

Livermore Iron Horse Trail Feasibility Study



Submitted to:

City of Livermore

Funding provided by:

ACTIA Measure B

Prepared by:

Questa Engineering Corporation

In Association with:

**Bicycle Solutions
Oakley & Oakley, Inc.**



April 7, 2009

Livermore Iron Horse Trail Feasibility Study

Submitted to

City of Livermore
1052 South Livermore Avenue
Livermore, CA 94550

Funding provided by

Alameda County Transportation Improvement Agency
333 Broadway, Ste. 300,
Oakland, CA 94612
Measure B Funding

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Questa Project #270029

APRIL 7, 2009

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Executive Summary

This Feasibility and Preliminary Design Study explores the opportunities, right of way (ROW) considerations and design constraints associated with construction of a six-mile Class I multi-use trail, in the City of Livermore, located parallel to an existing rail corridor. The study area ranges from Isabel Avenue, at Livermore's western limits, to Greenville Road, where the trail in the future will be located within an abandoned rail corridor owned by Alameda County.

In addition to evaluating the alignment, trail design and implementation options, the study presents preliminary options for grade separation of the trail at three major downtown intersections. The Study evaluates trail overcrossings at Murrieta Blvd., North P Street and North Livermore Avenue.

Owned by Union Pacific Railroad (UPRR), the rail corridor is actively used by the Altamont Commuter Express (ACE), with stations at Vasco Road and Downtown Livermore. There is also a northerly rail line east of Mines Road that is reserved for freight and a potential High Speed Rail line. The trail alignment is generally parallel to, and outside of the actual railroad right of way, but could be located within or adjacent to railroad lands if right of way is acquired or if the rail land use changes in the future.

Purpose and Need

The existing Iron Horse Regional Trail extends from Concord to Dublin, a span of 28 miles. In Pleasanton, planned and completed trail segments will connect to the paved, separated trail within unincorporated Alameda County along Stanley Blvd. This trail currently ends at Isabel Avenue, the western boundary of the City of Livermore. Continuation of the Iron Horse Trail through Livermore will close the gap between existing and planned trail segments that extend east of Livermore to the County Line. The Iron Horse Trail is a significant regional trail system, with connections to other trail systems of statewide significance, such as the Mokelumne Coast to Crest Trail, the Great California Delta Trail, San Francisco Bay Trail and the Bay Area Ridge Trail. Within Livermore, completion of the trail will expand the existing trail network along Livermore's creeks and open spaces, and provide nonmotorized travel opportunities for residents and visitors to connect to transit centers, Downtown, parks, schools and other destinations.

Challenges

The proposed segment through the City of Livermore is the most challenging to secure, since the railroad is privately owned, and the line is actively used. Portions of the 1997 abandoned railroad ROW within Livermore have been sold and developed over the years making it critical that the City of Livermore, Zone 7, LARPD, and EBRPD work closely together to secure easements through the development review approval process. The City of Livermore has worked closely with EBRPD over the last ten years to review development proposals adjacent to the railroad right of way in an effort to plan for and accommodate future segments of the trail. This effort has resulted in the construction of several disconnected segments of trail, as well as the acquisition of several 15- to 20-foot-wide easements for future trail construction.

In addition to right of way challenges, completion of a continuous trail will require installation of bridge crossings over several streets, potential grade-separated crossing of the railroad in one or more locations, installation of fencing or soundwalls to safely separate the trail user from the active rail line and conflicting neighborhood uses, trail improvements within narrow corridors, and signs and signals to safely guide the trail user along the appropriate route.

The Study includes some segments that have been identified as “Phase I” that can be implemented in the short term (1-5 years). Study segments that may take longer to implement, due to right of way constraints, costs/funding availability, or other issues, have been identified as “Phase II” in the Study.

Trail Segments

The study includes four trail segments (**Figure 1**):

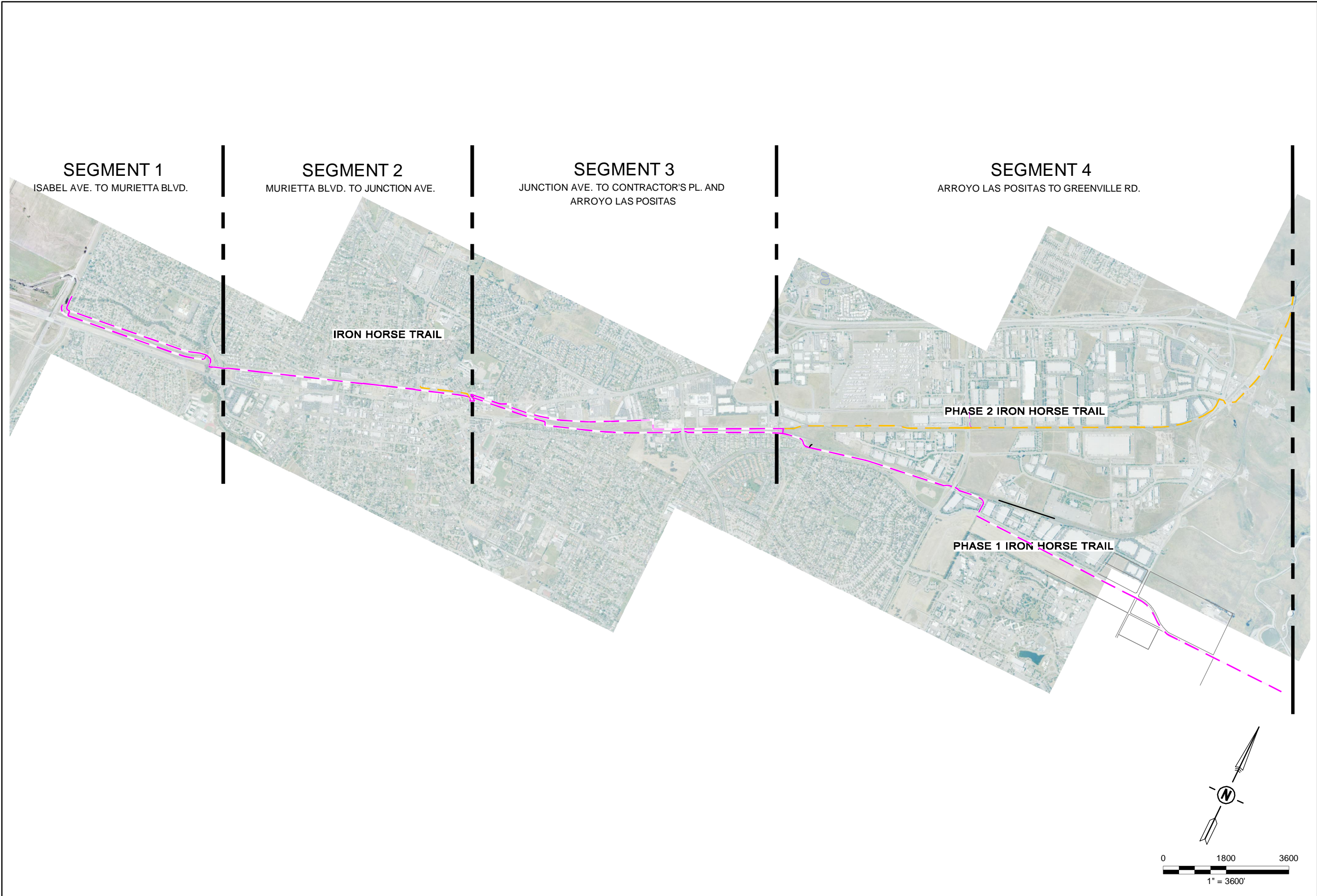
1. Isabel Avenue to Murrieta Blvd.

| | |
|------------------------|--|
| Length: | 5,200 feet |
| Right of Way Needed: | MOU/Agreement with Zone 7 |
| Phase I Alignment: | North side of Arroyo Mocho Channel, or South side of Arroyo Mocho Channel |
| Phase II Alignment: | N/A |
| Proposed Improvements: | Surfaced trail Pedestrian/bicycle bridge, Murrieta Blvd. Trail spurs and connections Signs and site furnishings |

This segment would be located within Zone 7 right of way on an existing access road, utilize an existing undercrossing of the railroad tracks west of Murrieta, and includes a new pedestrian/bicycle bridge across Murrieta to connect to an existing trail section.

2. Downtown Livermore, between Murrieta and Junction Avenue

| | |
|------------------------|--|
| Length: | 7,000 feet |
| Right of Way Needed: | Individual agreements as part of redevelopment |
| Design/Construction: | To be completed as part of site improvements, Downtown Parking Garage/LAVTA |
| Phase I Alignment: | South side of UPRR ROW, consistent with Downtown Plan |
| Phase II Alignment: | North side of UPRR ROW, one block: Livermore Avenue to Junction Avenue, trail to be routed under existing Livermore Ave. grade separation to north side of UPRR ROW to Junction Avenue, with existing at-grade crossing of tracks at Junction. This should be considered an interim alignment until pedestrian/bicycle facilities are incorporated into Parking garage and LAVTA facilities. |
| Proposed Improvements: | Surfaced trail Pedestrian/bicycle bridges (2), North P, N. Livermore Mid-block pedestrian crossing, North L Trail spurs and sidewalks Soundwall Landscaping and Signs |



Design:
Drawn: BJV
Checked:
App'd:



**IRON HORSE
TRAIL**
LIVERMORE, CA

- OVERALL TRAIL ALIGNMENT - PHASE I
- OVERALL TRAIL ALIGNMENT - PHASE II

**POTENTIAL TRAIL SEGMENT
STUDY AREAS**

FIGURE
1

This segment includes sections where the trail would be completed as a condition of property redevelopment in accordance with the Livermore Downtown Specific Plan. City-owned lands (such as the Downtown Parking Garage and bridges at North P Street and North Livermore Avenue overcrossings) would be implemented as public projects.

3. Junction Avenue to Contractor's Place/Arroyo Las Positas

| | |
|------------------------|---|
| Length: | approximately 9,500 feet |
| Right of Way Needed: | Individual agreements as part of redevelopment Existing easements UP ROW |
| Design/Construction: | To be completed as part of site improvements, Downtown |
| Phase I Alignment: | North side of UPRR ROW/Tracks, outside UP ROW |
| Phase II Alignment: | South side of UPRR ROW/Tracks, if ROW acquired |
| Proposed Improvements: | Surfaced trail Soundwall or fence Pedestrian/bicycle bridge, Arroyo Las Positas Signs and site furnishings |

This segment includes the area east of Downtown, characterized by a mix of residential, transitional and industrial uses. Any off-street trail within this area would need to utilize UPRR lands in order to provide a continuous trail connection. There are two options:

- South side of the tracks, ramping up from City property east of First Street, on overpass to north side of tracks, to connect to properties on south side of First Street to Trevarno Road. Trail to be implemented as part of project redevelopment. Trail to be constructed within existing easements from Trevarno Road to Arroyo Las Positas Road, where it would cross the existing channel via a new pedestrian/bicycle bridge.
- South side of the rail line, along city owned land and portions of Silver Oaks Way and other public lands. This trail would only be constructed if sufficient ROW could be obtained from the railroad for trail implementation, or if the rail land use changes.

