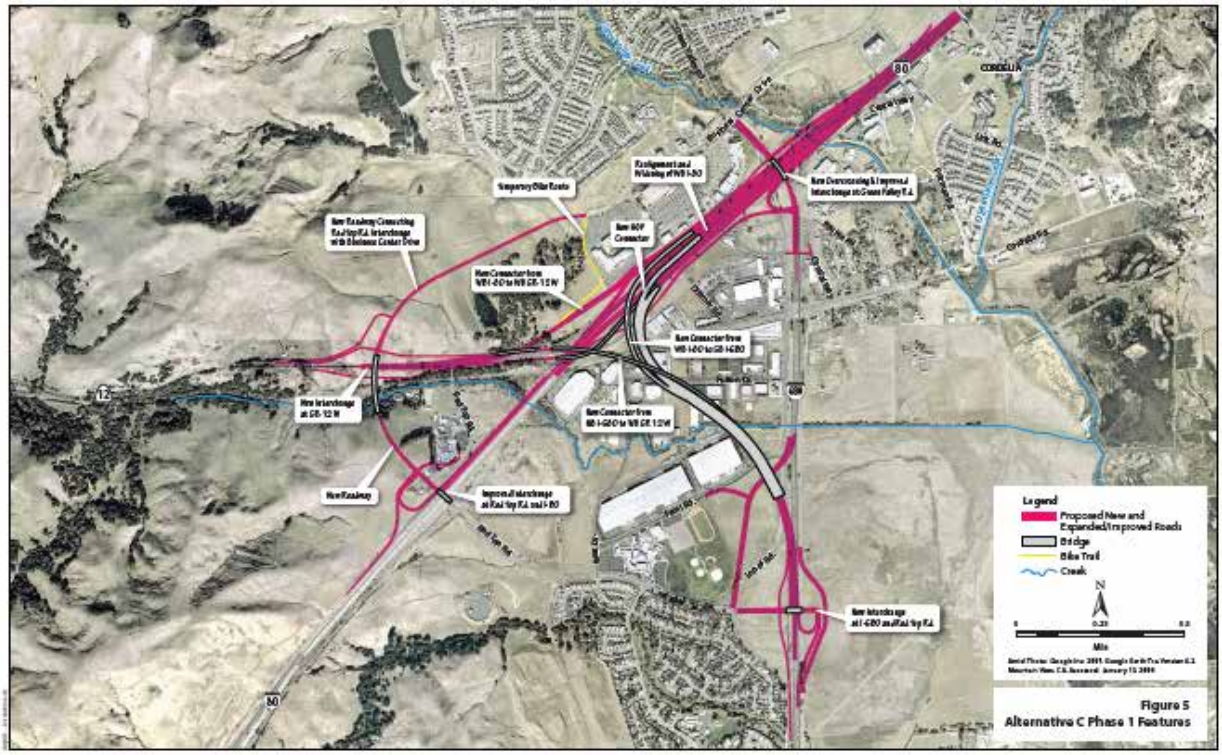

Figure 2.1.6.3

## I-80 / I-680 / SR 12 Corridor Improvements, Solano County

This is a multi-phased project to improve the I-80/I-680 transportation corridor between Red Top Road and the SR 12 east interchange, and beyond. The initial construction package, tentatively scheduled to commence in 2012, would begin the multi-phased construction of these improvements.

The STA Board locally preferred alternative would include complete replacement of Red Top Road between SR 12 and I-80, aligned on an arc west of the road's current SR 12 intersection. This project includes a grade separation over SR 12 and the railroad, connecting into the existing I-80 interchange, and a connection to Business Center Drive to the north. It will include bike facilities. The existing Red Top Road will be dead-ended at the railroad and will continue to serve as a local access road. The existing at-grade public railroad crossing will be closed, with potential exchange of crossing use associated with a future grade separation project elsewhere.

Bicycle and pedestrian facilities will be provided as part of the project. In addition, the project should include bicycle and pedestrian connections and transitions to existing facilities, including the Ridge Trail route along I-80 that connects to Green Valley Road and access to the bike lanes on SR 12. The project should be designed and implemented so as not to preclude any trails, paths or connections implemented as part of the Jameson Canyon Plan, and provide connection from Red Top Road to McGary Road.




I-80/I-680/SR 12 Corridor Improvements, Alternative C Phase 1

## Devlin Road

Devlin Road parallels SR 29 approximately ¼ mile to the west discontinuously, for approximately one mile north and one mile south of the SR 12 intersection, providing access to light industrial and warehouse uses in the Napa Corporate Park east of Napa Airport. The road is currently discontinuous. It has bike lanes on its northern segment (SR 29 to Aviation). At its south end it meets Kelly Road just west of SR 29.

The Napa County Public Works Department is in the initial design stages of a project that would extend Devlin Road south across Fagan Creek to fill in the missing gap in the roadway in this area.

Devlin Road is a Bay Trail and Ridge Trail connector route, and is being considered as a Vine Trail alignment.

## State Route 29 (SR 29)

SR 29 runs north-south along the western edge of the study area, connecting Vallejo through American Canyon, Napa, and points north. SR 29 has a major signal at SR 12 that is planned for replacement by a new grade separated interchange.

## Kelly Road

Kelly Road intersects SR 12 at a signal ¼ mile east of SR 29 [NAP 0.25]. It parallels SR 29 for approximately one mile north and one mile south of SR 12, and provides access to light industrial and warehouse uses and to Eagle Vines Vineyards and Golf Club south of SR 12. At its south end, Kelly Road crosses SR 29 at a signal and continues west, intersecting Devlin Road before ending at Airport Road.

Near Kelly Road's south end on the east side of SR 29, a private ranch road intersects from the east. That road runs eastward to a private crossing of the UPRR rail line at UPRR milepost 61.0.

Kelly Road is a Bay Trail and Ridge Trail connector route.

## Kirkland Ranch Road

Kirkland Ranch Road intersects SR 12 at a signal [NAP 1.31], whose south leg is the entrance to Chardonnay Country Club. The road turns east and serves the water treatment plants of the Cities of American Canyon and Napa near the intersection of Polson Road, then turns south as Lynch Road, intersecting SR 12 again approximately 4/5 mile east of the above signal [NAP 2.04]

## Polson Road and Mason Road

Polson Road and Mason Road are described here because they are potential endpoints for this feasibility Plan's northernmost alignment corridor.

West of the hills, Polson Road extends north of Kirkland Ranch Road starting at the City of Napa Water Treatment Plant, then curves eastward. It is private except within 0.3 miles of Kirkland Ranch Road.

East of the hills, Mason Road runs west from Green Valley Road as a public street for approximately 1.3 miles to a ranch gate, then another 2.4 miles to its western terminus at a residence, approximately 1 mile due north of the eastern end of Polson Road. Mason Road is now part of the Middle Green Valley Specific plan with future potential as a trail segment connecting Green Valley road to Vallejo Lakes.

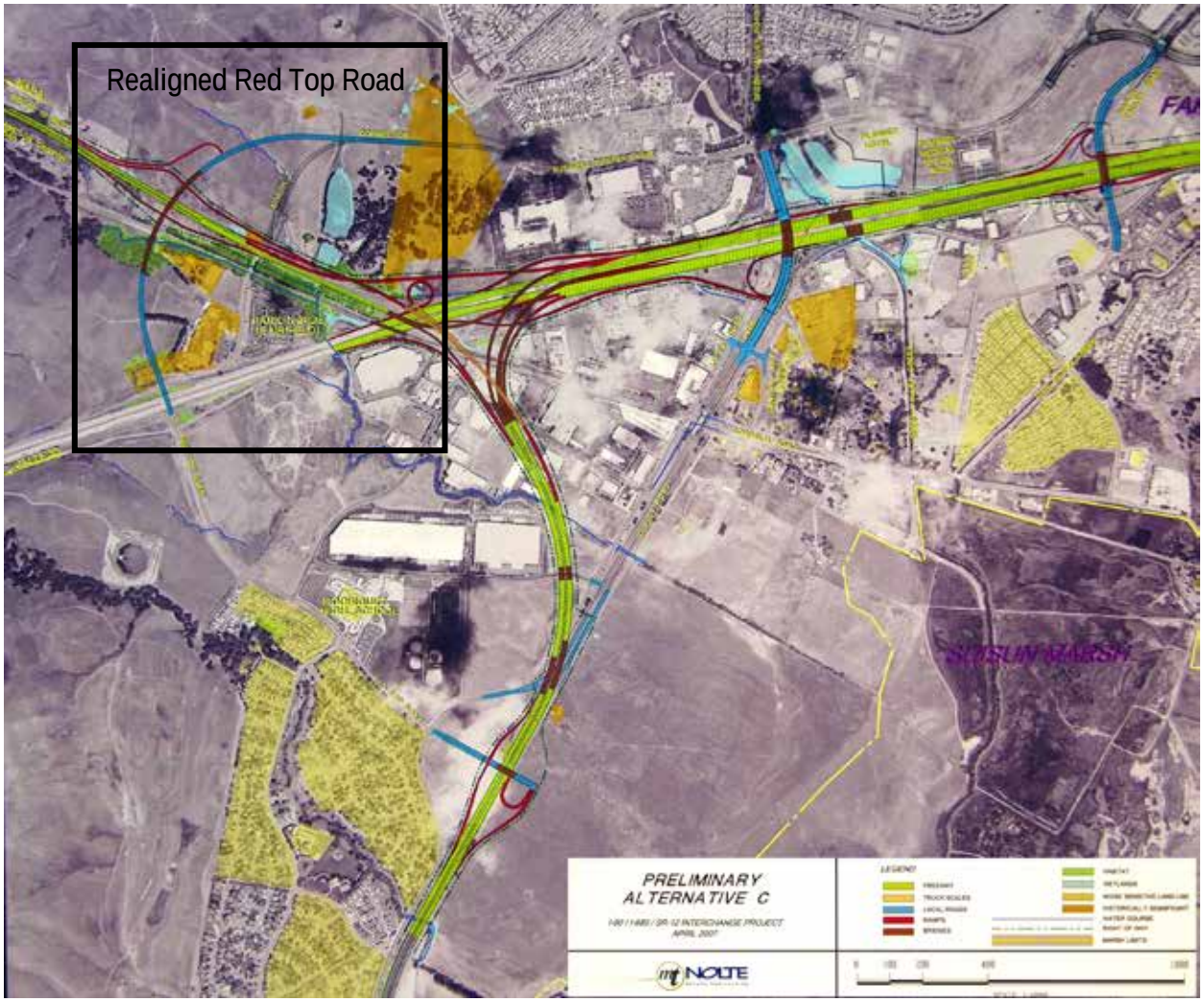
## Spurs Trail, Miner's Trail, and nearby private roads

Three private roads intersect SR 12 from the north between the Napa/Solano county line and the narrow portion of Jameson Canyon. Each serves several ranch properties to the north. The westernmost road [SOL 0.45] has no name. The remaining private roads are Spurs Trail [SOL 0.88] and Miner's Trail [SOL 1.0]. Spurs Trail is west of Cattle Creek, and Miner's Trail is immediately east of Cattle Creek, the location of the Large Mammal Undercrossing. One planned u-turn location is west of Spurs Trail, and includes a separate 1600 ft. private access road along the north side of the highway that could be considered for a portion of the Ridge Trail connector trail.

## Red Top Road

Red Top Road forms the eastern end of the study area along SR 12. It currently intersects SR 12 at grade at a T intersection from the south, crosses the UPRR rail line, serves several frontage businesses between the railroad and its interchange with I-80, then passes under I-80 and continues east, serving Rodriguez High School and nearby residential and commercial areas.

As part of the I-80/I-680/SR 12 Interchange project (discussed previously), Red Top Road will be realigned to the west of its current configuration, and will connect with an extension of Business Center Drive with an overpass over SR 12. Design of this segment should not preclude connection and transitions to a future Jameson Canyon trail.



## I-80

I-80 originates in San Francisco and runs approximately southwest-northeast past the study area between Vallejo and Fairfield. Along the east end of the study area it has the following interchanges: Red Top Road, and SR 12. To the north are the interchanges at I-680, Green Valley Road, and SR 12 East. The freeway also carries the SR 12 designation between the west (rural highway) and east (expressway) segments of SR 12.

## McGary Road

McGary Road is the east frontage road of I-80 from south of Lynch Road to just north of Red Top Road. This road is a vehicular route with Class II bicycle lanes on each side, and has been dedicated as part of the Ridge Trail available for hikers, bicyclists and equestrians. This road provides a local connection between Vallejo and Cordelia/Fairfield.

## Lynch Road

On the west side of I-80, Lynch Road extends in a northwesterly direction into the Lynch Canyon Open Space, ending there. There is a dedicated Ridge Trail segment within the Lynch Canyon Open Space, and along Lynch Road, connecting to McGary Road, north to Red Top Road, and south to Hiddenbrooke Parkway and Hiddenbrooke Open Space. Various maps also identify the eastern portion of Kirkland Ranch Road, between Polson Road and SR 12, as Lynch Road.

## Bay Area Ridge Trail Dedicated Segments

In the vicinity of the Jameson Canyon corridor, the Ridge Trail has an extensive network of dedicated segments that provide a presence in southern Napa and Solano counties. Dedicated segments include:

- Skyline Park, Napa
- Napa Solano Ridge Trail
- Rockville hills Regional Park, Fairfield
- McGary Road
- Lynch Road
- Lynch Canyon Open Space
- Hiddenbrooke Open Space

Within the study area, the Bay Area Ridge Trail Council has defined a north-south alignment corridor just west of the Napa / Solano county line. To connect the Ridge Trail across the SR 12 corridor requires crossing SR 12, the railroad, and Fagan Creek. There are three potential alternatives for the Ridge Trail crossing of SR 12:

§ Large Mammal Crossing. As identified above, the Ridge Trail route could utilize the Large Mammal Crossing under SR 12 that is planned as part the SR 12 widening project. This would necessitate an alignment that goes north/south across the railroad corridor utilizing the private at-grade crossing near the county line. The Ridge Trail would likely parallel SR 12 (east-west) for approximately ---feet to reach the mammal crossing. The trail could be a separate shared use path, or would need to utilize the SR 12 bike lanes to make this connection.

Issues with this route and use of the Large Mammal Crossing include:

- Use of the Class II bike lanes as a Ridge Trail route, which envisions use by pedestrians and others;
- Transitions and ADA accessibility to the undercrossing from the adjacent path;
- Safety fencing or other barriers to discourage social crossing of SR 12 at the at-grade rail crossing location; and
- Addressing Caltrans requirements to make crossing accessible to people

- Kirkland Road Crossing. Under this alternative, from the railroad crossing, the Ridge Trail would join the east-west shared use path and proceed west on the path to Kirkland Road. The Ridge Trail would cross SR 12 at the stop light to the north side of the highway and proceed up Kirkland Road. At this location, pedestrian improvements would be needed to facilitate a safe crossing of SR 12.

- Red Top Road. Under this alternative, at the railroad crossing, the Ridge Trail would join the east-west multi use trail and proceed east on the multi use trail to Red Top Road. It would then cross the railroad and SR 12 as part of the I-80/I-680/SR 12 interchange improvements, and continue north through Green Valley. Issues associated with this crossing include:

    - I-80/I-680/SR 12 interchange improvements completed as part of the interchange would need to be designed to ensure a smooth transition to the existing shared use path along the north side of I-80 between Red Top and Green Valley Roads including a connector segment which would extend north from the SR 12/Red Top Rd intersection connecting into Business Center/Mangels Blvd. area in north Cordelia. This route would provide for the continuation of the Ridge Trail to connect to the dedicated trail to Rockville Hills Park.

    - Locating the crossing at Red Top Road, at the east end of the corridor would not provide a direct connection to potential north-south routes near Kirkland Road, although trail users could utilize the SR 12 Class II bike lanes as a connecting route.

### *6.2.2 Railroad Opportunities and Constraints*

Union Pacific Railroad (UPRR). The rail line within Jameson Canyon is owned by Union Pacific Railroad, and operated by California Northern Railroad (CFNR, owned by RailAmerica). CFNR operates freight service on leased UP rail lines, including Schellville to Napa Junction and Suisun-Fairfield (23.6 miles). A single-track freight railroad parallels SR 12 on the south side from I-80 to west of the Napa/Solano county line, near the east end of the Chardonnay Golf Course, where the rail line turns south toward Napa Junction and American Canyon. Within the canyon the highway and railroad run close together, separated only by a steep hillside. East and west of the canyon they are far enough apart to accommodate agriculture and ranch parcels.

The railroad crosses under I-80 and has an at- grade crossing at Red Top Road. Between Red Top Road and Watson Lane near Napa Junction there are only three private crossings – two within the Jameson Canyon area where the railroad runs close to SR 12, and one on a long private service road that runs east of Kelly Road, along the southern end of Eagle Vines Golf Course and Chardonnay Golf Club.

Use of the Rail Corridor for a Trail. Although several of the adopted agency plans for the study area indicate a trail along the rail corridor (including Caltrans 2005 Study that identified this route as an ideal location for a shared use corridor), UPRR has indicated that they will not support nor consider public acquisition of right of way for a trail. The project team consulted UPRR, regarding rail plans and options for a rail/trail project. Terrel Anderson, Manager for Northern California, Oregon and Washington, based in Roseville, indicated that Union Pacific will not support any trails on or near their right of way, and intends to preserve all right of way for future operating growth.

Trail/Rail Crossing Issues. There are two public crossings of the rail corridor in Jameson Canyon: Red Top Road, and 6.7 miles southwest near Napa Junction. Each of these crossings is gated for vehicular travel. Between these crossings, there are six private railroad crossings with stop signs. The Ridge Trail from Lynch Canyon north to Napa County will need to cross the rail corridor, either at the public Red Top Road street crossing (future overpass), or at one of the private rail crossings, most likely the one nearest the Napa/Solano County line. This crossing accesses lands that have a dedicated Ridge Trail route. Use of this location would require conversion of the at-grade crossing

from private to public, through the PUC regulatory process (discussed below), and/or implementation of a grade-separated crossing.

Regulatory Issues. Railroad crossings are regulated by the California Public Utilities Commission (CPUC), including setbacks, grade separation, and use issues. General Order 26-D dictates setbacks, and General Order 75-D contains regulations for at-grade private rail crossings. In general, the CPUC strongly prefers that new rail crossing projects be grade separated, and often requires a nearby at-grade crossing to be removed if a new one is approved.

The California Public Utilities Code Section 7537 regulates private railroad crossings in conjunction with General Order 75-D:

*"The owner of any lands along or through which any railroad is constructed or maintained, may have such farm or private crossings over the railroad and railroad right of way as are reasonably necessary or convenient for ingress to or egress from such lands, or in order to connect such lands with other adjacent lands of the owner. The owner or operator of the railroad shall construct and at all times maintain such farm or private crossing in a good, safe, and passable condition. The commission shall have the authority to determine the necessity for any crossing and the place, manner, and conditions under which the crossing shall be constructed and maintained, and shall fix and assess the cost and expense thereof."*

Conversion of a private crossing to a public crossing would be subject to agreement from the property owner, the regulatory authority of the CPUC, and may be opposed by UPRR. Grade separation of trail facilities is a probable recommendation for any new trail crossing.

Railroad Grade Separation. In urbanized areas, the decision to create grade-separated crossings where an at-grade crossing already exists is often a factor of volume of use. The Manual on Uniform Traffic Control Devices (MUTCD) Guidelines recommend evaluation of all at-grade crossings as part of projects, due to the potential for accidents and congestion. A review of literature regarding pedestrian grade separation projects generally utilizes pedestrian traffic volumes of at least 100 users per hour, or higher peak averages when considering grade separation. Table 6-2 provides some general guidelines to determine the appropriate use of underpasses vs. overpasses for grade separation.

Table 6-2: Railroad Grade Separation/Crossing Guidelines

| Design Issue | Underpass | Overpass |
|---|---|---|
| Vertical Clearance | 8.5 to 10 ft. + 3 ft. cover | 26 ft. + |
| Access Ramp | 100 ft.+ | 208 ft. + |
| Utility Conflicts | Possible | No |
| Drainage | Pump may be needed | No |
| Security/Visibility | May be needed depending on location | May be needed depending on location |
| Cost | $500K + | $1M+ |
| Vandalism | Yes | Yes (need enclosed crossing) |

Guidelines for Overpasses. In general, overpasses are utilized to separate high-volume/high-speed pedestrian and motorized traffic. A typical overcrossing of a railroad is elevated at least 26 feet above the tracks, with approach ramps for ADA access at a maximum grade of 5% slope (limited segments may be slightly steeper if a level landing area is provided). Within the Jameson Canyon corridor, there are areas where the natural topography within the

eastern corridor could be optimized to reduce the overall length and height of overcrossing ramps; however, the structure would still be visually imposing, and relatively expensive.

***Stevens Creek Trail, Santa Clara***

***AMTRAK, Emeryville, CA***

***AMTRAK, San Luis Obispo, CA***

Federal research also indicates that an overpass structure may not be used if a more direct route is available. Vandalism, security and user safety issues increase where the volume of pedestrian use is low, and trail users might create "social trails" with informal trespass of the existing rail line. Ramps and stairs may also discourage use of the structure, although placing a ramp perpendicular to the structure directly from the trailhead area may be utilized to increase accessibility.

Caltrans Highway Manual (1985) recommends overpasses where grade separation is to be provided, due to potential for vandalism and crime. Costs associated with overpass construction include length and height of the structure, need for vertical clearance, ADA ramp, enclosure to protect the rail line from falling objects, and fencing adjacent to the tracks to prevent trespass.

