

February 20, 2020

TrailPeople & SHN



**City of Arcata**

Annie & Mary Trail  
Connectivity Project

**Final**

**Project Report**

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# Contents

<b>1. Introduction .....</b>	<b>1</b>
1.1 Background Overview.....	1
1.2 Project & Trail Objectives .....	4
<b>2. Project Context .....</b>	<b>5</b>
2.1 Location and Connections.....	5
2.2 Network Connectivity.....	6
2.3 Traffic Safety.....	8
2.4 Annie & Mary Trail .....	8
2.5 Relevant Plans and Policies.....	9
2.6 Existing Conditions, Opportunities and Constraints .....	11
2.7 Summary of Study Process and Public/stakeholder Input.....	16
<b>3. Alternatives Considered .....</b>	<b>19</b>
3.1 Railroad Corridor Alternative .....	21
3.2 West End Road Alternative .....	22
3.3 Hybrid Alternative .....	23
<b>4. Other Recommendations .....</b>	<b>32</b>
4.1 Trail Connections at Sunset Avenue, St Louis Overcrossing, Giuntoli Lane, and LK Wood Boulevard.....	32
4.2 Potential Trail Configurations .....	48
4.3 Roadway and Driveway Crossings.....	51
4.4 Signage.....	52
4.5 Fencing .....	55
4.6 Lighting .....	56
4.7 Bike Channels for Stairs.....	58
4.8 Amenities .....	59
<b>5. Funding Opportunities .....</b>	<b>61</b>

## Appendices

- Appendix A. Project Plans
- Appendix B. Memo: Existing Policies, Plans, & Proposed Improvements
- Appendix C. Railroad Interpretation Examples
- Appendix D. Memo: Existing Conditions, Opportunities & Constraints
- Appendix E. February Outreach Results Summary
- Appendix F. April & May 2019 Outreach Summary
- Appendix G. Valley West Walk Audit Report (Recommendations to Improve Pedestrian & Bicycle Safety for the Valley West Community in Arcata)
- Appendix H. Ramp Connection Concept Diagrams
- Appendix I. Conceptual Photo Renderings
- Appendix J. Memo: Best Practices for Context-Sensitive Complete Streets Design and Trails
- Appendix K. Funding Opportunities
- Appendix L. Public Draft Report Comments

# 1. Introduction

## 1.1 BACKGROUND OVERVIEW

The City of Arcata is planning the next section of the City's trail system, a segment of the Annie & Mary Trail, which will be the northernmost spur of the Great Redwood Trail. This project is officially known as the **Arcata Annie & Mary Trail Connectivity Project**.

**Project Team:** The City of Arcata retained TrailPeople, Landscape Architects and Planners and SHN Engineers as consultants for the planning and design of the Connectivity Project. RCAA led the public outreach for the project. The City, TrailPeople, SHN, and RCAA worked collaboratively as the project team.

**Project Task Force:** A Project Task Force was also created to support and guide the Connectivity Project. More details about the Project Task Force can be found in **Appendix D**.

**Public Outreach:** As a part of this project, the project team collaborated with residents, schools, and businesses to plan for safe walking and biking from downtown Arcata to the low-income neighborhood of Valley West, including access points from planned affordable housing and Humboldt State University. More details about the public outreach can be found in **Section 2.7** and **Appendix E, F, and G**.

### **Connectivity Project Funding**

*In 2017 the City of Arcata and Redwood Community Action Agency (RCAA) (as a sub-applicant) applied for and received a grant in the amount of \$250,000 for planning and studying the Arcata Annie & Mary Connectivity project. The grant is through the California Department of Transportation's Sustainable Transportation Planning Sustainable Communities Grant Application FY 2017-2018. This grant covers the original scope of the Connectivity Project.*

### **Northern Extension Project Funding**

*The Northern Project Extension portion (see next page) is funded by the City of Arcata, Friends of Annie and Mary, and Humboldt County Association of Governments (HCAOG).*

## a) Project Location

The Connectivity Project provides planning and design for the Annie & Mary Trail and connections to the Trail within the City of Arcata and north to the Humboldt Bay Municipal Water District (HBMWD) Park 1 (locally known as the "Water Park").

The original project scope included the proposed Annie & Mary Trail within the City of Arcata from the Sunset Avenue/Larson Park area near downtown and Humboldt State University to the Valley West and West End Road area, including the Aldergrove Industrial Park. In the original scope of the project, the trail was to start at Sunset Avenue and end at the West End Road and Ericson Way intersection.

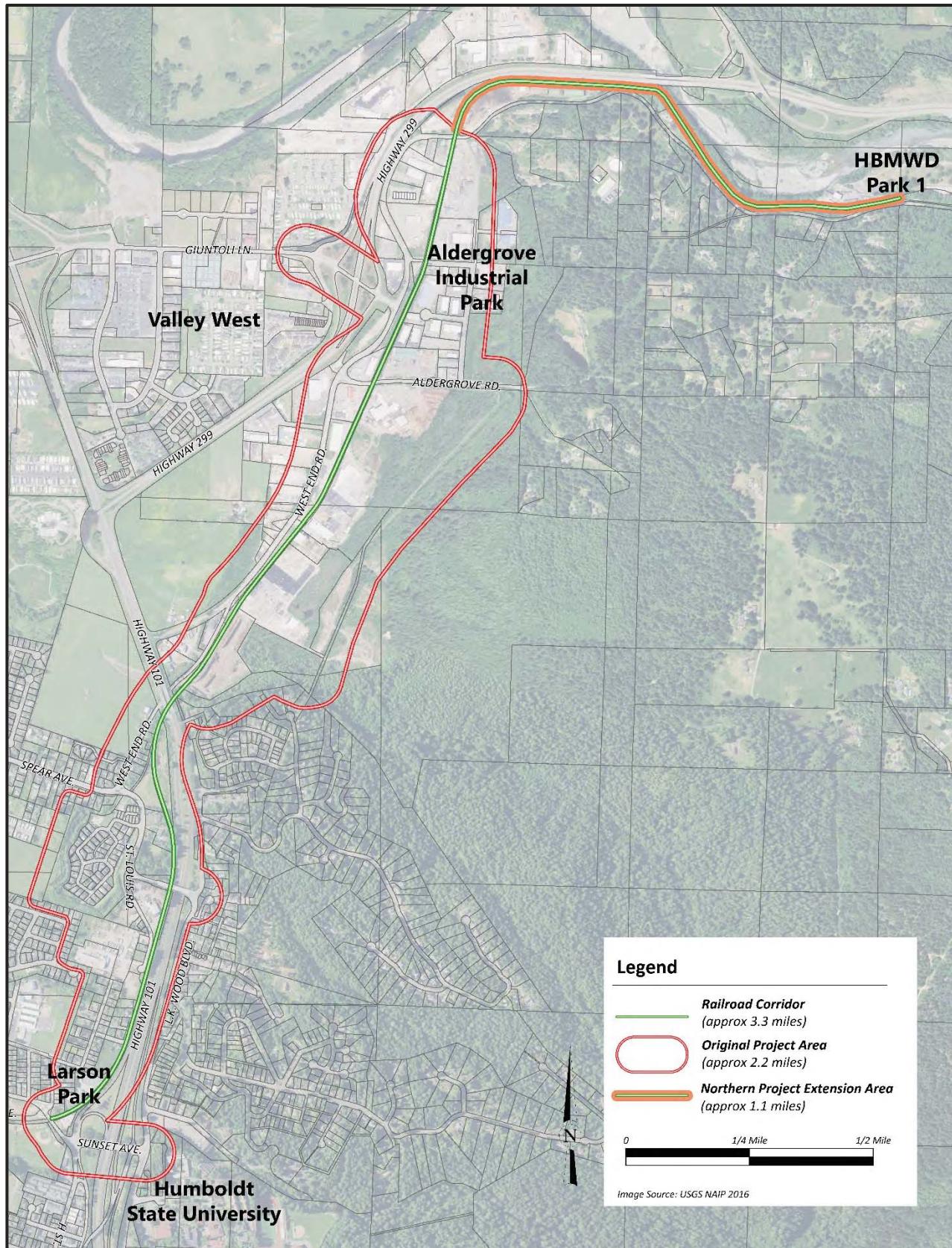
Through community input and local collaboration between the City of Arcata, Humboldt County, and HBMWD, the project was expanded to extend the trail beyond Arcata's city limits and to HBMWD Park 1 on West End Road (See **Figure 1**). This additional section, referred to as the **Northern Project Extension**, provides a scenic route and recreational end destination for trail users. It may increase chances of obtaining additional funding since the trail would connect to a recreational destination.

At the southern end, the trail connects to the existing Arcata City Trail. At the northern end, the trail will connect to a future section of the Annie & Mary Trail, and ultimately connect all the way to Blue Lake.

The Annie & Mary Trail represents the northern extent of the Great Redwood Trail, which will ultimately connect all the way from Marin County to Humboldt County.



**Photo 1: View along railroad corridor**



**Figure 1: Project Overview Map**

## 1.2 PROJECT & TRAIL OBJECTIVES

The objectives listed below are for the entire Annie & Mary Trail Connectivity Project. The triangle symbol (►) indicates objectives specific to the trail completion. Other objectives relate to the Connectivity Project planning and design process.

### 1. Enhanced Safety & Connectivity

- Enhanced safety for all modes traveling between Valley West, West End Road, Aldergrove Industrial Park, downtown Arcata, Humboldt State University, and HBMWD Park 1.

### 2. Robust Community Engagement

- Robust engagement of diverse Arcata residents, students, businesses and community organizations through public workshops, small group walking tours, one-on-one engagement, visual preference surveys and online engagement
- Consideration of environmental justice in the planning process so that all residents have an opportunity for meaningful involvement with respect to the environment and community health outcomes
- Involvement of school-aged youth in providing input and feedback on pedestrian and cyclist needs (e.g. Laurel Tree Charter School, Six Rivers Montessori)

### 3. Environmental & Community Benefits

- Reduction of greenhouse gases through improved safety for and encouragement of non-motorized transportation modes
- Increased commuting by walking and bicycling within the City

### 4. Enhanced Trail Design

- Identification of three conceptual design alternatives for walking and biking connectivity within the project area
- Utilization of best practices in context-sensitive “complete streets” design for small town streetscapes
- Application of low-impact development design features where possible
- Identification of priority project components for further study and implementation

### 5. Preparation for Trail Implementation

- Identification of potential implementation funding sources
- Preparation of preliminary design plans ready for final engineering



**Photo 2: Community Site Walk, August 2018**

## 2. Project Context

The Arcata Annie & Mary Trail Connectivity Project involved an assessment of current opportunities and constraints for walking and biking in the project study area. The Project also developed concept design alternatives for a trail and/or on-street facility for safe walking and biking connectivity in the study area.

### 2.1 LOCATION AND CONNECTIONS

The project area is primarily situated in the City of Arcata and connects the following areas:

- Central Arcata and Humboldt State University,
- Valley West Community on the north end of Arcata, and
- HBMWD Park 1 on West End Road at the northeast end, outside of Arcata's city boundaries.

The project connects to or near the following existing parks and trails:

- Humboldt Bay Trail, Arcata City Trail portion
- Shay Park
- Larson Park
- Arcata Skate Park
- Arcata Ridge Trail and Arcata Community Forest
- Janes Creek Meadows Trail and Meadows Park
- Aldergrove Marsh
- Carlson Park
- HBMWD Park 1

Safe connections to the trail extend the benefits to residential, industrial, commercial, and educational areas beyond the trail corridor. This includes connections to the corridor along:

- Sunset Avenue
- St Louis Road
- Giuntoli Lane



**Photo 3: Arcata City Trail along Sunset Avenue**

## Valley West/Giuntoli Lane Connection

The Giuntoli Lane connection, in particular, opens up non-motorized access for the Valley West community, which includes single- and multi-family housing, mobile home parks, hotels, and retail stores. This area has favorable demographics for active transportation (lower income, lower car ownership, senior and student populations), but non-vehicular access to and from Valley West is limited by State Route 299 on the east and Highway 101 on the west. Because of this, safe and legal bicycle and pedestrian access into and out of Valley West is limited to the shoulder of Giuntoli Lane. Limited hourly bus service is available in the Valley West area.

## 2.2 NETWORK CONNECTIVITY

The completed Annie & Mary Trail will provide direct access and connectivity for thousands of residents and employees, as well as several public schools.

Using publicly available data, the following table estimates the number of residents, jobs, and public schools that would be within specified distances of the trail. Distances were measured along public access routes: existing roads, trails, and paths. It was assumed that all public roads, trails, and paths were accessible, except Highway 101 and State Route 299. Residents were based on block data from the 2010 Census. Number of jobs were based on 2017 data from the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program.

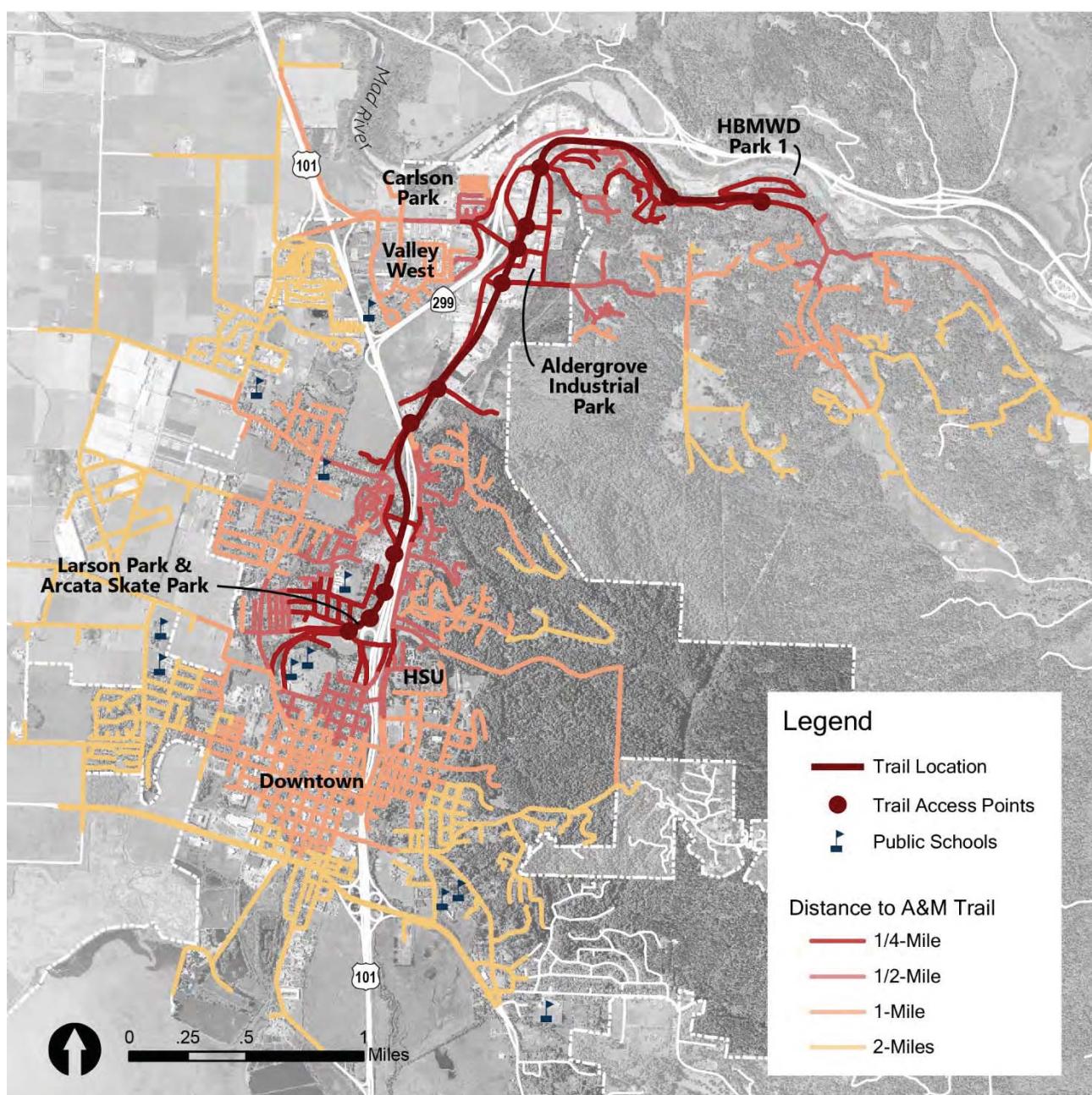
As discussed before, Highway 101 and State Route 299 represent major barriers for bike and pedestrian access to and from the Valley West neighborhood. With the trail access point at Giuntoli Lane and improvements across State Route 299, the entire Valley West neighborhood is within one mile of the trail, which provides access to parks, schools, businesses, and downtown Arcata.



**Photo 4: Cyclist navigating the Giuntoli Lane/State Route 299 overcrossing**

**Table 1: Analysis of Trail Service Area**

Distance	Residents	Jobs	Public Schools
1/4-Mile	1,174	1,326	3
1/2-Mile	3,298	2,073	4
1-Mile	8,273	7,686	6
2-Miles	15,289	10,827	11



**Figure 2: Diagram showing network analysis area**

## 2.3 TRAFFIC SAFETY

Traffic safety is a major concern for cyclists and pedestrians in the project area, so much so that many people stated that they would not walk or bike in the project area because of traffic safety concerns. From 2006 to 2017 there were 47 recorded collisions in the study area based on the Statewide Integrated Traffic Records System (SWITRS). Of those collisions, 14 involved a pedestrian and/or a cyclist. **Appendix D** provides maps of those collisions and more information.

## 2.4 ANNIE & MARY TRAIL

The Annie & Mary Trail is envisioned using sections of the former Arcata and Mad River Railroad right-of-way from Arcata to Korbel (east of the City of Blue Lake). The Arcata and Mad River Railroad, later nicknamed the Annie & Mary Railroad, was founded in 1854, making it the oldest working railroad in California. It operated on a unique narrow gauge until the 1940s when standard gauge rails were laid. Service ceased in 1983 due to landslides. It is California Historical Landmark #842.

The project will complete the southwestern-most portion of the Annie & Mary Trail. Future projects will connect Arcata's portion of the Annie & Mary Trail to other portions of the trail currently under design. The Annie & Mary Trail also represents the northernmost spur of the Great Redwood Trail, a 300-mile long trail envisioned on the former North Coast Railroad right-of-way from Marin County to Humboldt County.

## 2.5 RELEVANT PLANS AND POLICIES

### a) Senate Bill 1029

The North Coast Rail Closure and Transition to Trails Act (Senate Bill 1029) was passed by state legislature and signed by Governor Brown in 2018 after much negotiation. The bill calls for dissolving the North Coast Railroad Authority and developing a plan to create the Great Redwood Trail. Currently, the State Transportation Agency and the California Natural Resources Agency have until mid-2020 to develop the plan for dissolving the NCRA and adopting a plan to transfer the NCRA assets, including the 300-mile long right-of-way.