4. Arroyo Las Positas to Greenville Road

Phase I Alignment (Arroyo Las Positas Channel, Patterson Pass Rd):

| | |
|---------------|---|
| Length: | 13,100 feet |
| ROW Needed: | MOU/Agreement with Zone 7 |
| Improvements: | Surfaced trail Pedestrian/bicycle bridge, Arroyo Las Positas Signs and site furnishings |

Phase II Alignment (UPRR north corridor):

| | |
|---------------|---|
| Length: | 12,500 feet |
| ROW Needed: | Individual agreements or UP acquisition/easement |
| Improvements: | Surfaced trail Pedestrian/bicycle bridge, Vasco Road |

Pedestrian/bicycle bridge, Arroyo Las Positas
Pedestrian/bicycle underpass/tunnel, UPRR at Arroyo las Positas
Signs and site furnishings

- East of Arroyo Las Positas, the rail alignment splits into two separate tracks. The short-term, Phase I alignment would be located along the realigned Arroyo Las Positas, and developed in conjunction with Zone 7 restoration. If the trail is located on the Phase II alignment (extension of Contractor's Place), it will require grade separation of the dual tracks, either a clear-span bridge with at least 26 ft. of overhead clearance, or a tunnel undercrossing to reach the creekside trail route. The Phase I alignment would cross Patterson Pass Road, and continue east within street right of way to the City limits at Greenville Road, with possible future trail connections east to the South Bay Aqueduct.
- The Phase II, long term trail option would be located adjacent to the northern spur tracks, either on acquired individual easements obtained as part of redevelopment, rail ROW acquisition, or change of rail land use. A grade-separated crossing of Vasco Road would be needed for safe pedestrian crossing.

Trail Design and Management

Trails in Livermore are typically a minimum of 10-12 feet wide, with 2 foot graded shoulders on each side, and landscaping or other features within a twenty-foot wide corridor.

The trail will be designed as an all-weather, multi-use pathway, capable of accommodating pedestrians, bicycles, and universally accessible modes, as well as providing for emergency and maintenance vehicle access in some areas. The trail will be designed in accordance with accessibility standards, which require a firm, stable surface for trails.

Maintenance and management of the trail is typically under the direction of LARPD. There are also other potential project partners, such as Zone 7, EBRPD, or nonprofit groups that could contribute to trail management and operation.

Trail Implementation

Completion of a continuous Class I Iron Horse Trail through Livermore will likely be done in segments, depending on the implementation of adjacent development projects, redevelopment activities, Zone 7 restoration priorities, successful grant funding, easement acquisition, street and capital improvement allocations, and community support. Effective partnerships with stakeholders such as Zone 7, ACTIA, EBRPD, LARPD, rail/transit interests, redevelopment projects and nonprofit groups will be a key to project success. In addition, ongoing transportation and land use planning within Livermore should include project review to ensure that transportation projects such as a potential BART extension, ACE expansion or High Speed Rail maximize opportunities for trail connections and implementation of applicable trail segments.

1. Introduction

This Feasibility and Preliminary Design Study explores the opportunities and design constraints associated with construction of a Class I multi-use trail, primarily along an existing rail corridor in the City of Livermore. Portions of the trail being investigated in this Feasibility Study would also utilize maintenance access roads along flood control channels managed by the Alameda County Zone 7 Water Agency (Zone 7). Known as the Iron Horse Trail (IHT), this potential or future trail is generally parallel to the Union Pacific Railroad (UPRR) corridor between Isabel Avenue at Livermore's westerly limits, and Greenville Road on the City's eastern edge. East Bay Regional Park District (EBRPD) operates and manages the existing paved multi-use Iron Horse trail from the Dublin/Pleasanton BART Station north to Marsh Drive in the City of Concord under license agreements with Contra Costa County or Alameda County and/or Zone 7 Water Agency and the City of Dublin. The City of Pleasanton manages a new segment of Iron Horse Trail between Santa Rita and Busch Roads and Alameda County is responsible for the paved trail on the south side of Stanley Blvd. adjacent to Shadow Cliffs Regional Recreation Area to Isabel Avenue, which is located in unincorporated Alameda County. The EBRPD Trails Master Plan map shows an extension of the Iron Horse Trail east of Greenville Road to the San Joaquin County line, where the former rail alignment is owned by Alameda County.

Within the City of Livermore, operation and management of the trail is under the guidance of Livermore Area Recreation and Park District (LARPD), with staff assistance from the City. Trail planning and implementation within Livermore is done by LARPD, and trail implementation is consistent with the Livermore General Plan, Downtown Specific Plan and other planning documents.

This Feasibility Study examines a preferred alignment for the trail within the Livermore city limits, opportunities and constraints associated with trail implementation, right of way (ROW) needs, trail alternatives, potential project costs and implementation strategies. The Livermore Iron Horse Trail is identified in many local and regional plans as a priority for implementation, including the City of Livermore Bikeways Map, Downtown Plan, EBRPD Trails Master Plan, and LARPD Master Plan.

1.1 *Background of the Iron Horse Trail*

The existing Iron Horse Regional Trail extends from Marsh Drive in Concord, Contra Costa County to the Dublin/Pleasanton BART Station in Alameda County, a span of 28 miles. The Trail passes through the communities of Concord, Pleasant Hill, Walnut Creek, Alamo, Danville, San Ramon, and Dublin. The trail has direct connections to both the Pleasant Hill and Dublin/Pleasanton BART Stations and is located less than one mile away from the Walnut Creek BART Station. In Pleasanton, the City of Pleasanton has built and operates the Iron Horse Trail between Santa Rita and Busch Roads. South of Pleasanton, there are two miles of paved separated trail within unincorporated Alameda County property along Stanley Blvd. adjacent to EBRPD Shadow Cliffs Regional Recreation Area, which is maintained by Alameda County. The trail currently ends at Isabel Avenue, the western boundary of the City of Livermore.

The City of Livermore has worked closely with EBRPD over the last ten years to review development proposals adjacent to the UPRR ROW in an effort to plan for and accommodate

future segments of the Iron Horse Trail from Isabel Avenue to the City's eastern limits at Greenville Rd. This joint effort has resulted in the construction of several disconnected segments of trail, as well as the acquisition of several 15- to 20-foot-wide easements for future trail construction.

The proposed 6-mile trail within the City would be under the jurisdiction of the City of Livermore and the Livermore Area Park and Recreation District (LARPD). Alameda County has secured the former railroad ROW on either side of the City of Livermore, and EBRPD is considering a future license agreement with Alameda County for completion of the future trail along railroad ROW. In the EBRPD 1997 Trails Master Plan, the proposed trail is indicated as 4A, Iron Horse Trail- San Joaquin County to Shadow Cliffs. In the 2001 City of Livermore Bikeways and Trails Master Plan, the proposed Iron Horse Trail is listed as Project T16. In the 1991 LARPD Regional Trail Plan, some segments of the proposed Iron Horse Trail are shown, (segment east of Greenville Rd. as Trail E1). LARPD and EBRPD are currently preparing Master Plan Updates.

The proposed segment through the City of Livermore is the most challenging to secure, since ownership of this portion remains with the railroad company, with trail implementation generally occurring outside of, but adjacent to the active rail lines. Portions of the 1997 abandoned railroad ROW within Livermore have been sold and developed over the years making it critical that the City of Livermore, LARPD, and EBRPD work closely together to secure Iron Horse Trail easements through the development review approval process.

This Study examines potential alignments north and south of the railroad ROW. Opportunities for completion of the trail within Zone 7's flood control channel ROW are also explored as potential alignments.

1.2 Project Description

This IHT Trail Feasibility Study was commissioned to further explore a potential Class I trail along and adjacent to the railroad ROW, as well as to explore options for grade separation of the trail at major downtown intersections. The Study evaluates trail overcrossings at Murrieta Blvd., North P Street and N. Livermore Avenue. In addition, the Study analyzes trail options and potential alignments within four trail segments. Project segments (**Figure 1**) include:

Segment 1: Isabel Avenue to Murrieta Blvd.

The Livermore portion of the IHT would begin at the Isabel Avenue undercrossing of Stanley and the UPRR tracks. West of Isabel (in Alameda County), the existing IHT is on the south side of Stanley Blvd. and maintained as a separated Class 1 bikeway. The Altamont Commuter Express (ACE), a regional commuter rail and freight train service use the Union Pacific Railroad (UPRR) line, on the north side of Stanley Blvd. There is also an existing UPRR ROW, formerly owned by Southern Pacific Railroad (SPRR), south of the active line to the west of Downtown.

The new trail would connect to the undercrossing of Stanley and connect from the existing Isabel Avenue multi-use trail to the access road along Arroyo Mocho, where a new trail would be constructed on Zone 7 lands (north of UPRR ROW). The trail would be located adjacent to the Zone 7 Arroyo Mocho channel, on one of the access roads, to join the existing neighborhood trail along old Arroyo Mocho east of Cottonwood Court,

and would use the existing creek undercrossing to reach the south side of the UPRR tracks at Murrieta Blvd. Connections to the existing neighborhood trails would be maintained or improved. A new pedestrian/bicycle bridge would be constructed over Murrieta Blvd. to connect to the existing IHT segment at the northeast corner of Murrieta and Stanley. The precise location of the trail would be determined through coordination with Zone 7 to meet access and restoration needs, as well as secure agreements for use and maintenance of the trail.

Segment 2: Downtown - Murrieta Blvd. to Junction Avenue

This trail segment is within the Downtown Specific Plan area, and the trail alignment within this segment would be along the south side of the UPRR tracks, in accordance with the Livermore Downtown Specific Plan. Some portions of the trail in this segment have been completed, and properties that redevelop are required to dedicate and construct the trail within a twenty-foot easement. This segment also includes two pedestrian/bicycle bridges to provide connections at North P Street and North Livermore Avenue; these streets have grade-separated undercrossings of the railroad tracks where separate bicycle/pedestrian bridges would be built. At-grade mid-block street crossing improvements would be needed at North L Street.

Segment 3: Junction Avenue to Contractor's Place/Arroyo Las Positas

This segment includes the area east of Downtown, characterized by a mix of residential, transitional and industrial uses. The trail would be located on lands developed or redeveloped north of the rail line. Due to existing residential development and lot layout, a trail alignment south of the rail line could only occur if an easement or acquisition were obtained from the railroad to complete gaps in the ROW.