Guidelines for Underpasses. Underpasses are less popular in urban areas, due to concerns regarding crime, vandalism, drainage, high water tables, and relocation of utilities, not all of which apply at this site. Where possible, the rail track or roadway may be raised slightly to reduce the depth of the tunnel, to allow better visibility (although not likely at this site).

***Davis, CA***

***Santa Clara, CalTrain***

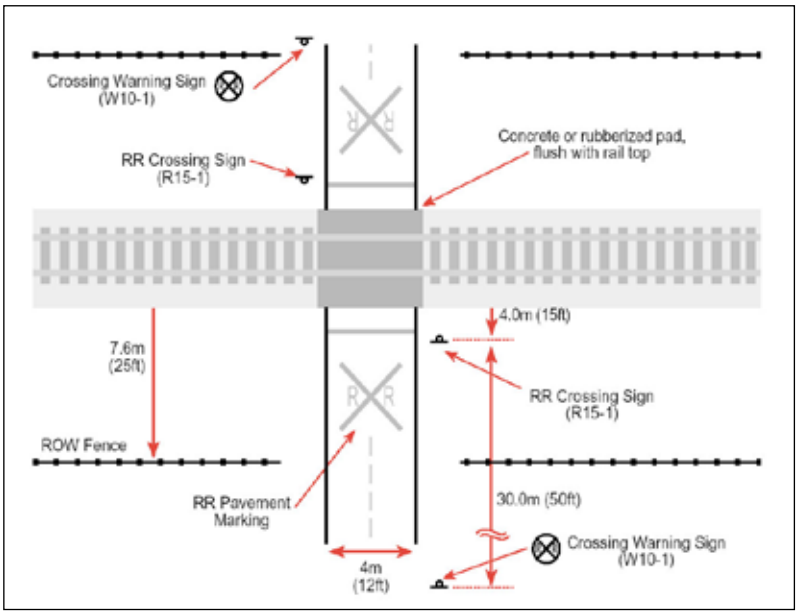
***Fremont, CA***

Within the Jameson Canyon corridor, there are also several areas where the tracks are located on levees that could be retrofitted with a short underpass. However, UP's right of way is approximately 100 feet wide, and tunneling for this distance, if required by UP, would be costly and could be technically challenging.

Issues related to an underpass at this site include geotechnical challenges related to shallow groundwater and poorly drained and weak soils, and potential conflicts with future rail use of the corridor. In addition, depending on the proximity of any underpass to existing at-grade crossings, trail users may attempt unsafe crossing shortcuts at-grade, even if they are signed as private crossings.

Design. According to Chapter 1000 of the Caltrans Highway Design Manual, the minimum acceptable vertical clearance for an underpass is 8.5 feet, with a width of 12 to 14 feet. An underpass would likely include concrete

headwalls, retaining walls and long ramps, and fitted with lighting and a pump system if located near any creek systems, or in an area subject to seepage.




***Typical At-Grade Rail Crossing Improvements***

Warrants. Specific warrants (justification) were developed by the US Department of Transportation in 1984 for grade-separated pedestrian crossings, and warrants were also included in the Caltrans Highway Design Manual (1995, for street grade separation). Within Jameson Canyon, most of these warrants would not apply:

- Pedestrian volumes over 100 persons per hour;
- Average Daily Traffic (ADT) vehicular volume greater than 25,000;
- The site is at least 600 feet from the nearest alternative safe crossing;
- There should be a physical barrier to prevent at-grade crossing;
- Artificial lighting of underpasses is recommended;
- Topography should be considered to minimize construction costs;
- Adjacent land uses should be considered;
- Funding must be available for the crossing;
- Study of present and future conditions regarding pedestrian usage and traffic volumes;
- School crossings.

Guidelines for At-Grade Crossings. If an at-grade crossing is allowed, it will be required to have safety signage, crossing improvements and warning devices. Fencing and barriers would be installed to funnel trail users to the crossing location, to avoid unregulated crossings. All signs, safety markings and other improvements will conform to the Manual of Uniform Traffic Control Devices. Signage will be installed to warn trail users, as well as signs warning the public not to trespass on railroad property.

### *6.2.3 Water/Utility Easements*

Several underground utility pipelines are located within or very near the UPRR ROW, including a high pressure gas line owned and operated by Kinder Morgan, the City of Vallejo water supply line, and the California Dept. of Water Resources North Bay Aqueduct pipeline (the aqueduct crosses to the north side of SR 12 near the mid-point of the Canyon). Based on discussions with a representative from the City of Vallejo Water Department who is familiar with this area, all of these utility pipelines are located within sub-surface easements on private lands, with surface rights only for repair and maintenance. A trail alignment along these utility easements does not appear to be feasible as part of the current easement agreement.

The City of Napa and the City of American Canyon operate water filtration plants off of Polson Road, and connect to water pipelines running west along SR 12 to their respective cities. These pipelines also are within underground easements whose surface rights do not allow trail construction and operation.

Napa Sanitation District owns and operates a large wastewater disposal facility on the north side of SR 12 between North Kelly Road and Kirkland Ranch Road, which they use for disposal of reclaimed water on irrigated hay fields. Potentially, (with agreement from Napa Sanitation District and appropriate design buffers) a trail could utilize a portion of the perimeter service road adjacent on the north side of SR 12 without affecting water disposal capabilities and ranching operations.

Locating a trail within utility easements would require coordination and agreement with each individual utility. Assumption of liability and risk, and agreement regarding who is responsible for repair of damage of the trail following utility maintenance would likely be a component of any right of way or use agreement discussions.

## 6.3 Environmentally Sensitive Zones and Constraints

Subject areas assessed in the environmental sensitivities analysis include:

- Topography and steep slopes
- Geology and slope instability
- Hydrology and flooding potential
- Biological Resources, including wetlands, special habitat areas, and sensitive species

The analysis was based on a field reconnaissance and a review of the following primary sources of information:

- SR 12 Initial Study/Mitigated Negative Declaration
- SR 12 Jameson Canyon Road Widening and SR 12/29 Interchange Improvement Project- Natural Environment Study
- Napa County General Plan- Environmental Impact Report
- Solano County General Plan-Environmental Impact Report
- Napa County Baseline Data Report (BDR).
- Solano County Water Agency; Multiple Species habitat Conservation Plan

### *6.3.1 Topography and Slopes*

Jameson Canyon forms a relatively narrow, moderately to strongly sloping, steep sided canyon that runs approximately 6 miles from the vicinity of Red Top Road (about ½ mile west of Interstate 80) to the mouth of the canyon near the Napa County Airport, which is just east of the SR 12/29 intersection. Topography in the project area is gradual on the west-facing slopes of the lower Napa Valley in the westernmost portion, and steeper on the north- and south-facing slopes of Jameson Canyon in the eastern portion.

Two highly dissected and more or less indistinct ridges form the upper slopes of the canyon on the north and south sides, with the northern ridgeline at about 900 to 1100 feet in elevation, slightly higher than the southern ridge line whose elevations lie between 850 to 900 feet. The width of the corridor formed by these ridges is about 11,000 to 13,000 feet on average. In contrast, the flat valley bottom only ranges in width from about 500 or 600 feet to as much as 1,200 feet. In one area, beginning about 2,500 feet west of Red Top Road, the canyon is very narrow and steep-sided, forming a heavily wooded gorge. The existing SR 12 is cut into the sandstone canyon walls in this area.

Jameson Creek, which flows eastward, runs near the base of the north slope, while Fagan and Sheehy Creeks, which flow west, are located near the south side of the small canyon valley. The north side slopes of the valley appears to be slightly steeper than the south side, with slopes ranging from 25% to well over 75% on the north, and 15% to 60% on the south. The south side has a more or less flattened toe slope along much of the canyon corridor, while the north slopes typically lack this flatter slope where the steep foothills transition to the valley floor. In many areas it appears that some of the flatter areas represent landslide run-out deposits.

As previously mentioned, both the north and south slopes are especially steep along a 2,500 foot long segment beginning about ½ mile west of Red Top Road. The existing SR 12 alignment has been cut into the canyon slope here, with a near vertical road cut height of nearly 30 feet. The heavily oak wooded Jameson Canyon Creek is at the toe of this escarpment. The steepness of the canyon slopes in this area significantly constrains the location of a trail alignment on the north side of SR 12.

Figure 6-2 presents a Slope Constraints Map of the Jameson Canyon corridor, prepared from available LIDAR topographic data. The slope map uses contrasting colors to depict slope ranges of 1% - 10%, 11% - 25%, 26% - 50%, and >50%. It is relatively easy to construct a Class I trail on slopes less than 10%, and becomes increasingly challenging, with higher costs, larger hillside cuts and greater disturbance areas, and much greater impacts on slopes above 25%. Although perhaps technically possible, constructing a Class I trail across large areas of slopes in excess of 50% should probably be considered infeasible.

Inspection of the slope map confirms that the most feasible route from a slope constraints perspective may be along the south side toe of the canyon, especially on the east end.

### *6.3.2 Geology and Slope Stability*

The Jameson Canyon corridor lies on the eastern edge of the California Coast Ranges, a complex, folded, northwest-trending range of mostly Cretaceous and Jurassic age rocks. The province is characterized by a series of northwesterly trending ridges, faults, and valleys and is bounded on the east by the Great Valley Province (Sacramento Valley) and on the west by the Pacific Ocean. Jameson Canyon is a rare east-west trending feature in the otherwise northwest-trending Coast Ranges.

The bedrock of this range consists mostly of folded and faulted sedimentary rocks with minor metamorphic and volcanic components, although there are significant expanses of volcanic rocks further to the north on the east side of the Napa Valley and underlying the Sonoma Mountains to the west.

The region is one of highly seismic activity, with numerous active or potentially active faults nearby including the San Andreas, Hayward, and Calaveras Faults. These are located near enough to the corridor to produce significant ground shaking and strong ground motion throughout the project area. The Green Valley Fault lies just 1.2 km (0.74 miles) east of Jameson Canyon, and marks the boundary of the Coast Ranges and the Great Valley alluvial plain to the east. Jameson Canyon lies between the Green Valley Fault Zone and the West Napa Fault Zone.

The rocks underlying the canyon are composed primarily of sandstones and shales of the Eocene Markley Formation. The Markley Formation is highly folded with axes trending northwest. The Markley formation where exposed in the roadway cut slopes consists of gray silstone and fine- to medium-grained, micaceous, arkose sandstone. At some locations in the Markley Formation, inclined clay layers have caused extensive landsliding. Most of the valley bottom of the Canyon is underlain by recent alluvial deposits, although older alluvial deposits are located at the western end of the corridor.

Extensive landslide deposits, many of which are large and actively moving, have been mapped especially in the southeast portion of the Canyon, south of Jameson Canyon Creek. Figure 6-3 presents a map of existing landslides in this area, derived from the ABAG Hazards Mapping website http://www.abag.ca.gov/bayarea/eqmaps/onaturalh.html. These landslide features will greatly affect the design, construction, and the ongoing maintenance needs of a paved, Class I trail, and constitute a major challenge and constraint to trail location. Nonetheless, if a trail were to be located on the side slopes at the east end of the canyon, it would need to traverse an area of active landslides, as do both SR 12 and the railway.

### 6.3.3 Hydrology and Flooding Potential

Three principal creeks drain Jameson Canyon: Jameson Creek, Sheehy Creek, and Fagan Creek. The east-west canyon actually drains into two differing water bodies, with the eastern end of the corridor and Jameson Creek draining past Cordelia east to Suisun Slough and Suisun Bay, and Sheehy Creek and Fagan Creek draining west to the lower Napa River. The former rail siding at Creston Station, located just off SR 12 near the center of the canyon, is the approximate watershed divide.

Jameson Canyon Creek itself is a small intermittent creek, with the channel bed typically less than 15 to 25 feet across. It is moderately incised, with stream bank heights of 8 to 10 feet or more. Several smaller un-named side tributaries drain the canyon. Sheehy and Fagan Creek are similarly sized. The floodplains of Jameson, Fagan, and Sheehy Creeks are small, with flood flows largely confined to the incised channel area, and virtually all of SR 12 is above the 100-year floodplain of these creeks. Flooding of the highway is only indicated where Fagan Creek crosses SR 12 at Kirkland Ranch Road. Figure 6-4 presents a map of flood hazard areas, based on FEMA floodplain mapping, as derived from the ABAG Hazards Mapping web page. http://www.abag.ca.gov/bayarea/eqmaps/onaturalh.html. However, portions of the rail corridor and parts of the valley bottom are within the floodplain of these creeks.

In terms of hydrologic constraints, creek crossings will require bridging, and there may be up to 8 to 10 small bridges required for construction of a Class I trail within the Jameson Canyon Corridor, depending on the selected alignment alternative. The elevation of the bottom of any proposed bicycle/pedestrian bridge will need to be above the 100–year flood elevation, with bridge abutment elevations located above Ordinary High Water (the approximate 2-year creek high water flow line), to be consistent with County, FEMA and FHWA regulations. Each bridge will need to be about 40 to 60 feet long to clear span the creek and its lower banks.

### 6.3.4 Biological Resources

Jameson Canyon is primarily comprised of grazed annual grasslands located on the steep canyon side slopes and along the edges of the alluvial valley, with Coast Live Oak woodland habitat located on several north-facing slopes, mainly at the east end, and on the upper sides of small tributary stream canyons. In addition, there are several small areas of brushland, and some linear windbreaks and stands of Blue Gum Eucalyptus. A narrow band of riparian (oak-willow) forest follows Jameson Creek, Fagan Creek, Sheehy Creek and their main (un-named) tributaries. In addition to these main habitat types there is a small area of alkali grassland and associated vernal pool habitat located in the northwest portion of the corridor, just west of SR 29. Figure 6-5 presents a map showing natural plant communities and habitat types, taken from the SR 12 Widening Project Natural Environment Study (NES), while Figures 6-6.1 through 6-6.3 show areas of wetlands and Waters of the US, such as creeks.

At the western end of the corridor, farmed irrigated hayland and two golf courses occupy the north and south sides of SR 12 respectively. There are also several areas of vineyards along both the north and south sides of SR 12, from east of Kelly Road to just east of Lynch Road. In addition, several small seasonal wetlands are found on the alluvial valley floor near the center of the corridor near the Napa- Solano county line.

#### Vegetation

Annual Grassland. Annual grassland is the most extensive plant community, occupying well over ¾ of the study area. Dominant plant species within this type include a large number of non-native annual grasses and weedy plants such as Italian ryegrass *(Lolium multorum,* Italian thistle *(Carduus pycnocephalus),* wild oats *(Avena barbata),* soft cheatgrass and ripgut grass *(Bromus hordeaceous* and B. *diandrus).* On the south-facing slopes of Jameson Canyon, black mustard *(Brassica nigra),* and fennel *(Foeniculum vulgare*), are more common locally. Other ruderal or weedy species that occur in more disturbed areas include chicory *(Cichorium intyhus),* Mediterranean Mustard *(Hirshfeldia incana),* and bull mallow *Walva nicaeensis).*

Three native perennial grasses, purple needlegrass *(Nassella pulchra),* California oatgrass *(Danthonia californica),* and alkali rye *(Leymus triticoides)* also occur in small, less disturbed areas within the study area.

The areas of open grassland are important habitat for several raptors such as Red-tailed Hawk *(Buteo jamaicensis),* and American Kestrel *(Falco sparverius).* California quail *(Callipepla californica),* Mourning Dove *(Zenaida macroura),* and Western Meadowlark *(Sturnella neglecta)* are a seed-eating birds that use grasslands for foraging and nesting. Insect eaters such as western scrub jays *(Aphelocoma californica),* barn swallows *(Hirundo* rustica), and northern mockingbirds *(Mimus polyglottos)* use the grassland areas for foraging. Mammals such as the California vole *(Microtus californicus),* pocket gopher *(Thomomys hottae),* and black-tailed jackrabbit *(Lepus coil fornicus)* forage and nest within grasslands. California ground squirrels *(Spermophilus beecheyi)* create burrows that are also used by other species*.* Mule deer *(Odocoileus hemiones columbianus)* use grasslands for grazing and resting at night. White tailed-kite *(Elanus leucurus),* loggerhead shrike *(Lanius ludovicianus), and* western burrowing owl *(Athene cunicularia hypugaea)* have been observed foraging within annual grasslands within the study area. Reptiles and amphibians rely on annual grassland for foraging and shelter.

The ruderal or disturbed and weedy areas provides some low-quality nesting and foraging opportunities for wildlife. Wildlife species commonly found in ruderal and disturbed areas include white-crowned sparrow *(Zonotrichia leucophrys),* Brewer's blackbird *(Euphagus cyanocephalus),* American goldfinch *(Carduelis tristis),* black-tailed jackrabbit, and California ground squirrel.

Oak Woodland. The dominant plant species in the oak woodland community is Coast Live Oak *(Quercus agrifolia)* with California Bay *(Umbellularia californica),* big-leaf maple *(Acer macrophyllum),* and California buckeye *(Aeseulus californica)* also present as common associates. The oak woodland areas typically have a closed canopy with a sparse understory of grasses*;* some areas have a dense shrub cover of poison oak *(Toxicodendron diversilobum),* common snowberry *(Symphoricarpos alhus var. laevigatus / S* rivularis)], and the introduced noxious Himalayan blackberry *(Ruhus discolor).*

Coast Live Oak woodlands provide habitat for a variety of wildlife species including a large number of birds. Cooper's hawk *(Accipiter cooperii)* may be expected to forage and nest within this habitat. Quail, wild turkeys *(Meleagri.s gallopavo),* squirrels, and deer all use this habitat type.

Riparian Forest. Coast Live Oak is also the dominant tree species in the Coast Live Oak-Willow Riparian Woodland habitat type, with red willow *(Salix laevigata),* arroyo willow (S. *lasiolepis),* and yellow willow (S *lucida* ssp. *lasiandra)* also present, along with California bay, big-leaf maple, and occasionally white alder, black walnut and valley oak *(Q. lobata)* tree species. The understory is often sparse and devoid of herbaceous species cover, but occasionally can be very dense with areas of native plants including common snowberry, Santa Barbara sedge *(Caret barharae),* California blackberry (R. ursinus), and horsetail *(Equisetum telmateia* ssp. *hraunii).*

Riparian areas are critically important to many species of wildlife, including amphibians, reptiles, birds, and small and large mammals. These areas provide cover, food, water, foraging, breeding and nesting habitat. The linear configuration of riparian areas also creates corridors for animal movement that are critical for wildlife migration and dispersal. Typical species expected to occur in this habitat type within the study area includes black phoebe *(Sayornis nigricans),* California quail, red-tailed hawks, raccoon *(Procyon lotor),* striped skunk *(Mephitis mephitis),* and gray fox *(Vulpes cinereoargentius).*

Both Coast Live Oak Woodland and Coast Live Oak-Willow Riparian Forest provide upland movement/aestivation habitat for a federally listed threatened species, the California Red Legged Frog. (CRLF).

Alkali Grassland. Alkali grassland is limited to areas just west of SR 29 near the Napa County Airport. This habitat type is dominated by saltgrass *(Distichilis* spicata) but alkali rye, fat hen *(Chenopodium album),* and pit-seed goosefoot (C. *herlandieri)* are also present.

Alkali grasslands provide upland movement/aestivation habitat for CRLF, and seasonally ponded basins or vernal pools within alkali grasslands may provide potential branchiopod habitat. Alkali meadows are generally too wet to provide suitable habitat for small mammals; however in late summer small mammals may visit alkali meadows that have dried. Mule deer may feed in alkali meadows, seeking forbs and palatable grasses. Waterfowl, especially mallards (Anas *platyrhynchos),* frequent streams flowing through alkali meadows. Yellow-headed *(Xanthocephalus xanthocephalus)* and red-winged *(Agelaius phoeniceus)* blackbirds occasionally nest in alkali meadows with tall vegetation and with adequate water to discourage predators. Various amphibian species are abundant in wet meadows throughout California.

Wetlands and Waters of the US. Wetlands and Waters of the US occur throughout the study area along creeks, as swales or roadside ditches, and as small, not-widely-distributed hillside seeps that are formed due to hydrologic conditions created by impermeable or semi-permeable clay soils. Wetland community types include riparian forest, seasonal and perennial wetlands, and areas associated with livestock ponds and small intermittent stream drainages. Several of these support hydrophytic (wetland) vegetation and are referred to as jurisdictional wetlands when they meet all three criteria (soils, hydrology, plants) to be so classified. Un-vegetated areas that have saturated soils or sediments and periods of standing or flowing water are considered to be "Waters of the US". In this area they are primarily small un-vegetated creeks and ditches, but some of the livestock ponds that are no longer used and maintained could potentially also qualify under certain circumstances.

The dominant (non-ripariian) wetland plant species occurring within the study area and as described in the NES included brown-headed rush *(Iuneus phaeocephalus var. paniculatus)* and creeping spikerush *(Eleocharis maerostachya).* Other wetland species such as Mexican rush *(J. mexicanus),* and common bulrush *(Schoenoplectus acutus)* are more locally distributed. Brown headed rush also occurs in small ephemeral wetlands on the open flats in the Napa Valley portion of the study area.

Wetland habitat is among the most productive wildlife habitat in California. It provides food, cover, and water for numerous amphibian, reptile, bird, and mammal *species.* Many species rely on wetland habitat for their entire life cycle. Wetlands and waters provide aquatic breeding and aquatic movement/aestivation habitat for CRLF, foothill yellow-legged frog *(Rana hoylii),* western pond turtle *(Clemmys marmorata marmorata),* and tricolored blackbird *(Agelaius tricolor).* Potential branchiopod habitat (vernal pool fairy shrimp and other species) may also occur with wetland and waters.