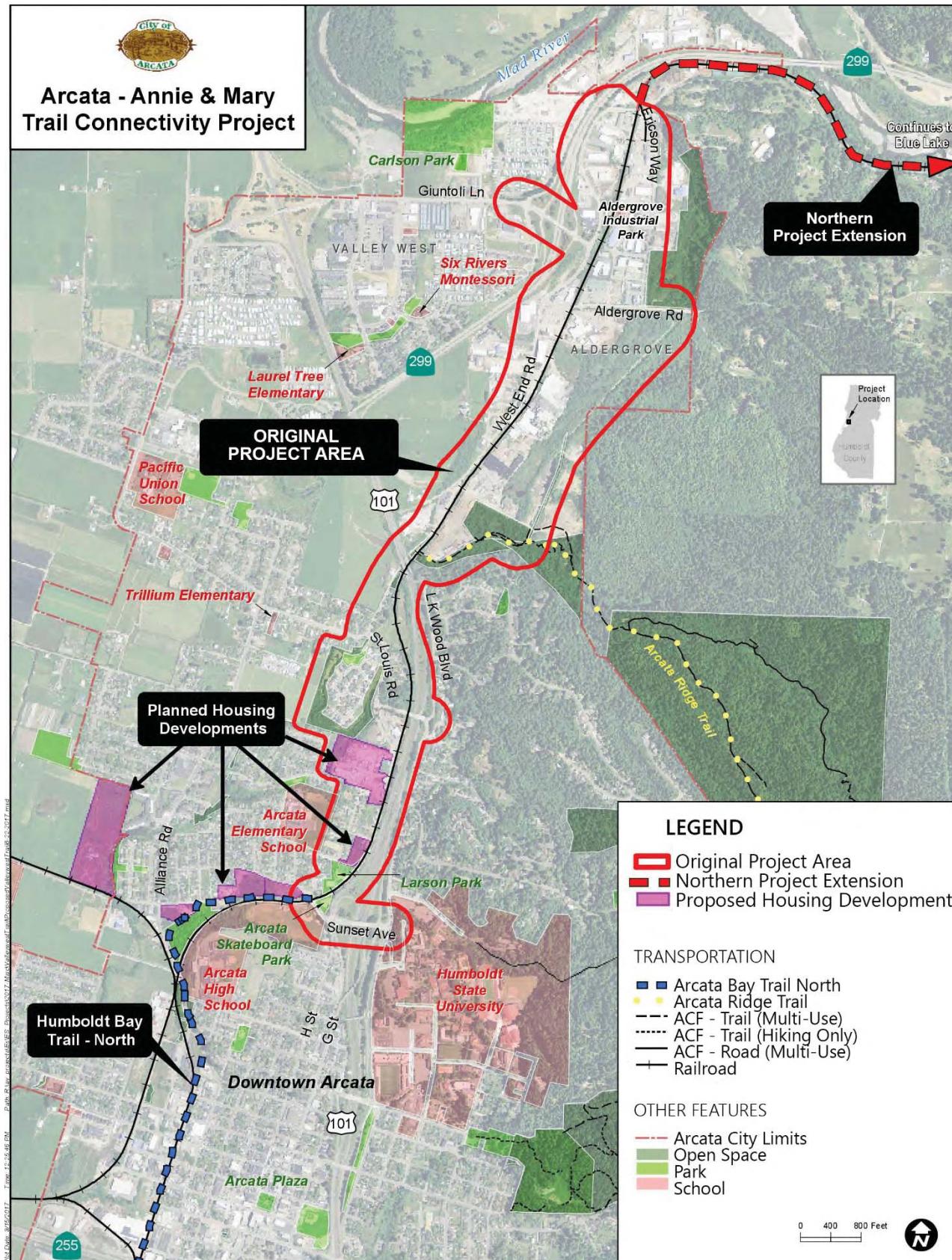
SB 1029 is an exciting step in establishing the envisioned Great Redwood Trail, of which the Annie & Mary Trail would be the northernmost spur. The bill also allowed the consideration of a rail-to-trail design, rather than only a rail-with-trail design. This provided more flexibility in the trail design and location and will reduce the cost of construction.

### b) Housing and Business Developments

There are currently seven proposed developments in the project area that may potentially relate to the Annie & Mary Trail Connectivity Project. These developments include proposed housing projects, roadway or transportation-related improvements, as well as the proposed City's Cannabis Innovation Zone. **Figure 3** shows the location of the proposed housing projects in relation to the project area. In addition, twelve planning documents relate to the project area. More information about the proposed developments and the twelve planning documents can be found in the document "Memo: Existing Policies, Plans & Proposed Improvements", included as **Appendix B**.

The proposed housing and business developments will bring additional residents and workers to the project area, which will increase demand for and use of the future trail. The proposed transportation-related improvements will either facilitate implementation of the trail or potentially require coordination to avoid interfering with the trail.

Where proposed developments are adjacent to the trail, the City may condition the development to construct trail connections or other related improvements, particularly if those improvements are identified in an existing document. For example, past plans for the Village Housing Project have included constructing a portion of the Annie & Mary Trail, connecting the property to Maple Lane and the Janes Creek Meadow Trail, and constructing sidewalk along St Louis Road to the overcrossing.



**Figure 3: Project Context and Proposed Developments**

## 2.6 EXISTING CONDITIONS, OPPORTUNITIES AND CONSTRAINTS

### a) Railroad Right-of-Way

The width of the railroad right-of-way (ROW) varies. For most of the project area, it is 20 to 35-feet wide. In the area just north of the St Louis Road overcrossing, there are portions of the ROW that are 60 and 80-feet wide. The approximate ROW for the project is shown on the Project Plans, included as **Appendix A**.

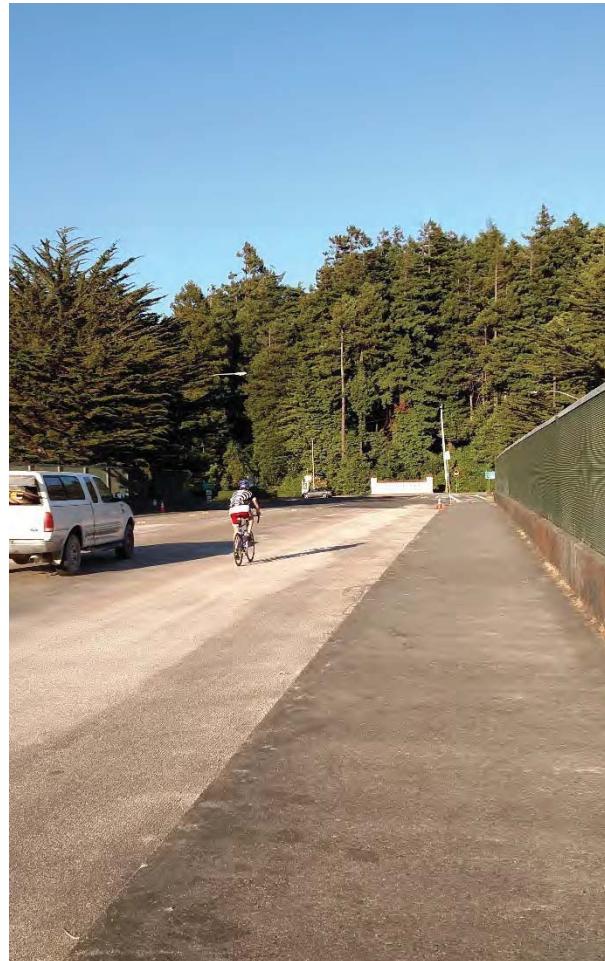
### b) Existing Trails and Transportation Network

The proposed trail connects with existing trails, bike routes, sidewalks, and roadways in the project area, and provides access to the existing bus network as well. These neighborhood connections are vital to ensure that all residents within the city can access the proposed Annie & Mary Trail. These connections are detailed in the Existing Conditions, Opportunities, and Constraints memo (**Appendix D**), shown on **Figure 4** and **Figure 5**, and detailed in the project plans.

While the vehicular network is well developed, some roadways present major obstacles to cyclists and pedestrians. The Sunset Avenue and Giuntoli Lane connections present challenging routes for walking and biking.

The connection from the project area to the Valley West community via Giuntoli Lane was one of the City's primary focus areas for improving bicycle and pedestrian safety and access to the Annie & Mary Trail.

The Sunset Avenue Connection is composed of a Highway 101 overcrossing and interchanges with G Street and LK Wood Boulevard, both of which are challenging routes for both bicyclists and pedestrians. The Giuntoli Lane Connection is also composed of a Highway 101 overcrossing and connects to West End Road. Giuntoli Lane has no shoulders and requires bicyclists and pedestrians to negotiate a series of wide on- and off-ramps and a T intersection to reach the rail corridor. There is an intervening steep slope between the T intersection at West End Road and the rail line.



**Photo 5: Sunset Avenue/Highway 101 Overcrossing, view toward LK Wood Boulevard & HSU**

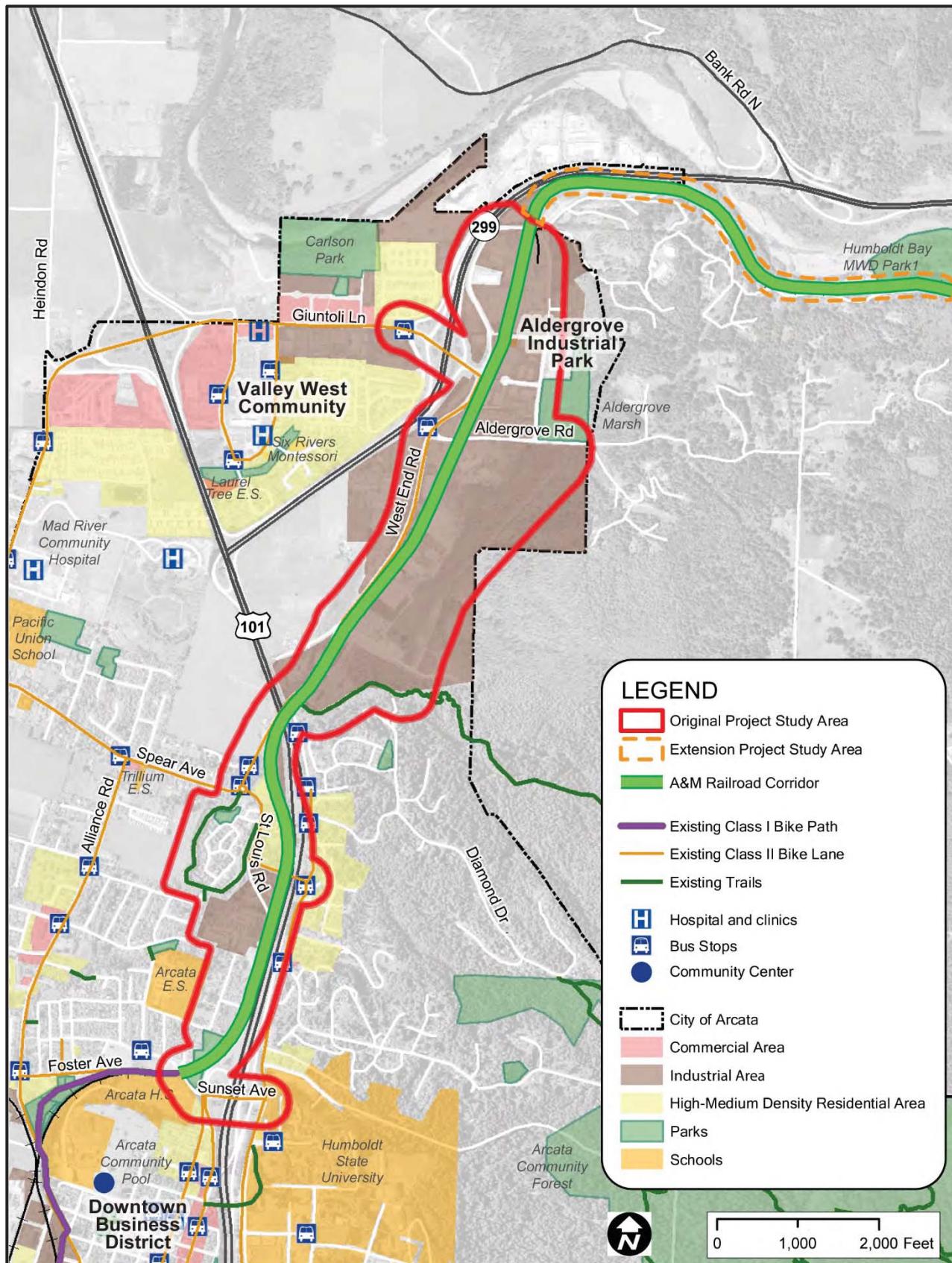
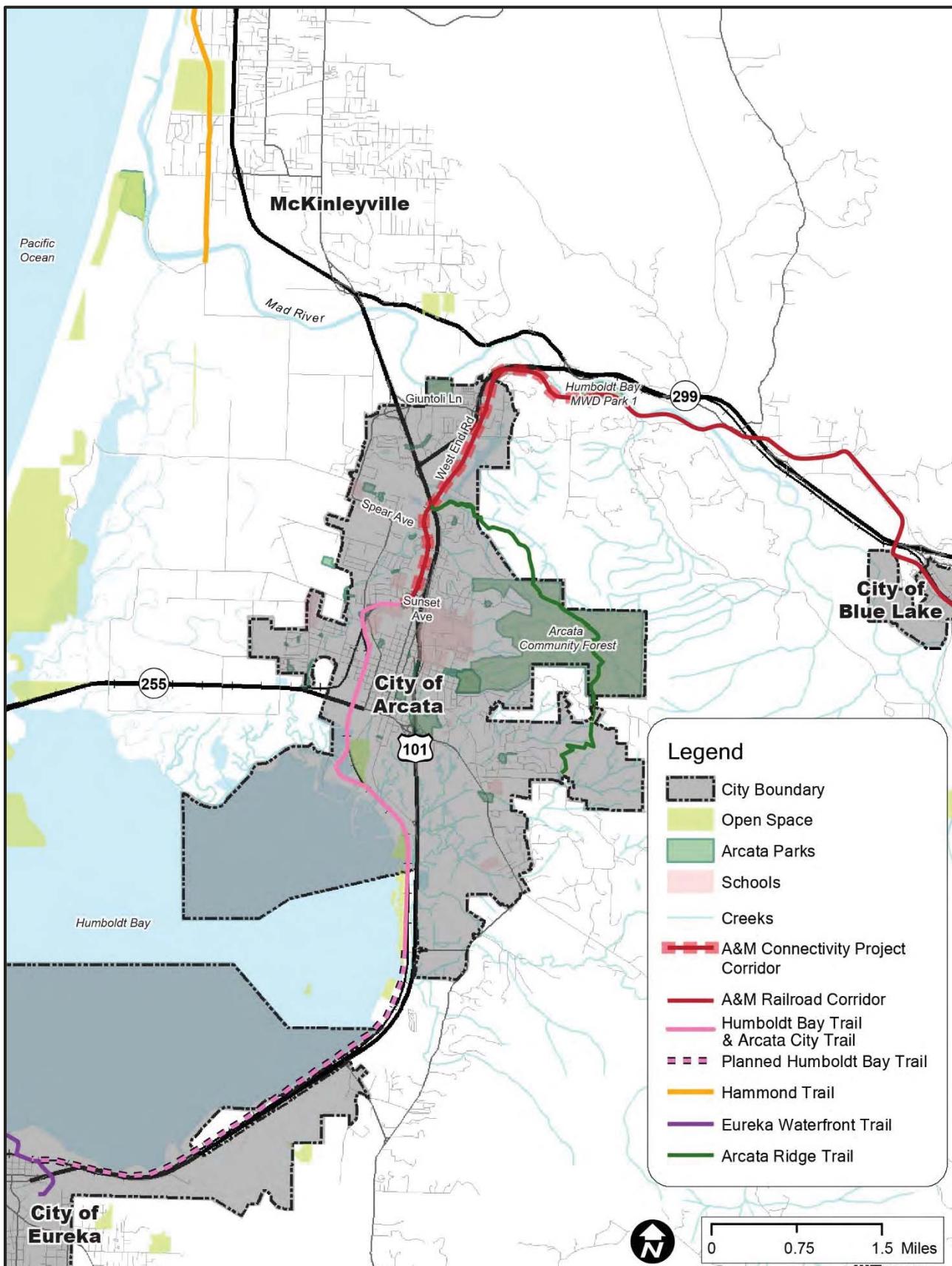


Figure 4: Project Area Transportation Network



**Figure 5: Regional Trail Map**

## c) Wetlands and Biological Resources

There are existing wetland areas, slopes and culverts along the northern part of the railroad corridor. The middle of the site area also has existing culverts and slopes near the railroad corridor. Janes Creek runs adjacent to the west side of the railroad corridor with riparian vegetation along both sides of the railroad corridor. Most biological constraints are located at the southern part of the project site where there are steep slopes, wetland areas, and culverts highly prevalent along the railroad corridor.

Detailed maps and further information are included in the Existing Conditions, Opportunities, & Constraints Memo (**Appendix D**).

## d) Historic Resources

As detailed below, there are many layers of history within the project area. Specific opportunities for interpretation are included below. There are also a few general opportunities for interpretation and community education along the trail, such as:

- Interpretive panels – These can be placed near relevant resources and provide context and information about the specific area.
- Murals/Undercrossings – the Highway 101 and St Louis Road undercrossings both provide opportunities for murals.

### Native American Resources

The site of one Native American village or camp has been noted in the project area, however the actual location of the village or camp is unknown. Based on historical maps, the site appears to be on or near the railroad ROW within the extension area of the project. Prior to construction, it is likely that additional research will be required to determine how to limit impact on this resource. With appropriate care and consultation, this may present an opportunity for interpretation. Consultation with the Blue Lake Rancheria, Wiyot Tribe, and Bear River Band of the Rohnerville Rancheria should be conducted prior to construction in this area.

### Rail Lines

The northernmost 1.9 miles of the project area (from the former Flakeboard Property to HBMWD Park 1) is part of the larger California Historical Landmark No. 842, Arcata & Mad River Railroad, which was the first working railroad in California.

The railroad corridor runs continuously the length of the entire project area. Within the city limits, the rails are almost entirely still in place. Outside of the city limits the rails have been entirely removed from the corridor. For most of the length of the project, there is one set of tracks present. For most of the area from



**Photo 6: Rail themed trail markers, Iron Ore Heritage Trail, Michigan**  
**(Source: RTC bkn94)**

the Highway 101 undercrossing to the West End Road crossing there are two sets of tracks present as well as at least two switches.

The development of the trail along the rail line presents an opportunity to provide historic interpretation and reuse of railroad materials. South of the former Flakeboard property, the rail corridor in the project area was part of the Northwestern Pacific Railroad. This segment has been determined to be ineligible for landmark status; however, the remnant railroad materials and intact prism of the railroad present an excellent opportunity for interpretation and reuse.

Rails or other materials from the Annie & Mary rail line or other segments of former Northwest Pacific Railroad (and future Great Redwood Trail) could be repurposed into creative bike racks, hitching posts, benches, interpretive sign mounts, or art installations along the trail. The Timber Heritage Society, whose mission is to create awareness and appreciation for the impact of timber, logging and railroads on the settlement and growth of Humboldt County, could be engaged to create or interpret this reuse of rail infrastructure. Additionally, O&M Industries, located in the Ericson Way area, could be a partner for fabrication of creative rail elements.

In some places it may be possible to retain certain railroad-related elements in-place, such as switches and switch arms, to retain context for the historic rail line. Some elements may also be re-used for interpretive purposes. Examples of railroad interpretation on other trails is given in **Appendix C**.

Prior to construction, an inventory of existing railroad infrastructure should be completed to determine which elements can be retained or relocated, and which must be removed.

## Civil War Era Resources

A marker for Camp Curtis, a Civil War-era military camp, is located on St Louis Road; however, the actual location of the camp is believed to be on or near the railroad ROW between the St Louis overcrossing and the Janes Creek Spur. As with the other historic resources noted above, the potential location of this resource presents a potential constraint, should resources be encountered, but also an opportunity for interpretation.

## e) Other Site Constraints

There are major water transmission lines and a gas line that run parallel to the rail corridor in the vicinity of West End Road. Construction above the lines is not recommended because of potential impact on the utilities and increased cost, coordination, and maintenance issues.

The Aldergrove Industrial Park is a designated Cannabis Innovation Zone (CIZ) and it is expected that more cannabis-related uses will move into the Industrial Park. Cannabis-related businesses may need additional security or have concerns about trail users near their facilities. However, employees and customers of the cannabis-related businesses also present an opportunity for work-related commute and customer trail use.

## 2.7 SUMMARY OF STUDY PROCESS AND PUBLIC/STAKEHOLDER INPUT

Outreach efforts for the Annie & Mary Trail Connectivity Project were led by RCAA. Efforts included several modes of outreach as outlined below and detailed in the Outreach Summaries (**Appendix E, F, and G**).

Events held:

- Walking Tour & Walk Audit (August 2018)
- Community Workshop #1 (February 2019)
- Community Workshop #2 (April 2019)
- Pop-up temporary infrastructure demo (April 2019)
- Pop-up information booth (May 2019)
- Project Task Force Meetings (January 10, April 10, August 8, 2019)

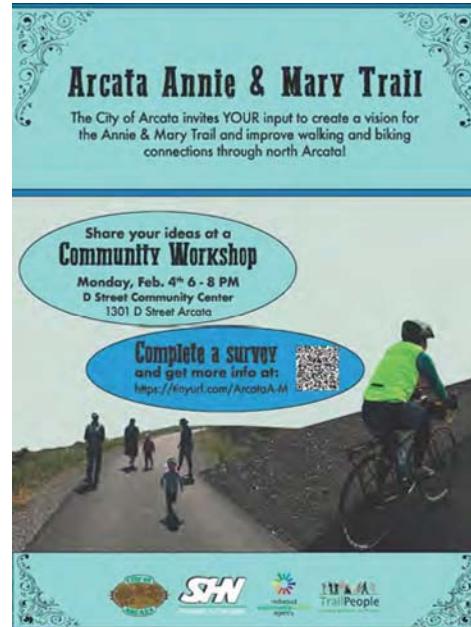
Community meetings attended:

- DELAC (District Level English Learner Advisory Committee) meeting
- Arcata Transportation Safety Commission (November 2018)
- Arcata Parks and Recreation Committee (December 2018)
- Humboldt Trails Summit (May 2019)
- Arcata City Council Meeting (September 2019)

Other:

- Print & Online Survey (See **Appendix E**)
- Project website (<https://www.cityofarcata.org/831/Annie-Mary-Trail-Connectivity-Project>)
- One-on-one stakeholder meetings (See **Appendix E and F**)
- In-person outreach along the Humboldt Bay Trail, at Valley West shopping center, and to businesses in the Aldergrove area
- Direct landowner outreach by City staff

City of Arcata staff actively engaged landowners and businesses in the industrial area along West End Road and Ericson Way where many construction and manufacturing companies are. As the Annie & Mary rail corridor runs through the heart of this area, any proposed transition of the rail corridor to a trail could impact the operations of this important industrial area. At the beginning of the project, the project team prepared a questionnaire for landowners/businesses adjacent to the rail corridor. This questionnaire was sent to landowners and businesses by direct mail, and city staff continued to engage with adjacent businesses and landowners at the February and May workshops and through individual conversations. A couple of landowners were interested in fencing to ensure privacy and safe business operations as well as ensuring access across the corridor at existing crossings. These ideas have been incorporated into the trail design.