- The Phase I trail would be located north of the rail line, with a crossing from the south side trail via the First Street Overpass. The trail would continue north of the rail ROW and be implemented as part of easement acquisition or redevelopment of lots north of the rail line. The trail would connect to existing easements east of Trevarno Road, along Contractor's Place to Arroyo Las Positas Road. A bridge would be needed across Arroyo Las Positas channel.
- The Phase II trail would only be completed if the City obtained permission or acquired easements on railroad or private lands on the south side of the tracks. The trail would be located within existing City ROW until it joins UP lands west of Silver Oaks Way. The trail would be located on the southern edge of rail lands, and incorporate City ROW along Silver Oaks to secure adequate width for a trail. ROW would need to be acquired along this south rail edge from the City property east of the First Street overpass to Arroyo Las Positas, where it would cross the existing channel via a new pedestrian/bicycle bridge.

Segment 4: Arroyo Las Positas to Greenville Road

East of Arroyo Las Positas, the rail alignment splits into two separate tracks. The main UPRR tracks cross the former SPRR line, and continue east, becoming the southern of the two rail rights of way. This southerly rail line is actively used for ACE and freight use, while the spur rail line continues northeast to serve industrial parcels west of Greenville Road, where the tracks terminate. The northern line (former SPRR), while not abandoned, is not a main line in this part of Livermore, serving only the light industrial uses in the area. In this area, the south rail line is adjacent to the realigned Arroyo Las Positas, a creek channel owned by Zone 7 Food Control. There are two options for the trail:

- The Phase I alignment would be located along one of the maintenance access roads of Arroyo Las Positas, and trail improvements would be coordinated with Zone 7's plans for restoration and trail implementation. A trail connection from the north side of the rail tracks along Contractor's Place to the south side of the tracks along reconstructed Arroyo Las Positas will require grade separation of the dual tracks, either a clear-span bridge with at least 26 ft. of overhead clearance, or a tunnel undercrossing.

- The Phase II alignment alignment would be located north of the rail line, or within the rail ROW if it were ever abandoned or a change in land use occurred, such as conversion to BART. If so, a route could potentially utilize existing and future trail easements adjacent to, or within the rail line. The northerly track has been evaluated for potential use as part of the Regional High Speed Rail alignment, although the HSR Commission and MTC Board recently selected (12/07) the Pacheco Pass, not Altamont alignment as the preferred route. This alignment has also been studied for expanded freight service, although it is conceivable (although unlikely) that this alignment could be considered for future trail use if abandoned.

2. Project Stakeholders and Related Projects

The Livermore portion of the IHT Trail will provide a key connection to the existing regional trails network around Livermore, and provide for eventual trail connections to the east. The trail will serve recreational needs as well as provide alternative transit modes for commuters to regional rail service and BART. Project stakeholders and policy documents related to the IHT include:

- City of Livermore
 - *Livermore General Plan*
 - *Livermore Bikeways and Trails Master Plan*
 - *Downtown Specific Plan*
 - *Redevelopment Agency*
- Livermore Area Recreation and Park District (LARPD)
- East Bay Regional Park District
 - *1997 Master Plan*
 - *2007 Draft Master Plan Map*
 - *Easements*
- Alameda County Transportation Agency: Alameda County Transportation Improvement Authority (ACTIA) and Alameda County Congestion Management Agency (ACCMA)
 - *Countywide Bicycle Plan, Countywide Pedestrian Plan*
- Alameda County Flood Control And Water Conservation District, Zone 7
 - *Zone 7 Streamwise Program*
 - *Stream Management Master Plan*
 - *Stream Management Master Plan Programmatic EIR*
- Caltrans Highway 84 Widening
- Railroad Planning and Regulation, California Public Utilities Commission for rail crossings

2.1 City of Livermore

2.1.1 Livermore General Plan

The Livermore General Plan was updated in 2003, and contains fundamental land use and development policies to guide the City's growth and development through 2025. The Plan's Circulation Element contains policies and programs related to trails.

The Circulation Element provides a policy framework for regulation and development of transportation systems in Livermore. Several goals, objectives, actions and policies in the Circulation Element support the development of the Iron Horse Trail. Goal CIR-3 promotes alternative transportation modes and Objective 3.3 calls for the City to provide a bicycle and trails network, listing the following policies:

- P1. *Develop a comprehensive bikeway and trails system as a viable alternative to the automobile for all trip purposes in order to maximize the number of daily trips made by non-motorized means for residents of all abilities.*
- P2. *Consider bicycle, pedestrian, and equestrian access in all aspects of City Planning and coordinate with other agencies to improve non-motorized access within the City of Livermore and to surrounding regional areas and facilities.*
- P3. *Provide related facilities and services necessary to allow bicycle and pedestrian travel to assume a significant role as a local alternative mode of transportation.*
- P4. *Improve the safety of bicyclists and pedestrians by educating all Livermore residents about bicycle and pedestrian safety and by enforcing bicycle and motorist laws and regulations effecting bicycle and pedestrian safety. Increase bicycle and pedestrian mode share by increasing public awareness of benefits of bicycling and walking and of the available bike and trail facilities and programs.*
- P5. *Maintain all roadways and multi-use trails so that they provide safe and comfortable bicycling, walking, and equestrian conditions.*
- P6. *Implement a bikeway system with community input on the priorities and with a minimal impact on the environment.*

The Circulation Element also recommends the following actions:

- A2. *Develop bicycle routes and multi-use trails in accordance with the City's adopted master plan for a bikeway and trails network.*

Goal CIR-6 calls for the City to develop a Downtown circulation system that is pedestrian-oriented and supports Downtown as a destination. Objective CIR-6.1 calls for design to maintain a safe and interconnected pedestrian-oriented Downtown circulation system, and lists the following policies:

- P1. *Promote pedestrian activity as the primary mode of travel in Downtown.*
- P2. *Provide a roadway system that is subordinate to the pedestrian environment.*

The Circulation Element specifically recommends the Iron Horse Trail provide pedestrian and bicycle connections between proposed residential development and the ACE passenger rail station, LAVTA transit center, and the Downtown.

2.1.2 City of Livermore Bikeways and Trails Master Plan

This plan was adopted in 2001 to update the existing set of goals, policies, data and programs for pedestrian, equestrian and bicycle facility improvement and development within the City. The plan contains (1) goals and policies, (2) description of existing conditions, (3) recommended trail/bikeway network and support facilities, (4) goals related to safety, education and promotion, and (5) an implementation plan. The plan identifies the Iron Horse Trail from Stanley Blvd. /Isabel Avenue to the eastern City limits as a proposed trail in the proposed bikeway network and lists several policies and actions related to development of the Iron Horse Trail. Policy 1.3 calls to develop an interconnected local and regional trail network that is safe and accessible for different modes and users of all abilities, utilizing existing trail easements and alignments where possible. Action Step 1.3 requires the design of facilities to meet the Americans with Disabilities Act (ADA). Policy 1.4 calls for provision of a high degree of access, safety and mobility for bicyclists and pedestrians through the downtown. Policy 1.6 calls to develop a multiuse bikeway system that encourages people to walk and bicycle to reduce automobile usage and improve air quality. Action Step 1.61 calls to connect employment areas to residential areas and regional routes, and Action Step 1.63 calls to complete cross-town connections of residential and commercial areas.

2.1.3 Livermore Downtown Specific Plan

The Livermore Downtown Specific Plan states the City's goals, objectives and policies for development in the downtown. The plan details the proposed land uses and their distribution, proposed infrastructure improvements, development standards, and implementation measures required to achieve its goals. The Livermore Downtown Specific Plan implements the broader policies of the General Plan as amended; however, the Specific Plan provides more detailed guidance. The Specific Plan contains the following components:

- *Description of existing conditions*
- *Revitalization strategy*
- *Land use and development policies*
- *Development standards*
- *Design standards and guidelines*
- *Circulation and transportation improvements*
- *Public utility and infrastructure improvements*
- *Implementation actions*
- *Financing strategy*

The proposed multi-use Iron Horse Trail is identified in the Specific Plan as an important regional and local connection from residential, cultural and open space uses to the Downtown and references the design standards that are to be applied from the 2001 Bikeways and Trails Master Plan. All properties fronting the trail alignment within the Downtown area (south of the rail tracks) are required to dedicate an easement and construct trail improvements (soundwall, trail, drainage, landscaping, curb/gutter, fencing, signs, etc.) as part of the approval process.

2.1.4 City of Livermore Redevelopment Agency 2004-2009 Implementation Plan

Livermore has established a Redevelopment Agency to assist in the implementation of redevelopment projects in the downtown area. The agency gets most of its revenue through property tax that is distributed to the agency when redevelopment properties increase in value. The agency spends this revenue on projects/improvements that eliminate blight. Goals and objectives in the 2004-2009 Implementation Plan related to the IHT include:

Goals

- *The assembly of land into parcels suitable for modern, integrated development with improved pedestrian and vehicular circulation.*
- *The provision of adequate land for parking and open spaces.*