### Wildlife

Regional Special-status Species and Habitats of Concern. Three sensitive community types, five habitats of concern (i.e., natural community types with an extent limited to within California) and critical habitat for eleven federally endangered species, fifty-one sensitive plant species and seventy-one sensitive animal species were discussed in the NES. The tables presented in Appendix A, taken directly from the NES, provide a compilation of those habitats and sensitive species obtained from CNDDB, CNPS, and USFWS databases and include information pertaining to each species' habitat requirements and the likelihood that suitable habitats are present within the canyon corridor. Figure 6-7 summarizes Special Status species in the project area.

The most significant of the habitat types are the seasonal wetlands and riparian forest that occur along some portions of Jameson Creek, Fagan Creek, and Sheehy Creek, because these support a number of sensitive species. In addition, the oak woodland habitat in portions of the corridor also supports a number of sensitive species. In terms of Listed, Threatened and Endangered species, the California Red Legged Frog is known to occur associated within a drainage feature near the northeast end of the study area. This area has been designated as critical habitat by the US Fish and Wildlife Service.

A project to construct a Class I trail may potentially affect the federally listed (threatened) California Red-Legged Frog (CRLF; *Rana aurora draytonii)* and three vernal pool large branchiopod species including the endangered Conservancy Fairy Shrimp (CFS; *Branchinecta conservatio),* threatened vernal pool fairy shrimp *(Branchinecta lynchi)* and as well as the endangered vernal pool tadpole shrimp. Additionally, the project may affect the California state listed, (threatened) Swainson's Hawk *(Buteo swainsonii),* and an additional fifteen California Department of Fish and Game (CDFG) amphibian, reptile, bird, and mammal species of special concern that could potentially occur in the study area. Trail construction could also potentially affect oak woodlands, riparian forests, wetlands, and other waters occurring within the area. Design guidelines and protocols for trails near sensitive wildlife areas is contained in the next section.

## 6.4 Jameson Canyon Conservation & Protection Designations

The Jameson Canyon area has been recognized by a number of agencies as deserving of special protection because of its sensitive and unique natural resources. This includes its designation by the FOCUS Program as a Priority Conservation Area or PCA, (administered through ABAG, with its partnering agencies), as a Habitat Conservation Area (Solano County part only) as part of the Solano County Water Agency's Multispecies Habitat Conservation Plan or HCP, (addressing Calif. Red Legged Frog and Swainson's hawk within Jameson Canyon) and designation by the US Fish and Wildlife Service of riparian and associated habitat along Jameson and Fagan Creeks as critical habitat for the California Red Legged Frog.

### *6.4.1 ABAG Priority Conservation Area*

According to FOCUS Program information; ABAG Priority conservation areas are areas of regional significance that have broad community support and an urgent need for protection. These areas provide important agricultural, natural resource, historical, scenic, cultural, recreational, and/or ecological values and ecosystem functions. Knowing the region's conservation priorities for targeting acquisition efforts will promote collaboration and investment in these areas that are critical to the region's quality of life and ecological diversity.

The purpose of designating priority conservation areas through the FOCUS Program is to accelerate protection and restoration of key natural lands in the San Francisco Bay Area through purchases or easements. The Ridge Trail route is a designated PCA. Conservation is promoted through regional designation by:

- *Coordinating conservation efforts within a regional framework of near-term priorities*
- *Providing a strong platform on which to leverage public and private resources*
- *Building upon prior and existing land protection efforts and investments*
- *Providing opportunities for forging new partnerships*

Designation of Jameson canyon as a PCA requires that the natural resources of this area be carefully considered in planning, but may also mean that as a PCA, additional funding options may be available for purchase of private properties that could potentially provide both Open Space and public access.

### *6.4.2 Habitat Conservation Plan*

The purpose of the Solano County Water Agency HCP is to promote the conservation of biological diversity and the preservation of endangered species and their habitats consistent with the recognition of private property rights; provide for a healthy economic environment for the citizens, agriculture, and industries; and allow for the on-going maintenance and operation of public and private facilities in Solano County.

"Incidental Take" allowed, provided suitable construction protection measures and compensatory mitigation is provided:

- *Provides Permit Streamlining*

- *Integrate Species Conservation Planning and Land Use Planning*
- *Allows Delegation of Federal Authority to Local Agencies in certain circumstances*

A cooperating local agency could potentially take advantage of the provisions of the already adopted HCP within Solano County for certain types of projects, for instance those where consultation with the US Fish and Wildlife Service under Section 10 is needed, and where the project does not involve Section 404 and consultation through the US Army Corps of Engineers. Since Section 10 consultation requires the preparation of a HCP, having one already prepared and approved may make the process more efficient.

### *6.4.3 Critical Habitat Designation*

As discussed in Section 6.6.3 – Federal Agencies, the habitat along and near both Fagan Creek and Jameson Creek have been designated by the US Fish and Wildlife Service as critical to the survival of California Red Legged Frog. This means that any project in this area will require an additional level of environmental review to insure that the listed species and its habitat are adequately protected from any actions that could disturb, disrupt or change the underlying physical characteristics that sustain the special habitat. The above Conservation and Protection status of public and private lands within Jameson canyon serve to insure adequate protection is provided to this area's resources, but will necessitate additional careful planning and coordination with Resource and Regulatory Agencies.

## 6.5 Regulatory Agency/Permitting Issues

There are a number of regulatory challenges to constructing a new trail alignment through the Jameson Canyon area. Depending upon the alignment selected, the trail would need to cross at least eight and possibly up to ten small tributaries of Jameson Creek and/or Fagan Creek, necessitating construction of bridges, culverts or other land disturbance that would trigger regulatory review. Fagan Creek flows westward from Creston Station near the Napa/Sonoma county line; Jameson Creek flows eastward from this point.

Both Jameson Creek and Fagan Creek have been declared critical habitat by the US Fish and Wildlife Service for the federally threatened California Red Legged Frog, and any of their tributaries that provide CRLF habitat would also be covered by the critical habitat designation.

Consultation with the Service, either under Section 7, if a Corps of Engineers wetlands fill permit were required, or under Section 10, would be needed. Consultation would include the development of avoidance and minimization measures to insure protection of this species and its habitat.

### *6.5.1 Local Agencies*

#### Napa County and Solano County Transportation Agencies,

#### Planning and Public Works Departments

Several local, county level planning and regulatory agencies would be involved with any trail project that moves forward in the planning, environmental review and engineering design and approval process. This could include the Solano Transportation Agency (STA) as a possible lead, or co-lead agency with its Napa County counterpart, Napa County Transportation Agency (NCTA). As the possible lead/co-lead, they would be responsible for CEQA review and permitting, preparation of project engineering plans, and construction implementation. In addition, if a feasible trail plan is identified and adopted, the plan could become parts of the County General Plans of both Counties, and/or parts of the Pedestrian and Bicycle Plans of Napa and Solano Counties.

Other County agencies could also have a role in project planning, engineering design, plan review and approval, and construction, including in Solano County, the Divisions of Planning and Public Works in the Resource Management Department, and in Napa County, the Department of Conservation, Development, and Planning, and the Public

Works Department. Solano County Parks, in the County General Services Department, and the Napa County Parks and Open Space District could also play a role in operating, managing and maintaining the public access trail system.

Regulatory Authority. The County Planning and Public Works/Engineering staff in both Napa and Solano Counties would have a regulatory role in the review and preparation of staff recommendations for approval by their respective County Board of Supervisors of any planning document, such as this Plan, and any corresponding changes to official public access, bicycle and pedestrian facilities planning documents. They would also be involved in the review and approval of the project's CEQA environmental document, as well as review of any engineering plans for consistency with County plans, codes and standards, and quite probably in construction over-sight.

### *6.5.2 State Agencies*

#### Association of Bay Area Governments (ABAG) – Bay Trail

As an advisory agency, the Bay Trail Board reviews and makes recommendations for trail implementation funding. In most projects, consistency with Bay Trail and other public access policies and plans is required as part of project funding and approval, and funding may be delayed if project consistency cannot be resolved. Currently, the adopted Bay Trail (a connector trail) is shown alongside SR 12. ABAG staff has indicated that they are not entirely satisfied with an alignment very close to SR 12, and consider it to be "under revision." The resolution of this issue is a primary objective of this Plan. If acceptable to other regulatory and land management agencies, the Bay Trail Board would likely adopt and move the Bay Trail to an alignment consistent with this Plan.

#### California Department of Fish and Game

DFG has an interest in any Jameson Canyon Trail as both a landowner/land manager of near-by properties, and as a regulatory agency. West of the Napa County Airport, DFG owns lands within the Napa-Sonoma Marshes Wildlife Area, which includes Bull Island and Fagan Marsh Ecological Preserve. In addition, they are in the middle stages of completing an ambitious program that will result in the restoration of hundreds of acres of former salt ponds to tidal marsh and seasonal wetlands habitat along the lower Napa River, west and north of American Canyon.

Regulatory Authority. DFG has regulatory authority over activities to ensure conservation, protection, and management of California's fish, wildlife, and native plant resources as described in Sections 1600-1616 of the State Fish and Game Code. To meet this responsibility, the law requires any person, state or local governmental agency, or public utility to notify the DFG before beginning an activity that will substantially modify a river, stream, or lake. If the DFG determines that the activity could substantially adversely affect an existing fish and wildlife resource, a Lake or Streambed Alteration Agreement is required. The DFG also has responsibility for overseeing and enforcing provisions of the California Endangered Species Act and for review of project proposals for potential impacts on riparian areas, wetlands, fish, and wildlife resources. This is most often completed as part of their role in CEQA review and comment.

#### California Department of Transportation (Caltrans)

Caltrans has an interest in this project, both as a TWG participant, and as a landowner within the corridor. Some of the trail alignment alternatives being evaluated are within the SR 12 Right of Way. Class II bike lanes will be constructed within their acquired ROW, as part of the Caltrans SR 12 Road Widening Project. In addition to their planning and regulatory role (as discussed below), Caltrans also has a potential role as a project sponsor and approval agency, even if the project were not constructed within or across any part of their ROW. This additional involvement could be through their review and approval of environmental documents and engineering plans, if any part of the project had state and/or Federal Highway Transportation funding, which would proceed through their Local Assistance Program procedures.

Regulatory Authority. An Encroachment Permit will be required for any infrastructure on Caltrans lands. In addition, as mentioned above, if federal funding is used and managed under Caltrans' authority, then the project must comply with Caltrans Local Assistance Program requirements. For this project, this may require that trail facilities be designed to Caltrans standards, per Chapter 1000 of the Highway Design Manual. Usually this is an 8-foot minimum paved section with associated striping and signage. Fencing along the Caltrans ROW to provide secure separation from adjacent active highways or private lands will also likely be required. Caltrans has a detailed encroachment permit approval process that includes engineering, traffic safety, and environmental review.

## San Francisco Bay Regional Water Quality Control Board (RWQCB)

The RWQCB is responsible for regulating surface water and groundwater quality in the San Francisco Bay Area to address water quality issues. As part of the California Environmental Protection Agency, the RWQCB administers water rights, water pollution control, and water quality functions for the state, conducts planning, permitting and enforcement activities, and is responsible for implementation of the federal Clean Water Act and the state Porter-Cologne Act. The RWQCB reviews proposed development actions for consistency with the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), which includes provisions for Beneficial Uses, such as habitat restoration and recreation.

Regulatory Authority. The RWQCB will need to issue a Section 401 Water Quality Certification for any trail project component that involves wetlands fill (see next section on US Army Corps of Engineers). Typically, a detailed soil erosion control and either a water quality protection plan or Stormwater Pollution Prevention Plan (SWPPP) is required to be prepared as part of the Section 401 application or separately for any construction project over 1 acre. This can also be used in support of any NPDES stormwater general permit issued by the State Water Resources Control Board.

## California Public Utilities Commission (CPUC)

The California Public Utilities Commission (CPUC) regulates railroad crossings, and associated rules regarding clearance. General Order 26-D dictates a minimum setback distance of 8'- 6", with a minimum setback recommendation of ten feet to any structure, and General Order 75-D contains regulations for at-grade private rail crossings. In addition, the minimum vertical separation from track to overhead structure is 22 feet, 6 inches, with additional clearance required for taller rail cars.

Regulatory Authority. The California Public Utilities Code Section 7537 regulates private railroad crossings in conjunction with General Order 75-D. As indicated earlier in the discussion on use of the UPRR ROW, conversion of private at-grade crossings to public trail use is closely reviewed by PUC staff and their Board, and they typically require substantial safety improvements and other mitigations.

At-grade crossing improvements typically consist of crossing warning signs, pavement stenciling, track improvements, and barrier fencing. In some situations, automatic signalization and lowering crossing arms are warranted. The decision to allow the transfer of private crossings to public use can be complex and time consuming (six months to several years). Factors considered typically include train traffic volume and train speed; safety issues associated with sight distance, noise, and crossing history, anticipated volume of pedestrian use, and the feasibility of grade separation alternatives. The opinion of the track owner and user is also considered in making a determination. Often the PUC will allow the conversion of a private crossing to a public crossing (with appropriate track safety improvements) if one or more nearby private crossings is eliminated.

### *6.5.3 Federal Agencies*

#### US Army Corps of Engineers (Corps)

The placement of any fill in freshwater, seasonal, and tidal wetlands, creeks and waters of the US within the study area is subject to regulation by the Corps of Engineers under Section 404 of the Clean Water Act, by the DFG, under Section 1600 of the California Fish and Game Code, as well as by the Regional Water Quality Control Board under Section 401 of the Clean Water Act. (These were discussed under State Agencies). Because of the sensitivity of the seasonal wetlands and stream corridors and their provision of habitat to several threatened and endangered species, trail construction that may cause a loss of wetland or substantial alteration of wetland functions and values will be evaluated closely as part of the permit review and approval process. Impacts to federally protected wildlife species trigger review and consultation by the US Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service, under Section 7.

Regulatory Authority. Permits would be required associated with fill or disturbance of Corps jurisdictional wetlands (and also areas under the regulatory authority of the DFG). Potential wetlands impacts would likely be associated with creek crossings and bridges, including bridge abutments and wing-walls, and any boardwalk footings or other trail construction element involving wetland disturbance. Mitigation will be required to ensure that that these resources are adequately protected during construction, that there is no net loss of wetland and sensitive species habitat, and that water quality and endangered species are adequately protected.

A preliminary jurisdictional wetlands determination has been completed in association with the NES for the SR 12 highway widening project. All of the proposed trail alignment alternatives being investigated will need to avoid wetlands fill placement, and/or be addressed as part of the Corps Section 404 review and USFWS Section 7 consultation for the project.

#### US Fish and Wildlife Service (USFWS)

USFWS enforces federal wildlife laws including the Endangered Species Act (ESA), designates Critical Habitat for Endangered Species and migratory flyways, and conserves and manages wildlife habitat and wetlands within properties under their jurisdiction. Under the authority of Section 7 of the ESA, USFWS would provide consultation to the US Army Corps of Engineers regarding possible habitat impacts to endangered species, if trail planning conflicts with species protection where Section 404 wetland fill permit applications have been submitted to the Corps of Engineers, or where other Federal actions are involved. Section 10 provides a means for nonfederal entities (states, local agencies, and private parties) that are not permitted or funded by a federal agency to receive authorization to disturb, displace, or kill (i.e., take) threatened and endangered species. It allows USFWS and/or NOAA Fisheries to issue an incidental take permit authorizing take resulting from otherwise legal activities, as long as the take would not jeopardize the continued existence of the species. Section 10 requires the applicant to prepare a Habitat Conservation Plan (HCP) addressing project impacts and proposing mitigation measures to compensate for those impacts. The HCP is subject to USFWS and/or NOAA Fisheries review and must be approved by the reviewing agency or agencies before the proposed project can be initiated. Because the issuance of the incidental take permit is a federal action, USFWS and/or NOAA Fisheries may also comply with the requirements of ESA Section 7 and the National Environmental Policy Act (NEPA).

Both Fagan Creek and Jameson Creek and associated habitat areas have been designated by the USFWS as Critical Habitat for California Red Legged Frog. Lands to the immediate east of Napa County Airport have also been designated as Critical Habitat for the vernal pool fairy shrimp, but such critical habitat does not extend into the Jameson Canyon area. These US Fish and Wildlife Service designations ensure additional regulatory scrutiny, under the Federal Endangered Species Act, for any project involving a federal action (such as wetlands fill) or federal funding, such as for bike lane or trail construction.

The additional biological review and consultation required by the Critical Habitat Designation would focus on prohibiting actions that could damage or destroy the protected species or their habitats, and more specifically, actions that could impact the "primary constituent elements" of the habitat. These elements refer to physical and biological conditions that need to be present and therefore protected, to continue to support the species for which the Critical Habitat Designation has been made.

Regulatory Authority. USFWS would be involved in project review and decision-making regarding lands that have potential endangered species habitat. The US Fish and Wildlife Service would also provide consultation to the Corps under Section 7, or alternately consultation under Section 10 of the ESA (if no other Federal action is involved) where any proposed trail alignment passes through and potentially threatens Critical Habitat for CRLF, or that of other federally listed species that they have regulatory responsibility for.

### National Marine Fisheries Service (NMFS)

The National Marine Fisheries Service or NOAA Fisheries is responsible for the management, conservation and protection of living marine resources within the United States Exclusive Economic Zone. NOAA Fisheries also plays a supportive and advisory role in the management of living marine resources in coastal areas under state jurisdiction and provides scientific and policy leadership in the international arena and implements international conservation and management measures as appropriate.

Under this mission, the goal is to optimize the benefits of living marine resources to the Nation through sound science and management. This requires a balancing of multiple public needs and interests in the sustainable benefits and use of living marine resources, without compromising the long-term biological integrity of coastal and marine ecosystems.

Regulatory Authority. Similar to USFWS would be involved in project review and decision-making regarding projects that have the potential to affect endangered anadromous fish species, or their habitat. NMFS would also provide consultation to the Corps under Section 7, or alternately consultation under Section 10 of the ESA (if no other Federal action is involved) where any proposed trail alignment passes through and potentially threatens such species. In this area, anadromous fish that could potentially be present include steelhead. However, according to the NES, steelhead has not been identified as being present within Fagan, Sheehy, or Jameson Creeks.

## 6.6 ADA Accessibility

The goal of trail implementation will be for an all-weather shared-use trail, that is capable of accommodating pedestrians, bicycles, and universally accessible modes, as well as provide for emergency vehicle access where feasible. The trail will be designed in accordance with ADA accessibility guidelines wherever feasible, which require a firm, stable surface for trails, and contain guidelines for grade, cross-slope, width, etc. There are many design standards that provide guidance regarding trail design, and the trail segments will need to comply with one or more standards, depending upon funding, trail classification (hiking only, shared use, bikeway, etc.) and feasibility for compliance with applicable standards. Trail and bikeway advisory and regulatory guidelines include:

- Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas (ABAAGODA, 2007)
- Caltrans Highway Design Manual (HDM) (Chapter 1000: Bikeway Planning and Design)
- Americans with Disabilities Act (ADA) www.access-board.gov
- American Association of State Highway and Transportation Officials (AASHTO)
- Manual of Uniform Traffic Control Devices (MUTCD)
- Institute of Traffic Engineering (ITE)
- Federal Highway Administration/National Highway Institute (FWHA, NHI)

## Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas (ABAAGODA, 2007)

Design of shared use trails such as this falls under the guidelines of the *Architectural Barriers Act Accessibility Guidelines for Outdoor Developed Areas* (ABAAGODA). Published June 20, 2007, these guidelines are applicable for trails and paths where one of the groups of intended users is pedestrians, as opposed to a facility designed exclusively for bicyclists. These guidelines are under review and expected to be federally adopted in 2012. These guidelines set forth recommended trail width, gradient, cross slope and other factors that affect trail accessibility. Depending upon the type of use, federal guidelines call for a trail gradient of 5%, or 1 ft. rise in 20 feet of distance, with a maximum 2% cross slope. Under some circumstances, depending on the type of anticipated use and connections to accessible facilities, short distances of trail at up to 10-12% grade may be allowed if a landing is provided:

- 1:20 (5%) any length
- 1:12 (8.33%) for up to 200 feet
- 1:10 (10%) for up to 30 feet
- 1:8 (12.5%) for up to 10 feet
- No more than 30% of the total trail length shall exceed 1:12

## Americans with Disabilities Act

Design and implementation of portions of the trail that connect to parking areas, restrooms, trailheads or other physical facilities might also need to comply with federal regulations contained in the *ADA Accessibility Guidelines for Buildings and Facilities* (ADAAG) http://www.access-board.gov/adaag/html/adaag.htm#4.3. These guidelines require a 36 inches minimum clear trail width, with passing space at minimum 200-foot intervals if the trail is less than 60 inches wide, depending upon the anticipated trail use.

## AASHTO Guidelines

The primary design guide for bicycle and shared use facilities is the "Guide for the Development of Bicycle Facilities" from the American Association of State Highway and Transportation Officials (AASHTO), 1999. The AASHTO Guide defines a "shared use path" as a facility on exclusive right-of-way and minimal cross flow by motor vehicles. Users generally include bicyclists, skaters, and pedestrians. In most cases, the AASHTO Guide requires a greater level of accessibility when designing trails for pedestrians, including bicyclists and skaters than the ABAAGODA guidelines, but trails should ideally be designed to comply with both standards.

## Caltrans Highway Design Manual (HDM) (Chapter 1000: Bikeway Planning and Design)

Shared-use trails, such as this, also fall under the regulatory requirements of AASHTO and Caltrans Highway Design Manual. Where possible, the trail will be designed to comply with both federal guidelines as well as Caltrans/AASHTO standards for shared use.

If portions of the trail are funded from transportation sources, it may need to conform to Caltrans standards for a Class I Bicycle Path. Caltrans has developed specific design guidelines in the Highway Design Manual for Class I multi-use paths. Design standards should meet or exceed the Caltrans standards to the maximum extent possible.