**Figure 6: Project Community Outreach Flyer**

As the trail is being planned along a public rail corridor has not been utilized for several decades there may be a transition for some businesses which have been using the corridor for additional space adjacent to their property. Several businesses were excited about increasing the walking and biking connectivity to their business for their employees.

The overwhelming majority of comments were supportive of the trail, with the majority of supporters specifically supporting the option for trail alignment in the railroad corridor (see **Section 3.1 Railroad Corridor Alternative**). Some highlights are included below. More details are included in the appendices.

**Survey:** 91% of the survey participants indicated they are interested in using the completed Annie & Mary Trail for fun, exercise, and/or recreation. Survey and workshop participants indicated safety concerns related to homelessness prevalence, fast traffic, and lack of lighting.

**February Community Workshop:** The project team held a kickoff community workshop which introduced the project and included multiple methods for gathering people's ideas and concerns about the trail.

**DELAC Meeting:** During the DELAC meeting, parents voiced that they have major concerns over the Giuntoli overpasses but are overall excited about having a new trail connection where they will feel safe walking with their kids.

**April Pop-Up:** At the April pop-up event on Sunset Ave, there was strong enthusiasm for the trail, interest in seeing the trail located on the railroad corridor, interest in a bus stop at/near the Arcata Skate Park, and support for safety and security measures for both trail users and nearby properties.



**Photo 7: February 4<sup>th</sup>, 2019 Community Workshop**

**April Community Workshop:** At the second Community Workshop in April, there was strong support for the railroad corridor alignment alternative and opposition to the hybrid railroad/on-street alternative.

**May Pop-Up:** At the May pop-up in the Aldergrove Industrial Park most people supported the idea of a trail nearby for them to use, as long as safety precautions were taken for bicyclists, pedestrians, and the employees who work in the industrial park.

**2018 Walk Audit:** Participants in the August 2018 Walk Audit in the Valley West area noted numerous safety issues in the Valley West community, including the connection to the project area over the State Route 299 overcrossing near Giuntoli Lane and West End Road. Participants noted issues including missing sidewalks, varying sidewalk conditions, a lack of signage, crossings and bus shelters, inadequate street lighting, overgrown vegetation, and an increase in homelessness in the community.

Recommendations from the Walk Audit related to the Connectivity Project included: improving neighborhood crossings, expanding the Zagster Bikeshare system to the Valley West neighborhood, and improving lighting along Giuntoli Lane. Further details are available in **Appendix G**.



**Photo 8: April 22nd Pop-up Temporary Infrastructure Event**

## 3. Alternatives Considered

Three trail connection alternatives were considered for the project. The alternatives were considered due to the significant constraints and costs for improving some portions of the rail line and connecting it to nearby streets. In addition, two to three community members expressed the concern that locating the trail on the railroad corridor could reduce real or perceived property and/or personal safety. The alternatives were designed to allow comparison of a range of potential benefits and drawbacks.

All alternatives began at Sunset Avenue as a continuation of the Humboldt Bay Trail. All alternatives ended at the northern project extension destination, HBMWD Park 1.

In each case the project will have linkages to:

- the Sunset Overcrossing,
- Larson Park,
- Todd Court,
- LK Wood Boulevard,
- Arcata Ridge Trail,
- St Louis Road,
- St Louis Road Overcrossing,
- Janes Creek,
- Giuntoli Lane,
- Ericson Court,
- Frank Marin Court, and
- HBMWD Park 1

**Table 2** provides a summary of the features of the alternatives and relative public support. **Figure 8** shows all three alternatives in the full context of the area.



**Photo 9: Arcata Ridge Trail entrance on West End Road**

**Table 2: Summary of Alignment Alternatives**

	Railroad Corridor Alternative 1	West End Road Alternative 2	Hybrid Alternative 3
# of Roadway Crossings	3	8	7
# of Non-Residential Driveway Crossings	9	48	42
# of Residential Driveway Crossings	0	16	5
Miles on Road	0 mi	2.0 mi	1.1 mi
Miles on Railroad	3.3 mi	1.5 mi	2.4 mi
Public Support *	High	Medium	Medium
<b>Connectivity to:</b>			
- Valley West	Good	Good	Poor
- West End Road	Great	Great	Great
- Aldergrove Industrial Park	Great	Poor	Great
- Downtown Arcata	Good	Good	Good
- HSU	Good	Good	Good
- HBMWD Park 1	Good	Good	Good
<b>Potential Resource Impacts</b> (low=better)			
- Cultural Resources	medium-low	very low	low
- Biological Resources	medium-low	low	low

\* Note: The relative public support was subjectively determined based on the results of the public outreach to date. Further details and objective results of the public outreach is included in Appendix E and F.

## 3.1 RAILROAD CORRIDOR ALTERNATIVE

Alternative 1 is the **Railroad Corridor Alternative** (see **Figure 9**). The concept for this alternative is to have the trail follow the railroad corridor as much as possible. This alternative includes no trail on roadways, 3.3 miles of trail on the railroad corridor, and crosses three roadways and nine non-residential driveways. The location of these crossings are shown on **Figure 12** through **Figure 15**.

The three roadway crossings are:

- at the beginning of the envisioned trail on Sunset Avenue;
- at the Alder Grove Road intersection; and
- at the West End Road and Ericson Way intersection.

This alternative has the least number of both roadway and driveway crossings, most of which are situated in the Aldergrove Industrial Park area.

Roadway and driveway crossings are points of conflict between trail users and vehicles and contribute to real and perceived traffic safety concerns for trail users. Careful design and construction can mitigate some safety and comfort concerns. For example, extra surface markings can draw attention to the presence of the trail and reduce the likelihood of a collision. However, a reduced number of crossings represents a reduced number of conflict points, which may increase real and perceived trail user safety and comfort.



**Figure 7: Photo rendering of Railroad Corridor Alternative near West End Road**

## 3.2 WEST END ROAD ALTERNATIVE

Alternative 2 is the **West End Road Alternative** (see **Figure 10**), which routes the trail off of the railroad corridor wherever feasible. This alternative was developed to establish whether an off-corridor option would be preferable to an on-corridor option.

As with all three alternatives, the West End Road alternative remains on the railroad corridor from Sunset Avenue until St Louis Road. At this point, the trail would follow along St Louis Road to West End Road, and then return to the railroad corridor at the intersection of West End Road and Ericson Way.

This alternative includes two miles on roadways, 1.47 miles on the railroad corridor, and crosses eight roadways, 48 non-residential driveways, and 15 residential driveways. The location of these crossings are shown on **Figure 12** through **Figure 15**.

The eight roadway crossings in the West End Road Alternative include:

- at the beginning of the envisioned trail on Sunset Avenue;
- at the St Louis Road and St Louis Road Overcrossing intersection;
- at the St Louis Road and Janes Creek Drive intersection;
- at the St Louis Road and Spear Avenue intersection;
- at the intersection of West End Road as it splits into West End Court;
- at the West End Road and Giuntoli Lane intersection;
- at the West End Road and Frank Martin Court intersection; and
- at the West End Road and Ericson Way intersection.

This alternative has the greatest number of both residential and non-residential driveway crossings. Eleven of the crossings are clustered within the residential area of West End Road between Spear and Highway 101. The remainder of the driveway crossings are spread out along the rest of West End Road and St Louis Road. In addition, West End Road has heavy, fast traffic, including logging trucks.

As noted above, roadway and driveway crossings are points of conflict between trail users and vehicles and contribute to real and perceived traffic safety concerns for trail users. Careful design and construction can mitigate some safety and comfort concerns. For example, extra surface markings can draw attention to the presence of the trail and reduce the likelihood of a collision.

Two to three community members commented that because the West End Road Alternative felt less secluded than Alternative 1, it might result in less property and violent crime. However, most people who responded to the survey or attended the community meeting felt that, on balance, the Railroad Corridor Alternative was preferable to the West End Road Alternative.



**Photo 10: View north on West End Road under Highway 101**

### 3.3 HYBRID ALTERNATIVE

Alternative 3 is the **Hybrid Alternative** (see **Figure 11**). The concept for this alternative is to use a combination of routes on and off the railroad corridor. As with all three of the alternatives, the third alternative would be on the railroad corridor starting from Sunset Avenue all the way to St Louis Road, transitioning onto a roadway on St. Louis Road. Just before Spear Road, it would turn on to the Janes Creek Connection, and then back on the railroad corridor. Midway between Highway 101 and Aldergrove Road, the Hybrid Alternative would route through a parking area to avoid an area with heavy industrial use. The route would then follow Aldergrove Road to the east, Ericson Way to the north, and return to the railroad corridor near the intersection of Ericson Way and West End Road. From there, the route would follow the railroad corridor all the way to HBMWD Park 1.

This alternative includes 1.1 miles on roadways, 2.4 miles on railroad corridor, and crosses seven roadways, 42 non-residential driveways, and five residential driveways. The location of these crossings are shown on **Figure 12** through **Figure 15**.

The seven roadway crossings on the Hybrid Alternative include:

- at the beginning of the envisioned trail on Sunset Avenue;
- at the St Louis Road and St Louis Road Overcrossing intersection;
- at St Louis Road and Janes Creek Drive intersection;
- at the St Louis Road and Janes Creek Connection;
- at the intersection of the railroad corridor and Aldergrove Road;
- at the intersection of Aldergrove Road and Ericson Way;
- at the intersection of Ericson Way and Ericson Court;
- at the intersection of Ericson Way and Frank Martin Court; and
- at the West End Road and Ericson Way intersection.

The driveway crossings for this alternative are mostly located along Aldergrove Road and Ericson Way, while a few more are located on the industrial detour to the east of West End Road.

As noted above, roadway and driveway crossings are points of conflict between trail users and vehicles and contribute to real and perceived traffic safety concerns for trail users. Careful design and construction can mitigate some safety and comfort concerns. For example, extra surface markings can draw attention to the presence of the trail and reduce the likelihood of a collision.

Also as noted above, this alternative may feel less secluded than Alternative 1, and therefore may potentially result in less property and violent crime. However, most people who responded to the survey or attended the community meeting felt that, on balance, the Railroad Corridor Alternative was preferable to the either the West End Road Alternative or the Hybrid Alternative.