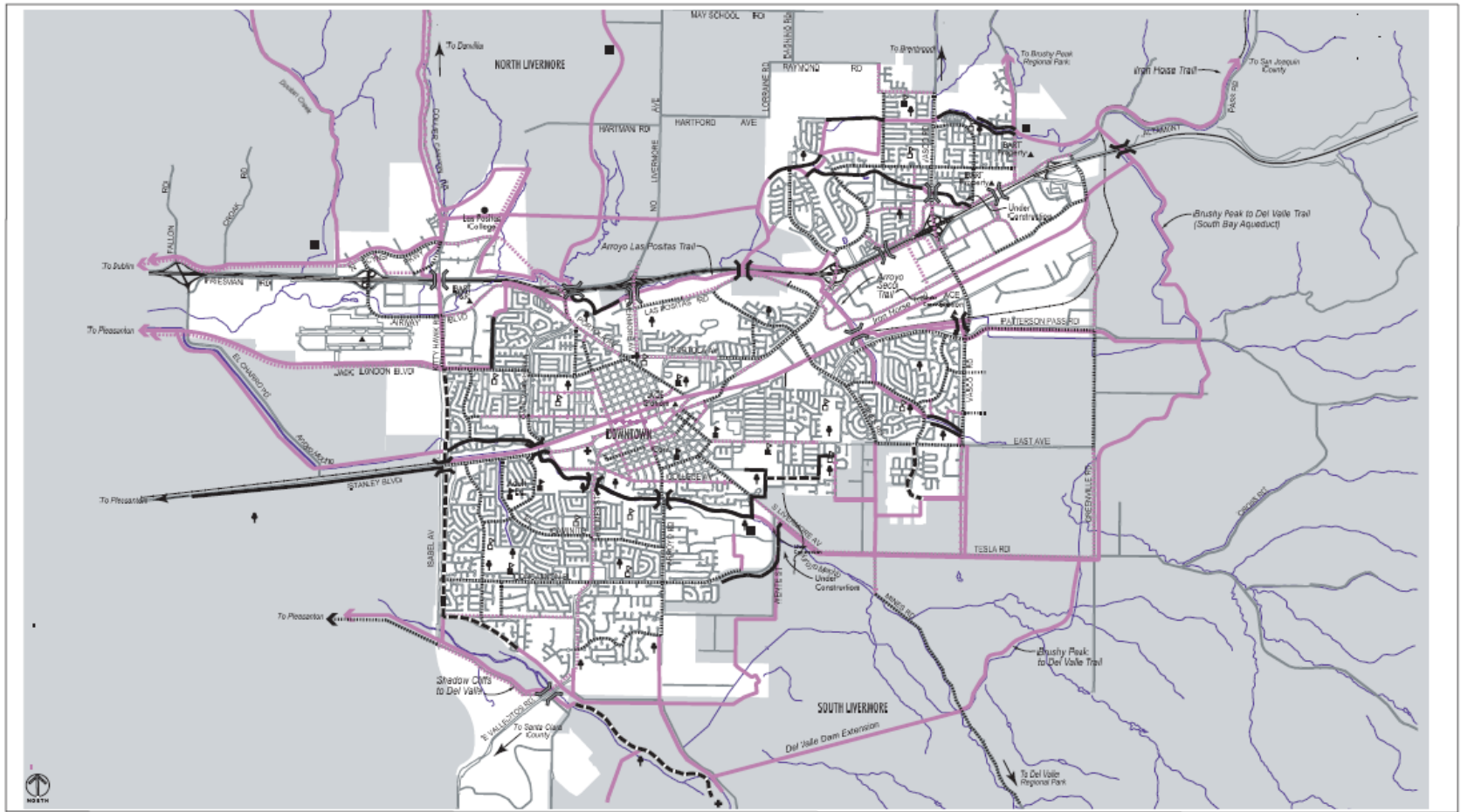
Objective

- *Enhance the aesthetics of the Downtown area with improved public infrastructure and pedestrian oriented amenities.*

The Redevelopment Agency owns several parcels along the proposed Iron Horse Trail alignment. Specifically, the agency owns two parcels in the vicinity of Murrieta and Stanley Boulevard and several parcels in the vicinity of Livermore Avenue and Railroad Avenue, which could potentially be used for trail right-of-way as well as other uses.

2.1.5 Regional Trail Connections

Figure 5-4 of the Livermore General Plan shows the Iron Horse Trail as well as regional trail connections, including a trail along Arroyo Mocho west of Livermore, connections to Shadow Cliffs via Isabel to the south, and the proposed Brushy Peak to Del Valle Trail along the South Bay Aqueduct east of the City.



- Existing Multi-Use Trails
- - - Existing Bike Lanes
- - - Existing Multi-Use Trails with Equestrian Component
- () Existing Over/Undercrossing
- () Proposed Over/Undercrossing
- Proposed Bike Lanes
- Proposed Trails
- ◆◆◆◆ Proposed Bike Routes
- Staging Area
- 🏠 Elementary Schools
- 🎓 Middle Schools
- 🎓 High Schools
- 🚏 Transportation Centers
- 🏥 Hospitals
- 🌳 Parks
- ☐ Area Outside City Limits

FIGURE 5 - 4

PROPOSED BIKEWAYS AND TRAILS NETWORK

LIVERMORE GENERAL PLAN

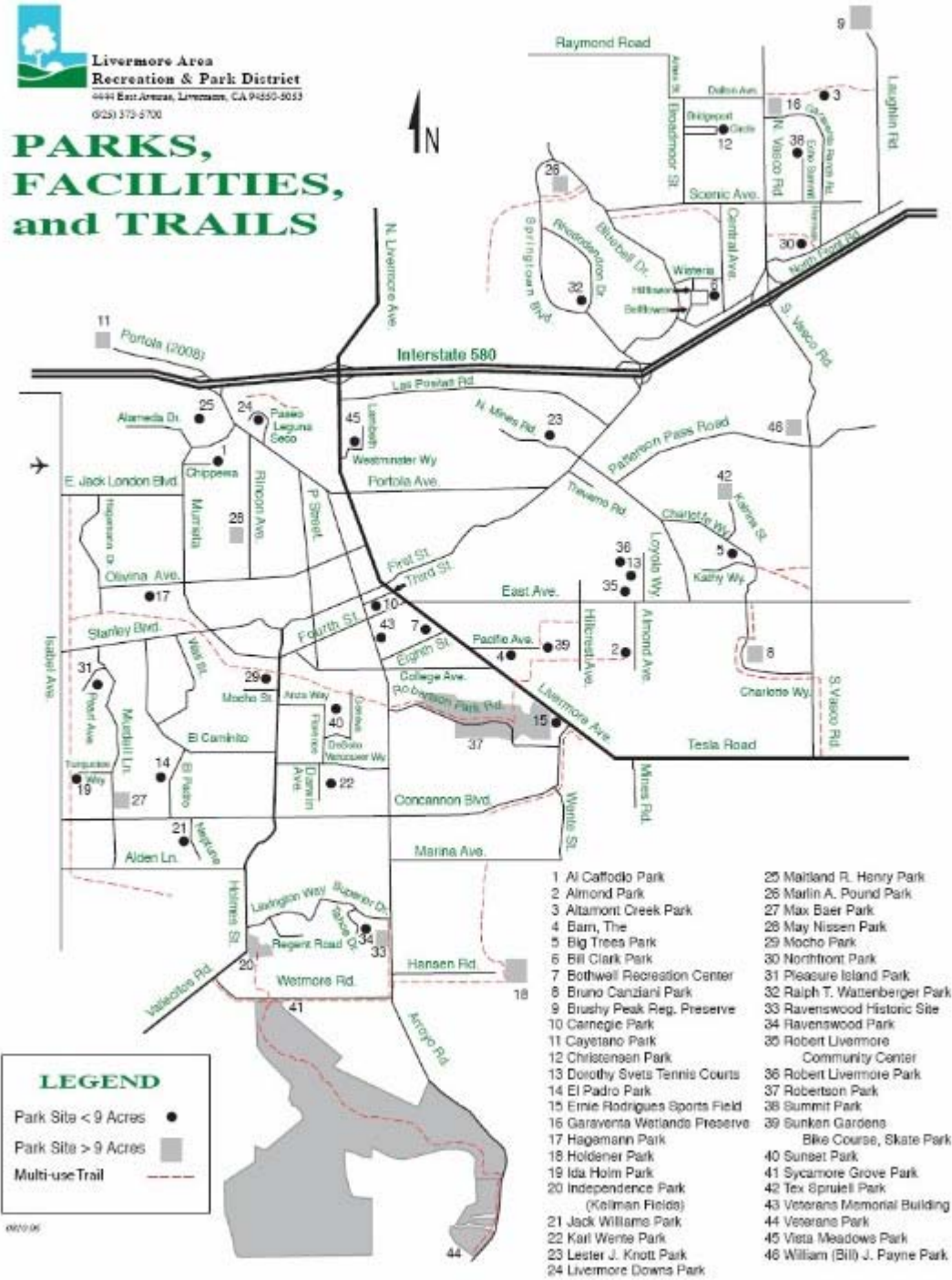
Livermore General Plan Bikeways and Trails Network Map

2.2 *Livermore Area Recreation and Park District*

The Livermore Area Recreation and Park District (LARPD) is an independent special district, formed to provide a system of park and recreation facilities. LARPD participates in decision-making regarding parks and trails. LARPD's 2006-2007 budget is \$20,513,797, the bulk of which comes from program fees, property taxes, and a special tax. The District also obtains money through the City of Livermore's parkland dedication or in-lieu fees for new park development. An LARPD 2006 Needs Assessment Survey concluded that outdoor, active, open space parks were rated as the most important components for the LARPD to focus on. A Master Plan is currently being completed; its directives include developing multi-purpose trails and fostering trail connectivity, consistent with Livermore IHT planning and implementation. It is likely that LARPD would become a manager of portions, if not all, of the trail network.

LARPD is an independent special district created by vote in 1947. It is governed by a five person elected Board of Directors. LARPD serves park and recreation needs within a 240 square mile area bounded by Contra Costa County to the north, San Joaquin County to the east, Santa Clara County to the south and the cities of Pleasanton and Dublin to the west (the area once known as the Murray Township). LARPD owns and manages over 1700 acres of parkland. LARPD also has a tax sharing agreement with EBRPD (Murray Township tax sharing agreement) for revenues to operate the district's regional park system.

LARPD is in the process of updating its Master Plan for the provision of recreation and parks facilities, and completed a needs assessment in 2006 to document the importance, usage, and satisfaction levels of residents regarding Livermore area's parks, sports and recreational activities, facilities, and programs. Among the key findings of the Needs Assessment, walking and hiking facilities and trails were ranked second and third as the most important components of the parks system.



LARPD Facilities Map

2.3 East Bay Regional Park District (EBRPD)

East Bay Regional Park District (EBRPD) is a California Special District. In Alameda County, EBRPD operates and manages approximately 110 miles of paved and unpaved regional trails, including the Iron Horse, Alamo Canal, and Tassajara Creek trails in Dublin. When complete, the IHT will consist of 17 miles in Alameda County between the Contra Costa and San Joaquin County lines.