## Accessibility Exceptions

The final trail design should be in compliance with all applicable guidelines and regulations for accessibility. The ABAAGODA Guidelines also contain conditions for exceptions to meeting trail accessibility goals, which might apply for some steeper areas of the Canyon where there are constrained areas, steep slopes and environmentally sensitive

areas that must be avoided. The ABAAGODA exception process provides conditions for exceptions that should be documented as each trail segment is implemented. The conditions include:

Condition 1.Compliance Would Cause Substantial Harm to Cultural, Historic, Religious, or Significant Natural Features or Characteristics

Condition 2. Compliance Would Substantially Alter the Nature of the Setting or the Purpose of the Facility, or Portion of the Facility

Condition 3. Compliance Would Require Construction Methods or Materials That Are Prohibited by Federal, State, or Local Regulations or Statutes

Condition 4. Compliance Would Not Be Feasible Due to Terrain or the Prevailing Construction Practices

Analysis of segment opportunities and constraints including evaluation of slope and terrain, and has been incorporated into the summary of constraints rankings presented in the next section. Documentation of exception conditions would be included in the detailed design planning for each segment as it is implemented. It is likely that some trail segments would require a documented exception under Condition 4.

## 6.7 Opportunities and Constraints Summary Map

As previously indicated, constraints mapping of the Jameson Canyon corridor began by dividing the corridor into five segments, described below:

- The Western segment includes the SR 12/29 intersection east to the area east of Kirkland Ranch Road, where the canyon narrows. In this segment, the corridor is generally flat and open.
- The Confluence segment occurs where SR 12 and the railroad converge east of Chardonnay Country Club, roughly where hills south of the railroad come close to the right of way.
- The Central segment is characterized by steep hills north of SR 12, with agriculture and residential development in a narrow band between SR 12 and the railroad/creek corridor.
- The Canyon segment begins approximately 1.8 miles to the east, where Jameson Canyon is severely constrained on both sides by topography and the highway and railroad.
- East of the Canyon is the Eastern segment, which includes the Red Top Road intersection.

Within each of these, preliminary trail alignment alternatives have been depicted for feasibility review.

Table 6-3: Trail Alignment Options and Segments

| | Segment | | | | |
|---|---|---|---|---|---|
| Alignment Option<br>Postmiles | Western<br>NAP 0.0 -<br>NAP 1.58 | Confluence<br>NAP 1.58 -<br>NAP 2.6 | Central<br>NAP 1.58<br>SOL 1.2 | Canyon<br>SOL 1.2 -<br>SOL 1.7 | Eastern<br>SOL 1.7 -<br>SOL 2.5 |
| 1 - Far North | | Through hilly terrain considerably north of SR 12.<br>Could potentially connect Polson Road and Mason Road. | | | |
| 2 – Highway<br>N = North side<br>S = South side | Follows SR 12 north of golf courses | Follows SR 12* | | | |
| 3 - Railroad<br>N = North side<br>S = South side | Follows railroad as it curves south toward American Canyon | Follows railroad* | | | |
| 4 - South Foothills | | Runs along north flank of south foothills, above the railroad* | | | |
| 5 - Golf Courses<br>N = Fagan Creek<br>S = South edge | From Kelly Road through or along golf courses | | | | |
| 6 - Far South | From American Canyon streets through Newell Ranch Open Space western easement | Through Newell Ranch Open Space and Lynch Canyon Open Space -- hilly terrain considerably south of SR 12 | | | |

** Options 2, 3, and 4 run close together through the Central and Canyon segments.*

Please note that because some Options do not span all Segments, and because topographic and other constraints may make trail alignments infeasible along some portions of each Option, the ultimate or preferred trail alignment selected may combine portions of two or more Options. For example, a complete alignment might run along the north side of SR 12 within the Western segment ("Highway North", Option 2N), then follow Kirkland Ranch Road to Polson Road to the north hills, emerging along Mason Road to Green Valley ("Far North", Option 1). Another complete alignment might run along the south edge of the golf courses ("Golf Courses South", Option 5S), cross to the south side of the railroad, and continue along the south foothills ("South Foothills", Option 4).

Figures 6-8.1, 6-8.2, and 6.8-3 provide summaries of the opportunities and constraints identified for the Jameson Canyon corridor, using color symbology:

- Green = low constraint
- Yellow = medium constraint
- Orange = high constraint
- Red = very high constraint (fatal flaw)

Table 6-4 and Appendix B provide a graphic summary of the opportunities and constraints.

Table 6-4: Summary of Constraints

*NOTE: Orient this page sideways to read west to east, with north at the top, parallel to overview Opportunities and Constraints maps.*

| | | | ALIGNMENT OPTION | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | <<< SOUTH … | | | | … | | | … NORTH >>> | |
| | | | Along UPRR[1] | | Golf courses | | South hills | Along UPRR[2] | | Along SR 12 | |
| SEGMENT | SUBSEGMENT | WEST END | 3S | 3N | 5S | 5N | 4 | 3S | 3N | 2S | 2N |
| Western | SR 29 intersection | Devlin | | | | | | | | | |
| | SR 29 to Kelly Road | NAP 0.0 | | | | | | | | | |
| | Kelly Road signal | NAP 0.25 | | | | | | | | | |
| | Kelly Rd to W boundary of Kirkland Ranch | NAP 0.25 | | | | | | | | | |
| | W boundary of Kirkland Ranch to midway to Kirkland Ranch Rd | NAP 1.1 | | | | | | | | | |
| | Midway to Kirkland Ranch Rd to K.R. Rd | NAP 1.2 | | | | | | | | | |
| | Kirkland Ranch Road | NAP 1.3 | | | | | | | | | |
| | K. R. Rd to Fagan Creek (spans Western & Confluence segments) | NAP 1.3 | | | | | | | | | |
| Confluence | | NAP 1.58 | | | | | | | | | |
| | Fagan Creek | NAP 1.9 | | | | | | | | | |
| | Fagan Creek to Lynch Road | NAP 1.9 | | | | | | | | | |
| | Lynch Road intersection | NAP 2.02 | | | | | | | | | |
| | Lynch Rd to creek near #3875 & #3890 | NAP 2.02 | | | | | | | | | |
| | #3875 & #3890 to #685 & #686 | NAP 2.32 | | | | | | | | | |
| Central | #685 and #686 to next creek | NAP 2.6 | | | | | | | | | |
| | Creek and home near RR approach from west | NAP 3.1 | | | | | | | | | |
| | Bay Area Ridge Trail corridor | NAP 3.15 | | | | | | | | | |
| | East of creek and private RR crossing | NAP 3.2 | | | | | | | | | |
| | Private RR crossing to E end of vineyards | NAP 3.2 | | | | | | | | | |
| | East end of vineyards to Spurs Trail | SOL 0.1 | | | | | | | | | |
| | Spurs Trail to Cattle Creek | SOL 0.88 | | | | | | | | | |
| | Cattle Creek | SOL 0.98 | | | | | | | | | |
| | Cattle Creek to Miner's Trail | SOL 0.98 | | | | | | | | | |
| | Miner's Trail | SOL 1.0 | | | | | | | | | |
| | Miner's Trail to narrow part of canyon | SOL 1.0 | | | | | | | | | |
| Canyon | Narrow part of canyon | SOL 1.2 | | | | | | | | | |
| Eastern | East of narrow part of canyon | SOL 1.7 | | | | | | | | | |

[1] = in Western segment, south of golf courses. [2] = in all segments east of Western segment

KEY

| Constraint level | Description |
|---|---|
| Low | Few or no constraints; trail alignment likely to be feasible |
| Medium | Moderate challenges but trail alignment probably feasible |
| High | Significant challenges and likely costly |
| Very High | Trail alignment determined to be infeasible |
| | Alignment Option is not present in this segment, or in this relative (south...north) position in this segment |

## 6.8 Bicycle and Pedestrian Project Opportunities

Opportunities for bicycle and pedestrian projects in the study area, as identified in Section 6.1 – Bicycle Routes and Pedestrian Project Opportunities, include:

- Provision of Class I pathways associated with planned improvements to the greater I-80/I-680/SR 12 Interchange area
- Provision of a Class I pathway associated with planned improvements to the SR 12/29 interchange

- Improvements to the Large Mammal undercrossing of SR 12 that will be constructed as a part of the Jameson Canyon roadway widening project. These improvements could potentially be made prior to the construction of any planned/approved Class I improvements paralleling SR 12, and may be a component of a Ridge Trail connector project.

In terms of prioritization of bicycle and pedestrian project opportunities, each of these projects would be a part of a larger transportation improvement project with its own design and implementation schedule, and construction budget, making it difficult to compare and rank them independently. Since these are in the planning and early design stages, each would be out five or more years from construction.

Both the I80-680-SR 12 project, with its bicycle/pedestrian component, and the SR 12-SR 29 project have great merit in meeting non-motorized transportation user needs and providing important local and sub-regional connections as shown earlier on Figure 5-1 (Planned and Existing Bicycle and Pedestrian Projects).

In addition to these more "local" projects, this Plan addresses potential alignment alternatives for a sub-regional connector between I80 in Solano County and, as a main focus, SR 29 in Napa County, paralleling SR 12 within Jameson Canyon (Note: at this point in time, we have not provided a prioritization of any of the east-west Class I trail options within the Jameson Canyon Corridor, or any individual components – as this awaits final feasibility conclusions and designation of a preferred alignment).

## 6.9 Segments Not Considered Feasible

As part of the Plan we developed a detailed topographic map of the study area using LIDAR (Light Detection and Ranging, i.e. optical radar) data, and derived a slope constraints map based on this data. Based on a careful examination of the slope information, we concluded that it was not feasible to construct a Class I (paved, ADA-compliant) trail that would meet longitudinal or cross slope criteria within the Far North (Option 1) or Far South (Option 6) portions of the study area. However, such a trail, which in the case of Option 1 (Far North) might for instance use portions of Polson Road or Mason Road and make a connection between them on private property, could be constructed that meets Ridge Trail standards for recreational hiking and equestrian uses. Such a trail would be difficult and costly to construct and maintain. Visual impacts, slope stability and other environmental issues would all be of significant concern.

### Option 1 (Far North)

The Far North option is probably feasible to construct to Ridge Trail standards, albeit at considerable expense. Even if the alignment basically followed Polson Road from the west and Mason Road from the east, severe topography near the Napa/Sonoma county line (near the Ridge Trail corridor) would probably necessitate switchbacks to maintain an ADA-compliant grade for pedestrians and bicyclists, if that were indeed possible. The value of this alignment would be recreational only. West of the foot of Polson Road at Kirkland Ranch Road, a complete trail corridor could follow Kirkland Ranch Road to SR 12, then run along the north side of SR 12 following Option 2N (Highway North).

### Option 6 (Far South)

Like Option 1 (Far North), the Far South option is probably feasible to construct to Ridge Trail standards, albeit at considerable expense. Severe topography would probably necessitate switchbacks to maintain an ADA-compliant grade for pedestrians and bicyclists, if that were indeed possible. The value of this alignment would be recreational only. In the Western segment a narrow strip of Newell Ranch Open Space connects to a street in American Canyon. The Ridge Trail corridor intersects the midpoint of this alignment and could connect to the east-west trail via one of two paths through canyons near the high point of the route.

## Comparing the Far North and Far South Options

Although Option 1 (Far North) and Option 6 (Far South) would both have significant recreational value, Option 6 has several advantages:

- It has settlements at both ends (American Canyon to the west, and the part of Fairfield/Cordelia just beyond I-80 to the east). This would create a stronger recreational amenity for both counties.
- Because it traverses the Newell Ranch and Lynch Canyon open spaces, its east-west alignment does not rely on private roads. The Far North option would follow the private segments of Polson Road in Napa County and Mason Road in Solano County.
- It connects the Ridge Trail with American Canyon.
- It could connect to the Jameson Canyon trail via Creston Station Ranch, a private open space.
- It would connect under I-80 to McGary Road, an established bicycle touring route, via the existing Lynch Road interchange.

## Conclusions Regarding the Far North and Far South Options

Because the Far North and Far South options cannot meet Class I trail criteria, they have been dropped from further consideration. However, the Far South option could potentially continue to be reviewed as a Ridge Trail route, but would need to resolve private property issues.

## Segments Considered Not Feasible

Based on the detailed analysis of Opportunities and Constraints and Cost-Benefit, it is not practical to construct a Class I trail in an east-west route alignment, within or in close proximity to SR 12 and the existing State of California Right of Way. This is primarily due to steep canyon slopes, but also other environmental and physical constraints, including landslide deposits and the sensitive creek riparian corridor. The existing City of Vallejo water pipeline and the State Aqueduct pipeline also do not have available surface easements within which it is possible to construct a trail. Representatives of Union Pacific (UP) Railroad were contacted and are unwilling to consider a Class I trail within their Right of Way. UP Railroad representatives indicated their preference to reserve any un-used right of way for possible future rail expansion.

Segments considered not feasible included routes along the ridgetops at the north and south ends of the study area. These areas are topographically constrained, geographically separated from the trail connections at SR 29 and Red Top Road, and difficult to access due to land ownership issues.

In addition, a Class I continuous trail within the SR 12 right of way is not a feasible/practical solution to travelling through the canyon corridor.

# 7. CONCEPT DESIGN AND ALIGNMENT OPTIONS

## 7.1 Alignment Options

This section of the Plan discusses potential east-west alignments for trails along or near SR 12 between SR 29 and I-80. There are multiple potentially feasible alignments for routing a Class I or separated trail for the western two-thirds of Jameson Canyon, beginning just east of the Napa-Solano County line, but only one feasible alignment (4) for the Canyon on the eastern one-third.

Alignments identified as being potentially feasible, and worthy of more in-depth investigation and analysis include:

- 2N, along the north side of SR 12,
- 2S, along the south side of SR 12
- 5S, running along the perimeter of the Chardonnay Golf Course
- 3S along the south side of the UP Railroad Tracks, and
- 3N along the north side of the UP railroad Tracks
- 4, south of the UP Railroad tracks

However, it should be emphasized strongly that all of these alignments would involve the construction of at least one (and some alignment alternatives, more than one) over-crossing of either UPRR Railroad, or SR 12, or both.

Figure 7-0 provides an overview of the feasible alignment options and Figures 7-0.1, 7-0.2, and 7-0.3 show potential options that were evaluated in more detail. Table 7.1, (below) describes their advantages and issues.

Table 7-1: Trail Alignment Options – Advantages and Issues

| Alignment Option | Advantages | Issues |
|---|---|---|
| 2N – Highway North<br>North edge of SR 12 ROW after widening | Fairly level within much of Napa County. Could possibly build bench in widened section | Deep ranch properties with homes at Miner's Trail, Spurs Trail, and the private road west of Spurs Trail.<br>Large and steep hills and valleys through canyon. |
| 2S – Highway South<br>South edge of SR 12 ROW after widening | Fairly level west of the canyon's narrow segment. | Vineyards, ranches, and several houses in strip between SR 12 and railroad. |
| 3N – Railroad North<br>North edge of railroad ROW | Fairly level close to railroad<br>Not constrained by SR 12 widening project | Ranches, vineyards, one house and pool adjacent.<br>UPRR will not permit trail within ROW, to preserve for potential future intensification of use. |
| 3S – Railroad South<br>South edge of railroad ROW | Fairly level close to railroad<br>Not constrained by SR 12 widening project | Few access points from north side of railroad (Red Top Road and one private crossing)<br>Engineering challenges through canyon. |
| 4 – South Foothills<br>South of railroad, along north face of foothills | Ranch land except one house.<br>Potential spur through Creston Station Ranch to Lynch Canyon Open Space and I-80. | Few access points from north side of railroad (Red Top Road and one private crossing)<br>Engineering challenges through canyon, including one valley that may require a bridge. |
| 5N – Golf Course / Creek<br>Along creek through golf courses | Scenic<br>Not constrained by SR 12 widening project | Seasonal wetlands and habitat along creek<br>Need for segment along Kelly Road from golf course south edge to SR 12 or SR 29.<br>Possibly consider in addition to SR 12 alignment. |
| 5S – Golf Course / South<br>South edge of golf courses | Scenic. Not constrained by SR 12 widening project | Need for segment along Kelly Road from golf course south edge to SR 12 or SR 29.<br>Possibly consider in addition to SR 12 alignment. |

## 7.2 Feasibility Analysis and Conceptual Design

### Feasibility Analysis

This section of the report presents a summary of the Feasibility Analysis and a Conceptual Design for an east-west Bay Trail alignment and a north-south Ridge Trail alignment. Overall, and based on our detailed analysis of Opportunities and Constraints as presented in Section 6.0, we did not find that it is feasible to construct a Class I trail in an east-west route alignment, within or in close proximity to SR 12 and the existing State of California Rights of Way. This is primarily because of steep canyon slopes, but also other environmental and physical constraints, including landslide deposits and the sensitive creek riparian corridor. The existing City of Vallejo water pipeline and the State Aqueduct pipeline also do not have available surface easements within which it is possible to construct a trail. We also contacted representatives of Union Pacific Railroad and they are unwilling to consider a Class I trail within their Right of Way, as they want to reserve any un-used Right of Way for possible future rail expansion.

### East-West Bay Trail Alignment

It would be possible to construct a Class I trail, (although with a great deal of engineering difficulty and cost), that is primarily routed through private lands within the Jameson Canyon Corridor. This is shown schematically in Figure 7.0. We have not yet evaluated the difficulty of obtaining Right of Way from the various private property owners and ranchers within Jameson Canyon. Typically public access trails do not or very rarely utilize condemnation proceedings for acquisition of private lands for trail improvement projects, and several state and federal grants for trail construction prohibit this.

The following provides a summary of the feasibility of routing an east- west Class I trail through Jameson Canyon presented as a discussion of each segment, including the Eastern, Canyon, Central, Confluence, and Western segments:

## Eastern Segment

Highway Options 2N and 2S appear to be feasible, though 2N (Highway North) would involve topographic challenges. Railroad Options 3N and 3S appear to be infeasible due to topography and dense vegetation in the western portion of this segment. Option 4 (South Foothills) appears to be feasible if the trail is aligned south of an area of dense vegetation, which would also position it to connect well with Red Top Road and I-80.

## Canyon Segment

Due to topography, Options 2 (Highway) and 3 (Railroad) are not feasible through the narrow part of Jameson Canyon. South Foothills option is the only feasible alternative near the highway/railroad corridor.

## Central Segment

Highway South option 2S appears to be feasible. Highway North option 2N is feasible except near the Creston Station Ranch private railroad crossing. Railroad Options 3N and 3S are deemed infeasible due to topography and/or the adjacent creek. Option 4 (South Foothills) appears to be feasible; this is supported by the presence of unpaved ranch roads running east-west on the north face of the hills approximately where a trail would be aligned.

The Ridge Trail corridor crosses SR 12 and the railroad in this segment, roughly aligning with the private railroad crossing at Creston Station Ranch.

## Confluence Segment

Options 2N, 2S, and 3N appear to be feasible. Options 3S and 4 are deemed infeasible due to topography, and Option 3N is topographically challenged near the east end of this segment.

Of these, Highway South Option 2S is preferred because it is less constrained than Highway North option 2N, and its alignment south of the highway makes possible connections in segments to the east.

## Western Segment

Options 2N, 2S, 3N, 3S, and 5S appear to be feasible. Option 5N (Golf Course – Creek) is infeasible due to environmental and safety constraints. The Highway options (2N and 2S) are preferable because they connect to SR 29 (and Devlin Road to the west). Of these, Highway South Option 2S is preferred because it is less constrained than Highway North option 2N, and its alignment south of the highway makes possible connections in segments to the east.

## North –South Ridge Trail Alignment

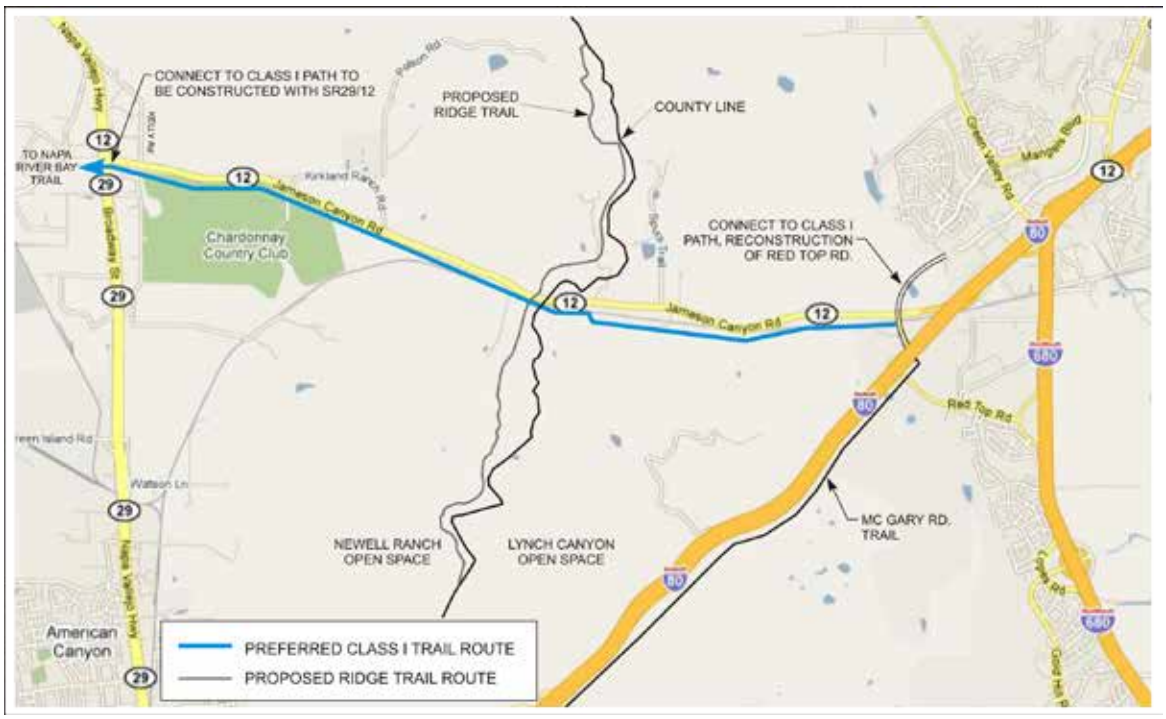
The north-south or Ridge Trail alignment would also largely be on private ranch lands, although preliminary discussions with Ridge Trail and Napa County Park and Open Space District representatives indicates this may be very feasible. It appears that the most feasible Ridge Trail alignment would be located just west of the Napa-Solano County line, in a route that would require a new pedestrian over-crossing of SR 12 and the Union Pacific Railroad.