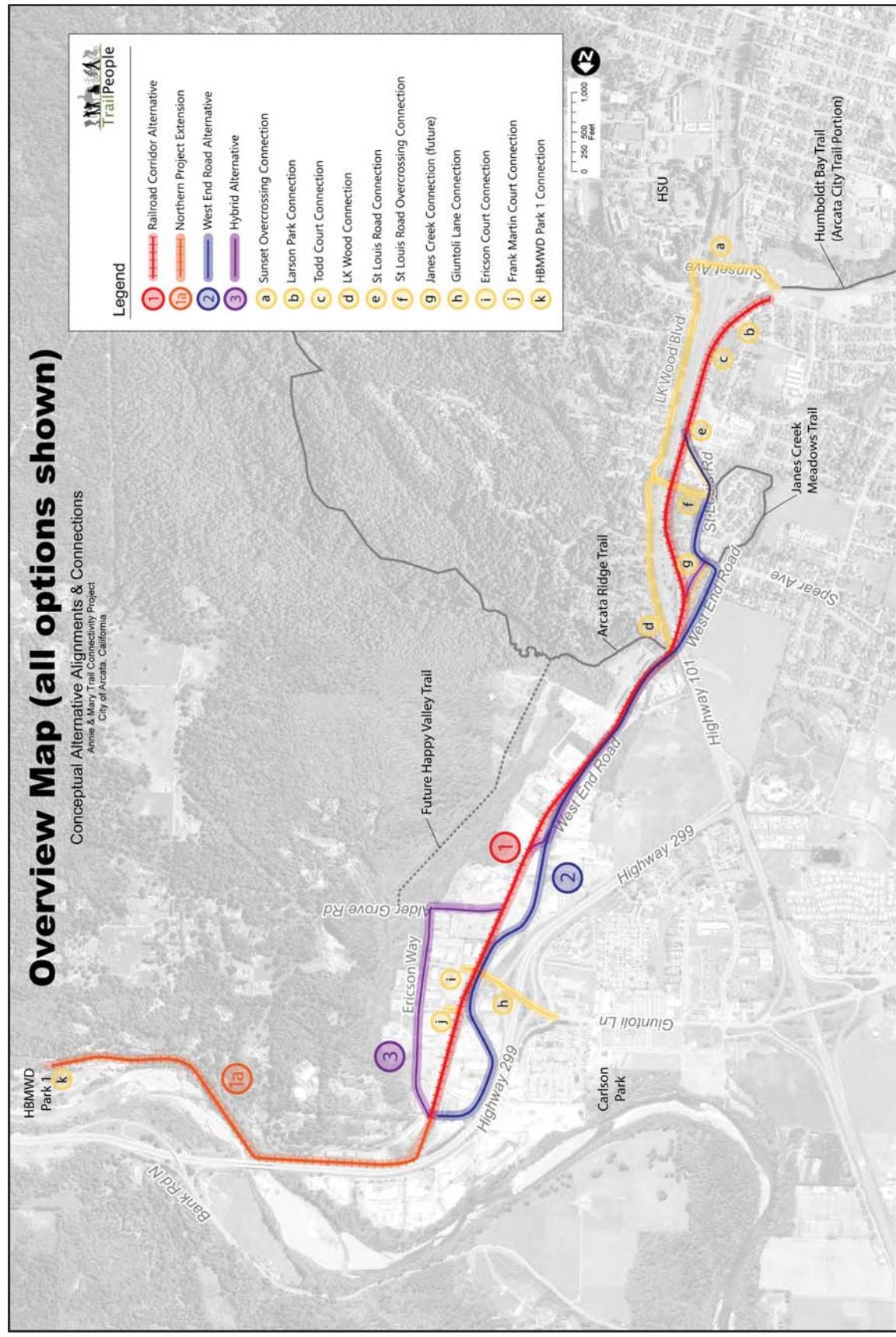


Figure 8: Overview showing all alternatives

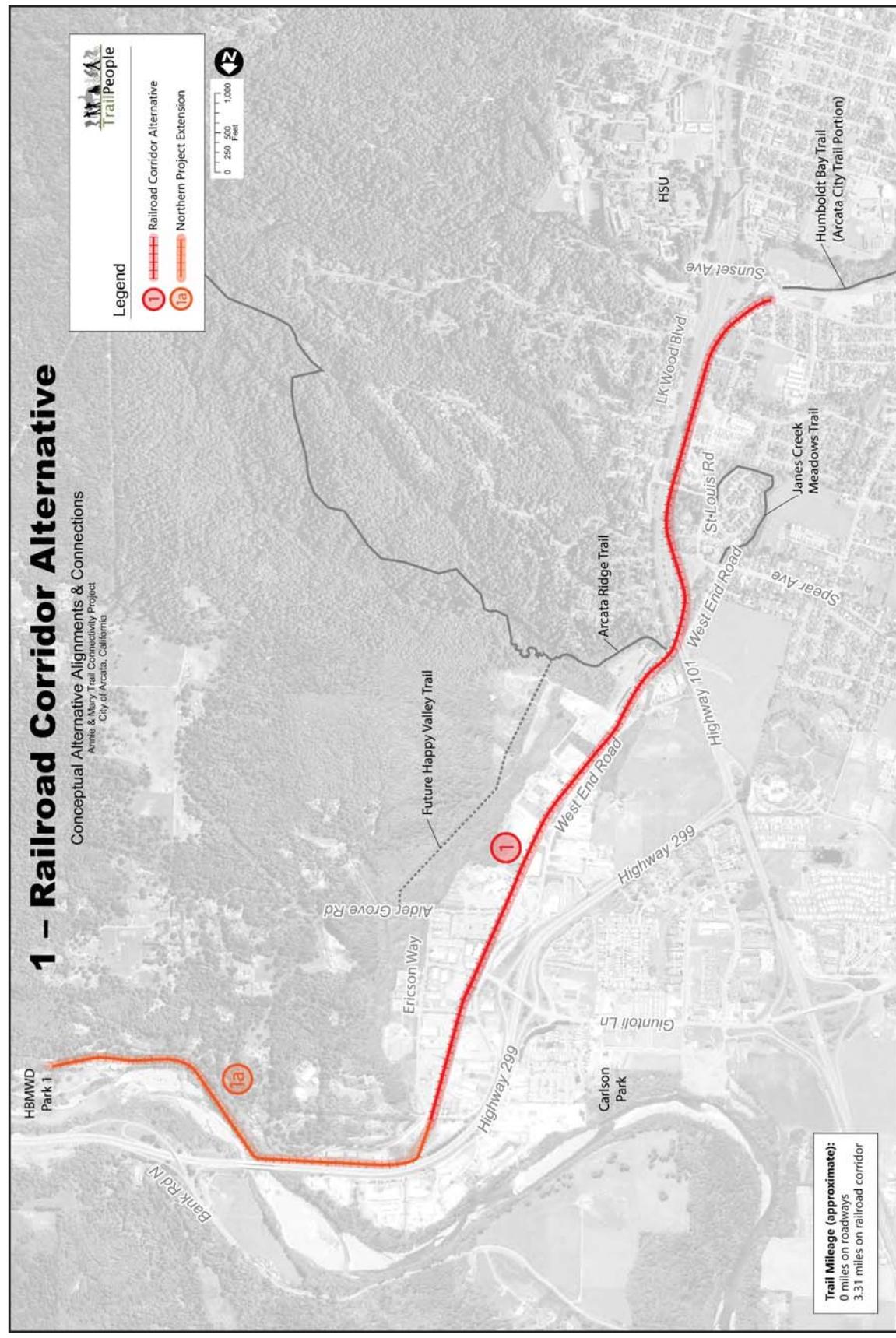


Figure 9: Railroad Corridor Alternative 1

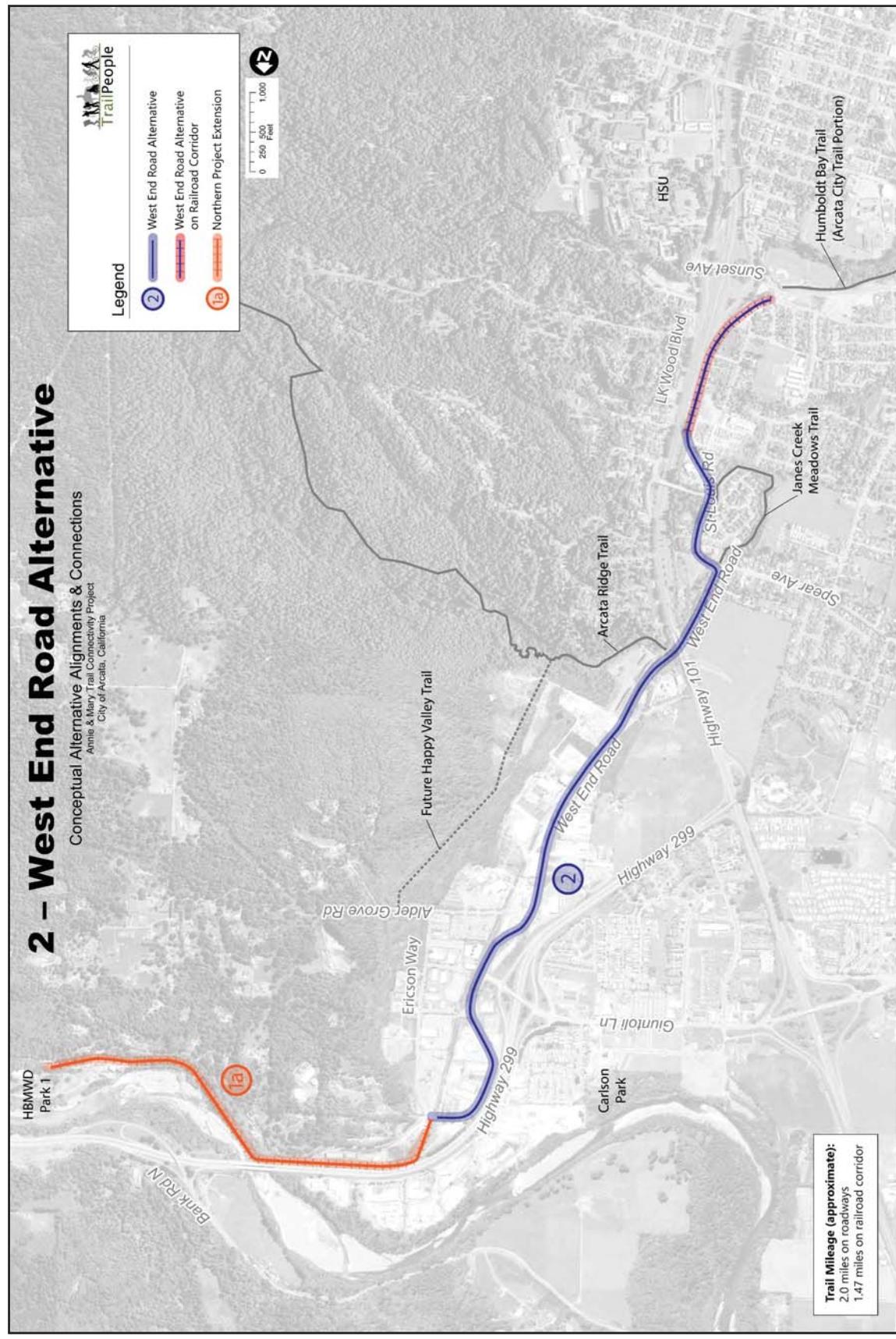
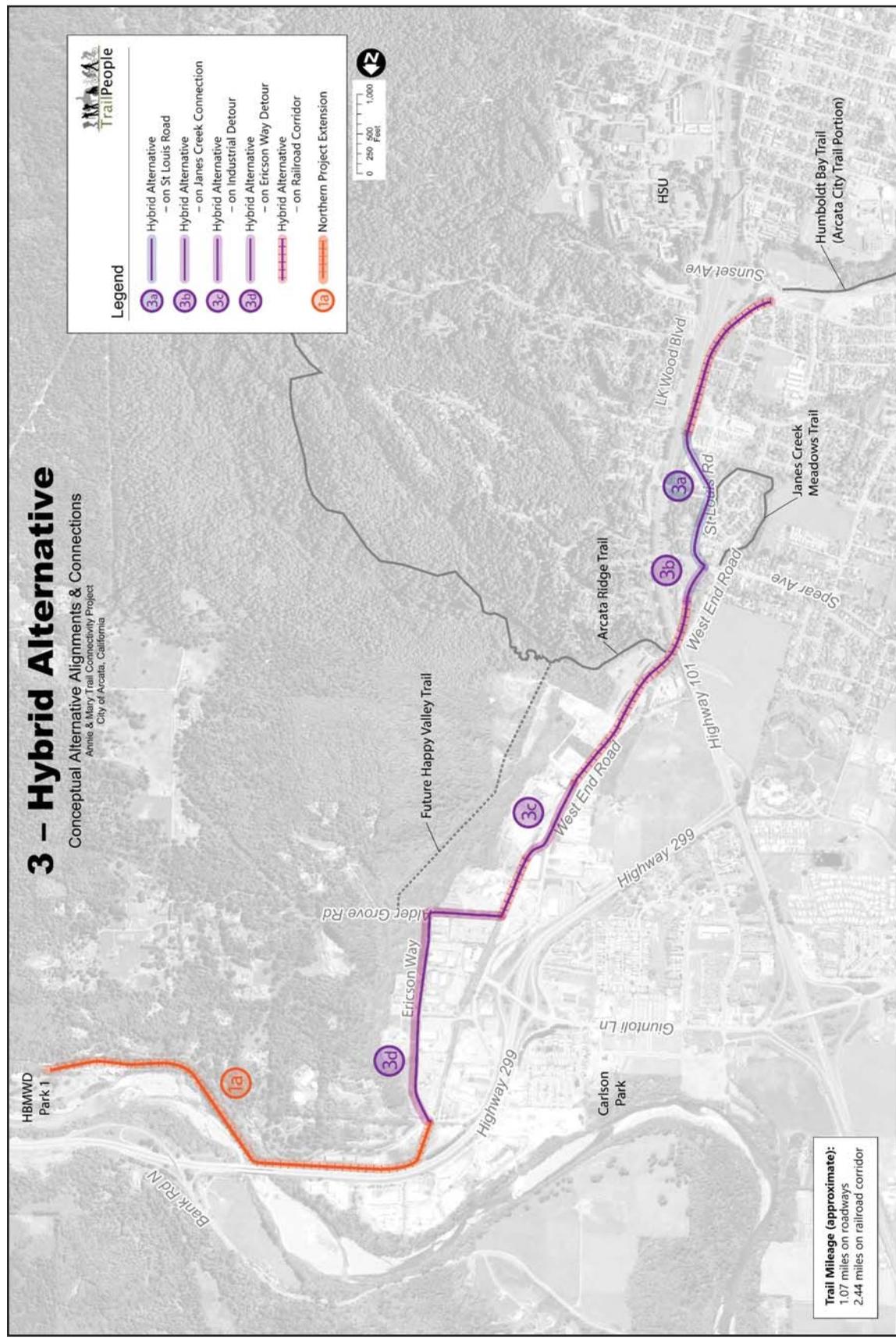
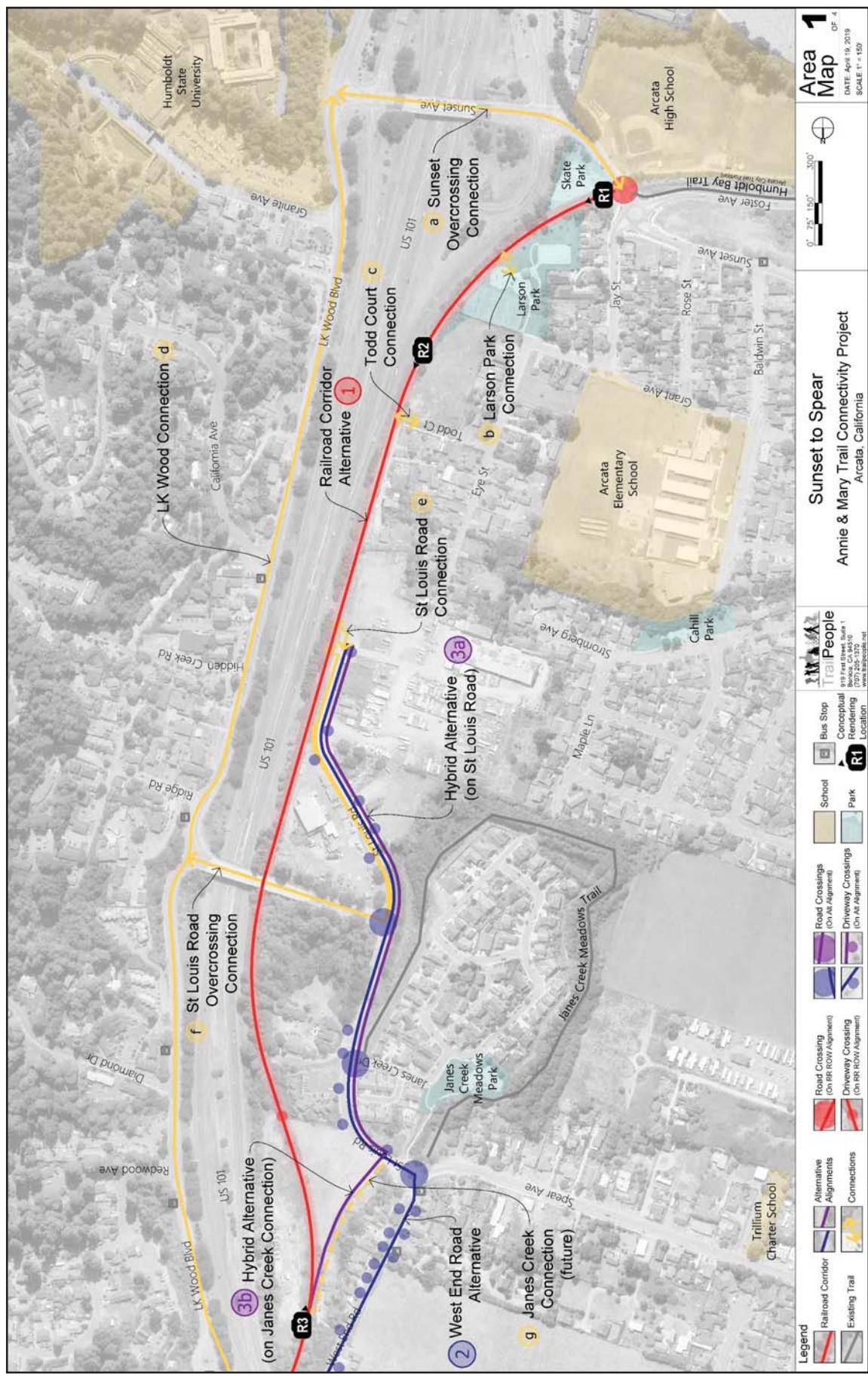


Figure 10: West End Road Alternative

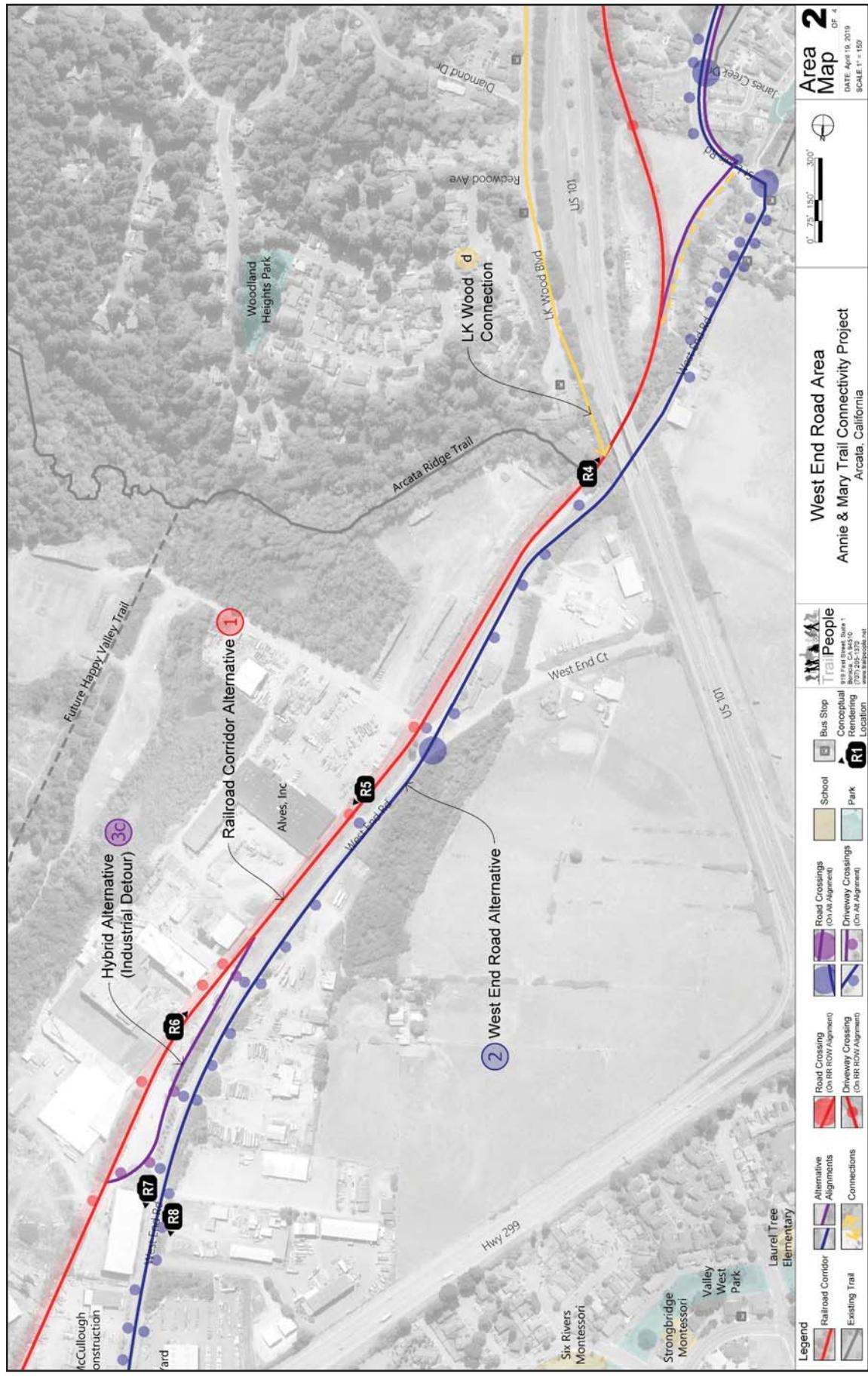


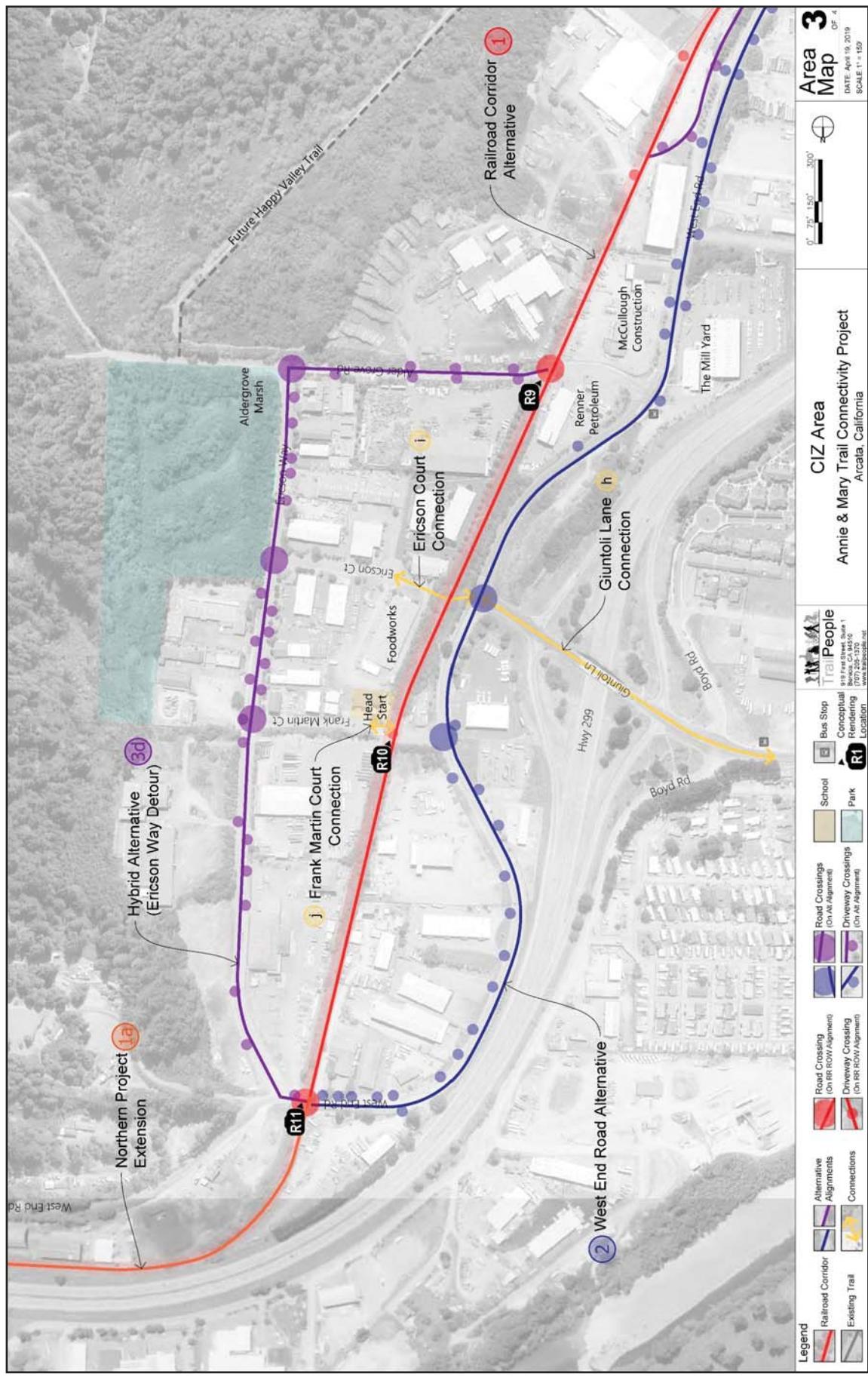
**Figure 11: Hybrid Alternative 3**



**Figure 12: Area Map showing alignment alternatives, connections, and crossings from Sunset Ave to Spear Ave**

Alternatives Considered





**Figure 14: Area Map showing alignment alternatives, connections, and crossings in Cannabis Innovation Zone area**

## Alternatives Considered

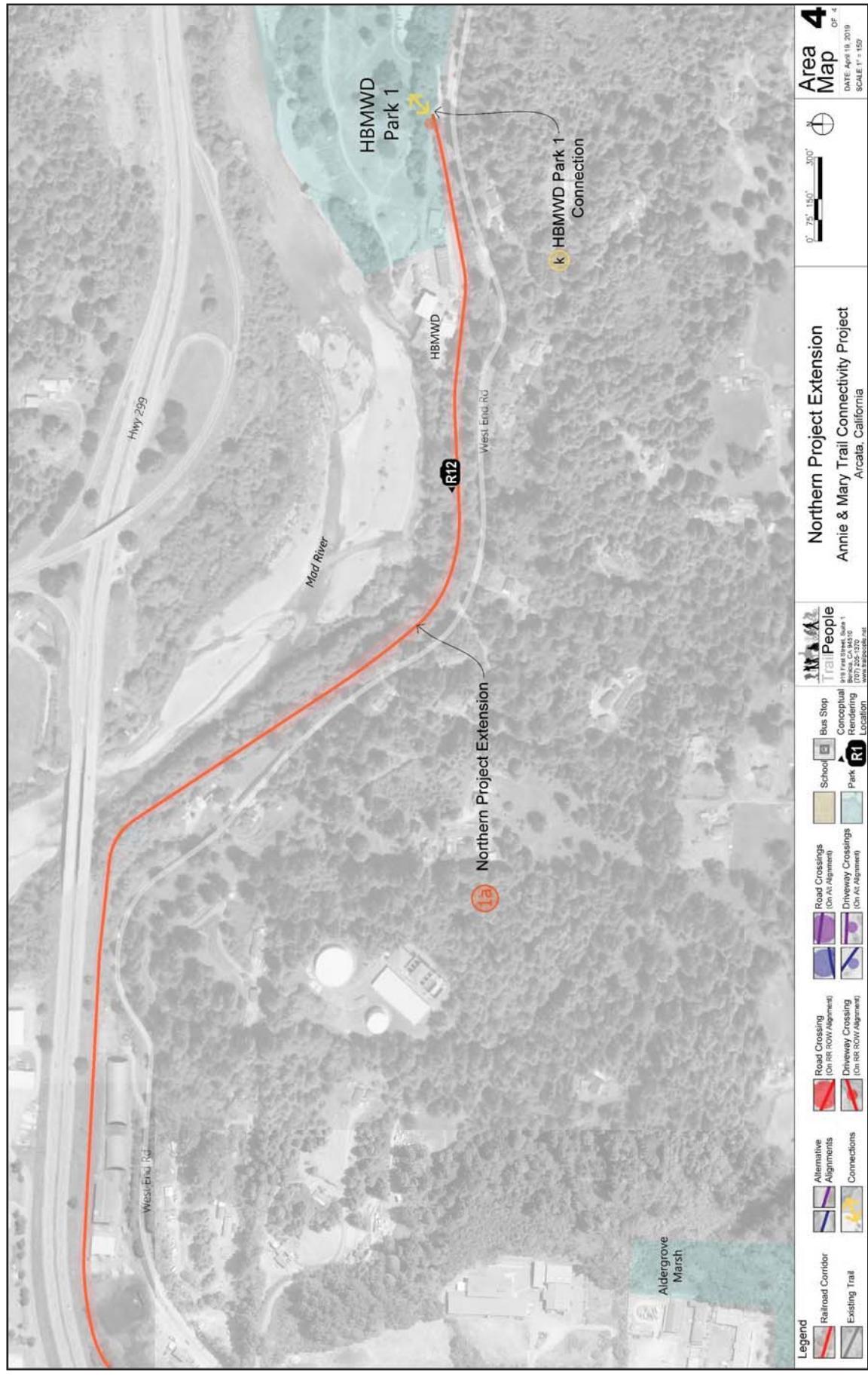


Figure 15: Area Map showing alignment alternatives, connections, and crossings in Northern Project Extension area

Alternatives Considered

page 31

## 4. Other Recommendations

### 4.1 TRAIL CONNECTIONS AT SUNSET AVENUE, ST LOUIS OVERCROSSING, GIUNTOLI LANE, AND LK WOOD BOULEVARD

The trail connections at Sunset Avenue, St Louis Overcrossing, and Giuntoli Lane present unique and difficult challenges for connectivity. Constrained road widths, complicated intersections, and/or roadway configurations that prioritize vehicle flow have resulted in conditions that are confusing and/or hazardous for cyclists and pedestrians to navigate.