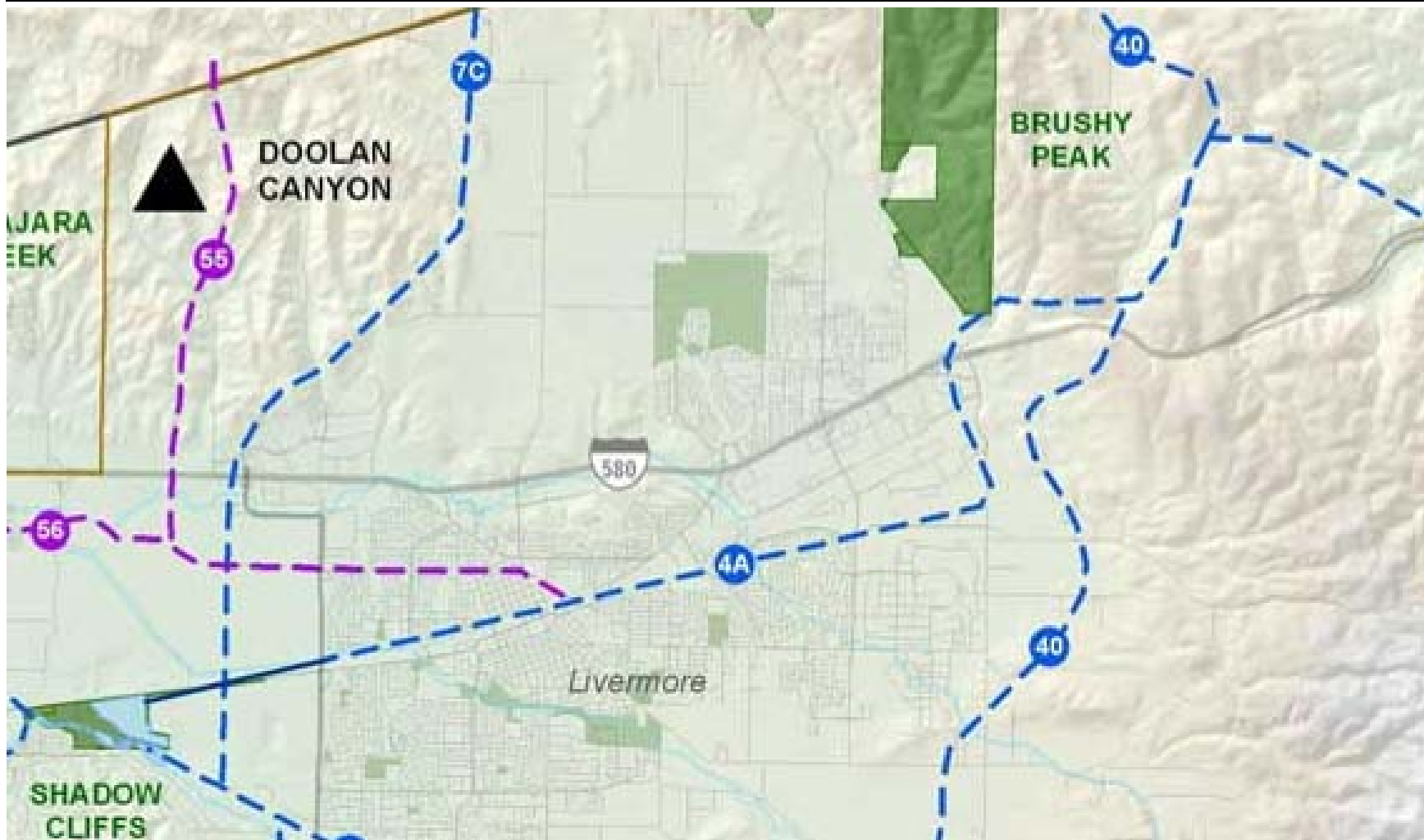
Master Plan 1997. In 1997, the Park District completed the “Master Plan 1997,” which set forth priorities for park development and management. Some of these priorities that relate to Livermore IHT implementation include:

- Complete the acquisition and facility development program of Measure AA-the 1988 bond act mandating and funding new parks, trails and facilities-and acquire new park sites and trail corridors.
- Complete key park and trail projects in the eastern part of the District to serve newly annexed areas and anticipate urban growth. Where possible, enhance facilities, services and programs provided by other agencies.

Draft Trails Master Plan 2007. EBRPD released its Draft Trails Master Plan map in October 2007. The map shows the proposed extension of the IHT through Livermore, and connections to the proposed Brushy Creek to Del Valle Trail, and a proposed extension along the Arroyo Mocho (connecting to the Livermore IHT east of Contractor’s Place) to Doolan Canyon north of Livermore.

EBRPD Livermore IHT Trail Easements. As a result of coordinated planning efforts with the City of Livermore, EBRPD has acquired several 15-20’ wide easements for the trail in the vicinity of Vasco Road and also east of Mines Rd. These are shown on the Right of Way Plans.

1. F&P Properties, Las Positas Road, recorded June 30, 1998, 20’ wide trail easement.
2. Multi-Foods (6211 Las Positas Road) (2/2/04) A UPRR railroad siding easement is on the south property line. The southernmost 20 ft. of the property is reserved as a no-build zone for the ultimate use for the Iron Horse Trail. The railroad still has an easement for a freight spur line, and the City will not allow any building expansion into the R/R spur. If the R/R spur easement is abandoned, EBRPD will have the first opportunity to accept a trail easement.
3. Ellis Partners – May 2001, Vasco Road. APN 099B 5900 022 11 (portion), EBPRD easement - .59 acres, 1290 linear feet of a 20-ft. wide easement west side of S. Vasco Rd.
4. Top Grade Development (50 Contractors Street) (1998). 15’ wide trail easement through lots 5 and 6 of Parcel map 7090. EBRPD currently has an easement from west of Mines Road along the Top Grade Development to its eastern property line near Las Positas Road.
5. Tesla Power Plant (Midway Road, APN 99B-7825-1-4 Section 30, Township 2S, Range 4E) (2003). CEC Tesla Power Plant proposal water supply pipeline and natural gas pipeline will cross UPRR in two locations. In addition, the transmission line will run adjacent to the RR right of way. EBRPD commented that approval should not preclude the Iron Horse Trail and should coordinate.
6. EBRPD requested inclusion of IHT components and connections, where appropriate, as part of the Greenville Road widening project.



**EBRPD Draft Trails Plan, 2007 (excerpt)
Existing and Proposed Trails in the Livermore Area**

1997 Potential Regional Trails

- 4A Iron Horse Trail San Joaquin County to Shadow Cliffs
- 7C San Francisco Bay to San Joaquin River Trail, Shadow Cliffs to Morgan Territory

1997 Other Regional Trails

- 40 Brushy Peak to Del Valle

2007 Potential Regional Trail Additions

- 55 Doolan Canyon to I-580
- 56 Arroyo Mocho Trail

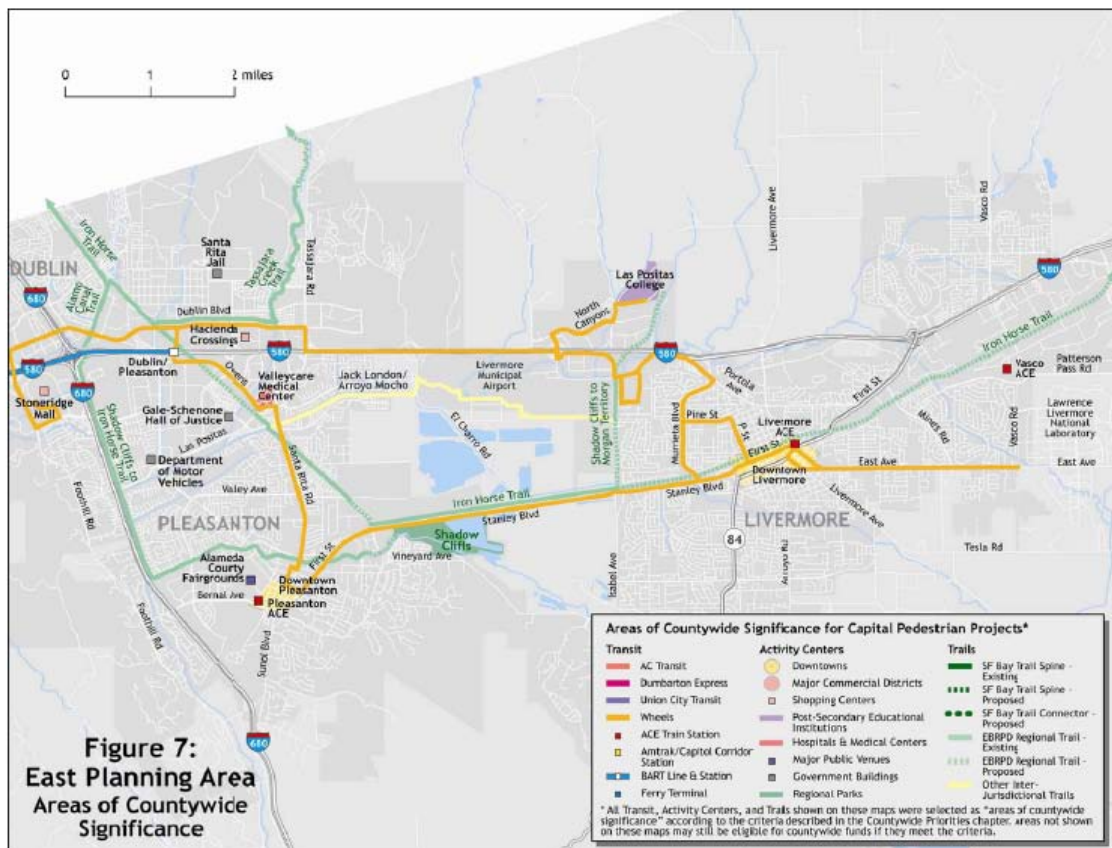
2.4 Alameda County Transportation Authority

Alameda County Transportation Improvement Authority (ACTIA) Alameda County Congestion Management Agency (ACCMA)

The Alameda County Transportation Improvement Authority (ACTIA) is the public agency that administers Alameda County’s half-cent sales tax for transportation projects and programs. This tax was authorized by Alameda County Measure B, originally approved by the voters in 1986 and reauthorized in 2000. Five percent of Measure B revenue is allocated to bicycle and pedestrian projects and programs.

The Alameda County Congestion Management Agency (ACCMA) is tasked with planning and implementing congestion management projects and programs, including those aimed at bicyclists and pedestrians. The ACCMA administers many bicycle and pedestrian funding sources, including Alameda County’s portion of the Regional Bicycle and Pedestrian Program.

Countywide Bicycle Plan and Countywide Pedestrian Plan. These plans provide the framework for non-motorized facilities within Alameda County to document existing conditions, provide guidelines and identify best practices for construction of bicycle and pedestrian facilities. The plans also provide background for revenue and expenditures related to multi-use trails. The Iron Horse Trail is identified as a major regional interjurisdictional trail.