## 7.3 Preliminary Recommended Alignment

Following are preliminary alignment recommendations:

- Consider a trail alignment following Option 2S (Highway South) through the Western, Confluence, and Central segments. Cross the railroad at the Creston Station private crossing via a new over-crossing structure and continue east using Option 4 (South Foothills) to Red Top Road and I-80.
- North of SR 12, align the Ridge Trail as shown on its existing maps, roughly paralleling the county line on the Napa County side. Add a pedestrian-bicycle overcrossing of SR 12 near the Creston Station private railroad crossing, then share that grade crossing with the Jameson Canyon trail.
- Optionally, consider continuing the Ridge Trail pedestrian-bicycle overcrossing over the railroad at that location.
- Optionally also implement Option 6 (Far South) along with the north-south Ridge Trail segment through Creston Station to join the mainline trail on the south foothills above the private railroad crossing.

The most feasible alignment based on this information is depicted below and in more detail in Figure 7-1:



# 8. TRAIL DESIGN GUIDELINES

Trail design sections, as well as construction protocols to minimize disturbance to adjacent areas will be critical to successful project implementation. Trail design issues include:

- Trail width, grade and surfacing.
- ADA accessibility.
- Design to minimize wildlife effects.
- Geotechnical considerations.
- Fencing/screening to minimize visual impacts yet provide enclosure where needed.
- Safety of trail users on a trail facility located at or near an active rail ROW.
- Safe crossings at existing streets and roads.
- Management requirements and costs to be incurred by the management entity for long-term management and maintenance of the trail facilities.
- Visibility and security concerns of adjacent properties.

## 8.1 Trail Width, Surface, Type and Use

The trail alignment must provide sufficient width and clearance for access and maintenance vehicles. The width must also accommodate pedestrians, bicycles, and others with two-way traffic, and on occasion, patrol, maintenance, and emergency vehicles. Because of the need to meet these requirements, a minimum 12-foot wide trail (10-foot surfaced, 1-foot gravel shoulders) is recommended, with turnouts located in key areas. For segments where equestrian use is expected, a separate four to six foot section should be considered (16-20 ft. total width). Each phase of trail implementation will be evaluated for compliance with current ADA requirements.

The trail should be surfaced with a durable material that complies with universal access needs. Paving designs should be selected that provide permeability, where appropriate, and fit with the rural setting. In some locations, it will be appropriate to remain as “natural” as feasible, and could be constructed as a permeable path with cemented quarry fines over aggregate base or other stabilizer. Trail sections along ramps, bridges, rail crossings and boardwalk approaches, and any trails that will be routinely utilized by motorized vehicles for access and maintenance should be paved.

In areas where new asphalt paving is needed, the trail should consist of a minimum 10-foot wide asphalt pathway using 3 inches of asphalt concrete, with 2-foot wide (minimum) shoulders of 4 to 8 inches of Class 2 aggregate base (AB).

The trail should generally be elevated slightly above existing grade, with a cross slope of 2% to provide drainage and trail compaction. Where the trail is located near or over an existing road, the trail should be separated by a vegetated strip or shoulder that is a minimum five feet wide to separate trail users from vehicular travel.

Slope stability, erosion potential, and pathway drainage issues will need to be carefully evaluated during the design of each trail segment. In general, the trail should be outsloped to minimize slope disturbance, however, in some areas of steep slopes and less stable terrain, it may be necessary to inslope the pathway and provide drainage swales.

Weed management may be needed along the trail if stabilized quarry fines are used, because weed seeds can get into and grow within some of the fine cracks that develop in these materials, and non-native invasive species often colonize disturbed areas. Annual spring upper levee mowing, or other form of weed control may be needed in the spring to discourage colonization by invasive species.

## Bay Area Ridge Trail Design and Construction Standards

Where the trail is a designated Ridge Trail segment, the trail design should meet BARTC construction guidelines, shown below. This could be utilized for segments where accessibility and shared use needs are met elsewhere.

The narrow-trail guideline applies to lengths of trail where expected low use, topography, sensitive habitat, easements, or other restrictions limit trail width. Where possible, the wide-trail guideline should be used. In considering and applying these guidelines to trail engineering, implementation personnel should give the highest importance to the safety of trail users. Although the trail is generally designed for moderate physical challenge, some trails in areas with difficult terrain may be physically challenging.

Table 8-1: Bay Area Ridge Trail Design and Construction Standards

| ITEM | WIDE-TRAIL GUIDELINE | NARROW-TRAIL GUIDELINE |
|---|---|---|
| Minimum / Maximum tread width | 4 feet / none | 18 inches / 30 inches |
| Minimum clearing width on each side of trail | 1 foot | 1 foot |
| Minimum clearing height | 9 feet | 9 feet |
| Maximum sustained grade | 10% | 15% |
| Maximum grade for no more than 500 feet | 15% | 25% |
| Minimum inside radius for switchbacks | 5 feet | 3 feet |
| Minimum cross slope | 2% | 2% |
| Water control | appropriate techniques for the circumstances | |
| Surface | appropriate for the location | |

## Bay Trail Design Guidelines

Consistency with the Bay Trail Plan design guidelines is important in order to create a regional trail system that provides similar accommodations for trail users and maintenance access. The Jameson Canyon Corridor Trail segment would be considered a Multi-use path, with some areas to be paved, and most areas with a hardened trail surface constructed using stabilized quarry fines. Bay Trail Plan Design Guidelines are shown below.

Table 8-2: Bay Trail Design Guidelines

| ITEM | HIGH-USE (SEPARATE PATHS)* | MULTI-USE PATHS* | BICYCLE-ONLY PATHS* | HIKING-ONLY PATHS | NATURAL TRAILS |
|---|---|---|---|---|---|
| Min. width (one way) | 8-10' | 10' | 8' | 5' | 3-5'[a] |
| Min. width (two way) | 10-12' | 10-12' | 10-12' | 8-10' | 5' |
| Surface | asphalt[b] | asphalt | asphalt | hardened | natural/ boardwalks[c] |
| Horizontal clearance (incl. shoulders) | 12-16' | 14-16' | 10' | 9-12' | 7-9' |
| Shoulder[d] | 2' | 2' | 2' | 2' | unspecified |
| Vertical clearance | 10' | 10' | 10' | 10' | unspecified |
| Cross slope | 2% max | 2% max | 2% max | 2% max | unspecified |
| Maximum grades[e] | 5% | 5% | 5% | 5% | unspecified |

*Standards meet Caltrans Class I bikeway standards*
[a] *Minimum widths that are less than 5' will be required to have 5'x5' turnouts at intervals to meet accessibility standards.*
[b] *High-use pedestrian path could be hardened surface other than asphalt.*
[c] *Natural surfaces may require surface hardening to provide accessibility.*
[d] *Area specified is area on both sides of the trail.*
[e] *Percentage grade for short distances with flat rest areas at turn outs, except where site conditions require a greater slope for short distance.*

## Bridges and Boardwalks

Boardwalks would be utilized to limit access to adjacent seasonal wetlands and to cross sections of drainage channels or soft soil areas. The boardwalk design would utilize helical anchors and drilled piers to minimize construction effects. A potential bridge over Fagan Creek would be a prefabricated clearspan structure, installed by crane to minimize disturbance to adjacent areas.

Grade separation of any rail crossing could also necessitate installation of a bridge, although use of an oversized culvert is more likely. All potential bridges should be a minimum of 8-10' wide pre-fabricated steel clear-span bridges, to provide pedestrian and bicycle access, while also supporting occasional emergency access by ATV, or other light vehicle access. Bridge abutments would typically be constructed on 18-inch diameter concrete piles or 24-inch diameter piers driven or drilled to a minimum depth of 20 feet. The bridges would typically utilize 3-inch by 6- or 8-inch recycled plastic lumber decking over pre-fabricated support structures.

If a boardwalk is used, it would be constructed using strong and durable materials requiring a minimum of maintenance and capable of supporting lightweight vehicle loads. Because the boardwalk would be constructed over created wetlands, use of construction materials and methods that minimize disturbance are critically important. Non-corrosive helical earth anchors (piers) are recommended for the boardwalk foundation system because they will provide sufficient resistance in soft underlying soils, and can be installed without the use of heavy construction equipment. It is anticipated that 1 ¾-inch post helical piers would be spaced at a maximum of 8-feet, and extend 8- to 10-feet into the soft underlying soils. The recommended boardwalk would consist of 2-inch by 6-inch joists and 4-inch by 6-inch beams of Trimax (or equivalent structural composite lumber) or IPE (sustainable, long-life tropical hardwood), and 2-inch by 6-inch recycled plastic lumber decking. The boardwalks would connect to the adjacent grade with approach ramps constructed of engineered fill at a maximum 5% slope.

These foundation and structural recommendations must be followed up with a comprehensive geotechnical investigation and structural analysis as part of the development of final construction plans.

## 8.2 Accessibility

As discussed in Chapter 6.6, trail segments that are intended for use by pedestrians must be designed to be accessible. Federal accessibility guidelines are in the process of being adopted. Compliance with accessibility regulations will likely be a component of project funding for trail implementation. In addition to regulations regarding trail grade, cross-slope, surface and width, there are regulations regarding accessibility of site furnishings such as benches and drinking fountains, as well as regulations that apply to accessible routes such as trailheads, parking areas and restrooms.

Implementation of individual trail segments, trailheads and other areas should be designed in compliance with applicable accessibility regulations.

## 8.3 Design and Implementation Protocols for Sensitive Habitat Areas

An important component of providing public access near sensitive wildlife areas is to limit the potential impact of human intrusion and trespass into sensitive areas. Where sensitive habitat exists (wetlands and creeks within the study area, as well as cultural resources sites), setbacks, fencing or vegetation buffers may be needed to minimize intrusion into these areas. Design elements that may be considered to minimize intrusion include:

- Avoid locating the trail within the riparian corridor, or within wetlands where possible.
- When crossing creeks, utilize clear-span pre-fabricated bridges to minimize site disturbance.
- Vegetation buffers should consist of native plant species to provide a natural barrier to human intrusion into wetlands, as well as provide refugia cover to wildlife.
- Interpretive components will be included in the project implementation, such as including interpretive displays to inform trail users about the needs of sensitive species, programs and signs to teach trail users how to behave in a habitat, user outreach, docents, adopt-a-trail, stewardship programs, etc.
- Leashed pet policies may be appropriate for certain trail segments.
- If needed to protect habitat conditions, seasonal closure of certain trail segments may be implemented to protect wildlife (during nesting periods).
- The trail should be managed and monitored to provide opportunities to improve or adjust access, such as providing screening, adjusting access points, or incorporating needed buffers or use restrictions to support habitat needs.

## 8.4 Geotechnical Considerations

Vehicular Load Rating for Emergency Access. Some trail segments should be designed for access by emergency vehicles, with a minimum weight capacity of 10,000 pounds (H10 load). Heavier load ratings (h-20) may be required by local fire and emergency response units, depending on availability of access and location. This may be desirable in locations where the trail will also provide fire access to landowners, facilitate agricultural operations, or to facilitate access across creeks.

Flood Prone Areas. Trails located adjacent to areas that may be subject to periodic inundation may need to be reinforced with structural geosynthetics such as geocells to provide a stable trail surface and improve year-round

accessibility. The need for structural support will be determined through additional engineering analysis as part of the trail design. Where trails are proposed to cross over such areas, they will require special structures and treatment, such as over-excavation and placement of engineering geotextile such as Geocell, and import of thick section of granular aggregate base. The wettest of these areas will likely require the use of a boardwalk structure supported on short piles or another anchor system.

Slope Instability. Precise trail siting will be needed to avoid landslide areas. If the trail will cross areas of slope instability, these areas must be carefully evaluated to ensure that trail safety is maintained, and that further degradation of slope conditions does not occur. Geotechnical slope stabilization, including reconstructive slope grading, drainage structures, and retaining walls may be needed in some areas, especially at the east end of the corridor. These measures can be expensive, and careful placement of site features will be critical.

Pavement Design. A detailed geotechnical investigation should be completed for all areas that are to be improved with a hard, non-flexible trail surface (such as asphalt concrete or concrete paving). Depending on soil conditions and pavement design needs, the use of geotextiles, and a more flexible trail surface, such as stabilized decomposed granite (DG) or stabilized quarry fines (QF) should be considered for such poor soil areas.

## 8.5 Signage and Wayfinding

A common trail signage design scheme should be utilized throughout the corridor. Multi-use trail signing and markings should follow the guidelines as developed by Caltrans and the Manual on Uniform Traffic Control Devices. This includes advisory, warning, directional, and informational signs for bicyclists, pedestrians, and other users. Striping, marking, and signing plans will be subject to approval by the implementing agency.

Sign design should be consistent throughout the project, and sign elements should be grouped and designed to minimize visual intrusion. Sign elements may include more than one agency signs, as well as directional and informational elements. Signage and design standards that might apply include:

- STA
- BARTC
- NCTPA
- NCRPOSD
- Solano County Parks
- Solano County Public Works
- City of Fairfield
- ABAG SF Bay Trail
- California Cross State Trail
- California Great Delta Trail

Trail Signs

In accordance with proposed accessibility regulations, it is recommended that trail signs provide information about the trails' running slope, width, cross slope, and other characteristics to enable people to make informed decisions about using trails based on the characteristics of the trails. Signs along the levee top will be minimized, to avoid creation of raptor perches.

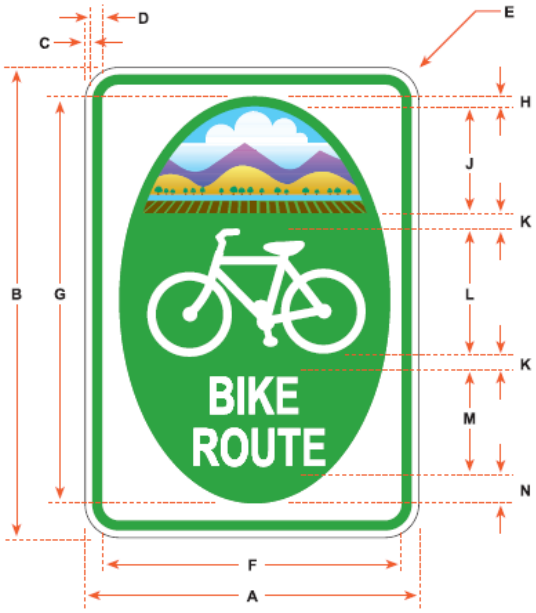
In general, all signs should be located two to four feet from the edge of the paved surface, have a minimum vertical clearance of 8.5 feet when located above the trail surface and be a minimum of four feet above the trail surface when located on the side of the trail. All signs should be oriented for clarity to the user.

In addition to directional signs, interpretive/educational signs should be posted at trail access points. Signs should include GPS coordinates to facilitate emergency access. Trail use regulations such as keeping dogs on leash, intrusion into sensitive areas, and other programs to protect sensitive habitat would also be placed at trailhead access locations.

As a primarily recreational trail, lighting along the trail is generally not appropriate. Lighting should be considered at access points that adjoin streets. Solar operated fixtures are appropriate for these locations. Dusk to dawn closure of the trail is expected.

Wayfinding Signage. The following signage is recommended for the trail or related projects in the corridor:

**State of California - Department of Transportation**
**Code : SG45**
**MUTCD Number: None**




| Sign Size | Dimensions (inches) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N |
| 12 x 18 | 12 | 18 | 1/4 | 1/4 | 1-1/2 | 10 | 16 | 1/4 | 4 | 3/4 | 4-1/2 | 4D | 1-3/4 |
| 18 x 24 | 18 | 24 | 3/8 | 1/2 | 1-1/2 | 15 | 21 | 1/2 | 5 | 1 | 6 | 5D | 2-1/2 |

**Colors**
**Border and Legend - Green (Reflective)**
**Background - White (Reflective)**

In addition to the Solano County Bike Route symbol, a Ridge Trail logo with directional symbology for Napa and Solano County should be included below the sign specifications above as follows:

## 8.6 Trailheads and Access Points

Trail access, parking, restrooms, waste disposal, interpretive elements, drinking fountains and benches should be provided at key locations, including trail intersections, SR 12 crossings and connections to local trails. This will allow areas for emergency access circulation, passage, as well as an opportunity to provide interpretive and directional signs for trail users. Potential trailhead access amenities could be located in the vicinity of Kirkland Ranch Road, at the Ridge Trail north/south intersection with the east/west route, and in the vicinity of realigned Red Top Road.

Trailhead Elements and Interpretive Displays

## 8.7 Fences, Gates and Bollards

Fencing may be needed adjacent to sensitive habitat areas (wetlands) to prelude trail users and domestic animals from the area. This can be simple as 3 or 4 strand wire fencing, or welded wire mesh with wood posts. Top rails should be avoided where possible to minimize perching by raptors. Fencing adjacent to Caltrans ROW would need to meet Caltrans standards, generally wire fencing or chain link fence.

Posts at trail intersections and entrances will be necessary to keep vehicles from entering. Posts should be designed to be easily moveable by emergency vehicles, such as bollards or a pipe gate and bollard, but consistent with the rural setting. Pipe Gates are appropriate at locations where vehicular access will be needed.

## 8.8 Maintenance and Management Considerations

Operation and maintenance of the trail system is an important component of overall trail implementation. Since it is likely that implementation will occur in phases and by various entities, commitment to a uniform maintenance strategy is desirable. Since the trail will span two counties and multiple jurisdictions, it will be beneficial to develop policy and cooperative management agreements to facilitate management of the trail.

### Ridge Trail Maintenance Guidelines

The Ridge Trail has adopted the following recommended maintenance guidelines:

1. The trail should be kept clear of brush, branches and litter.
2. Trail surface damage should be promptly repaired.
3. Appropriate techniques should be used and maintained to minimize erosion, other trail surface damage, and maintenance cost and time.
4. Where support facilities such as parking, restrooms, drinking water, and trash receptacles exist, they should be maintained in working order and in a condition suitable to supplying the services intended.
5. Trail segments providing for access by persons with physical disabilities should have facilities and trail standards adequate for this use maintained in accordance with applicable regulations.

Trail Maintenance Vehicle
Steven Creek Trail, Santa Clara

6. Logo and directional signs, including trailhead signs and trail markers, should be installed and maintained as identified on a Sign Plan developed for the section in conformity with BARTC Trail Signage Policy, confirmed as necessary by on-site physical inspection by the County Committee.
7. Safety signs for connections along road shoulders and across roads should be installed and maintained.

## Volunteers

In some communities, a volunteer citizen's patrol has been established to help provide supervision and maintenance assistance along trails, such as informational guidance and trash removal. Maintenance needs are also dependent on the type and amount of supporting infrastructure that is developed along the path. Maintenance activities associated with the trail include:

- Trash disposal
- Sign replacement and repair
- Vegetation trimming
- Pavement repair
- Graffiti removal
- Weed control
- Repair/replacement of site furnishings, such as benches and trash receptacles.

# 9. COST ANALYSIS, FUNDING AND IMPLEMENTATION

Funding may come from multiple sources, and matching funds may be required to complete funding package. Bicycle and pedestrian projects are typically funded from State and Federal-aid highway, transit, safety, recreation, and other programs. Bicycle projects must be primarily for transportation (not recreation) purposes and must be consistent with adopted transportation plans.

Obtaining project funding is often very competitive and success varies according to the number of applicants and the relative merits of each competing project. However, receiving grant funding for trail construction is generally more successful when the following components are in place:

- The project is a component or element of a larger regional trail system, with connections, and has been addressed in a feasibility study or master plan, prepared among cooperating agencies and with stakeholder input.
- The project has demonstrated local community support and elected government official's support.
- Partners are included in the project and the partner nonprofit or community organizations have a demonstrated history working with the agency to implement a project, and are involved in implementing the grant request (such as Bay Area Ridge Trail and Land Trusts).
- Environmental review (CEQA and NEPA for Federal funds) has been completed, including a Notice of Determination from the Lead Agency.
- A Resolution from the Lead Agency(s) accepting the Master Plan or Feasibility Study and authorizing application for grant funding has been passed.

Allocation of project funding and procurement of funds from grants or other sources must follow the appropriate guidelines of the granting entity. Caltrans Local Assistance coordination may be required as a project component, including a local agency match, if funding is sought from federal sources.

Most grant funding is for construction only, and does not typically include operations and maintenance costs. Considering the steep topography, stream crossings needed, and the significant slope instability issues that occur within the Jameson Canyon corridor, some mechanism to set aside or reserve funds for maintenance and repair will be essential to the long term success of any trail project within this corridor.

## 9.1 Preliminary Project Costs

Planning level cost estimates were developed for each of the feasible trail segments, adapted from a methodology used to estimate costs for completion of the Bay Trail (*The San Francisco Bay Trail Project Gap Analysis Study, 2005*). The cost analysis is based on typical costs for similar constructed trail projects, since preliminary engineering designs (including grading and slope stabilization plans scaled cross sections) are not available at the feasibility study level (Appendix D).