Most of the proposed reconfigurations focus on creating clear, dedicated space for cyclists and pedestrians. The following overall concepts were relied upon to create these configurations:

- **Reduced vehicle travel lanes** – Narrower lanes encourage slower driving and provide space for cyclists and pedestrians. Where the roadway reconfigurations are shown, the width of the lanes was set at 11-feet.
- **Continuous sidewalks, one side minimum, both sides where possible** – Existing sidewalks were maintained, and new sidewalks were created on at least one side of every roadway. Sidewalks were designed at five feet wide, or to matching existing sidewalks.
- **Continuous bike lanes, both directions** – Existing bike lanes were maintained and new bike lanes were added to provide continuous bike lanes in both directions. For increased visibility, bike lanes are shown painted green. Where a potential conflict with vehicles exists, the green bike lanes are dashed to provide guidance to cyclists and increase visibility and awareness for drivers. Bike lanes were designed at a minimum of five feet wide.
- **Buffered bike lanes** – After laying out the travel lanes, sidewalks, and bike lanes, any remaining roadway was used to provide a buffer between the vehicle travel lanes and the bike lane. The minimum width for a buffer is 18 inches. Depending on the width and the location, the buffer may be paint-only, or may include vertical barriers.
- **Reduced turn radii** – Wherever possible, the radius of corners for vehicle travel ways was reduced. Smaller radii encourage slower and more attentive driving, reduce bike and pedestrian crossing distances, and increase opportunities for protection of the most vulnerable users. In most cases, the extra area could be built into a raised island, providing additional protections for cyclists and pedestrians. In some cases, the area must be maintained as road grade for large trucks that would not otherwise be able to navigate the turn. In these cases, the area is shown striped, to provide a visual cue to all drivers. This may also be an appropriate location for a mountable curb or apron.

Bike lane protection options can be seen on the following page.

## Bike Lane Protection Options:



### Striping

- Striping 2'+ visual between bike lane, travel lane or parking lane.
- Easy to implement.
- Minimal space requirement.

### Flexible Bollards

- 3' minimum buffer required between bike lane and traffic.
- Provides strong visual cue and physical protection.
- Less potential for fixed-object collision hazard for cyclists.

### Raised Barrier

- Landscaping, low planters, "armadillos", and/or mountable curbs.
- 3' minimum buffer required between bike lane and traffic.
- Provides visual and physical protection.
- May not be preferred by cyclists.

## Truck Turn Area Buffer Options:



### Striping and/or Color

- Visual cue
- Easier to implement than paving and/or curb changes.

### Mountable Truck Apron

- Visual cue
- Tactile cue
- May require grading for drainage modifications.

## a) Sunset Avenue & Larson Park Connections

The connection to Humboldt State University from the trail on the railroad corridor at Sunset Avenue crosses multiple complex intersections, which are challenging for vehicles, bikes and pedestrians alike. One of the biggest challenges is at the eastern end, where two freeway access ramps meet LK Wood Boulevard and Sunset Avenue. Another challenging area is at G and H Streets, which converge near Sunset Avenue.

Cyclists or pedestrians connecting to the trail from the LK Wood Boulevard/Sunset Avenue intersection must cross two freeway ramps and three roads (LK Wood Boulevard, G Street, and H street) when travelling on the north side of Sunset Avenue. Cyclists or pedestrians travelling on the south side of Sunset Avenue (or continuing along the Humboldt Bay Trail/Arcata City Trail), must also cross Sunset Avenue. See **Figure 17**.

The City has a long-term vision for a roundabout at the LK Wood/Sunset Avenue/freeway access ramp intersection. The City worked with a consultant to develop a design for this roundabout (see **Figure 16**), which will improve access and safety for all intersection users. However, this plan is in the early stages of development and there is currently no funding for implementation.

While the City works to find funding and further develop the roundabout plan an interim plan is included as part of this project to quickly improve safety and access for cyclists and pedestrians. Note that before the City moves forward with any of changes at the freeway access ramps, whether it is the interim changes or the long-term roundabout, Caltrans staff will need to review the proposed design for adequate sight distances, turning radii, and lane widths.

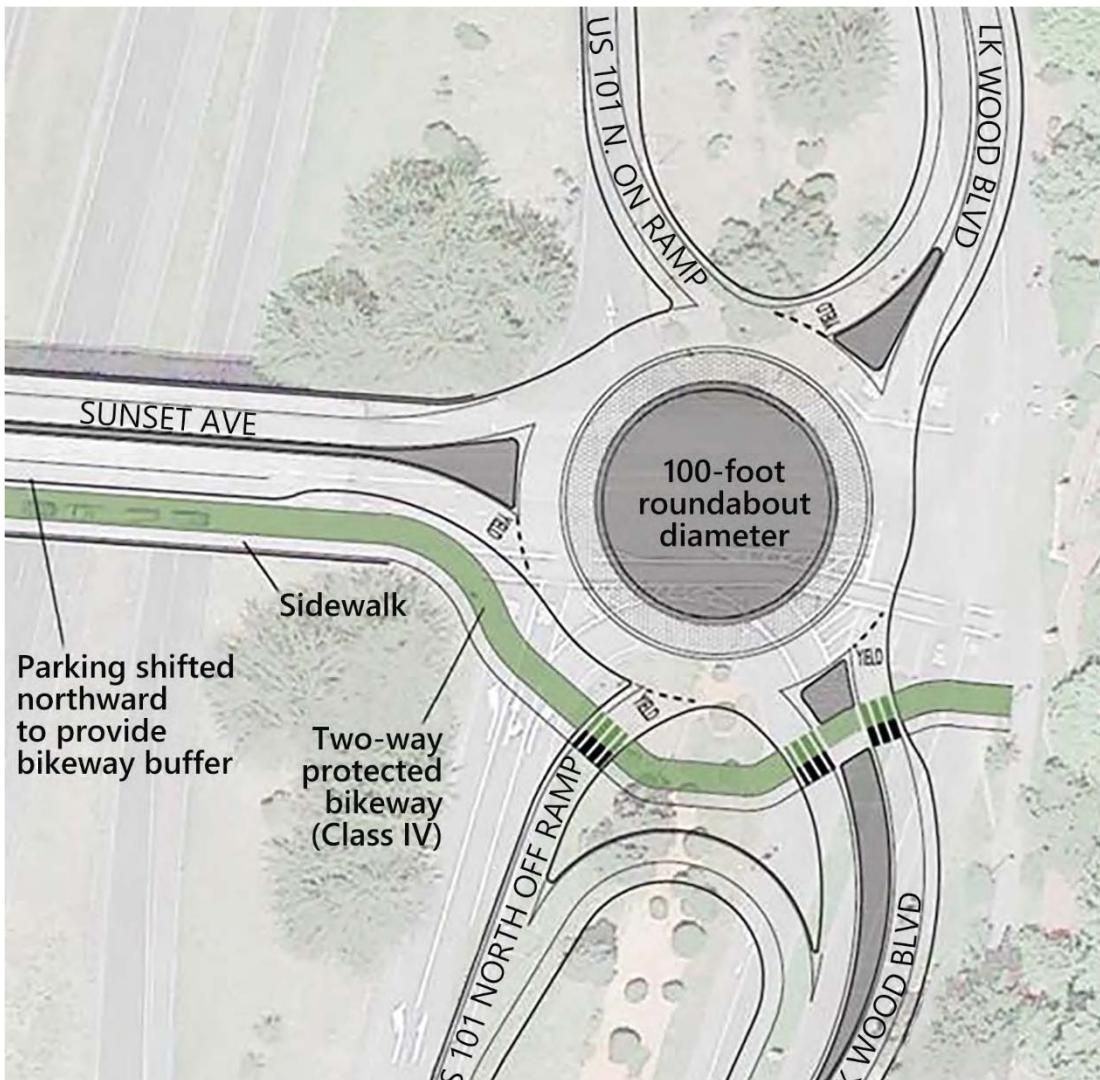
**Figure 18** shows the proposed interim plan for the Sunset Avenue and LK Wood Boulevard intersection. If space allows, the right turn from LK Wood Boulevard to Sunset Avenue could be configured to provide additional bikeway setback, per current National Association of City Transportation Officials (NACTO) guidelines.

**Figure 17** shows the proposed improvements for the Sunset Avenue and G/H Street intersection, including the elimination of the slip right turn from Sunset Avenue to H Street.



**Photo 11: View of potential location for Larson Park connection**

**Figure 17** also shows the proposed ramp connection from the trail to Larson Park. The Project plans include a ramp and short stairway at this location, as well as an additional connection further west, directly across the trail from a new connection to the Arcata Skate Park. These connections will make Larson Park more accessible to the community and help connect Larson Park to the Arcata Skate Park.



**Figure 16: Long-term concept for Sunset Avenue/LK Wood Boulevard.**

## b) St Louis Road Overcrossing Connections

The proposed plan for the St Louis Road Overcrossing includes improved pedestrian access at the LK Wood Boulevard intersection, buffered bike lanes, reduced turn radii, and new sidewalk and bike lanes along the portion of St Louis Road from the overcrossing to the end of the road south of the overcrossing. See **Figure 19**.

The reconfigured intersection of LK Wood Boulevard and the St Louis Road Overcrossing, as shown in **Figure 20**, will significantly reduce pedestrian travel distances and crossing distances, particularly for pedestrians connecting to the north of the overcrossing. The three-way stop clarifies movements for all users and increases visibility for cyclists and pedestrians.

The improvements at the west end of the overcrossing, as shown in **Figure 21**, clarify bicycle movements and slow vehicular traffic. The additional sidewalk to the southeast of the intersection will provide a connection to the trail at the south end of St Louis Road. A new bike lane is provided in the uphill direction of this section of roadway, and sharrows are added in the downhill direction where there is not enough room for a bike lane. The uphill bike lane provides protection for slower climbing cyclists.

A short connection to the trail is shown in **Figure 19** at the south end of St Louis Road. This connection will likely be made with a small bridge over the existing drainageway.



**Photo 12: View east on St Louis Road Overcrossing**

### c) Giuntoli Lane Connections

There are currently no pedestrian connections from the Boyd Road and Giuntoli intersection to West End Road, and no pedestrian connections from West End Road to the trail corridor. As with the other intersections, the proposed plans show reduced lane widths, reduced corner radii, new sidewalks, and new and improved bike lanes. (See **Figure 22**) However, due to high truck volumes, the reduced lane widths and corner radii areas will need to be marked with paint or mountable curbs to allow trucks to use the space when needed.

The Giuntoli Overcrossing is the major barrier to non-motorized access from the Valley West neighborhood to the trail corridor. Without replacing the overcrossing or attaching a sidewalk to the outside, the most feasible proposed solution is to reduce the lane widths to 11 feet, provide bike lanes in both directions, and provide a sidewalk on the south side of the bridge. A cross section of this configuration is shown in **Figure 22**. While this is an improvement over the existing conditions, it is still less-than-ideal due to the high volume of large trucks that use the overcrossing.

Note that if Caltrans determines that the weight of the additional sidewalk material is too much for the existing Giuntoli bridge structure, flexible delineator posts may be used to separate a multi-use lane from the travel lanes.

**Figure 23** shows the reconfigured intersection with an overlay showing the potential path of travel for trucks using this portion of the intersection. Also shown in **Figure 23** is the potential connection to the trail in the railroad corridor and to Ericson Court. There is an approximately 14-foot elevation difference between the railroad corridor and West End Road. To provide ADA-compliant access, an approximately 210-foot long ramp is required. Multiple configurations were considered for this ramp—including straight runs to the north or south, dog-legged runs to the north or south, or the offset jog shown in **Figure 23**. Stairs were included in all of the configurations.



**Photo 13: View east from West End Road to Giuntoli Lane/Highway 101 overcrossing**

Alternatively, a longer, but less steep connection (5% maximum running slope) could be used. This would function as a trail and would connect straight from the Giuntoli and West End Road intersection to the trail either to the north or the south. This has the advantage of being much more accessible to cyclists, but the longer distance and less direct connection to Ericson Court may not be desirable. This connection would be approximately 290 to 330-feet long, depending on where it connects to the trail.

In all cases, a connection from the railroad corridor to Ericson Court will be created via Frank Martin Court and via a path on the south side of the FoodWorks driveway. Both are shown in **Figure 22**.

The final design balanced access and construction costs by using a "dog-leg" ramp, a mid-ramp stairway, and a new sidewalk and bike lane along West End Road from Giuntoli Lane to the driveway at Frank Martin Court. While this ramp is more difficult for bicycles to navigate, the improved bike access on West End Road provides an alternative route to a trail access point approximately 600 feet north, near Frank Martin Court.



**Photo 14: View west on Giuntoli Lane on the Highway 101 overcrossing**

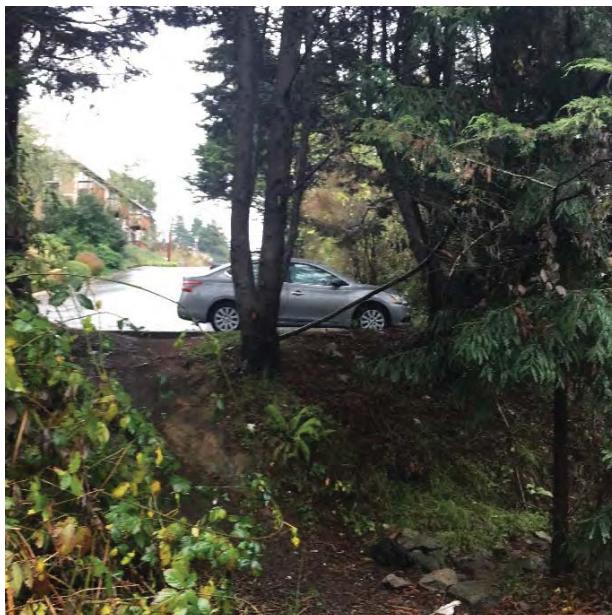
## d) Trail Connection at LK Wood Boulevard & Arcata Ridge Trail

One of the most requested connections (besides the Giuntoli connection) was at the north end of LK Wood Boulevard, through the railroad corridor to West End Road. Some people already use this connection, even though there is not a public passageway. A connection in this area would provide access from the north directly to the HSU area, without requiring pedestrians or cyclists to navigate the St Louis Road overcrossing or the Sunset Avenue overcrossing.

There are several challenges to making this connection, including:

- **Elevation**—35-foot elevation change would require approximately 560 feet of ramp to meet ADA requirements. With stairs, approximately 60 treads would be required. See **Figure 24** for conceptual layouts of a ramp option and a stair option.
- **Private Property**—the parcel with parking for the apartment complex is privately owned. Even if the owner was interested in providing public access, the parked vehicles present a hazard to pedestrians and cyclists. Also, the steep slope of the driveway precludes ADA access, and there is not enough space for a separate stairway.
- **Caltrans ROW**—a narrow strip of property to the southeast of Highway 101 is one potential location for a trail connection. However, to provide ADA access, the 560-foot ramp would require significant structures to work, and therefore may be prohibitively expensive. Even if an ADA design exception was granted (allowing construction of a stairway without a ramp) a stairway may be prohibitively expensive due to the complexities of the area. Additional coordination with Caltrans would also increase costs and difficulty in completing this connection, and costly 100% engineering designs may be required before Caltrans coordination could begin.

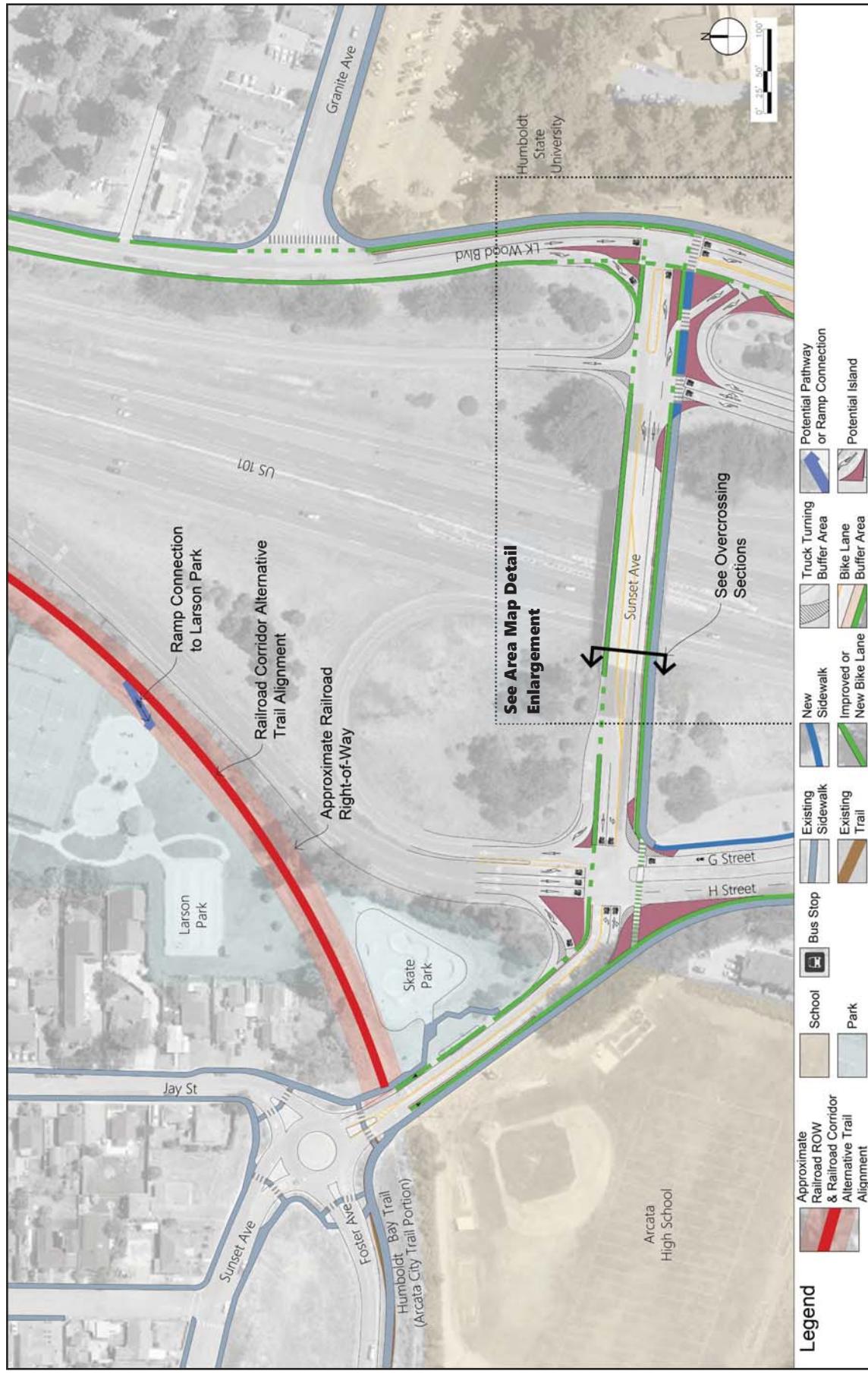
For these reasons, a connection at this point is not being included in the Project plans. However, it is recommended that access at this location be studied as a separate project.