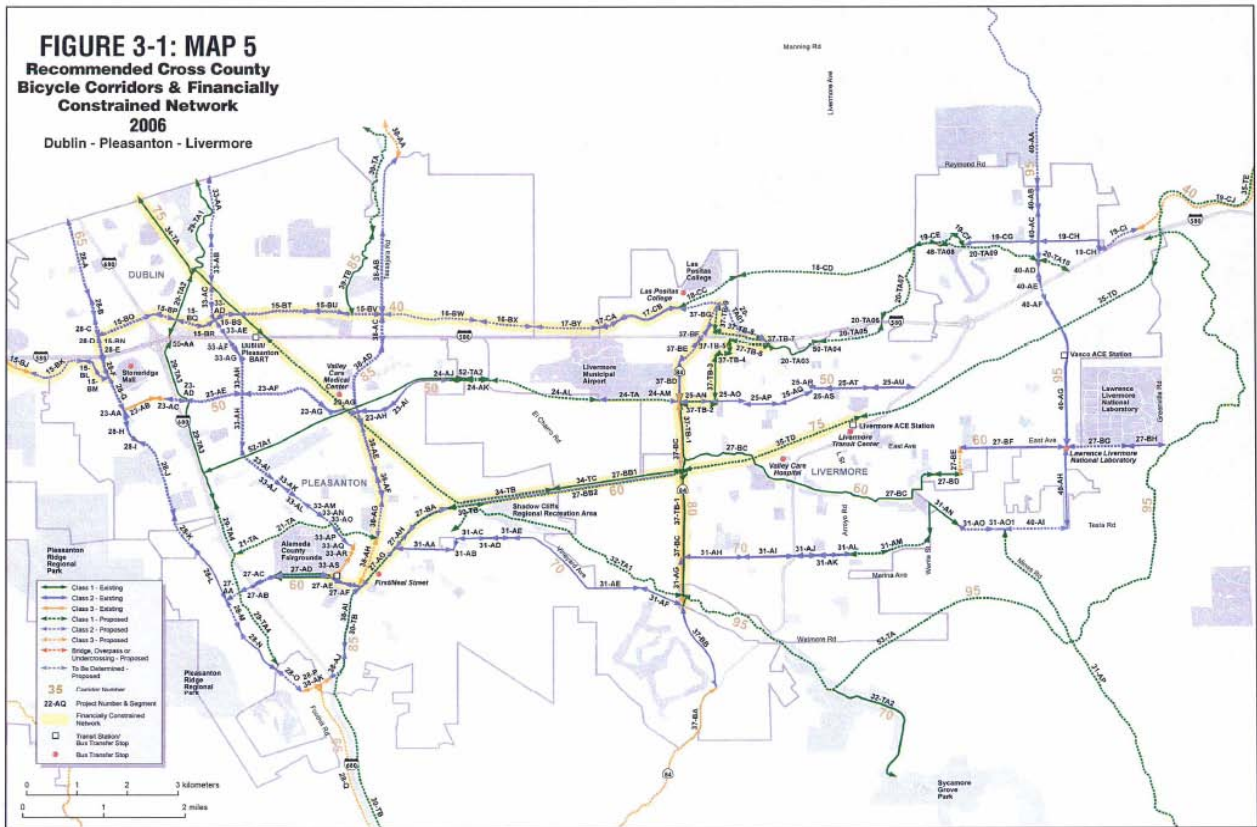
Countywide Pedestrian Priorities Alameda Countywide Strategic Pedestrian Plan, 2006

2006 Alameda Countywide Bicycle Plan. The CMA and ACTIA Boards adopted the final Alameda Countywide Bicycle Plan on October 26, 2006. The Plan provides a framework for improving Alameda County’s bicycling environment. Partially funded by Measure B, this update focused on identifying facilities that have been completed since the Plan was adopted, revising and correcting maps and appendices to add new projects and modified alignments and developing a fiscally constrained list of high priority projects.

The portion of the Iron Horse Trail from Isabel to Junction Avenue (Old First Street) is listed in the Countywide Bicycle Plan as “Financially Constrained” and “Next Highest Priority” for implementation. This 2.4 mile Segment (TD-75) is estimated in the Plan to cost \$1,879,488 in 2006 dollars, with funding for construction not currently allocated.

Appendix C-3 DESCRIPTION OF CROSS-COUNTY CORRIDORS

| Project: 35 | | Iron Horse Trail | | Corridor: 75 | | | | | | | | | | | | |
|-------------|----------------|------------------|-----------------------------|-----------------------------|----------------|-------|--------------------------|---------------------|----------------|----------|----------------|-------------------|-----------------------|---------------|-------------------------|---------------|
| Segment | City | Roadway | From | To | Length (miles) | Exist | Recommended Bikeway Type | Improve Interchange | Install Signal | Location | Improve Grates | Improve RR Tracks | Arterial Improvements | Total Cost | Financially Constrained | High Priority |
| TD | Livermore | Iron Horse Trail | Livermore city limit - west | Junction Ave | 2.3 | No | Class 1 - Bike Trail | | | | | | | \$1,879,488.0 | Yes | |
| TD1 | Livermore | Iron Horse Trail | Junction Ave | Livermore city limit - east | 4.1 | No | Class 1 - Bike Trail | | | | | | | \$2,819,232.0 | | |
| TE | unincorporated | Iron Horse Trail | Livermore city limit - east | San Joaquin County line | 10.9 | No | Class 1 - Bike Trail | | | | | | | \$7,048,060.0 | | |



Bicycle Corridor Priorities
Alameda Countywide Bicycle Plan, 2006

2.5 Alameda County Flood Control & Water Conservation District, Zone 7

The Zone 7 Water Agency is a part of the Alameda County Flood Control and Water Conservation District, and is responsible for providing flood control and water resources to the Livermore-Amador Valley. The California Legislature created the overall County Flood Control District in 1947 and Zone 7 was formed by a vote of local residents in 1957. The Zone 7 service area includes the cities of Pleasanton, Dublin, Livermore, the Dougherty Valley, and unincorporated Alameda County. The mission of Zone 7's flood control section is to "provide for the control of flood and storm waters and for the protection of life and property from damage or destruction of such waters."

Zone 7 owns and maintains about 39 miles of flood control channels, ranging from trapezoidal shaped concrete lined channels to natural creeks. In the Study Area, channels managed by Zone 7 include Arroyo Mocho, north of Stanley Blvd., and Arroyo Las Positas/Arroyo Vista/Arroyo Seco in eastern Livermore. Potential trail alignments could be located on or adjacent to these creeks and channels along existing maintenance roads, subject to agreement for liability and maintenance of trail facilities. Utilization of existing creek crossings to enhance trail connections near the railroad tracks is a valuable consideration.

In 2006, Zone 7 completed the Stream Management Master Plan (SMMP), as part of a comprehensive Streamwise Program for waterway improvements. The SMMP includes three potential projects that are within the study area, where recreational and non-motorized trail projects are under consideration as ancillary projects related to future flood control and habitat restoration improvements.

Zone 7 Stream Management Master Plan and Stream Management Master Plan Master Environmental Impact Report, August 2006. The SMMP is a Master Plan document that provides the framework for implementation of regional flood protection over approximately 426 square miles within Zone 7's service area within the Upper Alameda Creek Watershed. Zone 7 developed the SMMP to replace the 1966 Flood Control Master Plan and to guide a multidisciplinary approach to flood protection and stream management within the Zone 7 service area. The SMMP is a master plan that addresses flood protection and drainage issues, as well as other issues affecting management of streams and arroyos. The SMMP evaluates flood protection, as well as other resource values affected by stream management and identifies opportunities for other local agencies and Zone 7 to collaborate on mutually beneficial management activities. The SMMP focuses on six resource areas: Flood Protection and Drainage, Erosion and Sedimentation, Water Supply, Water Quality, Habitat and Environment and Recreation, Trails and Public Education. Trails goals and objectives include:

Goal: Promote recreational, alternative transportation, and public education opportunities along streams and the Chain of Lakes

- Objectives:*
- A. *Promote community involvement in stream stewardship*
 - B. *Provide educational opportunities for students and the general public.*
 - C. *Cooperate with local and regional agencies to implement appropriate recreational features along streams and the Chain of Lakes.*
 - D. *Promote trails and recreation features that provide connectivity to existing or future planned trails, and recreational areas or facilities.*
 - E. *Protect or enhance visual resources along streams.*
 - F. *Incorporate public safety measures into recreational features along streams and Chain of Lakes.*

G. *Promote the expansion of trails to develop alternative, non-motorized transportation corridors along the streams and arroyos.*

Regarding trails and recreation on Zone 7 lands, the SMMP states:

Zone 7 believes that an educated public will help protect the watershed and groundwater basin. There are several education and outreach programs in existence. In 1984, the Zone 7 Board of Directors decided to make available to local parks and recreation provider agencies, its right-of way along streams to include recreational opportunities and open space. There are many proposed trails in the SMMP and coordination with local interest groups, schools and recreation agencies is an important element in the plan.

There are two creek reaches within Zone 7's jurisdiction that are within the Study Area for the Livermore IHT. **Reach 2** is located in northeast Livermore and continues east adjacent to Lawrence Livermore National Laboratories (LLNL). This reach is highly urbanized with little existing habitat. It includes the realigned Arroyo Las Positas and Arroyo Seco, owned by the City of Livermore. The realigned Arroyo Las Positas north and west of LLNL has problems with high velocity and erosion. **Reach 3** is located south/west of Reach 2, and includes the section of Arroyo Mocho between Isabel and Murrieta. Arroyo Mocho is an important area for groundwater recharge in Zone 7, and fish barriers are an impediment to habitat enhancement in this reach. Reach 3 has an extensive trail system south of Stanley and is identified as having potential for extension upstream for additional recreational access.

There are three projects in the SMMP that include trails which could be utilized as parts of, or connections to, the Iron Horse Trail. These include:

- Project R2-1, Velocity Control Project, Realigned Arroyo Las Positas
- Project R2-3, Arroyo Seco Trail Project, and
- R3-5, Fish Barrier Removal at Stanley Boulevard and Railroad Overcrossing

SMMP project descriptions are included below. Since these are preliminary concepts, and Zone 7 staff has indicated that restoration and trails projects could be located on either side of the channel, depending upon precise channel restoration plans and trail connection needs. Utilities within the corridor will also affect trail and creek designs for these areas.

The following information has been abstracted from Zone 7's SMMP for these projects, and the funding allocation and implementation timeline has not been established for these projects.