### *9.1.1 Trail Construction Cost Groups*

Costs are divided into generalized groupings associated with expected level of difficulty for permitting and construction. The most significant factor used in deciding construction difficulty was cross slope steepness and the presence of unstable slopes and erosive soil conditions. Costs for trail construction, including grading, drainage, paving, erosion control and slope treatment, were grouped into four groups of construction difficulty:

A: Trail construction would occur on gently sloping terrain (< 10%), where there are no expected significant drainage or slope issues.

B: Trail construction would occur where there are moderate cross slope (11-25%) and drainage issues, but soil erosion and slope instability would be minor problems.

C: Trail construction would occur on steep slopes (26-50%) with increasingly challenging erosion control and slope stabilization problems, but not active landslides, which may require some slope stabilization, erosion control and short retaining walls.

D: Trail construction would occur in the most challenging situation, where there are anticipated significant issues associated with steep side slopes, (>50%), high erosion hazards and slope instability due to active landslides and landslide run-out debris. Typically trail drainage, extensive retaining walls, and slope reconstruction and stabilization in areas of landslides would be required elements of trail construction in areas predominated by Group D conditions.

Utility relocation, right of way (ROW) and property acquisition costs, traffic control, access and the availability of mobilization and staging areas, sources of fill and excess cut soil disposal and environmental mitigation needs can all be a significant part of total construction costs, but are typically not specifically included as separate line items in cost estimating at this level of project feasibility evaluation and planning, but are included as part of the overall grading and paving cost allowance.

The basis of the cost assumptions were for constructing a multi-purpose paved 10-foot-wide trail through variably sloping and oak wooded terrain (essentially a single lane rural country road, which could also provide emergency access for rural property owners).

Mobilization, traffic control, clearing and grubbing, grading, minor drainage structures such as culverts, sub-base preparation, asphalt concrete paving, and signage and trail furnishings were all lumped together into one overall component (grading and paving), while fencing was identified as another distinct cost associated with a multi-use trail project. Bridges and boardwalks were also separated out for cost accounting. These represent the bulk of the trail construction costs, with the grading, slope work and drainage and paving having the highest contribution to the overall trail construction cost

Feasible segments are summarized in Table 9-1, outlining preliminary project cost by segment (length measured in lineal feet). Segments considered infeasible were not evaluated, and are shown with a zero (0) in the cost table (Appendix D). Shaded segments indicate the preferred preliminary alignment (see Section 7).

Table 9-1: Construction Cost Summary

| ALIGNMENT OPTION | Western | Confluence | Central | Canyon | Eastern | TOTALS |
|---|---|---|---|---|---|---|
| 2N – Highway North | Length: 7,150 LF | Length: 4,850 LF | Length: 10,100 LF | Length: 2,800 LF | Length: 3,700 LF | 28,600 LF |
| North edge of SR 12 ROW after widening. PLUS: Fairly level within much of Napa County. Could possibly build bench in widened section. MINUS: Deep ranch properties with homes at Miner's Trail, Spurs Trail, and the private road west of Spurs Trail. Large and steep hills and valleys through canyon. | $1,230,740 | $1,086,310 | $3,367,960 | Not feasible | Not feasible | $5,685,010 |
| 2S – Highway South | Length: 6,900 LF | Length: 4,850 LF | Length: 10,100 LF | Length: 2,750 LF | Length: 3,150 LF | 27,750 LF |
| South edge of SR 12 ROW after widening. PLUS: Fairly level west of the Canyon's narrow segment. MINUS: Vineyards, ranches, and several houses in strip between SR 12 and railroad. | $1,552,890 | $892,160 | $2,081,660 | Not feasible | Not feasible | $4,526,710 |
| 3N – Railroad North | Length: 12,800 LF | Length: 4,600 LF | Length: 7,200 LF | Length: 2,700 LF | Length: 3,150 LF | 30,450 LF |
| North edge of railroad ROW. PLUS: Fairly level close to railroad. Not constrained by SR 12 widening project. MINUS: Ranches, vineyards, one house and pool adjacent. UPRR will not permit trail within ROW, to preserve for potential future intensification of use. | $1,637,030 | $1,272,060 | Not feasible | Not feasible | Not feasible | $2,909,090 |

| ALIGNMENT OPTION | Western | Confluence | Central | Canyon | Eastern | TOTALS |
|---|---|---|---|---|---|---|
| 3S – Railroad South | Length: 12,800 LF | Length: 4,600 LF | Length: 9,950 LF | Length: 2,700 LF | Length: 3,150 LF | 33,200 LF |
| South edge of railroad ROW. PLUS: Fairly level close to railroad. Not constrained by SR 12 widening project MINUS: Few access points from north side of railroad (Red Top Road and one private crossing) Engineering challenges through canyon. | $1,495,830 | Not feasible | Not feasible | Not feasible | Not feasible | $1,495,830 |
| 4 – South Foothills | Length: N/A | Length: 4,900 LF | Length: 10,050 LF | Length: 2,700 LF | Length: 3,150 LF | 20,800 LF |
| South of railroad, along north face of foothills. PLUS: Ranch land except one house. Potential spur through Creston Station Ranch to Lynch Canyon and I-80. MINUS: Few access points from north side of railroad (Red Top Road and one private crossing) Engineering challenges through canyon, including one valley that may require a bridge. | Not feasible | Not feasible | $2,205,130 | $818,620 | $1,157,540 | $4,181,290 |

| ALIGNMENT OPTION | Western | Confluence | Central | Canyon | Eastern | TOTALS |
|---|---|---|---|---|---|---|
| 5N – Golf Course / Creek | Length: 7,900 LF | Length: N/A | Length: N/A | Length: N/A | Length: N/A | 7,900 LF |
| Along creek through golf courses. PLUS: Scenic. Not constrained by SR 12 widening project. MINUS: Seasonal wetlands and habitat along creek. Need for segment along Kelly Road from golf course south edge to SR 12 or SR 29. Possibly consider in addition to SR 12 alignment. | Not feasible | N/A | N/A | N/A | N/A | $0 |
| 5S – Golf Course / South | Length: 5,600 LF | Length: N/A | Length: N/A | Length: N/A | Length: N/A | 5,600 LF |
| South edge of golf courses PLUS: Scenic. Not constrained by SR 12 widening project. MINUS: Need for segment along Kelly Road from golf course south edge to SR 12 or SR 29. Possibly consider in addition to SR 12 alignment. | $1,935,310 | N/A | N/A | N/A | N/A | $1,935,310 |

### 9.1.2 Preferred Alignment Construction Cost

Based on this evaluation, a "most feasible" route along the south side of SR 12 with an estimated construction cost of $8.8 million (not including ROW acquisition costs) is identified for further study to provide a path beyond the Class II bicycle lane on SR 12. This route is technically the most feasible of five alternative routes considered but still has considerable challenges.

The route most feasible consists of Option 2S (Highway South) through the Western, Confluence, and Central segments with a new undercrossing of the railroad at the Creston Station private crossing; continue east using Option 4 (South Foothills) to Red Top Road and I-80. The total cost for implementation of the Preferred Alignment would be approximately $8,778,875 ($6,502,870 in construction, and $2,276,005 for planning, design and environmental costs), excluding right of way or land acquisition costs, as discussed below.

Construction Cost. The preferred trail route incorporates Segment 2S to Creston Station, construction of a new railroad undercrossing near Creston Station and the Napa/Solano County line, and continuation of the trail route along Segment 4, south of the rail line. Construction costs for this route are $6,502,870.

Planning/Design/Environmental Costs: In addition to the actual on the ground construction costs, there are several other "up-front" costs that need to be accounted for in developing total project costs, estimated as a percentage of project construction. For the preferred alignment, this is approximately $2,276,005. This does not include costs for right of way or land acquisition. Planning/design/environmental costs include:

1. Follow-up planning and preliminary engineering, including right of way work (5% of the total construction costs): $325,144.

2. Design level engineering, including geotechnical engineering, structural and hydrology/hydraulics analysis (10% of the total construction costs): $650,287.

3. Environmental review (CEQA/NEPA), Habitat Mitigation Plan and project permitting (5% of the total construction costs): $325,144.

4. Biological Monitoring and Construction management, including construction site inspection (15% of the total construction costs): $975,431.

### 9.1.3 Right of Way and Easement Acquisition Costs

Acquisition of trail easements or fee title for land that may need to be purchased for construction of the Jameson Canyon corridor trail can be one of the primary costs of project implementation. One of the possibilities for trail ROW acquisition might be their dedication as a floating easement as a requirement or part of a larger agricultural land conservation easement or agreement. Preliminary discussions with representatives of the Solano Land Trust indicate that such a requirement is sometimes a condition of an agricultural land conservation purchase agreement when funded by state agencies.

Trail ROW can also be included as part of a development agreement or condition of approval for a private commercial or residential land subdivision development, or as a part of a future transportation improvement project within the corridor. Another possibility that has occurred in other areas is where individual property owners may voluntarily agree to a trail easement, because of their support of a trail project based on its merits, and value of the small amount of tax deduction that is available.

According to discussions with Solano Land Trust and Napa Land Trust representatives, there is the real possibility of agricultural land conservation agreements within the corridor, possibly including floating trail ROW requirements, and

several private ranch owners are considering voluntary trail easements. Considering land use and zoning designations and development opportunities within the corridor, the possibility of large-scale easement acquisition as a condition of future land development agreement is more remote.

In addition to the State lands within the Caltrans ROW, there are some additional public lands within the corridor, held by the Department of Water Resources as a part of the State Water Project, and by the City of Vallejo. The feasibility of using these ROWs, in addition to the Union Pacific Railroad ROW, were investigated as a part of this study and found not to be feasible. Some public land within the corridor is also owned and managed by the Napa Sanitation District, some of which is leased to the Chardonnay Golf Course on the south side of Jameson Canyon Road, while their lands abutting the state highway lands on the north of Jameson Canyon Road are used for farming as a part of their wastewater disposal spray irrigation project. Depending on the selection of the preferred alignment, (2N vs. 2S) discussions with the District will be needed regarding possible use of their lands along SR 12 for a trail.

A Class II bikeway will be constructed as a part of the soon to be constructed SR 12 improvement project. Highway projects in advanced planning within the Jameson Canyon corridor include improvements at the SR 12 - Red Top Road intersection in Solano County and at the SR 12-SR 29- Airport Blvd intersection in Napa County. These projects will include consideration of connections to local bike paths and trails.

Acquisition of Private Right of Way: ROW acquisition costs are difficult to estimate at a feasibility study level, without the benefit of a full land appraisal, but some general cost information can be presented for feasibility study planning purposes.

An estimate of ROW acquisition costs can be determined based on the value of land “across the fence” from the trail alignment. According to discussions with realtors in the Napa-Solano area, a review of online articles on the value of vineyards in Napa, and a review of online real estate listings of ranch land for sale in both Napa and Solano Counties, rural un-developed ranchlands typically range in value from about $7,000.00 to $10,000.00 per acre ($0.16 to $0.23 per sq. ft.). Properties in Napa County (outside of the Napa Valley, but within a Napa wine appellation area), with available water and suitable soil conditions and that have potential for vineyard development have land values in the range of $20,000.00 to $30,000.00 per acre ($0.46 to $0.69 per sq. ft.). Producing vineyards (outside of the Napa Valley proper) depending on the wine grape variety and age, condition, and productivity of the vineyard, and its location, can range in value from upward of $50,000 to more than $70,000.00 per acre ($1.15 to $1.61 per sq. ft.).

For general planning purposes, we have used a median cost range of: 1) $0.20 per square foot for raw, sloping ranch land in Napa and Solano County that does not have vineyard development potential, 2) $0.40 and $0.60 per sq ft. for lands that have a potential for growing wine grapes in Solano and Napa Counties, respectively, and 3) a median value of $1.15 per sq. ft. for producing vineyards in Solano County, outside of a wine appellation area., $1.50 per sq. ft. for producing vineyard lands in Napa County. These land values are consistent with the ROW purchase costs for farmland within Jameson Canyon associated with the SR 12 improvement project. ROW land values in land purchase agreements ranged from $.028 to $1.15 per sq. ft., reflecting the purchase of valley bottom lands with some potential for vineyard conversion in Solano County, to purchase of small tracts of vineyards.

Using a recommended trail ROW width of 30 feet, this equates to costs per lineal foot of A) $6.00 for raw ranch land, B) $12.00 and C) $18.00 for ranchlands that have vineyard potential in Solano and Napa Counties, and D) $34.50 and E) $45.00 respectively for producing vineyards in Solano and Napa Counties.

Each trail segment option was then evaluated using the project GIS aerial photography and soils maps to determine the amount of the segment in lineal feet that falls within each of the land cost groups, based on existing land use, soils, and slope. Table 9-2 summarizes the planning level cost estimates for ROW acquisition.

## Table 9-2: ROW Costs

| OPTION | A - Ranch Land ($6.00/LF) | | B - Vineland Potential, Solano ($12.00/LF) | | C - Vineland Potential, Napa ($18.00/LF) | | D - Producing Vineyard, Solano ($24.50/LF) | | E - Producing Vineyard, Napa ($45.00/LF) | | OPTION TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LF | Cost | LF | Cost | LF | Cost | LF | Cost | LF | Cost | |
| 2N - WESTERN | 0 | $0 | 0 | $0 | 5,000 | $90,000 | 0 | $0 | 2,150 | $74,175 | $164,175 |
| 2N –CONFLUENCE | 1,250 | $7,500 | 0 | $0 | 0 | $0 | 0 | $0 | 3,600 | $124,200 | $131,700 |
| 2N - CENTRAL | 10,100 | $60,600 | 1,520 | $18,240 | 0 | $0 | 0 | $0 | 0 | $0 | $78,840 |
| 2N - CANYON | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 2N - EASTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| OPTION TOTALS | 11,350 | $68,100 | 1,520 | $18,240 | 5,000 | $90,000 | 0 | $0 | 5,750 | $198,375 | $374,715 |
| 2S - WESTERN | 100 | $600 | 0 | $0 | 0 | $0 | 0 | $0 | 6,800 | $234,600 | $235,200 |
| 2S - CONFLUENCE | 100 | $600 | 0 | $0 | 0 | $0 | 0 | $0 | 4,750 | $163,875 | $164,475 |
| 2S - CENTRAL | 4,400 | $26,400 | 3,500 | $42,000 | 0 | $0 | 1,200 | $41,400 | 0 | $0 | $109,800 |
| 2S - CANYON | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 2S - EASTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| OPTION TOTALS | 4,600 | $27,600 | 3,500 | $42,000 | 0 | $0 | 1,200 | $41,400 | 11,550 | $398,475 | $509,475 |
| 3N - RR WESTERN | 100 | $600 | 0 | $0 | 0 | $0 | 0 | $0 | 12,700 | $438,150 | $438,750 |
| 3N - RR CONFLUENCE | 400 | $2,400 | 0 | $0 | 0 | $0 | 0 | $0 | 4,200 | $144,900 | $147,300 |
| 3N - RR CENTRAL | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 3N - RR CANYON | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 3N - RR EASTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| OPTION TOTALS | 500 | $3,000 | 0 | $0 | 0 | $0 | 0 | $0 | 16,900 | $583,050 | $586,050 |
| 3S - RR WESTERN | 1,500 | $9,000 | 0 | $0 | 0 | $0 | 0 | $0 | 11,300 | $389,850 | $398,850 |
| 3S - RR CONFLUENCE | 800 | $4,800 | 0 | $0 | 0 | $0 | 0 | $0 | 3,800 | $131,100 | $135,900 |
| 3S - RR CENTRAL | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |

| OPTION | A - Ranch Land ($6.00/LF) | | B - Vineland Potential, Solano ($12.00/LF) | | C - Vineland Potential, Napa ($18.00/LF) | | D - Producing Vineyard, Solano ($24.50/LF) | | E - Producing Vineyard, Napa ($45.00/LF) | | OPTION TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LF | Cost | LF | Cost | LF | Cost | LF | Cost | LF | Cost | |
| 3S - RR CANYON | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 3S - RR EASTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| OPTION TOTALS | 2,300 | $13,800 | 0 | $0 | 0 | $0 | 0 | $0 | 15,100 | $520,950 | $534,750 |
| 4S. WESTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 4S- CONFLUENCE | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 4S. CENTRAL | 2,250 | $13,500 | 7,500 | $90,000 | 0 | $0 | 0 | $0 | 0 | $0 | $103,500 |
| 4S. CANYON | 2,700 | $16,200 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $16,200 |
| 4S. EASTERN | 3,150 | $18,900 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $18,900 |
| OPTION TOTALS | 8,100 | $48,600 | 7,500 | $90,000 | 0 | $0 | 0 | $0 | 0 | $0 | $138,600 |
| 5N - WESTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5N - CONFLUENCE | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5N - CENTRAL | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5N CANYON | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5N - EASTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| OPTION TOTALS | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5S - WESTERN | 720 | $4,320 | 5,010 | $60,120 | 1,430 | $25,740 | 0 | $0 | 0 | $0 | $90,180 |
| 5S - CONFLUENCE | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5S - CENTRAL | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5S - CANYON | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| 5S - EASTERN | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | 0 | $0 | $0 |
| OPTION TOTALS | 720 | $4,320 | 5,010 | $60,120 | 1,430 | $25,740 | 0 | $0 | 0 | $0 | $90,180 |

*0 = Infeasible segment for grading & paving*

TOTAL R.O.W. - PREFERRED ROUTE (2S West-Confluence-Central; 4 Canyon-Eastern): $554,575

As noted in the table, the estimated ROW acquisition costs, based on the assumptions presented, total $544,575.00 for the preferred alignment. Placed in perspective, these ROW acquisition costs represent less than 1% the total of construction costs. It is worth noting that the lands with the greatest land values are in the Napa County portion of the Jameson Canyon corridor, and that the lands also have the lowest per lineal foot construction costs, because of flatter slopes. Paradoxically, the lands with the highest per lineal foot construction costs are located at the east end of the corridor in Solano County, because of cross slope and slope stability issues, while these lands also have the least per lineal foot of potential ROW acquisition costs.

In addition to actual easement or Right of Way acquisition costs, engineering and program administration costs are factored into the analysis. These include boundary survey, legal description preparation, appraisals, legal/ROW agent costs, and program administration. These costs are estimated to be approximately 20% of the total, or an additional $110,000.00, making total ROW acquisition costs approximately $660,000.00.

It should be emphasized that use of these cost approximations does not constitute any sort of offer or position on land acquisition needs and costs by STA or any of the cooperating stakeholder agencies that are a part of this Feasibility Study; it merely provides a perspective on the possible range of ROW acquisition and a comparison with trail construction costs.

Acquisition of the needed ROW will be challenging. The ROW needed is generally used for low intensity range land on the east end of the corridor, but is within or immediately adjacent to vineyards, or lands with vineyard potential on the west end. In addition, in a few instances the preferred trail alignment is located near ranch buildings, although a more detailed alignment study could shift the precise alignment locally to minimize these impacts. Because of these issues, there will need to be a concerted effort to minimize project impacts on vineyard lands and vineyard operations that occur within the west end of the corridor.

More importantly to understand is that there is no certainty that any of the private landowners along the alignment would voluntarily relinquish ROW, and most grants for trail construction generally prohibit land condemnation. In addition, there is no certainty that the impacts of conversion of vineyard lands to trail usage, or impacts on adjacent vineyard operations would be found to be acceptable.

### *9.1.4 Operations and Maintenance*

Operations and maintenance of the Jameson Canyon corridor trail will be extremely important to ensure that the facility remains open, safe and productive as both a recreational and transportation facility. Operations will consist primarily of safety and security patrols, and to ensure that trail users are not trespassing on adjoining properties. Because of steep slopes and slope instability issues, trail maintenance costs will be higher than those typical for a recreational trail and will consist primarily of cut slope maintenance and erosion control, maintaining drainage structures, and maintaining the paving through periodic pot hole repair, crack sealing and slurry sealing. Other needed maintenance may include mowing, tree limbing, and weed control within the ROW, and repair of signage, trailhead parking facilities, and bridge and creek crossings.

In addition to maintenance costs, operations include periodic inspections, system management, patrol, and other administrative functions that should be factored into the overall costs of the trail system.

Representative annual costs for maintaining bicycle/pedestrian trails are as follows: 1) approximately $8,700 per mile for the Joe Rodota and West County Trail system in Sonoma County, 2) costs of approximately $5,800.00 per mile per year for maintenance of Class I trails by East Bay Regional Park District, 3) costs of just over $2,000.00 per mile in a survey completed by Rails to trails in 2005, and 4) costs of $6,5000.00 per mile as outlined in NCHRP Report 552 (p. 20).

Given the steep topography, slope stability issues that the Jameson Canyon Corridor trail will cross, and the number of drainage crossings that need to be maintained, we anticipate annual operations maintenance costs to average approximately $8,000.00 per mile, or about $45,000.00 annually for the proposed 5.6-mile trail system.

## 9.2 Cost Effectiveness

Construction, and operation and maintenance of the Jameson Canyon corridor trail will be costly, and because of the difficulty of obtaining competitive grant funding for capital intensive ROW acquisition and trail construction, total construction costs are an important determinant in considering overall project feasibility.