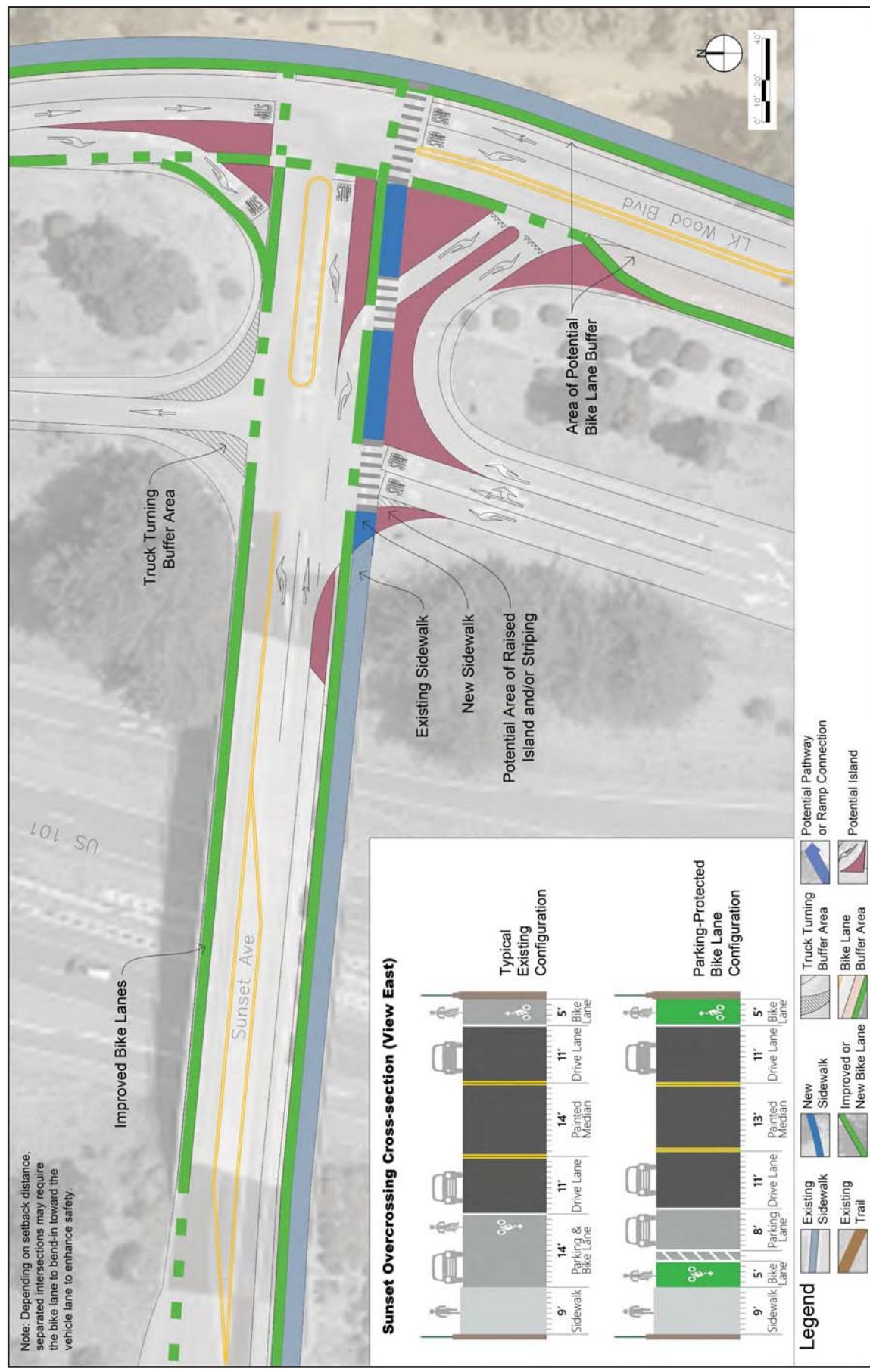


**Photo 15: View from railroad corridor up private driveway to LK Wood Boulevard**



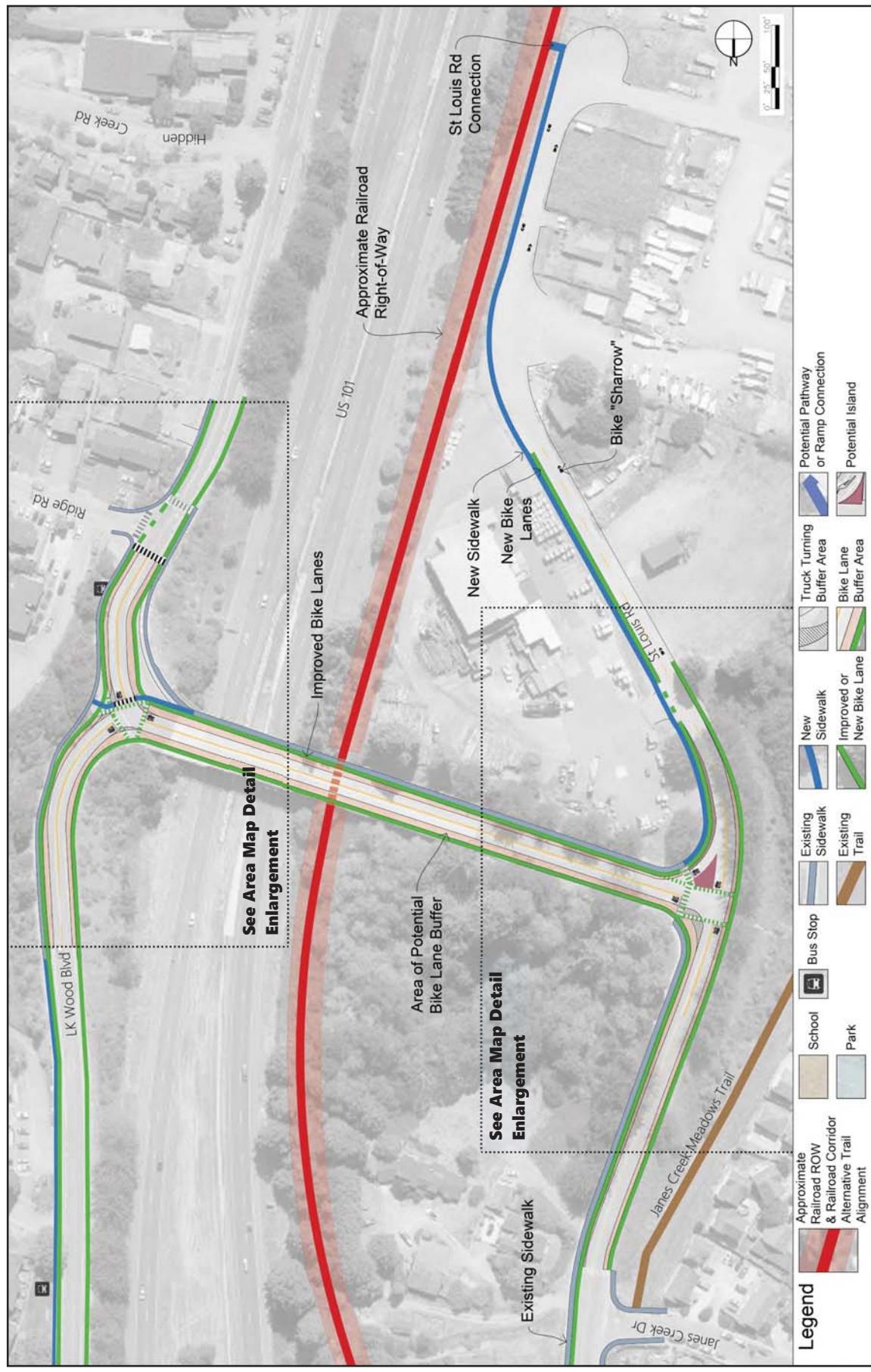
**Photo 16: View from railroad corridor up Caltrans ROW with Highway 101 overcrossing to the right**





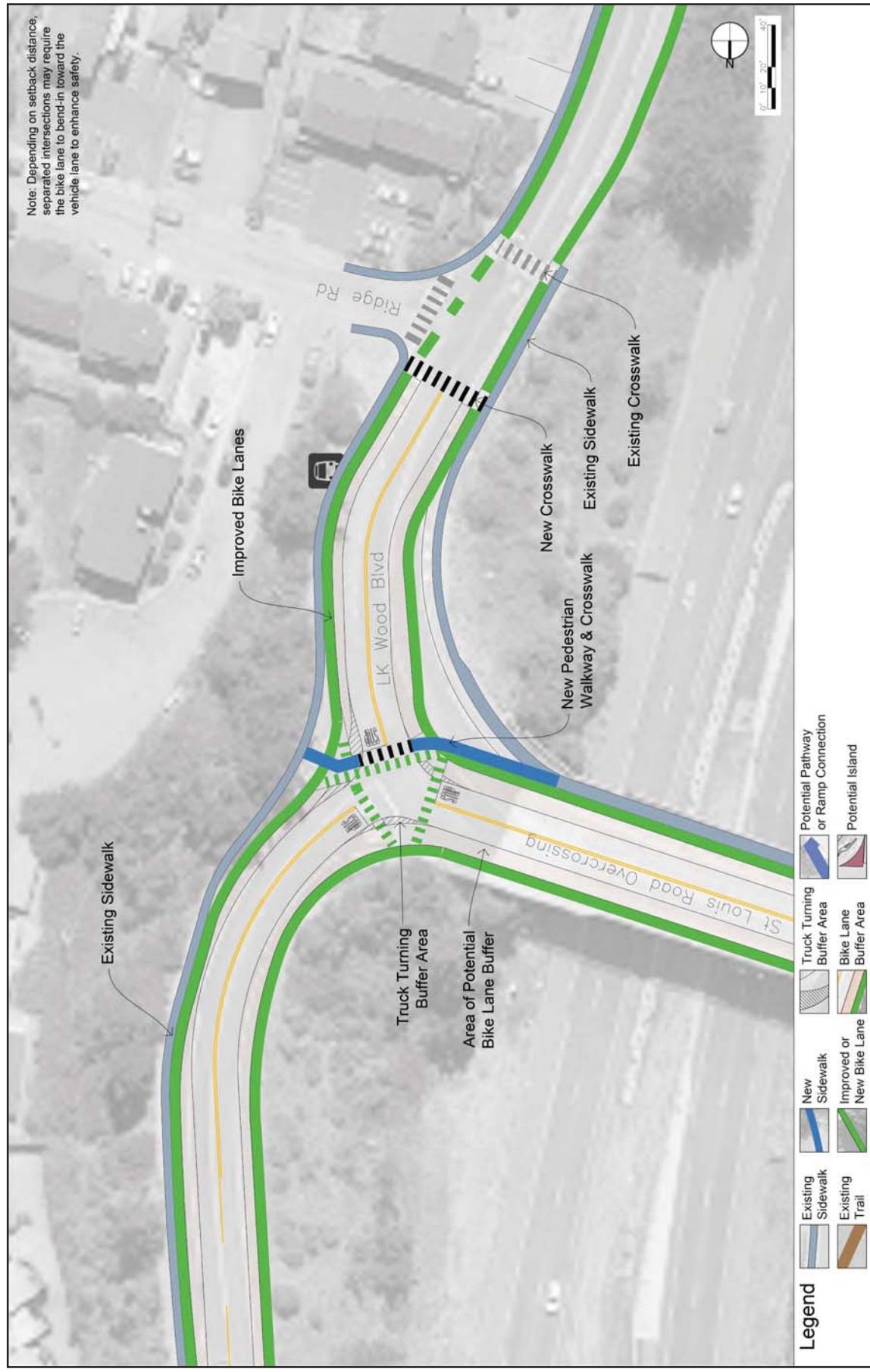
**Figure 18: Focus Area Map Detail 1a – Sunset Avenue & LK Wood Boulevard Intersection**

Other Recommendations



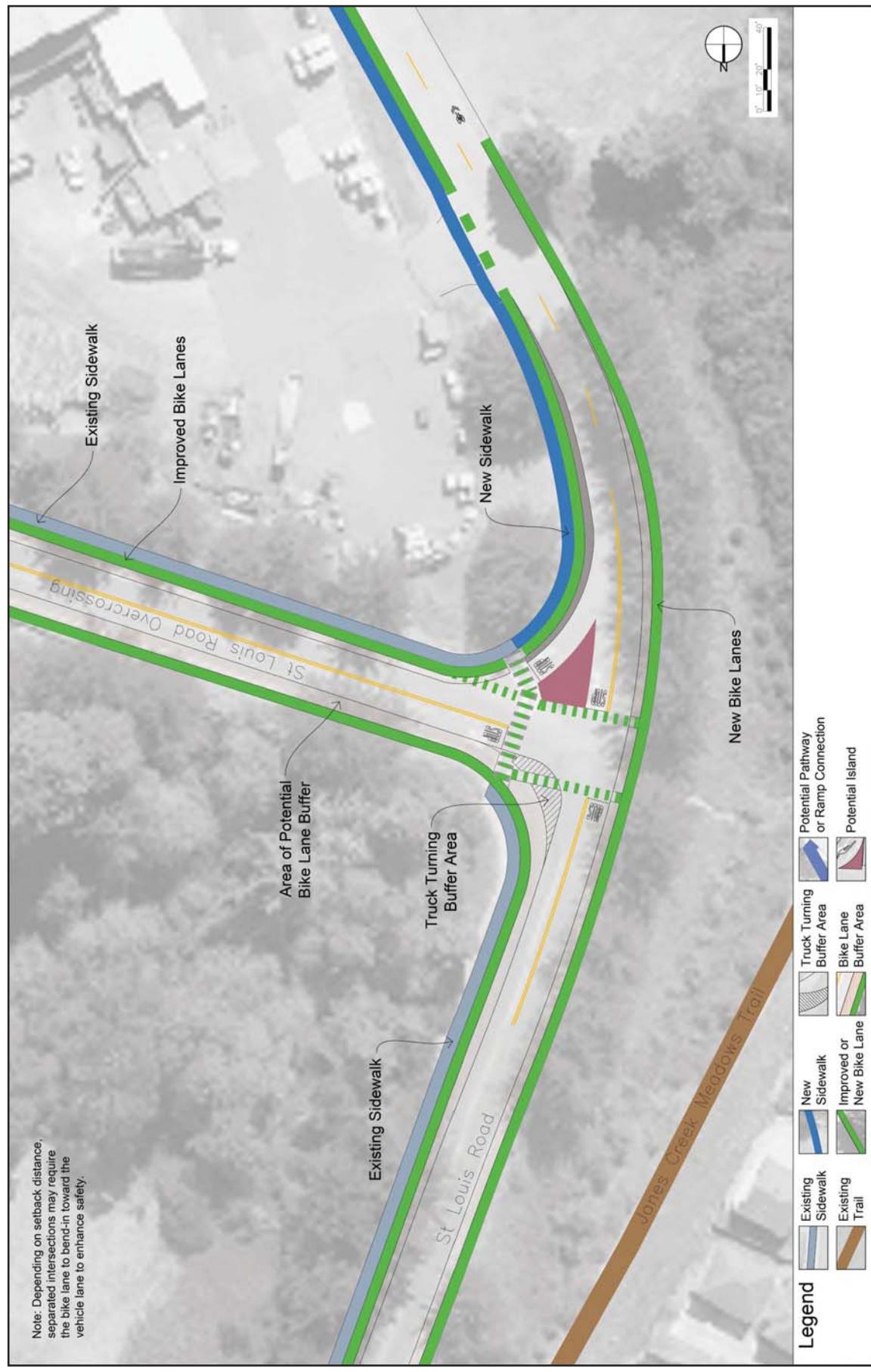
**Figure 19: Focus Area Map 2 - LK Wood Boulevard & St Louis Road Area**

Other Recommendations



**Figure 20: Focus Area Map Detail 2a - St. Louis Road & LK Wood Boulevard Intersection**

Other Recommendations



**Figure 21: Focus Area Map Detail 2b - St Louis Road Intersection**

Other Recommendations

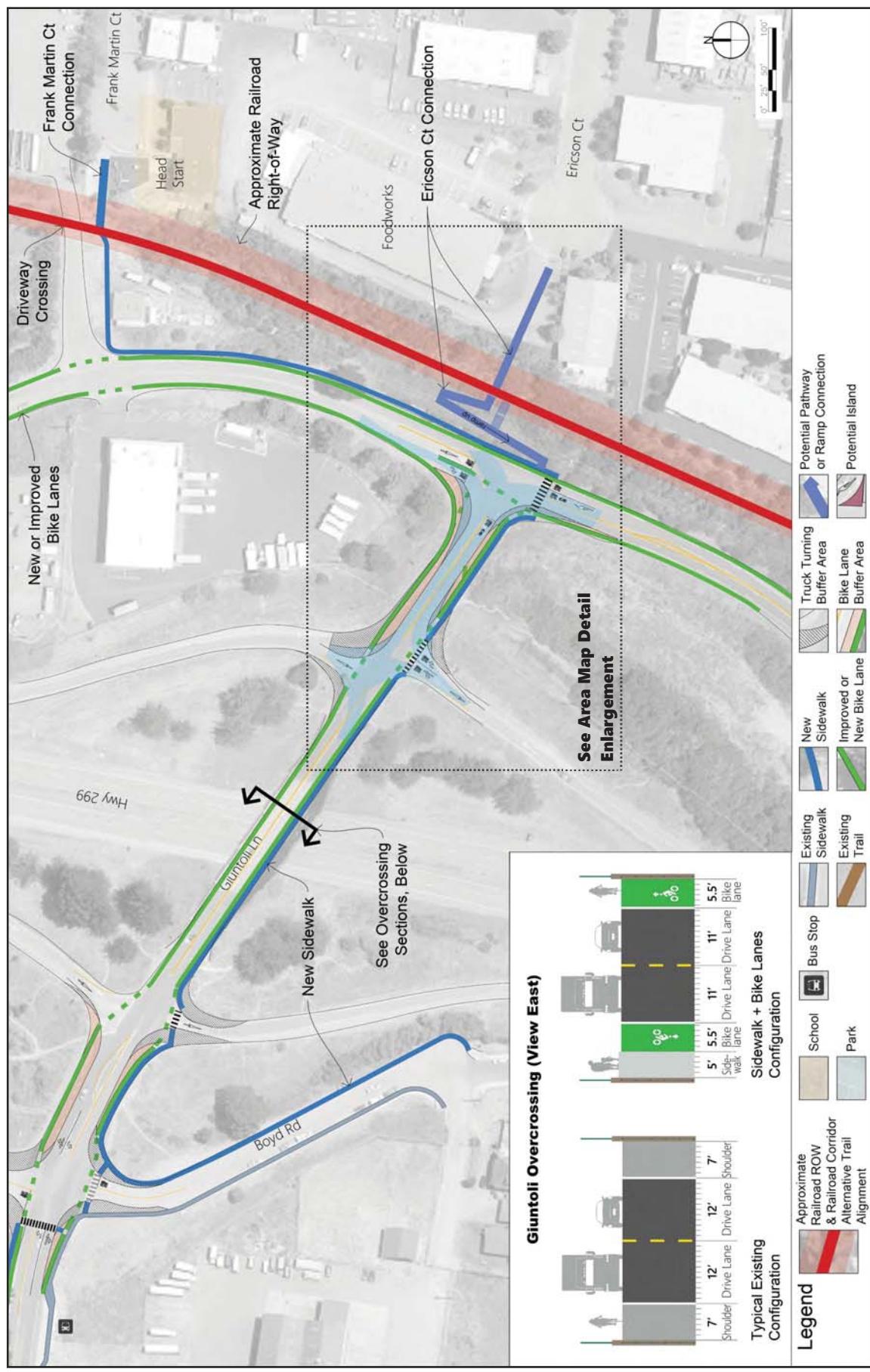
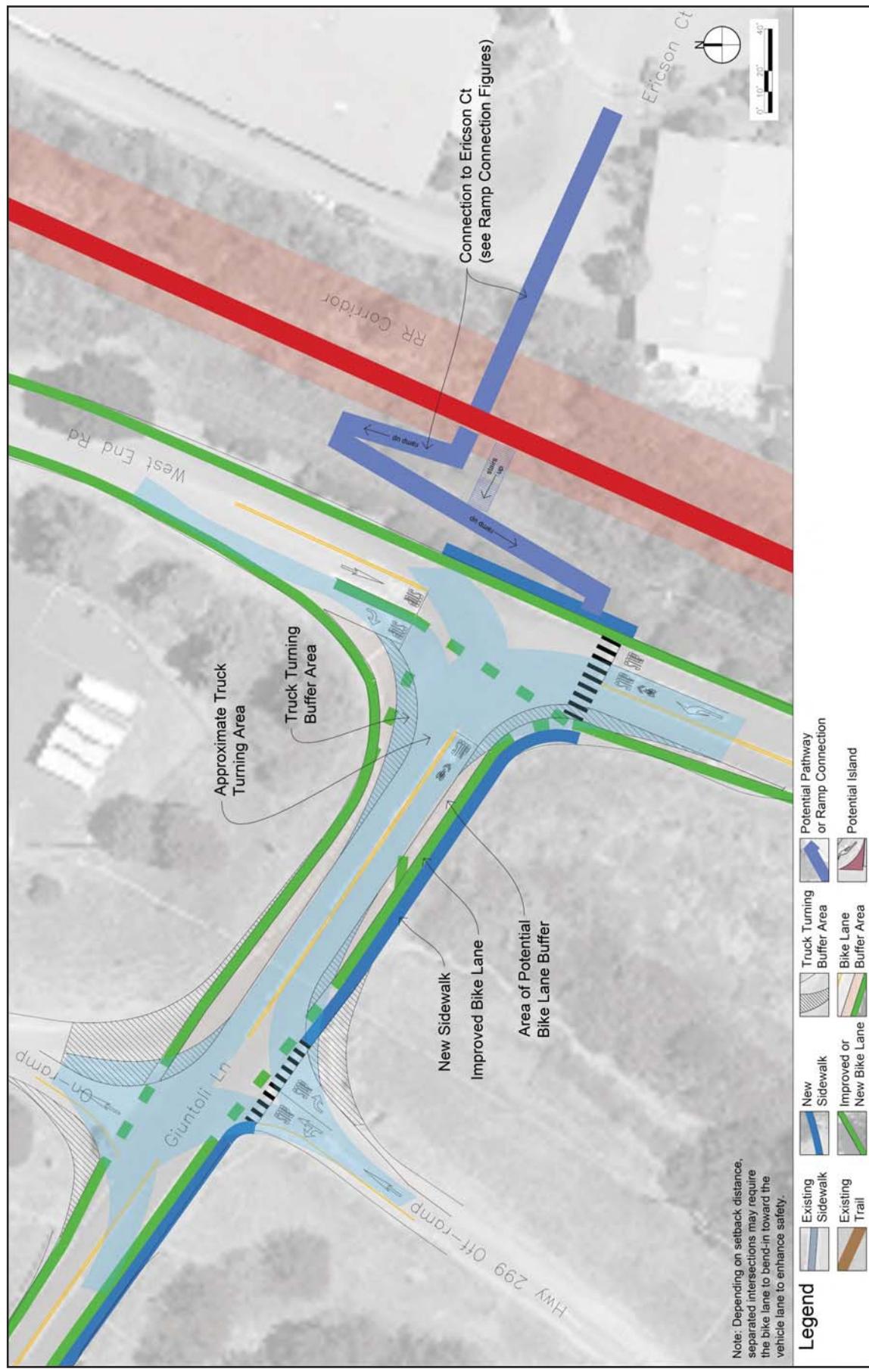