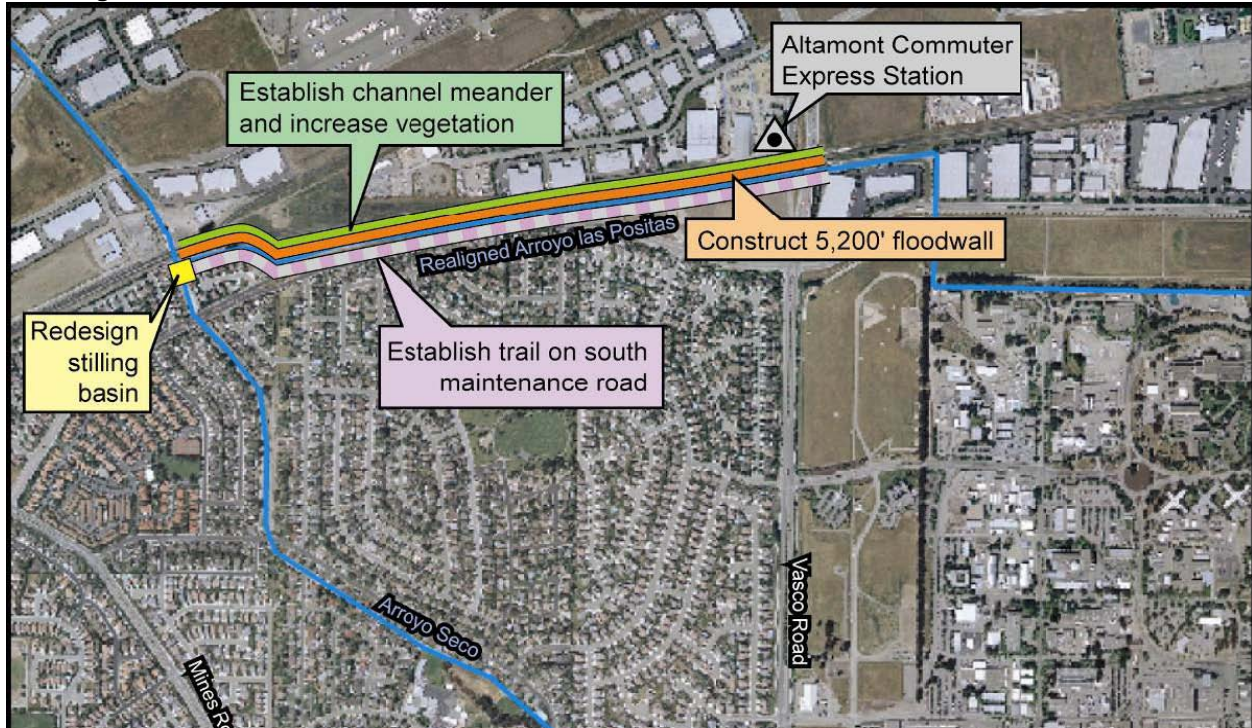
SMMP Trails Operation and Maintenance. In correspondence with Joe Seto of Zone 7 (May 11, 2006) regarding the EIR for the SMMP, Mr. Timothy Barry of LARPD indicated that creek restoration and trails projects need to be coordinated to ensure that there is consistency in the development, operation and management of trails within Livermore. He states:

The community's current trail system (Livermore/Murray Township) is fragmented between three agencies without any significant coordination between the agencies for the maintenance, operations, and regulation enforcement of existing trails. The SMMP proposed to further increase that fragmentation. It is the District position that Zone 7 should not be operating recreational trails in District's service area. However, with the development of new trails, there is a need for ongoing funding to provide for the operations and maintenance of these new facilities. The District is willing to maintain and operate these new facilities, but will not accept new responsibilities without adequate funding for maintenance and operations.

Implementation of trails within Zone 7 lands and in conjunction with flood control and creek restoration projects therefore needs to be carefully coordinated and adequately funded to ensure long term trail viability.

SMMP Project Number R2-1

Velocity Control Project, Realigned Arroyo Las Positas, from confluence with Arroyo Seco to Patterson Pass Crossing



SMMP Project Number R2-1 Location

Purpose: Flood protection along Realigned Arroyo Las Positas.

- Address in-stream and bank erosion due to high velocity flood flows.
- Create links to regional trails.

Project Components:

1. Construct 5,200 feet long, 4 feet high floodwall along the south bank of Realigned Las Positas from confluence with Arroyo Seco (STA 0+00) to Shelley Street (STA 52+00).
2. Construct velocity/erosion control measures (STA 62+00 to 10+00), including:
 - Channel meander along 5,200' of Realigned Arroyo Las Positas channel.
 - Channel meander dimensions 7,800 feet (1.25 x existing channel length of 5,200 feet).
 - Rock vane downstream of channel meander.
 - Reconfiguration of concrete weir stilling basin to provide better energy dissipation.
 - Increased vegetation along the channel sloped and banks.
3. Establish 5,300 feet of trail on existing south maintenance road from Vasco Rd (STA 53+00) to confluence with Arroyo Seco (STA 0+00) to be linked to Regional Trails Project R.2-3.

Capital Cost Estimate: \$19,390,000

Implementation Issues:

- Space constraints and potential utility conflicts.
- Permitting in compliance with CWA Section 401/404.
- Special-status species permit coordination.
- Coordination with City of Livermore and LARPD on trail development.
- This area designated as critical habitat for CRLF.

Project Precursors:

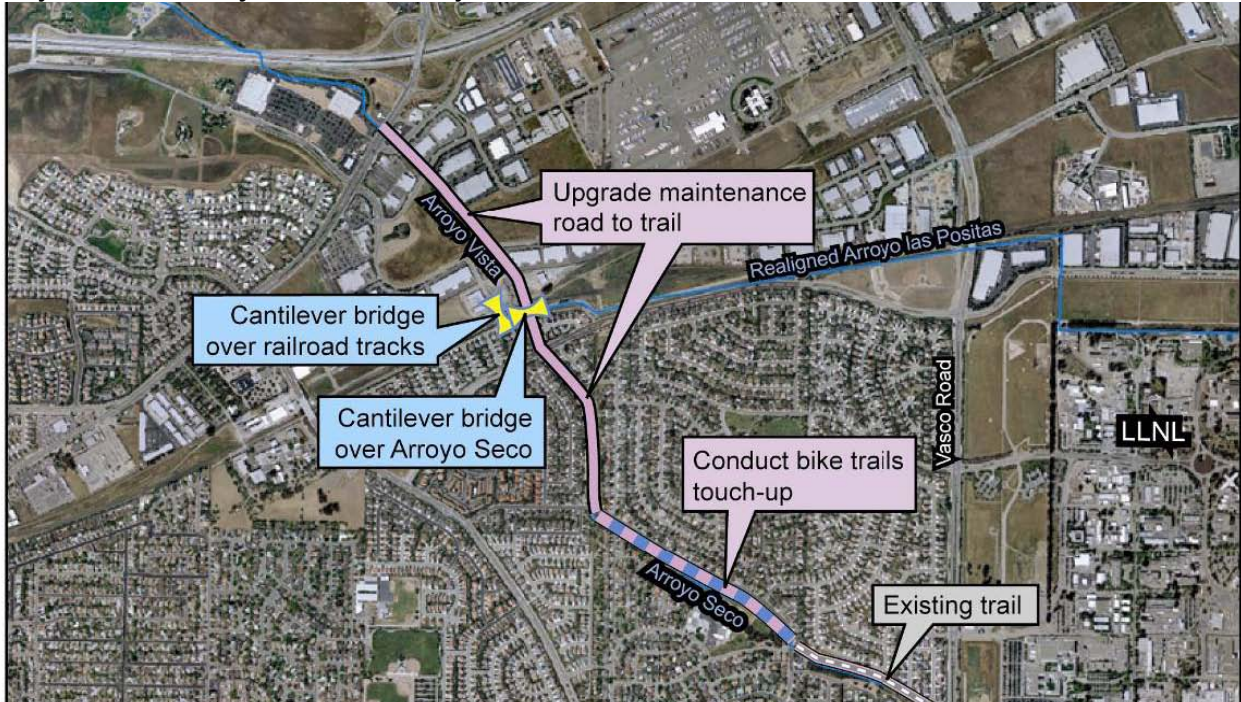
- Hydrologic/hydraulic/geomorphic modeling.

Project Benefits:

- Remove area along realigned Arroyo Las Positas from FEMA 100-year flood zone.
- Reduces erosion.
- Improves riparian conditions through re-vegetation.
- Provides regional trail connectivity.
- In combination with Regional Trails Project R.2-5, provides non-vehicular travel between neighborhoods, transit centers (Altamont Commuter Express Vasco station), and job centers.

SMMP Project Number R2-3

Project Name: Arroyo Seco Trail Project



SMMP Project Number R2-3 Location

Purpose: Create a system of regional trails.

Project Components:

1. Upgrade 6,000 feet of maintenance road to trail along Arroyo Seco (STA 105+00 to 45+00).
2. Conduct bike trail touch-ups on existing bike trails along Arroyo Seco from the first to the second Charlotte Way crossings (STA 130+00 to 110+00).
3. Construct a cantilever bridge to route the Arroyo Seco trail over the railroad tracks.
4. Install two signs for safety at each side of the cantilever bridge¹.
5. Construct a cantilever bridge over Re-aligned Arroyo Las Positas (STA 0+00) to tie-in to Arroyo Seco trail.
6. Acquire approximately 0.35 acres of land for bike trail touch-ups (2,000 feet x 8 feet).

Capital Cost Estimate: \$1,650,000

Implementation Issues:

- Coordinate with Southern Pacific to obtain permissions to cross railroad right of way (ROW).
- Coordination with LARPD, the City of Livermore and other agencies with responsibility over public safety.

¹ It should be noted that the “cantilever bridge” over the railroad tracks would need to provide 26 feet of vertical clearance and that at-grade signalized crossings are discouraged by the PUC; alternative designs will likely be needed, with incrementally greater costs.

Project Precursors:

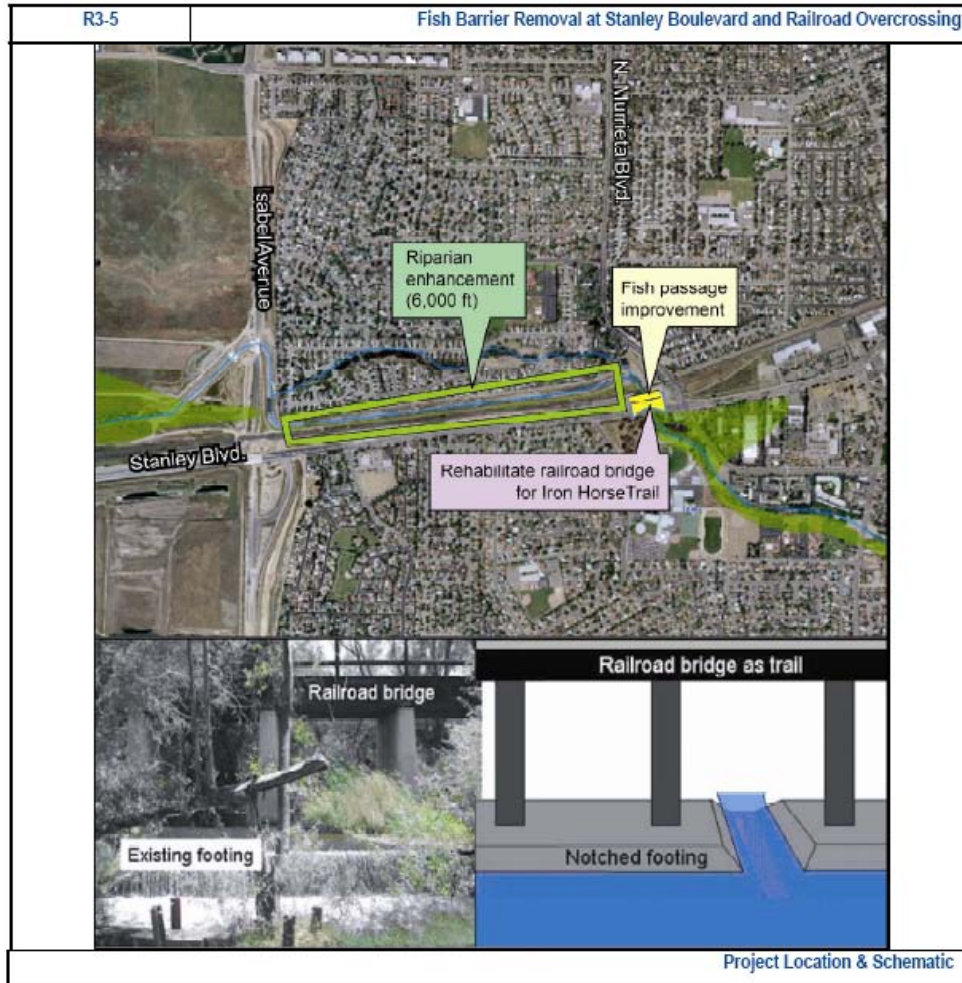
- Develop liability and use agreement for use existing maintenance roads as trails.