### *9.2.1 Relative Cost Comparison*

One measure of the cost effectiveness of a project is a comparison of the costs of the proposed trail with nearby similar trail projects. Costs of the Jameson Canyon corridor trail (preferred alignment) are estimated to average about $1.4 million per mile, and nearly $1.5 million per mile if ROW acquisition costs are figured in. In comparison, costs for the Napa River and Bay Trail are relatively inexpensive at about $160,000 per mile (trail is on public lands, mainly on nearly level levee top, and no additional ROW needed), while the Napa Valley Vine Trail costs are expected to average between $700,000 and $1.1 million dollars per mile, which includes about $50,000 to $100,000 per mile in ROW costs. As such, the Jameson Canyon Corridor Trail would be about 20%to 50% more than costs for the Vine Trail, and greater than ten times more per mile than Napa River and Bay Trail. This is not surprising given that the Jameson Canyon Corridor Trail would traverse an area of steep and unstable slopes and cross a minimum of six streams requiring bridge crossings, while the Napa River and Bay Trail primarily follow along levees or along and adjacent to road ROWs on gentle slopes, and with a minimum of stream crossings.

### *9.2.2 Benefit Cost Analysis*

Another measure of the cost appropriateness or cost effectiveness of a proposed project is its Benefit Cost Ratio as determined through a Benefit Cost Analysis. As the name implies, a Benefit Cost Analysis compares the total costs of a project with perceived benefits, and is a tool used use in state and federal project planning and policy decision-making. In other words, it estimates the equivalent money value (typically in dollars) of the benefits to the community of a project to establish whether the project's estimated cost expenditures are worthwhile.

In addition to determining costs and benefits in equivalent money value, they also have to be expressed in terms of a particular time frame. This is especially important for projects which may not be constructed for some time in the future, which may take several years to construct, for which there are high annual and long term operations and maintenance costs, and for which benefits may accrue over a long life of the project. Typically this is done by converting the future costs (including a summation of annual operating and maintenance costs) and all future benefits throughout a project's planning life to its present day economic value using a discount or interest rate.

For instance, for a proposed flood control project, the total costs of a dam or for flood control channel construction are compared with the public benefits applicable to both communities and individual property owners in terms of flood prevention and flood damage reduction. This is done over the expected life of the flood control project, and annual flood control channel maintenance costs, along with any ongoing environmental mitigation costs. As noted above, costs and benefits are usually normalized to present day dollars, although benefits most often extend well beyond the present.

To be viable and cost effective, the benefits of a project should exceed its costs when viewed over the life of a project and analyzed in terms of present day costs (i.e., Benefit: Cost Ratio > 1.0). Although the costs of construction of a trail can be readily understood, (but not as easily determined at a Feasibility Study level), trail construction benefits are somewhat more obscure and difficult to measure.

One benefit of the proposed Jameson Canyon multi-use trail project is the outdoor recreation experience of the trail user. In economic terms this benefit is typically measured and valued by user expenditures such as how much money a typical trail user is willing to spend to get to and from the venue and how much money they typically are willing to spend once there (i.e. travel to the site, parking, any admissions, souvenirs, meals, etc.). The economic value or monetary equivalency of the recreation experience is how much the recreational user is willing to invest in achieving it. Since these benefits relate to or are proportionate to the total number of trail users, an important component of measuring the benefits of constructing a trail is determining the likely number of users on an annual basis and for the life of the project. For trail and recreation projects such as this, typically a 25- to 30-year project life expectancy or life cycle is used.

Other benefits of a multi-use trail include the health benefits of physical exercise (individual and community health care cost reduction benefits), increased mobility (ability to reach a destination safer and quicker, with a better user experience) and decreased automobile usage (reduced congestion, reduced air pollution, user cost savings). For the Jameson Canyon corridor trail, the primary benefit will be in terms of meeting recreation demand and the recreation experience, although some minor mobility, health, and decreased automobile use benefits will also occur.

Other benefits that are not included in this analysis, and that are sometimes ascribed to a project such as this, include local construction job creation and the local purchase of construction materials and equipment, and changes in local land values as a result of trail construction.

### *9.2.3 Online Benefit Cost Analysis of Bicycle Facilities Tool*

Benefit cost models are available for bicycle facilities, although they do not factor in other users of the Jameson trail, including pedestrians, equestrians and others. The benefits of a bicycle trail and the procedures used to economically quantify these benefits (including procedures on how to estimate trail use as a part of a benefit cost analysis for a proposed bicycle facility) are presented in the National Cooperative Highway Research Program Report 552; *Guidelines for Analysis of Investments in Bicycle Facilities* (Krizek, 2006). A simplified annual cost-benefit analysis model based on this approach, and developed by the same author, is provided via an online walk-through calculator of trail construction costs, trail use and demand estimates, and economic benefits on the Bicycle Encyclopedia web site "Benefit-Cost Analysis of Bicycle Facilities" http://www.bicyclinginfo.org/bikecost/.. This site is maintained by the University of North Carolina, Chapel Hill.

The model uses 2000 Census data regarding bicycle use in a number of metropolitan areas across the United States, along with population density (people per square mile) near the proposed facility, proposed bicycle facility information and other bicycle transportation research and demographic information to estimate bicycle facility use. The online model brackets expected facility use by providing three levels of demand prediction: 1) a "low estimate", 2) a "mid estimate", and 3) a "high estimate". Land use patterns such as the proximity of the facility to parks and open space areas, schools, and other attractors that are traditionally used in transportation planning are not directly used in the on-line model. Benefits are then assigned to the user estimates, based on, for instance savings in doctor visits and other medical expense reductions, for health Benefits, an estimate of the value of travel time reduction for mobility benefits, and a value of a recreation, or a portion of a day, for recreation experience.

For modeling purposes, users of the facility were captured as bicyclists. Based on land use and population density of adjacent urban areas, it was assumed that the higher density provided a higher estimate for bicyclists than the characteristics of the corridor and observations of trail usage from adjacent areas would otherwise suggest. Therefore, it was also assumed that the users represented would include pedestrians in addition to cyclists.

There is no ability to calibrate the model with actual bicycle count data, such as from near-by reference areas, or include other user survey information. Presumably the tool user has the discretion to select the predicted demand level within the bracketed bounds, (low, medium, or high facility use estimates) based on a consideration of these

and other land use, demographic and geographic factors, such as nearby parks, open space area, or connector trails.

Although this model is likely most appropriate for estimating costs, facility user demand and use benefits for a more traditional bikeway project within an urban area (as opposed to a rural off street bicycle pedestrian facility), it does provide a means to quickly and efficiently complete a planning level Benefit Cost Analysis. This Benefit Cost Analysis can be used as a preliminary tool for use in decision making regarding the project's merits and overall feasibility, however, it should be emphasized, it does not account for non-cycling use.

### *9.2.4 Notes Regarding Online Bicycle Facilities Tool Use in Jameson Canyon Benefit Cost Analysis*

Since the trail cost portion of the online model appears to be geared for a more urban trail without the steep slope and slope stability constraints present in Jameson Canyon, and requires a higher level of preliminary design than was developed in this Feasibility Study, the cost portion of the Benefit Cost Analysis tool was obtained from the information developed and presented previously in this section.

In addition, because it is not presently known how much, if any, of the trail system will require the purchase of ROW, the Benefit Cost Analysis was completed both <u>with</u> and <u>without</u> ROW costs as a part of total project costs.

The user demand and trail use component of the online model is determined in large part by population density (population per square mile), information on bicycle use as recorded in the 2000 Census for the nearest metropolitan area (or a user supplied estimate) and the proximity of the proposed bicycle facility to population centers, with predominant weight given to population density within ½ and 1 mile of the facility being considered. Again, estimates of pedestrian and equestrian use are not included in the model, but the assumption was that the use estimates provided by the model would include pedestrians.

The online model uses both total trail length and population density in quarter-mile distance increments from the proposed facility, in addition to certain population demographic by Standard Metropolitan Region (project is located San Francisco-Oakland-San Jose Metropolitan Area) for estimating trail user for mobility, congestion and health benefit determinations, but only population density for recreation benefits. (Trail length is also used as benefits are accrued per lineal mile of bicycle facility constructed). However, as noted in NCHRP Report 552 on page 25, *"No effect of proximity to off-road bike facilities on bicycle use was detected".*

To determine population density in the Jameson Canyon corridor study area for use in the online model, we obtained the US Census Bureau TIGER II Census tract maps, and corresponding population and demographic information from the 2000 US Census. This analysis was assisted using the project GIS.

For the determination of annual benefits, we used an average population density of 35 residents per square mile as the population density located within ¼ mile and ½ mile of the proposed facility as model inputs. This is equivalent to a total population of about 280 residents of the roughly 1-mile-wide by 8-mile-long greater Jameson Canyon area, including the Kelley Road, Red Top Road and some of the western Pleasants Valley area. (The Caltrans CEQA document for the SR 12 improvement project lists 2,077 households and 5,965 residents as the Local Project Region that would be most impacted by the project).

We also used the 2000 Census data to determine population density for the greater Napa, American Canyon, eastern Vallejo, and Fairfield areas. These areas represent the principal user group population for the proposed trail. We used an 8-mile radius centered in the middle of the corridor (roughly the Napa Solano County line) to determine population by Census tract, Census tract size, and resultant population density, again assisted by the project GIS. The aforementioned cities are located within the 8-mile radius used in the Census tract population density analysis. We adjusted the 2000 Census information of total population living within the 8 mile radius to the present by using the

average percent population increase of the four cities from 2000 to 20009 as estimated by the US Census Bureau and shown on their Census Quick-facts link. From this we obtained a population density of 890 people per square mile, which was used in the analysis. We termed this the Facility Use Population and the 8 mile radius area the Population Draw Area. Tables 9-3 and 9-4 use these terms, which are modifications of the terms used in the original Online Model. The model input and output data and assumptions, including the US 2000 Census tract based population and population density information is presented in Appendix E.

### *9.2.5 Online Benefit/Cost Model Results*

As noted previously, the online bicycle facility demand and benefits calculator presents outputs of benefits categorized as low-, mid- or medium-, and high-end estimates. As shown in Table 9-3, (a screen capture of the online model output) a range of *28 to 261* daily recreational trail users, or *10,220 to 95,265* annual users represent a low to high* expected trail use.

From what we know about existing use of trail facilities in this area, these use estimates seem to reasonably bracket the range in use expected following construction of the Jameson Canyon trail project. This range reflects recreation, mobility, health and the suburban setting for decreased automobile use, (shown in the table using shading). Considering future construction of adjacent trails and recreation facilities, including the Napa Vine Trail, Napa River Bay Trail, Lynch Creek and Newell Park Open Space areas, and anticipated parks and trail facilities in the Green Valley area, it is reasonable that trail use will increase towards the medium range estimate for recreation benefits at some point during the assumed 30-year life of the project.

**Sensitivity Analysis*
Although the model from the online tool identifies 261 daily recreational users (95,265 annual users) as the medium estimate, STA staff consensus was that this number is high for Solano County in this situation. As a result, the medium output from the online tool was used as the high estimate.

Table 9-3: Trail Use Demand as Predicted by Online Bicycle Benefit Cost MODEL

| Annual Demand | Low Estimate | High Estimate |
|---|---|---|
| *Population of Draw Area for Facility Use* | 8,663 | 8,663 |
| *Existing Bicycle Commuters from Population Draw Area* | 39 | 39 |
| *New Commuters from Development of Pathway* | 7 | 7 |
| *Total Existing Cyclists from Population Draw Area* | 125 | 1,519 |
| *Total Expected Daily Users of Proposed New Facility* | 28 | 261 |

| Annual Benefits | Low Estimate | High Estimate |
|---|---|---|
| *Recreation* | $76,837 | $930,616 |
| | Low Estimate | Mid Estimate |
| *Health* | $3,528 | $33,469 |
| | Urban | Suburban |
| *Decreased Auto Use* | $2,127 | $1,309 |
| | Per trip | Daily |
| *Mobility (Off street trail)* | $4.08 | $185 |

Note: $ values utilized in Benefit Cost Analysis are those highlighted in table above.

TOTAL ANNUAL BIKE FACILITY BENEFITS

Total annual benefits for the model for low and medium facility use are:

§ Low Facility Use Estimate Annual Benefit $125,132.00 *
**(sum of low estimate recreation (10,220 users annually, mobility, low estimate health, suburban decreased auto use) BCR=0.31)* #

§ High Facility Use Estimate Annual Benefit $978,911.00 *
**(sum of medium estimate recreation 95,265 users annually), mobility, low estimate health, suburban decreased auto use) BCR=2.41* #

# See Section 9.2.6 for discussion of calculation of Present Day Value Benefits & Costs

· *Trail Use Needed for Positive Benefit Cost Ratio*

Factoring in expected pedestrian, equestrian and increased use as a result of population growth, increased trail connections and park and recreation facilities in the study vicinity (Table 9-4), it is estimated that approximately 90 users a day would be needed for a positive benefit/cost ratio, with Total Annual Benefits of around $418,000, using the same online benefit Cost Analysis model

Table 9-4: Trail Use Demand (including Pedestrian/Equestrian use) needed to have a Positive Benefit Cost Ratio

| Annual Demand | Estimate |
|---|---|
| Residents of Draw Area for Facility Use | 30,813 |
| Existing Bicycle Commuters | 138 |
| New Commuters due to trail | 21 |
| Total Existing Cyclists from Draw Area | 446 |
| *Total New Facility Users* | 90 |

| Annual Benefits | Estimate |
|---|---|
| *Recreation* | $250,105 |
| *Mobility - Off Street multi use trail* | Per Trip |
| | $4.08 |
| | Estimate |
| *Health* | $11,484 |
| *Decreased Auto Use* | $6,922 |

TOTAL ANNUAL MULTI-USE FACILITY BENEFITS

Total benefits for the model (using 90 facility users per day) is $418,531.00. This was the daily average facility use that was determined to be needed to achieve a positive Benefit Cost Ratio or BCR of 1.02 as discussed in the next section.

### *9.2.6 Present Day Value of Costs and Benefits, & Benefit/Cost Ratio*

The online facility benefits calculator presents only annual costs and benefits, and does not calculate the costs and benefits over the life of the project, or present annual operating and maintenance (O&M) costs or annual benefits in present day dollars. The Benefit Cost Ratio was determined to be very negative (BCR= 0.31) when the Low Facility Use Estimate of 28 users a day was utilized and very positive (BCR = 2.41) when the High Facility Use Estimate of 261 users a day was utilized. The Low end Estimate seems lower than expected and the High end Estimate seems too optimistic. As noted in section 9.2.5 we therefore used the model through a series of repetitive runs to determine what Facility Use was needed to have a positive Benefit Cost Ratio. This was determined to be 90 Facility Users per day (BCR = 1.02). For this analysis we assumed a common trail facility project life of 30 years, with a discount or interest rate of 2% (a typical bond rate) and a typical 1% annual inflation rate. This is presented in Table 9-5. Full Cost Benefit model spreadsheets based on different use scenarios, with and without a consideration of the costs of Right of Way acquisition, are available upon request from Questa Engineering.

Table 9-5:
Desired Present Day Value of Costs & Benefits for Scenario with Positive Benefit Cost Ratio

| Assumptions * | Inputs |
|---|---|
| Annual Benefit (starting year after construction, based on 90 users per day) | $418,531 |
| Construction Year | 2013 |
| Construction Cost (ROW included) | $8,888,875 |
| Annual Operating and Maintenance Cost | $45,000 |
| Interest Rate Assumption | 2% |
| Inflation Assumption | 1% |
| Project life cycle | 30 years |
| | |
| Present Value (Benefits) | $9,397,874.37 |
| Present Value (Costs) | $9,222,395.79 |
| Benefit/Cost Ratio | 1.02 |

* (90 users per day at $10.00 recreation use value is desired)

### *9.2.7 Benefit/Cost Analysis Limitations*

The assumptions used in the online bicycle facilities model are paramount to its outcome, including total construction costs, annual O&M costs, the life of the facility, and the amount of recreational trail use and the value assigned to each recreation use day. Even the assumptions regarding discount and interest and inflation will affect the BCR.

Variables that should be evaluated further include projected trail use and the $10.00 per day used in the on-line model for recreation-visitor day or portion thereof, which is based on a national value, rather than trail use in the Bay Area.

Projected Trail Use. There are no trail use statistics available for southern Solano County or southern Napa County area, although as a reference, the Napa Valley Greenway Feasibility Study (Vine Trail) estimated that this trail might

attract up to 1.5 million visitors a year to Napa Valley (NCTPA, 2008). Trail use statistics collected for several regional trails in the San Jose area, including the Guadalupe River Parkway Trail, indicate use rates of 150,000 to 200,000 trail users a year, as do trail counts completed by Marin County Public Works Department for such popular trails as the Mill Valley Sausalito Path (Marin County, 2007, Laski, 2009).

Considering population growth in this area, anticipated completion of the Napa Valley Vine Trail, Napa River Bay Trail, and the opportunity for the Jameson Canyon trail to connect to some significant rural trail hiking and riding experiences within a short drive of a major urban area, a trail use rate of 90 per day seems appropriate over the life of the project. This is the facility use estimate needed to obtain a positive Benefit Cost Ratio.

Trail Use Benefit Value. A value of $10.00 per day was assigned in the on-line bicycle benefits model as the value of recreation benefits of bicycle use. This is low compared to recreational trail use values assessed in the Bay Area.

A review of the assumptions of the on-line model indicates that this was based in part on a bicycle economic benefits analysis conducted by the City of San Francisco Department of Transportation, which found daily benefit values of $40.00 per day. (Krizek, 2007, San Francisco Transportation Authority, 2004) This was scaled done in the on-line model to $10.00 based on the assumption that a typical bicycle trip was closer to 1 hour or a ¼ of a visitor day (few recreational trail bicycle 8 hours non-stop). A typical ride may be from the Red Top Road area to downtown Napa, or American Canyon, with a total to and back ride time of closer to 4 hours.

Other literature regarding the economic benefits of recreational hiking and bicycle riding ranged from just under $20.00 per day to just over $40.00 per day (Lindsey, 2004, Waters, 1988, Trust for Public Land, 2009, Bower, 2007). The Napa Valley Vine Trail online Fact Sheet uses a value of $50.00 per day for the economic impact of visitors drawn to Napa by the trail, but the focus of this assessment is on benefits to the local economy from tourism, and not necessarily recreational use benefits, although the concepts are inter-related. Napa Valley Vine Trail *About (on-line Fact Sheet http://vinetrail.org/faq/*

Depending on the recreational user day benefit value assumed ($20.00, $30.00, or $40.00 per user day) the Benefit Cost break-even point (BCR = 1.0) would be reduced from the present model assumption of 90 users per day to between about 25 to about 45 average daily users, which is a modest target.

### *9.2.8 Recommendations*

Utilizing a readily available online bicycle-only Benefit Cost model presents a good starting tool for estimating project Benefits and Costs. This is an especially important tool for use in public process decision making for projects that are costly to construct and maintain. Factoring in the unique characteristics of the project, as well as projected use by a range of users, including pedestrians, equestrians and others, an approximate usage of 90 users a day (32,850 trail users/visitor days annually) is needed for a positive BCR. Although the preferred alignment will be relatively expensive to construct, given physical, environmental and ROW challenges, it provides a positive benefit cost ratio at about 90 users per day when using a relatively modest recreation use value of $10.00 per day. Varying the recreation benefit from $20.00 to $40.00 per day will reduce the needed recreational use factor for a positive Benefit Cost Ratio proportionally. Because of the wide disparity between the estimates provided by the on-line model used, and questions about the appropriateness of the assigned benefit values, it is recommended that a more detailed Benefit/Cost analysis be completed.

## Natural Trail Design Alternative Cost Savings

The Jameson Canyon corridor trail is presently conceived of as having a 10 foot wide trail tread, with an asphalt concrete (ac) paved surface, and two- 2 foot wide shoulders, ( essentially a single lane county road through steep, partly oak wooded, and unstable topography) . The trail would be designed and constructed to fully meet ADA trail standards, including typically 5% maximum longitudinal grades.

A less expensive trail design alternative to consider, including on an interim basis, until trail use levels meet the positive benefit cost goal of approximately 90 users per day, would be an 8 foot wide travel-way with a natural (stabilized soil or aggregate) trail surface. Turn outs and passing lanes could be provided approximately every 500 feet, or where more favorable side slope topography and environmental conditions allow.

The more narrow trail tread surface would greatly reduce grading quantities and costs, and the soon to be adopted Federal ADA trail standards for the less expensive natural trail surface also allows steeper longitudinal trail slopes, potentially saving substantial amounts in grading and paving costs. We estimate total costs savings using an alternative/interim 8 foot wide trail with a stabilized natural surface to be on the order of 25% to 40%, potentially reducing total construction costs from about $6.5 million to on the order of $4.to $5 million. The trail could then be upgraded at some time in the future when increased trail use levels warrant a higher standard.

### Land Trust and Agency Coordination

Since the trail will predominantly be located on or adjacent to private farm and ranch lands, follow-up planning/engineering work should be completed in addition to discussions with key property owners, possibly in cooperation with the Solano Land Trust and the Napa Land Trust and the Ridge Trail. Coordination with the California Department of Fish and Game and the U.S. Fish and Wildlife Service will also be important next steps.

### Partner Agency Plan Adoption

Partner agencies are encouraged to adopt the plan and incorporate its recommendations into future planning efforts, so that it becomes a blueprint for trail efforts within the Jameson Canyon area. Next steps in implementing the trail include:

- Incorporate the Study into the guiding planning documents of each partner agency
- Encourage discussions with Land Trusts, Ridge Trail and local landowners to secure trail access
- Refine the precise trail alignment and prepare conceptual engineering plans
- Identify project costs and benefits based on projected use and regional recreational values
- Complete environmental evaluation, permitting and design for selected trail segments as funding and adjacent projects are completed.

## 9.3 Priority Project List

Often a linear trail project of some length can be broken into individual segments, with projects prioritized and phased for construction, where the highest priority segments (those most needed, serving the most people, or where a trail gap can be readily filled or a connection to another trail made) are phased and constructed first. Selection of a priority project list is difficult for the Jameson Canyon corridor trail, as for the trail to be truly useful as an east-west link, the entire trail needs to be built. In addition, the acquisition of funding by various implementing agencies may influence priorities for implementation.