Figure 22: Focus Area Map 3 - Giuntoli Lane Area

Other Recommendations



**Figure 23: Focus Area Map Detail 3a - Giuntoli & West End Road Intersection**

Other Recommendations

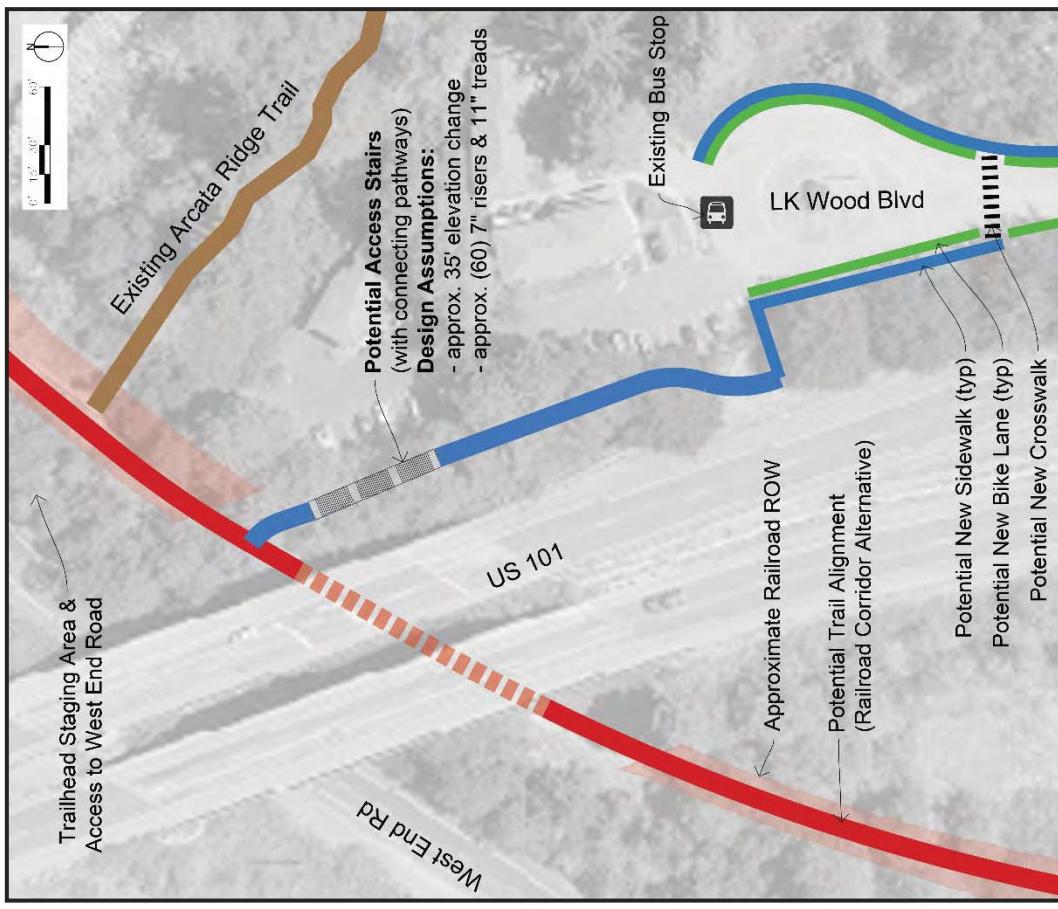
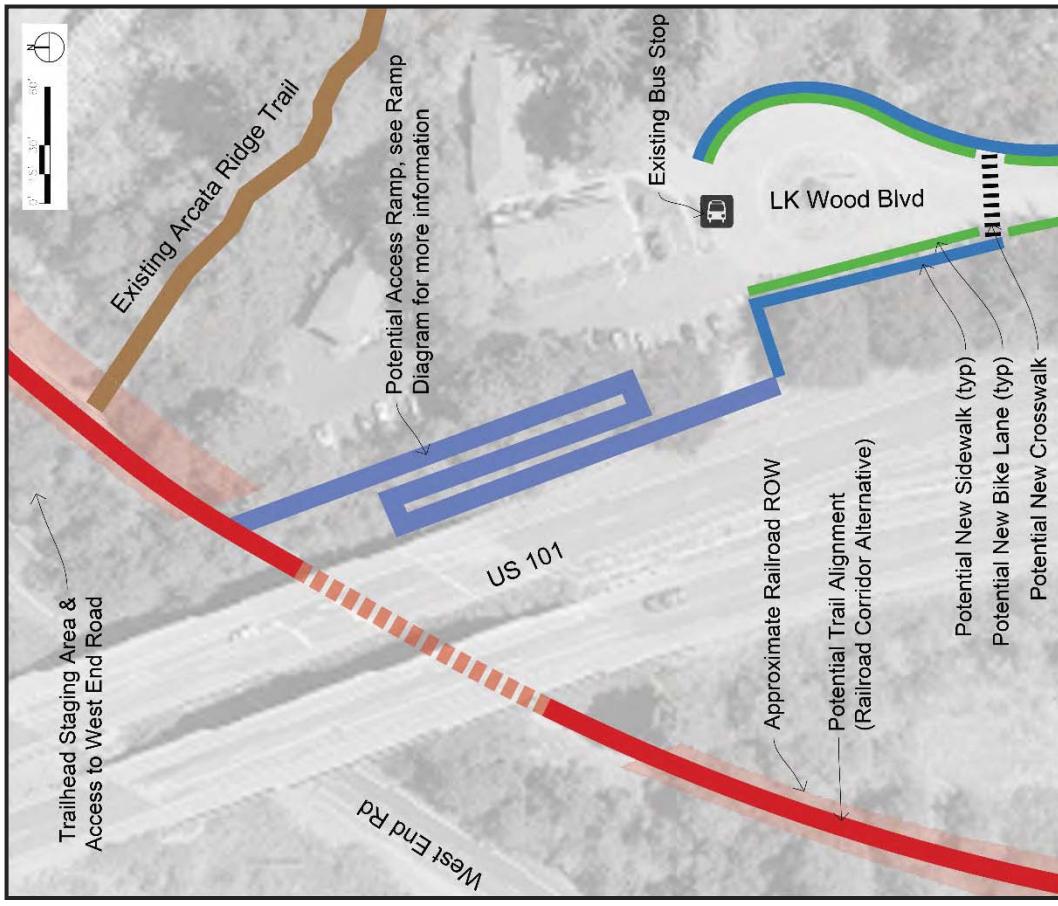


Figure 24: Ramp & Stair Access Diagrams for LK Wood Boulevard & West End Road Area

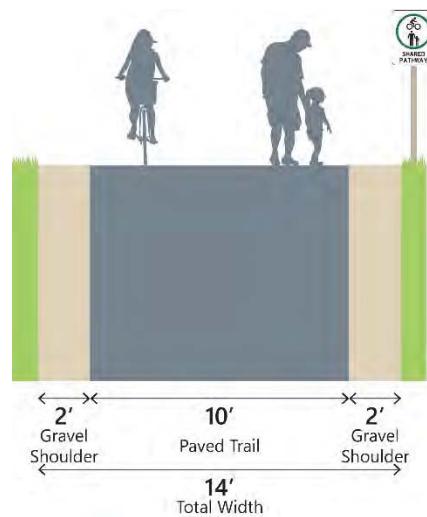
## 4.2 POTENTIAL TRAIL CONFIGURATIONS

In most places, there will be limited options for the actual trail configuration. The minimum trail, as described below, is the standard trail used for most of the corridor. In response to community feedback, where possible, a wider shoulder could be provided on one or both sides of the trail to accommodate pedestrians and equestrians. To address safety and privacy concerns, landscaping, fencing and clear sightlines are provided where possible. The bike lane with widened sidewalk configuration was not used in the final design. It was included in Alternatives 2 and 3, where alignment was along a roadway and there was insufficient space for an entirely separate trail.

**Appendix I** includes photo renderings showing different potential trail configurations at several locations along the corridor.

### a) Minimum Trail

The configuration for most of the trail route is a ten-foot wide paved trail with two-foot wide gravel shoulders on both sides (14-foot overall width). A ten-foot width meets the minimum preferred width for a Caltrans Class I Bikeway and meets minimum AASHTO guidelines. It is also the design width of the Humboldt Bay Trail, which connects to the Annie & Mary Trail at the south end of this project. The Humboldt Bay Trail is expected to attract



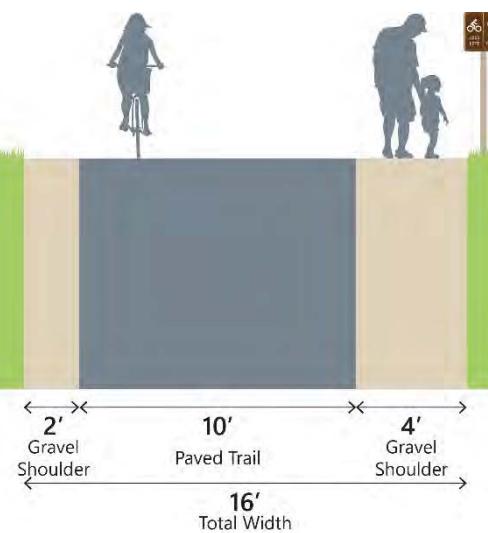
**Figure 25: Photo Rendering – View North at Skate Park, All Alternatives, showing minimum trail configuration.**

more users as it connects two more densely populated areas. Ten feet has been adequate for most of the Humboldt Bay Trail, although additional width would be desirable where feasible and therefore can be assumed to be adequate for the Annie & Mary Trail.

The gravel shoulders provide the structure required for the asphalt surface and provide a buffer from adjacent elements. While the shoulders aren't necessarily designed to be side paths and will not be maintained as formal side paths, they may be wide enough to work as one for pedestrians. At two feet, however, they will not be wide enough for equestrian use.

## b) Wide-Shoulder Trail

In areas where there is sufficient room, a wide-shoulder trail is included, with a ten-foot paved trail, a two-foot shoulder on one side, and a four-foot wide-shoulder on the other side. This additional space on at least one side will provide enough room for a comfortable pedestrian and/or equestrian path. As with the narrower, two-foot shoulders, this additional width will not be maintained as a formal side path. However, the additional level and hardened surface will provide a comfortable alternative for pedestrians.



**Figure 26: Photo Rendering – View South at West End Road near West End Court, Railroad Corridor and Hybrid Alternatives, showing wide-shoulder configuration.**

## c) Bike Lane & Widened Sidewalk

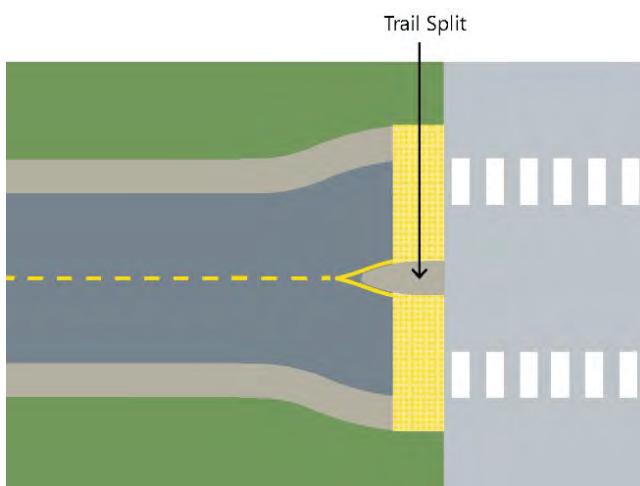
For Alternatives 2 and 3 (the West End Road and Hybrid Alternatives) when the trail was routed on West End Road and there wasn't enough room for a separate trail, a bike lane and widened sidewalk would have been provided instead of a fully separated multi-use trail. In these cases, a five-foot bicycle lane would have been provided on each side of the street, with a ten-foot sidewalk on the at least one side of the road. The sidewalk would be designated to be used by both pedestrians and cyclists, so that cyclists who are uncomfortable riding with vehicular traffic would be able to remain on a separated path.



**Figure 27: Photo Rendering – View North along West End Road Sidewalk Alternative, West End Road Alternative, showing bike lanes and widened sidewalk configuration.**

## 4.3 ROADWAY AND DRIVEWAY CROSSINGS

Roadway and driveway crossings put pedestrians and bicyclists at risk for potential harm from moving vehicles. Recommended safety features, such as signage, markings, and specialized infrastructure, are necessary to alleviate this risk. The goal of these features is to communicate to drivers the existence of a trail with both pedestrians and bicyclists crossing from two directions. These features also communicate to trail users the existence of a roadway crossing and their need to use caution. Signage and markings may additionally clarify user right-of-way. Note that excessive use of warning and control devices may reduce the effectiveness of any of the devices and may cause trail users and drivers to ignore similar devices. Planning and designing for the most vulnerable roadway users—pedestrians—creates a safe environment for all trail users.

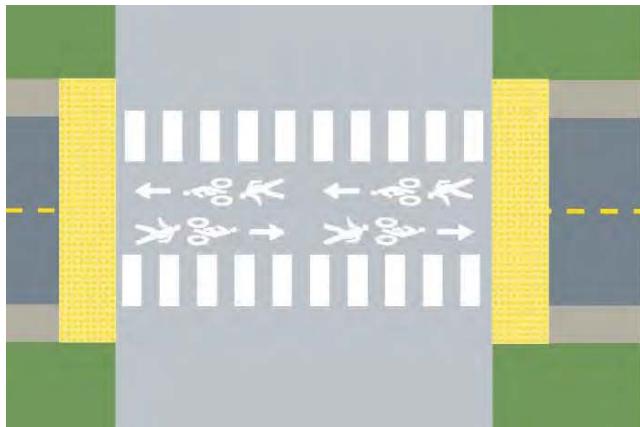


**Figure 28: A divided trail entry slows trail users, prevents vehicle entry, and reduces hazards.**

Most crossings on the trail only require signing and striping. Additional treatments are necessary where the trail crosses high volume roads.

In all cases, visible changes in materials and/or striping clearly indicate the presence of the crossing to both vehicles and trail users. Signs give priority to the direction of traffic with the highest volume. At all driveways, priority is given to trail users. At the three roadway crossings (Sunset Avenue, Alder Grove Road, and West End Road) priority is given to the road users. These will be the only locations where the trail user will have a stop sign.

As an alternative entry design where space allows, a divided trail can provide multiple benefits: it slows trail user speeds as they approach the crossing; it deters vehicles from



**Figure 29: A high-visibility crosswalk with bike markings explicitly allows bicycles and alerts drivers to additional users.**

entering the trail; and it splits trail users by direction. This design is not used in the proposed plans, but the trail may be retrofit with this design if needed.

In most cases, people recognize and respect that trails are for the exclusive use of non-motorized vehicles. If people driving on the trail becomes a problem, this three-step approach is recommended:

1. posting signs,
2. enhancing the trail-oriented aesthetic (additional landscaping, non-asphalt materials, etc.), and
3. finally, targeted surveillance and enforcement.

Bollards should not be used unless there is a history of vehicle encroachment on the trail and all countermeasures have been exhausted; as bollards on multi-use trails have been found to lead to collisions that have seriously injured trail users. Bollards also deter access by emergency vehicles. A better design for emergency access is a split-trail design, which allows emergency vehicles to access the trail by straddling the central landscaping.

High-visibility crosswalks are recommended at all crossings. Adding pedestrian and bicycle markings in the crosswalk emphasizes the trail's shared use and direction of travel.

## 4.4 SIGNAGE

A strong signage and wayfinding system, including maps, regulatory signs, directional signs, and on-trail markings makes the trail network knowable and usable. It also supports emergency response and trail maintenance activities and provides information to the public about trail conditions. Signage and wayfinding is one of the most cost-effective upgrades for a trail network, but it must be done thoughtfully and systematically, by considering the system as a whole and coordinating the system with the needs of emergency responders and the community, among others, to maximize the benefits.

**Regulatory signs** will meet requirements of the California Manual of Uniform Traffic Control Devices (CA MUTCD). Initial regulatory signs on the trail will include stop signs (CA MUTCD sign R1-1, 18-inch) at the three road intersections (Sunset Avenue, Aldergrove Road, and West End Road). Signs on the roadways at those intersections will alert drivers to the location of the trail (CA MUTCD signs W11-15, W11-15P, & W16-7P/9P).

Additional signs may be included to alert trail users of road crossings ahead (CA MUTCD sign W2-1, 18-inch) or remind cyclists to yield to pedestrians (CA MUTCD sign R9-6). As noted above, if vehicles encroach onto the trail, a "No Motor Vehicles" (CA MUTCD R44A(CA) or R5-3) sign may be posted.

Avoid sign clutter, which reduces the effectiveness of all signs. Only install regulatory signs as needed to ensure the safety of the trail users.



**Figure 30: Trail crossing signs will be posted at each of the three road crossings.**

**Wayfinding signs** should be clear and consistently placed. At a minimum, at each intersection with a road or trail should have a sign to clearly inform trail users of the name of the road or trail they are crossing. Street name signs can be placed above stop signs, as shown in **Figure 31**. Street names can also be added to trail markers or directional signs, as shown in **Figure 32**.