In terms of connections to other existing trails and the prioritization and selection of trail segment(s) that could potentially be used by a large group of people, constructing the segments at the east end of the corridor would seem appropriate as a high priority. Unfortunately, this segment also has the most challenging ROW, environmental and engineering issues, and would be one of the most costly to construct, because of steep terrain, creek issues, and slope instability. However, a trail on the east end of the corridor would readily tie into the bicycle/pedestrian improvements Caltrans will be constructing over the next several years in the Red Top Road area and would provide a connection between the Lynch Canyon Open Space, and the Ridge trail and the trail system.

There are relatively fewer ROW, environmental, and engineering issues on the west end of the corridor, where Segment 2 could be built, and eventually tie into the bicycle/pedestrian improvements that are planned for the SR 12/SR 29 intersection. Although less people live in this immediate area of southern Napa County, this trail segment would connect to be the planned construction of the Vine Trail and the Napa River and Bay Trail, which might be in place within the next five to seven years. Completion of segment 2S as a relatively high priority to link the Kelly Road area with Creston Station could also provide connections to Newell Ranch and Lynch Creek Open Space areas if the Ridge Trail is completed in this area.

In a complex project such as Jameson, where there are environmental, ROW, and/or engineering issues to address, trail segments with the least challenging environmental and permitting issues, or where constructability and costs do not present major hurdles and the trail is on public lands, are selected first for construction. This approach helps give the project traction to move forward, as a demonstration project to illustrate what can be accomplished within the corridor.

Given this and the less challenging environmental and constructability issues, lower costs and more favorable ROW, we recommend initiating Jameson Canyon construction on the west end as the first priority with Segment 2, and Segment 4 as a secondary priority.

## 9.4 Funding Sources

For a regional trail such as this, the majority of the funding would likely come from federal sources, such as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Several funding programs are available under this Act, with the programs administered at the state and regional levels, often by Caltrans or local Transportation Agencies such as STA or NCTPA.

Since any corridor-wide trail project will be a part of the San Francisco Bay Trail, and the Jameson Canyon Corridor is within a zone considered a priority conservation area because of its high biological values, funding by the Bay Trail and the State Coastal Conservancy can also be considered.

The Metropolitan Transportation Commission, the Regional Transportation Planning Agency for the San Francisco Bay Area, oversees several additional state and federal sources of funding that can be considered for a regional trail project. These include the federal government's Transportation Enhancement (TE) program, the Congestion Management Air Quality Improvement (CMAQ) programs, California's Transportation Development Act (TDA) and the State Transportation Improvement Program (STIP).

### *9.4.1 Local and Regional Funding Sources*

§ Capital Improvement Programs. Local funding for trail projects may include a commitment of funds from local capital improvement programs (CIP). These are typically allocations from City or County General Funds designated for important projects, and given to Public Works Departments to oversee construction plan preparation, bidding, and construction/construction management. These are funds set aside by a local city or county to support specific earmarked projects. CIPs are sometimes used to meet the local share or match requirement of larger competitive grants, and can be combined in partnerships with local nonprofits, and sometimes with developer impact fees and other funding. Due to budgetary constraints, capital improvement funding is often committed to major infrastructure and deferred maintenance needs.

§ Transportation Development Act (SB 821). Transportation Development Act (TDA) Article III funds are state block grants that are awarded annually to local jurisdictions for the engineering design and construction of bicycle and pedestrian projects throughout California. Two percent (2%) of the local transportation fund in each county are allocated to fund facilities for the exclusive use of bicyclists and pedestrians, including preliminary engineering, ROW acquisition, construction and construction management, and project reconstruction or

retrofitting. TDA funds are generated from state sales tax revenues and are distributed through the local transportation agency (STA and NCTPA).

§ Mello-Roos Community Facilities Act. Bike paths and bike lanes can be funded as part of a local assessment or benefit district, approved by the property owners of the special assessment district. However, in the case of Jameson Canyon, many of the potential trail users would likely originate outside of a likely Jameson Canyon Mello-Roos funded benefit assessment district, and therefore this mode of funding is probably applicable to only very local spur or loop trails constructed off the main spine of any future Jameson Canyon corridor trail.

§ Landscaping and Lighting District Act of 1972. The Landscaping and Lighting District is a flexible tool used by local government agencies to pay for landscaping, lighting and other improvements and services in public areas, including annual maintenance. It is based on the concept of assessing only those properties that benefit from the improvements. The construction and maintenance of trails have been successfully included in a number of LLDs.

As with Mello-Ross, since many of the likely Jameson Canyon trail users would originate from outside of the Jameson Canyon corridor, formation of an LLD as a main source of construction funding is very unlikely. However, given the high trail maintenance costs, further consideration could be given to the formation of an LLD as a way to fund trail maintenance. This would be a novel approach and would require much larger community support. The LLD would obviously need to incorporate a much larger area of southern Solano County and southern Napa County, and the fact that two separate county jurisdictions are involved further complicates consideration of this as a possible source of funding for trail maintenance and repair.

§ ABAG Bay Trail. The Association of Bay Area Governments (ABAG) has available funding for construction grants to close gaps in the Bay Trail, and portions of the preferred Jameson Canyon trail would qualify for consideration. These are competitive grants and are subject to appropriations by the state legislature and the availability of general obligation bond funding. Bay Trail also funds preparation of feasibility and planning studies, as well as the preparation of engineering plans, but does not typically provide funding for environmental documents.

§ Napa Valley Vine Trail. The Napa Vine Trail is a grassroots effort (a 501c non-profit organization) to implement a 44-mile trail from the Vallejo Ferry to the north end of the Napa Valley. Congressman Mike Thompson has applied for federal funding towards trail implementation. In this portion of Napa County, the route is anticipated to traverse along Highway 29, although the exact route has not been determined. There might be an opportunity for funding a portion of the trail if the Vine Trail adopts this alignment.

Based on a personal telephone conversation with Chuck McMinn, Director of the Napa Vine Trail, their organization is typically willing to match (50%:50%) any City or County contribution to the preparation of engineering plans and environmental documents. The engineering plan match is 50:50 but is limited to the 35% design.

Typically a 35% design is suitable for CEQA review and most permits, and includes a pretty precise alignment, the location and preliminary design of special structures such as walls, bridges and boardwalks, fencing, etc., and a cost estimate that should be within 20% of the Final Design Cost, which in itself should be within 10 to 15% of actual cost.

The Vine Trail organization may be willing to discuss the possible funding of Ridge Trail and Bay Trail (spines, not spurs) project engineering and environmental work, although their initial focus will likely be on the Vine Trail alignment within the Napa Valley.

For actual construction, Vine Trail is trying to philanthropically raise about 20% of the costs of the spine trails (Vine, Bay, Ridge) trail system for the often required local match. The working assumption is for a design and construction of around $78 to $80 million for the total Napa Valley trail system, from Vallejo Ferry to north Valley, so their goal will be to raise about $16 million.

§ Agency Allocation. Funding for trail implementation could conceivably be combined with planned Capital Improvement Projects, such as for Park improvements, for circulation and transportation projects, for flood control/infrastructure and other improvement projects.

§ Miscellaneous Sources. Local sales taxes, non-profit land dedications, private donations, fund-raising events and volunteer actions are other local options to generate funding for trail projects. Creation of these potential sources usually requires substantial local support.

### *9.4.2 State Funding Programs*

§ California Dept. of Parks and Recreation-Recreational Trails Program. The Non-motorized Trails Grant Program of the Recreational Trails Program is administered by the California Department of Parks and Recreation, which receives federal funding to develop and maintain recreational trails and trail related facilities, such as hiking, equestrians, and bicycling, skating and other uses. Funds may be used for maintenance of existing trails, trail restoration, links, trail maintenance equipment, environmental education programs, and easement acquisition. RTP projects must be ADA compliant and may be used for:

- Maintenance and restoration of existing trails;
- Purchase and lease of trail construction and maintenance equipment;
- Construction of new trails; including unpaved trails;
- Acquisition of easements or property for trails;
- State administrative costs related to this program (limited to seven percent of a State's funds);
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a State's funds).

§ California Department of Parks and Recreation -Habitat Conservation Fund. Also administered by the CA Department of Parks and Recreation, this grant funds habitat acquisition projects, enhancement projects, and programs that provide for the interpretation of the State's park and wildlife resources or programs which bring urban residents into park and wildlife areas or provide opportunities for urban residents to use park and wildlife areas, or programs that include nature interpretation programs designed to increase the peoples' awareness and appreciation for park and wildlife resources.

§ State Coastal Conservancy. The San Francisco Bay Area Conservancy Program (Bay Program), administered by the Coastal Conservancy, was established to address the natural resource and recreational goals of the Bay Area. The Conservancy may award grants to help achieve the following Bay Program goals:

- Protect, restore, and enhance natural habitats and other open-space resources of regional significance throughout the nine-county area;
- Improve public access and related facilities to and around the Bay, its surrounding hills, and the coast, through completion of bay, coast, and ridge trails that are part of a regional trail system; and
- Promote projects that provide open space that is accessible to urban populations for recreational and educational purposes.

Trail projects that also combine habitat restoration and protection and environmental education would be ideal for grant funding by the Conservancy. In this case, since Jameson Canyon is within a Conservation Priority Area, it may receive special consideration.

Funding can cover project planning and engineering design, environmental review, construction and construction management, and in certain cases, maintenance and land management. Funding availability is subject to legislative appropriations of bond funds, and by the periodic passage of voter approved bonds for outdoor recreation, land acquisition, and habitat restoration and enhancement.

§ Caltrans Programs. Caltrans Office of Local Programs administers federal programs that can be used for trails-related projects. This includes:

- Bicycle Transportation Account, providing grant funding to local jurisdictions for bicycle related projects, with an emphasis on bicycling for commuting. The local match must be a minimum of 10% of the total project cost.

- State Transportation Improvement Fund. The STIP is a multi-year capital improvement program of transportation projects funded with revenues from the State Highway Account and other sources. STIP programming generally occurs every two years. Caltrans and the regional planning agencies prepare transportation improvement plans for fund allocations.
- Safe Routes to School provides funding for projects that construct facilities to enhance the safety for pedestrians and bicyclists. By enhancing the safety of the pathways, trails, sidewalks, and crossings, the likelihood of attracting and encouraging additional students to walk and bike increases. This could be utilized for trail improvements in the Red Top Road area where there are logical connections to local schools.
- Partnership, Statewide, and Transit Planning grants for improvements to the state or regional transportation system.
- Community-Based Transportation Planning grants focus on integrated land use and transportation planning, including alternative transportation methods. Pedestrian and bicycle trails to link neighborhoods and transit centers would be applicable, at either end of the trail.

§ The Environmental Enhancement and Mitigation Program (EEMP) was established by the Legislature in 1989. It generally offers a total of $10 million each year for grants to local, state, and federal governmental agencies and to nonprofit organizations for projects to mitigate the environmental impacts caused by new or modified state transportation facilities. State gasoline tax monies fund the EEMP. Grants are awarded in three categories:

- Highway Landscape and Urban Forestry-- Projects designed to improve air quality through the planting of trees and other suitable plants.
- Resource Lands -- Projects for the acquisition, restoration, or enhancement of watersheds, wildlife habitat, wetlands, forests, or other natural areas.
- Roadside Recreational -- Projects for the acquisition and/or development of roadside recreational opportunities.

§ Transportation Funds for Clean Air Program (TFCA). The Bay Area Air Quality Management District (BAAQMD) provides funding for projects consistent with BAAQMD's Clean Air Plan. Projects must demonstrate that they result in air quality benefits. Automobile registration fees generate funds, with approximately $20 million collected annually. These funds are distributed to either a regional competitive fund (60%) or to a Program Manager Fund (40%).

§ Regional Bicycle and Pedestrian Program (RBPP). The RBPP program has committed $200 million dollars towards funding significant bicycle and pedestrian projects, particularly those that serve schools or transit, and is managed through the applicable transportation agency (STA/NCTPA).

§ Wildlife Conservation Board funds the acquisition of lands or improvements that preserve wildlife habitat or provide recreational access for hunting, fishing or other wildlife-oriented activities. Projects eligible for funding include interpretive trails, river access, and trailhead parking areas. The State of California must have a proprietary interest in the project. Local agencies are generally responsible for the planning and engineering phases of each project. Property acquired or developed under the program must be retained in perpetuity for public recreational use.

§ California Conservation Corps (CCC). Local, state and federal agencies as well as non-profit organizations may contract with the CCC. The CCC does not provide funding, but is a low cost source of labor. Some grants require the inclusion of CCC labor as a project component.

### *9.4.3 Federal Funding Programs*

§ Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users (SAFETY-LU) Administered by the U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA), there are a variety of grant and loan programs available to cities, counties, state transportation departments, and nonprofit organizations and private entities if they are working through a public-private partnership. The overall purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements. FHWA's categories for bicycle safety improvements, include:

- Provide new trails where possible throughout the community;
- Connect existing trail segments;
- Add shoulders to popular bicycling routes; and
- Widen outside through lanes or add bike lanes.

Specific funding programs under SAFETEA-LU include, but are not limited to:

- Congestion Mitigation and Air Quality (CMAQ) – Funds projects that are likely to contribute to the attainment of national ambient air quality standards
- Recreational Trails Program for non-motorized trail projects
- Safe Routes to School Program
- Transportation, Community and System Preservation Program
- Federal Lands Highway Funds

§ Land and Water Conservation Fund (LCWF). LCWF provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Administered by the National Parks Service and the California Department of Parks and Recreation, it has been reauthorized until 2015. Cities, counties and districts authorized to acquire, develop, operate and maintain park and recreation facilities are eligible to apply. Applicants must fund the entire project, and are reimbursed for 50 percent of costs.

## 9.5 Next Steps

Implementation of the *Jameson Canyon Corridor Bicycle and Pedestrian Connections Plan* is a multi-step process. The following steps outline the near-term process for further trail planning, design and construction.

Agency Approval. Adoption or approval of the Plan should be completed by each agency responsible for project implementation; incorporation into applicable planning documents.

Coordination with Nonprofits and Landowners. Continuing discussions with private landowners, Ridge Trail, Napa and Solano Land Trusts, Vine Trail and other potential project partners is essential to Plan implementation. Successful negotiation and cooperation will enable the determination of a precise trail alignment.

Preliminary Project Design. Preliminary design should be completed to determine a more precise route, identify specific project impacts (area of wetlands disturbance, location and length of bridges, access points and infrastructure, etc.). Completion of preliminary design for the entire alignment will facilitate environmental review and allow incorporation of mitigation and minimization of impacts into individual project segments. The preliminary design process can often proceed at the same time as the initial environmental review work is being completed. Work includes topographic survey, geotechnical evaluation, soil borings, and identification of circulation improvements, fencing, parking and trailhead components. The CEQA and NEPA document can be completed based on the follow-up Preliminary Engineering Design.

Environmental Review. Evaluation of the trail alignment and potential impacts and mitigation measures associated with trail implementation should be completed in accordance with the California Environmental Quality Act (CEQA), and compliance with the National Environmental Policy Act (NEPA), will be required if any federal funding is involved. Some grant programs require that environmental review be completed prior to funding. As such, it is expected that potential trail impacts can be incrementally mitigated within the context of a much larger project. In addition, all public access features should be completed at the same time as habitat creation, and with appropriate buffers, separation and design components to allow for successful multi-species habitat restoration. Environmental analysis should include evaluation of the benefits of trails to provide educational opportunities proximate to habitat areas, and recognize that restored habitat does not yet exist, as well as project goals that include public access.

Funding. Project funding for the restoration project should fully include all public access related components as part of the project. Grant-funding opportunities exist for recreational trails, non-motorized vehicle improvements, Ridge and Bay Trail implementation, as well as environmental education opportunities associated with public access and habitat restoration.

Design. Trail design includes the trail, surfacing for accessibility, bridges, access points, parking areas, benches and site furnishings, interpretive elements, and any needed screening or buffering to protect sensitive habitat areas. Other infrastructure includes utilities, culverts, bridges or crossings associated with rail use. Railroad crossing improvements need to be fully designed for timely evaluation as part of any PUC application. Designs that are not complete may significantly delay the evaluation and processing of the application.

Design may include restoration and habitat enhancement, either as a beneficial design use or to mitigate specific site disturbance. Seasonal wetlands may be impacted on a temporary or permanent basis, requiring permit approval, reconstruction, and post-construction monitoring and management. Where possible, design should minimize the need for bridges and boardwalks to cross the new design features.

Typically a design proceeds through several stages of preparation and review, from concept drawings to a final construction bid package (i.e., 30% completion, 70% completion, and 90% completion review and submittals). Depending on complexity, the completion of a final design and bid package, followed by public bidding, can take from six to more than twelve months.

Permitting. Permit applications and requests for permit approvals from applicable regulatory agencies will be completed and should be included in initial phases of implementation, where feasible. This includes the PUC rail crossing review, which can take several years to complete if the information is not appropriately presented.

Trail Construction. Construction will likely occur in segments, with implementation completed by more than one agency. Construction includes advertisement for bidding trail construction, contract award, construction, and likely will include post-construction monitoring and management of any habitat or wetlands disturbed as a result of construction.

# 10. REFERENCES

Association of Bay Area Governments, 2011. Landslide Maps and Information. http://quake.abag.ca.gov/landslides/

Bowker, J.M., Bergstrom, J.C. & Gill, J. (20007) Estimating the economic value and impacts of recreational trails: a case study of the Virginia Creeper Rail Trail, Tourism Economics, 13(2) 241-260.

California Department of Fish and Game, 2010. California Natural Diversity Database.

California Department of Transportation, January 2008. *Final IS/MND/EA State Route 12 Jameson Canyon Rd. Widening and State Routes 29/12 Interchange Project.*

California Department of Transportation and Nelson/Nygaard, March 2005. *Rail Right of Way and Abandoned Corridors Study, Final Report.*

City of Fairfield, 2002. *Fairfield General Plan.*

City of San Jose Trail Program, Trail County 2009 Summary Report
*http://www.sjparks.org/Trails/documents/TrailCount2009SummaryReportfinal.pdf*

County of Marin Public Works and Alta Planning , 2007 *Marin Nonmotorized Transportation Pilot Program Summary of 2007 Bicycle and Pedestrian Counts and Surveys*
http://www.walkbikemarin.org/documents/CountsSurveys/NTPP_Count_Survey%20Report_1.pdf

EarthTech, 2007. *Regional Rail Plan for the San Francisco Bay Area, Final Report.*

El Dorado County Transportation Commission, 2004. *California Cross State Bicycle Route Study: Bay Area to Lake Tahoe, The Golden Pedal Route.*

Humphrey Institute of Public Affairs, University of Minnesota, 2006, *Guidelines for Analysis of Investments in Bicycle Facilities.*

Krizek, K.J., G. Poindexter, G. Barnes, and P. Mogush, May 2007.Analyzing the Benefits and Costs of Bicycle Facilities via Online Guidelines. Planning, Practice & Research, Vol. 22, No. 2 pp.197-213.
http://carbon.ucdenver.edu/~kkrizek/pdfs/Benefits%20costs%20via%20guidelines.pdf

Laski, M. and Dawson, D. An Evaluation of Bicycle and Pedestrian Mode Share Shift in Marin County, CA
*http://www.westernite.org/annualmeetings/sanfran10/Papers/Session%207_Papers/ITE%20Paper_7C-Lasky.pdf*

Lindsey, G. Man, J. Payton, s,& Dickson, K. (2004) *Property values, recreation values, and urban greenways.* Journal of Parks and Recreation Administration, 22(3) pp.33-*2*
*http://journals.sagamorepub.com/ebooks/jprabackissues/jpra223555/Article5.pdf*

Napa County, 2008. *Napa County General Plan*
http://www.co.napa.ca.us/GOV/Departments/8/Forms/8_Circulation%20_06.02.08_.pdf

Napa County Regional Park and Open Space District, 2008. *Napa County Regional Park and Open Space District Master Plan 2008 — 2013.*

Napa County Transportation Planning Agency and Alta Planning + Design, September 2008, *Napa Greenway Feasibility Study.*

Napa County Transportation Planning Agency and RL Banks Associates, 2003. *Napa/Solano Passenger/Freight Rail Study.*

Napa Valley Vine Trail *About (on-line Fact Sheet)* *http://vinetrail.org/faq/*

National Cooperative Highway Research Program Report 552; (Krizek, 2006) *Guidelines for Analysis of Investments in Bicycle Facilities*. *http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf*

Questa Engineering Corporation, 2007. *Napa Bay Trail Feasibility Study. Richmond, CA.*

Solano County, 2008*. Solano County General Plan.* http://www.solanocountygeneralplan.net/

Solano Transportation Authority.

*Solano Comprehensive Transportation Plan Alternative Modes Element (in progress)*
*Solano Countywide Bicycle Plan (2004)* http://solanolinks.com/plans2.html#bikeplan
*Solano Countywide Pedestrian Plan (2004)* http://solanolinks.com/plans2.html#pedplan
*North Connector TLC Concept Plan (2008)* http://solanolinks.com/plans2.html#nc
*Solano Bikeway Extension Feasibility Study (2003)*

The Trust for Public Land (2009) *Measuring the Economic Value of a City Park System*
http://www.8-80cities.org/Articles/Measuring%20Economic%20Value%20City%20Park%20System.pdf

# Appendix A:
# Meeting and Workshop Notes

# Appendix B:
# Special-Status Species

# Appendix C:
# Detailed Analyses of Trail Route Options

# Appendix D:
# Cost Methodology

# Appendix E:
# Benefit Cost Analysis Methodology and Background Information