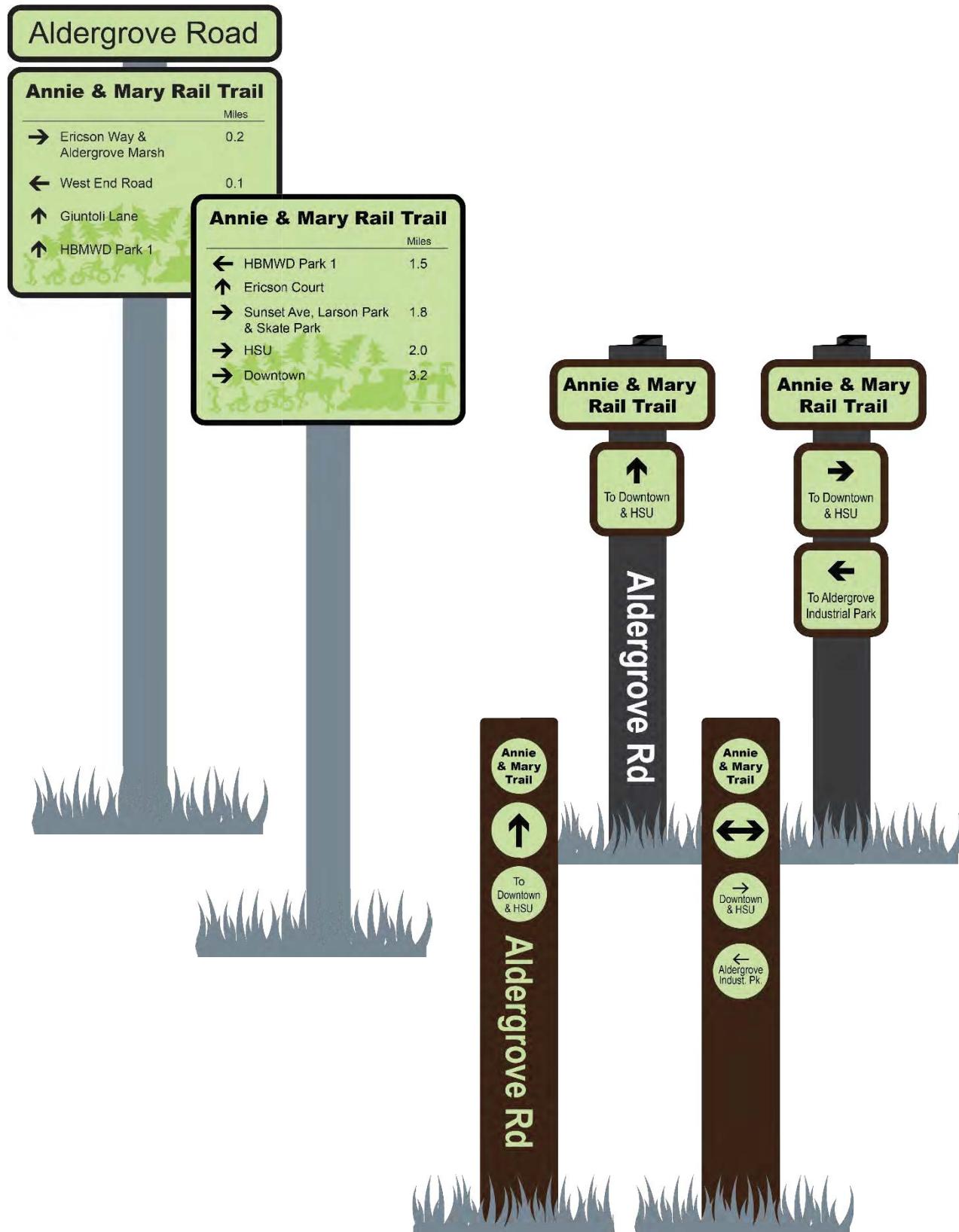
Trail markers are the simplest and least intrusive signs to install. They can be a wood post with identification and directional plaques attached (as shown in **Figure 32**). If available, remnant pieces of railroad tracks can be used in place of wood posts, which would provide tie into the history of the corridor.

Trail markers should be installed at every trail juncture, as shown on the Project Plans.

Directional signs are also simple to install but require some advance planning to design the signs and determine the destinations and distances to be listed. Examples of how the directional signs might look are shown in **Figure 32**.



**Figure 31: Example of a street name plaque mounted above stop sign with optional trail identification sign.**



**Figure 32: Examples of directional signs (top right), trail markers on rails (middle right), and trail markers on wood posts (bottom), for locations at road intersections (with road names) and at other trail junctions (without road names).**

## 4.5 FENCING

Depending on the location, height, style, and maintenance, fencing can enhance and/or diminish the safety of a trail. Fencing can act as a safety barrier (e.g. where vehicles could encroach on the trail or where trail users should be prevented from accessing adjacent dangers). Fencing can also address the privacy concerns of adjacent property owners.

Generally, the existing fencing along the trail should remain in place. In a limited number of locations, new fencing should be installed. These locations are shown on the Project Plans and described below.

**Height:** Fencing heights of two feet or less is often sufficient to delineate property boundaries and restrict vehicular encroachment, while still providing open sight lines. Tall fencing (over six feet high) should only be used where lower fencing does not provide sufficient privacy or security. Extra care should be taken to limit placing tall fencing on both sides of the rail as it can cause a "canyon" effect, which is uncomfortable for trail users. Tall fencing also diminishes visual sight lines and may make trail users feel as if they are unable to escape the corridor if needed.

**Visual permeability:** Where possible, fencing should be visually permeable to allow trail users to see through the fencing. The increased sight lines may increase feelings of comfort and trail safety. Permeable fencing can also accommodate the growth of trailing plants which, while decreasing visibility, can increase the aesthetics and enjoyment of the trail. Welded-wire fencing is becoming more common along trails for these reasons. Traditional chain-link fencing is not recommended as it is easy to climb and cut while being hard to maintain.

**Location:** Fencing should be placed as far away from the trail as possible. In constrained conditions, as with all vertical objects, fencing should be placed with at least two feet of clearance from the usable edge of the trail.

**Gates and Access Points:** Depending on the managing agency's policies, gates and access points may be installed connecting private properties to the trail where desired. Much like a driveway or walkway connected to the sidewalk, connections encourage trail use and often lead to enhanced maintenance by the adjacent owner.

**Coordinating with Property Owners:** Private property owners may have a visual preference for trail fencing to match the fencing on other areas of their property. This may create a patch-work effect along the trail, but otherwise has little negative impact and can create goodwill. In such cases it is

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**Privacy Fencing** is recommended in the two places where the trail is directly adjacent to houses. This fencing should be solid enough and tall enough to provide privacy.

Approximate locations:

- STA 54+00 to 56+00 — directly south of the Highway 101 overcrossing
- STA 154+00 to 157+00 — in the Northern Extension area.

**Low Fencing** is recommended at a handful of locations in the Aldergrove Industrial Park area where some delineation may be required to separate the trail from larger open storage or parking areas.

Approximate locations:

- STA 83+50 to 85+75 (both sides) — north of the Alves, Inc property
- STA 85+75 to 92+50 (one side) — north of the Alves, Inc property
- STA 93+00 to 93+50 (both sides) — north of the driveway crossing
- STA 95+70 to 100+00 (one side) — south of Alder Grove Road

important to establish maintenance agreements with the property owners to ensure the city is not responsible for the maintenance and replacement of a variety of fencing styles.

**Other Design Options:** Landscaping can serve as a barrier similar to fencing. Densely planted grasses and low shrubbery can effectively reduce encroachment between the trail and surrounding land uses.

## 4.6 LIGHTING

Where trail use is permitted after dark, trail lighting can increase the safety and comfort of users by increasing the visibility of obstructions (fallen trees, debris or other pedestrians and cyclists), allowing users to perceive potential criminal activity and avoid it, and illuminating trail users at roadway crossings to enhance their visibility to motor vehicles.

Generally, trail lighting can either be connected into an existing electrical grid, connected to a separate system (such as a solar array), or each fixture can be powered individually (with an individual solar panel for each fixture).

**Solar Powered Lighting:** Trail lighting that includes a solar panel for each fixture is becoming more commonplace. Each pole usually includes a fixture, a battery pack and a solar panel. The poles are usually placed deeply in the ground (+/-6 feet) and may require no additional footings. The biggest limiting factor on use of solar powered lighting is the presence of a significant tree canopy. However, as batteries, solar panels, and light technology improves, it may soon be possible to power lights in areas previously considered infeasible.

Because installation is usually simple and it is easy to scale up where cost is an issue, this type of lighting works well for trails. Lighting is best installed during trail construction but may be installed after trail construction. Care should be taken to avoid damaging the trail surface if the trail has not been designed to accommodate the weight of construction equipment.

Most solar powered systems also include light sensors, which can discern ambient light and adjust the lighting levels of the fixtures as needed. This reduces energy use and reduces unnecessary light (an important factor when installing "dark sky" lighting). It also ensures that trails are properly lit, without requiring reprogramming, as the hours of darkness change over the year and when daylight may be limited during overcast weather. The hours of daylight (on the shortest day) and number of consecutive days without sunlight (cloudy days) should be considered and will affect the size of the panel and battery that should be used.

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***Lighting Recommendation:*** As the Annie & Mary Trail is expected to be used as a transportation corridor (e.g. for commuting, shopping, etc.), as well as a recreational corridor, the trail is expected to be used after dark. Therefore, as budget allows, lighting should be installed to enhance user safety and increase trail use.

*The priority for lighting is the intersections and points of potential conflict, as listed below:*

- Sunset Ave intersection (if not already lit);
- Todd Court connection;
- St Louis Road connection;
- St Louis Bridge undercrossing;
- Driveway crossing north of St Louis Bridge;
- (Future) Intersection with spur to St Louis Road roundabout;
- Highway 101 overcrossing;
- Driveways (4) between Arcata Ridge Trail staging area and Alder Grove Road;
- Alder Grove Road crossing;
- Giuntoli Lane to Ericson Court connection;
- Frank Martin Court intersection and connection;
- West End Road crossing;
- Driveway at HBMWD

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A photometric analysis should be conducted prior to the design of the lighting system and an analysis of the system's functionality once the lighting has been installed to ensure it meets the standards established for the trail.

**Scale:** Lighting should be installed at a pedestrian scale, which generally means the lights should be lower and closer together than those typically placed on roadways.

**Locations:** As with all vertical objects, light poles should be placed with at least two feet of clearance from the usable edge of the trail. Where lighting the entire trail is not desired or feasible, lighting should focus on critical points such as at roadway crossings and neighborhood connections; at transit, schools, and shopping/employment centers; and in tunnels and on bridges.

**Brightness and Glare:** Lighting should maintain horizontal illumination levels of .5-2 foot candles (5-22 lux) and not be designed with very bright and very dark areas which make it more difficult for trail users to see as their eyes adjust to the lighting levels. Lighting should not be placed in locations where it might shine directly in the eyes of trail users (or motorized vehicles on parallel roadways) as the glare might impair visibility.

**Dark Skies:** Only "dark sky friendly" lighting should be used. This includes lighting and fixtures that minimize glare, light trespass, and up lighting. This is typically accomplished by using shielded light fixtures keep light only where directed (i.e. toward the trail). This is especially important in natural areas where animals might be affected by un-natural light sources.



**Photo 17: Solar lighting and low fencing shown along a trail in Ukiah  
(source: First Light Technologies)**

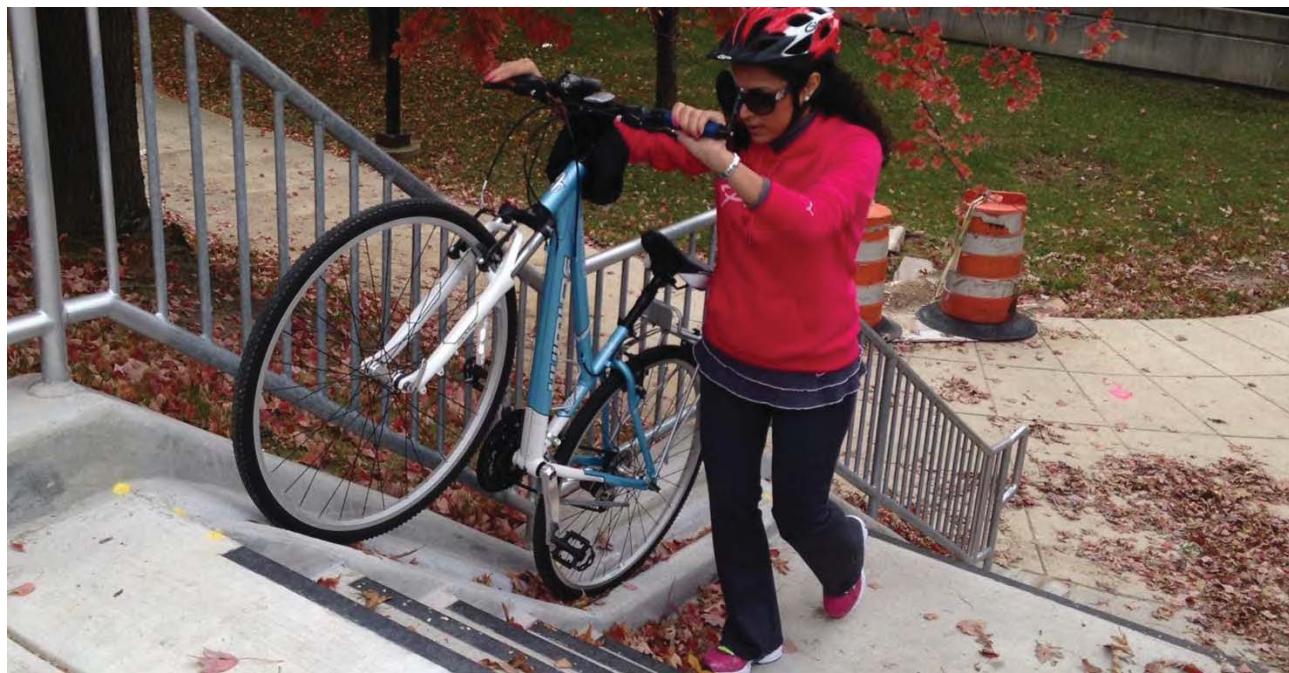
## 4.7 BIKE CHANNELS FOR STAIRS

Where stairs are provided as access to the trail, a bike channel or bike ramp should be included if feasible. These channels can make it easier for riders to push their bicycle up or down the stairs. Bike channels can be challenging to design: if they are too close to the stair handrails, they can be difficult to navigate for a bicycle. However, if they are too far from the stair handrails they can become a tripping hazard for pedestrians. The angle of the stairs may also be prohibitively steep for all but the strongest cyclist to navigate. Several agencies have worked to develop solutions to these issues. Examples can be seen in Portland, Oregon, and at the San Francisco Bay Area subway stations.

The most successful bike channels are designed with the staircase, allowing the designers to consider the steepness and location from the outset. However, at least one company sells a product to retrofit a new bike channel onto an existing stairway.



**Photo 18: A bike channel by CycleSafe can be added to existing stairways, if the stairs are not too steep or narrow**



**Photo 19: A cyclist navigates a bike channel in Glenmont, Maryland**

## 4.8 AMENITIES

Trail amenities are elements that support user access and improve the user experience. They are often invisible to the user, except in their absence. Some amenities, such as trash receptacles, help maintain a positive experience for users. Other amenities, such as benches, make trails more usable and comfortable by providing resting places.

Trail amenities can fall into two categories: amenities found at the trailhead, and amenities found along the trail. Within the trailhead amenities, there are those that are appropriate at larger trailheads, or staging areas with parking, and those that are appropriate at the smaller and more typical trail access points.

For the purposes of this project, the three following locations are considered staging areas:

- The trailhead/staging area at the Arcata Ridge Trail on West End Road just north of the Highway 101 overcrossing.
- The small proposed parking area near Frank Martin Court.
- The trailhead/staging area at the HBMWD Park 1 site.

Trail access points will be at every road crossing and at the Arcata Skate Park, Larson Park, Todd Court, St Louis Road, the future connection to St Louis Road Roundabout, Giuntoli Lane, and Ericson Court.

More details on trail amenities in general are included in **Appendix J**, and proposed locations of basic amenities are included on the Project Plans. A summary of recommendations is included below:



**Photo 20: Trail users take a break and regroup on a stone bench in Morro Bay, CA**

**Table 3: Recommended location for trail amenities**

	Staging Areas	Trail Access Point	On-Trail
Trail Amenity			
Trailhead Information Kiosk	✓	( ✓ )	
	✓	✓	✓
	✓	✓	✓
	( ✓ )	( ✓ )	( ✓ )
	( ✓ )		
	( ✓ )	( ✓ )	( ✓ )
	✓	✓	( ✓ )
	✓	✓	( ✓ )
	✓	( ✓ )	( ✓ )
	✓		( ✓ )
	✓	( ✓ )	
	✓	✓	✓

✓ Amenity strongly recommended at this location

( ✓ ) Amenity recommended if space and budget allow



**Photo 21: New interpretive panels should match the style and layout of existing panels.**

## 5. Funding Opportunities

The funding opportunities described below outline various sources of funding focused on the construction of multi-use paths that would be applicable and available to Arcata. They include state, regional, and local sources of funding. A combination of funds from these sources along with direct funding from partner agencies should be considered. More details are available in **Appendix K**.

**Table 4: Potential Funding Opportunities**

Name	Description	Applications Due
<b>Funding for Large Projects (typically in the \$millions)</b>		
Active Transportation Program (ATP)	This program funds active transportation (focused on walking and bicycling) projects that lead to a mode shift, enhance safety, reduce greenhouse gasses, and addresses equity issues. Grants prioritize infrastructure. <a href="http://www.dot.ca.gov/hq/LocalPrograms/atp">www.dot.ca.gov/hq/LocalPrograms/atp</a>	Annually in July
Green Infrastructure Grant Program	This program funds projects that acquire, create, enhance or expand community parks and green spaces including acquisition, design and construction of projects. <a href="http://resources.ca.gov/grants/green-infrastructure">resources.ca.gov/grants/green-infrastructure</a>	
Land and Water Conservation Fund Program (LWCF)	This fund provides for the acquisition and development of recreation facilities such as trails. The fund is a state-administered program of the National Park Service and provides up to \$3 million per project. <a href="http://www.parks.ca.gov/lwcf">www.parks.ca.gov/lwcf</a>	
Recreational Trails and Greenways Grant Program	This grant provides nonmotorized infrastructure development that promote access to parks. Funding is available for trails, non-motorized bridges, and land acquisition for trails. A 20% match is required unless the project serves severely disadvantaged communities. <a href="http://resources.ca.gov/grants/trails">resources.ca.gov/grants/trails</a>	Annually in July
Regional Park Program (RPP)	This new program will fund projects that create, expand, or renovate parks and park facilities such as trails (with preference given to multi-use trails), regional trail networks and interpretive facilities. <a href="http://www.parks.ca.gov/rpp">www.parks.ca.gov/rpp</a>	
Rural Recreation, Tourism and Economic Enrichment Investment Program (RTT)	This new program will fund projects that provide new recreational opportunities in support of economic and health-related goals in rural communities that have demonstrated deficiencies and a lack of outdoor infrastructure. <a href="http://www.parks.ca.gov/rrt">www.parks.ca.gov/rrt</a>	
Solutions for Congested Corridors Program (SCCP)	This program provides funding to achieve a balanced set of transportation, environmental, and community access improvements and is funded annually at \$250 million.	

Name	Description	Applications Due
	<p>Preferred projects provide transportation choice while preserving local community character.</p> <p><a href="https://catc.ca.gov/programs/sb1/solutions-for-congested-corridors-program">https://catc.ca.gov/programs/sb1/solutions-for-congested-corridors-program</a></p>	
<b>Urban Greening Grant Program</b>	This program funds projects that reduce commute vehicle miles traveled by constructing bicycle paths that provide safe routes for travel between residences, workplaces, commercial centers, and schools.	Spring
<b>Humboldt County Headwaters Fund Grants (Community Investment Fund) (FCP)</b>	This program funds projects with long-term, tangible impacts that facilitate community and economic development in Humboldt County. Projects can include transportation systems and those that support tourism such as trails. Funding may be provided in the form of loans.	
	<a href="https://humboldtgov.org/2190/Grant-Programs">https://humboldtgov.org/2190/Grant-Programs</a>	
<b>Coastal Conservancy Grants</b>	The Coastal Conservancy accepts grant applications on an ongoing basis for projects that benefit public access, natural resources, and climate resiliency on the California coast.	
	<a href="https://scc.ca.gov/grants/">https://scc.ca.gov/grants/</a>	
<b>Integration into Larger Projects</b>	Many federal or state-funded capital projects (such as roadways and transit) require or recommend the inclusion of safe walkways and bikeways. Integrating trail infrastructure into larger projects typically marginally increases overall costs while reducing project costs by taking advantage of economies of scale and coordinating acquisition and construction.	
<b>Transportation Development Act (TDA) Local Transportation Fund (LTF)</b>	In 2012 Humboldt County Association of Governments (HCAOG) adopted a policy to set aside up to 2% of the Local Transportation Fund (LTF) allocation (part of the California Transportation Development Act (TDA)) for pedestrian and bicycle allocations. These funds are allocated to areas of the county based on population, taxable sales, and transit performance.	
<b>Funding for Small Projects</b>		
<b>Humboldt County Headwaters Fund Grants (Mini Grants)</b>	For smaller trail-related projects, this fund awards grants for community events and innovative projects which positively impact Humboldt's economy. Awards are usually in the \$1,000 to \$1,500 range.	
	<a href="http://humboldtgov.org/266/Headwaters">http://humboldtgov.org/266/Headwaters</a>	
<b>Adopt-A-Trail Programs</b>	These programs recognize individuals, families or businesses who contribute funding or maintain a segment of the trail most often with a plaque along the trail.	
<b>Memorial Funds</b>	Funds provided by family and friends on behalf of a loved one who has passed are often provided for trail development or trail-side amenities.	