Project Benefits:

- Provides regional trail connectivity.
- In combination with the Velocity Control Project R.2-2, provides non-vehicular travel between neighborhoods, transit centers (Altamont Commuter Express Vasco station), and job centers.
- Increases public awareness of streams.

SMMP Project Number R3-5

Fish Barrier Removal at Stanley Boulevard and Railroad Overcrossing Arroyo Mocho



SMMP Project Number R3-5

Purpose: Arroyo Mocho has been identified as a future corridor for steelhead migration. The purpose of this project is to restore Arroyo Mocho as a fish migration corridor by removing a fish barrier at the abandoned railroad ROW crossing near Stanley Blvd (STA 409+00), and improving riparian habitat along Arroyo Mocho from Stanley to Isabel Avenue.

Project Components:

1. Modify railroad bridge footing for fish passage purposes. Modification will include removal of a portion of concrete slab and addition of appropriate energy dissipation features (STA 409+00).
2. Rehabilitate abandoned railroad bridge as part of Iron Horse Trail (STA 409+00).

3. Conduct approximately 6,000 feet of riparian enhancement along both banks of realigned Mocho (flood control channel) from Stanley Blvd to the Isabel Bridge crossing (approximately 8.3 acres).

Capital Cost Estimate: \$7,870,000

Implementation Issues:

- Cost/Benefit ratio needs to be analyzed
- Coordination with Southern Pacific Railroad, LARPD, Caltrans, CDFG, RWQCB
- Permitting in compliance with Clean Water Act Section 401/404

Project Precursors:

- Analysis of structural needs of the railroad bridge and feasibility of removing a section of the footing.

Project Benefits:

- Relieve major fish barrier along Arroyo Mocho
- Alleviates local sediment accumulation
- Increases regional connectivity by providing an off-road stream crossing
- Improved habitat conditions along Mocho between Stanley Blvd and Isabel Ave

2.6 Caltrans Highway 84 Widening Project

The California Department of Transportation, in cooperation with ACTIA and the City of Livermore, have developed a current proposal to widen and upgrade State Route (SR) 84 to expressway standards (55 miles per hour) from Ruby Hill Drive to Jack London Boulevard in eastern Alameda County, California. The purpose of the project is to improve SR 84 as a regional route, improve traffic circulation, upgrade SR 84 to an expressway facility, and improve bicycle and pedestrian access. The Initial Study for this project (EA 297600, October 2007) includes a discussion of potential trail connections along Isabel and at Stanley. In this area, Hwy 84 would be widened to six lanes, primarily by widening the highway west of its current configuration. The existing bridge structure at Arroyo Mocho would be widened, and a separate bridge would be provided (as part of the project) on the west side of the highway to facilitate access to Arroyo Mocho and existing PG and E facilities on the south side of the realigned channel.

The existing multi-use trail loop under Stanley and the railroad along Isabel is retained as part of the project, and will be critical to maintain grade-separated trail connections. If the IHT is at some point re-aligned west of Isabel to the north side of Stanley (and potentially along Arroyo Mocho/Quarry Lakes area), then a possible spur connection along the west side of Isabel should be considered, as well as use of a separate bridge across Arroyo Mocho to provide connections to trails at Oaks Business Park and Jack London Drive.

2.7 Railroads

Regulatory Authority. In addition to property ownership of the rail corridor, railroads are regulated by the Federal Railroad Administration as well as the California Public Utilities Commission (CPUC), which regulates railroad crossings, and enforces regulations 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. There are currently no pedestrian overpasses over the railroads within the Feasibility

Study Area, although there are road over railroad grade separations at North First Street, Mines Road and Vasco Road that provide sidewalk on at least one side. There are existing railroad over roadway grade separations at Livermore Avenue, P Street and Murrieta Blvd., for which a separate pedestrian/bicycle bridge would be needed to provide passage for IHT users parallel to the rail alignment at these locations.

A potential pedestrian/bicycle overpass in the vicinity of the Downtown Transit Center could be considered especially if passenger rail service is increased or High Speed Rail is implemented.

The California Public Utilities Code Section 1201-1220 further defines the authority of the Public Utilities Commission to regulate rail crossings. Section 1202 states:

“The commission has the exclusive power:

(a) To determine and prescribe the manner, including the particular point of crossing, and the terms of installation, operation, maintenance, use, and protection of each crossing of one railroad by another railroad or street railroad, and of a street railroad by a railroad, and of each crossing of a public or publicly used road or highway by a railroad or street railroad, and of a street by a railroad or of a railroad by a street.

(b) To alter, relocate, or abolish by physical closing any crossing set forth in subdivision (a).

(c) To require, where in its judgment it would be practicable, a separation of grades at any crossing established and to prescribe the terms upon which the separation shall be made and the proportions in which the expense of the construction, alteration, relocation, or abolition of crossings or the separation of grades shall be divided between the railroad or street railroad corporations affected or between these corporations and the state, county, city, or other political subdivision affected.

A private at-grade crossing currently exists west of Mines Road that serves the Hexcel property, which is slated for future residential development. The California Public Utilities Code Section 7537 regulates private railroad crossings in conjunction with General Order 75-D, making improvements at this intersection problematic:

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.

California High Speed Rail. The California High-Speed Rail Authority (Authority) is proposing a high-speed train system to provide a safe and reliable mode of travel that links major statewide metropolitan areas in the state. The Authority, in cooperation with the Federal Railroad Administration (FRA), released a final program environmental impact report/environmental impact statement (EIR/EIS) in September 2005 for the statewide high-speed train (HST) system. The Authority, with the FRA, has prepared a program EIR/EIS that further examines the San Francisco Bay Area to Central Valley region as the second part of programmatic analysis in the tiered environmental review process. This second program EIR/EIS generally describes the environmental impacts of a proposed HST system within the broad corridor between and including the Altamont Pass and Pacheco Pass.

The EIR/EIS is currently under review. MTC in October 2007 indicated a preference for routing the HSR through Pacheco Pass, which would eliminate the UPRR route through Livermore. However, MTC's recently adopted Regional Rail Plan contains policies to strengthen the use of existing rail corridors for rail use, including policies that preclude the conversion of unused rail corridors to trails. As discussed below, the trackage in Livermore is planned for expanded freight and improved passenger rail in addition to potential HSR routing.

In addition, regional rail planning for the ACE in San Joaquin and Alameda County indicates a long-term desire to move ACE off of UP trackage and to acquire their own ROW. This potentially includes purchasing the alignment east of Greenville Road (now owned by Alameda County) and reverting to rail use, as well as the northern UP alignment (ACE Corridor Analysis, 2007)

MTC Regional Rail Plan. This plan, adopted in September 2007, contains policies and programs for improving regional rail connections throughout the Bay Area. The Plan will look at improvements and extensions of railroad, rapid transit and high-speed rail services for the near- (5 to 10 years), intermediate- (10 to 25 years), and long-term (beyond 25 years). Plan components include:

- Improving the Bay Area's existing rail system
- Locations for new rail extensions and train stations
- Rail sharing between passenger and freight trains
- Planning for growth and building new homes near rail
- Evaluating initial rail concepts

Recommendations for rail in the Tri-Valley area, which may affect the location, design and implementation of the Livermore IHT (shown in **bold**), include two Alternatives:

Alternative 1:

Tri-Valley Corridor (I-580, I-680 & I-205 from East Bay to Tracy/Manteca)

- Upgrade UPRR route with **capacity and operational improvements to provide higher speed service** for regional trains to Central Valley; put SPRR alignment through Niles Canyon back in service to provide continuous second main between Niles Junction and Sunol;
- **Add trackage in Pleasanton and Livermore to provide two continuous main tracks; put SPRR alignment over Altamont Pass back in service and shift Altamont trains to former SPRR line;**
- Relocate Tracy station to downtown on former SPRR trackage and relocate Vasco Road station to provide intermodal with BART at Greenville Road / I 580
- Extend BART system along I-580 to intermodal with regional rail standard trains at Greenville Road interchange with added BART stop at Isabel / I-580

Alternative 2:

Tri-Valley Corridor (I-580, I-680 & I-205 from East Bay to Tracy/Manteca)

- Construct separate higher-speed regional passenger line from Stockton to Niles following former SPRR from Stockton to downtown Tracy with new crossing at Patterson Pass,

- **Separate trackage along UPRR alignment through Livermore and Pleasanton, and new tunnel from Sunol to Niles; services operate from Sacramento to San Jose and from Merced to Oakland**
- **Extend BART one stop via El Charro Road to new intermodal terminal with regional lines and buses at Isabel / UPRR**

Coordination with regional rail planners will be important to ensure that trail/rail conflicts are avoided, and that opportunities for trail implementation associated with rail improvements (such as placing the trail on adjacent utility easements or access roads) is included in the rail planning process.

3. Opportunities and Constraints

This Section of the Feasibility Study discusses opportunities and constraints to constructing a trail within, or near the UPRR corridor. Maps of these areas are found at the end of this Section (**Figures 1-1 through 4-5**).

Trail **opportunities** are improvements or elements that enhance, simplify or mitigate trail issues. Opportunities include:

- Available public right of way
- Few utilities or conflicts with fences and infrastructure
- Potential for connections to significant activity centers such as neighborhoods, schools, parks and retail areas
- Sufficient overhead clearance
- Adequate separation from adjacent uses
- No significant vegetation
- Separation from natural areas such as creeks or wetlands
- Adequate visibility
- Minimal elevation changes

Constraints are conditions that may hinder or delay trail implementation. These include:

- Lack of public right of way
- Significant utilities, utility crossings, or multiple jurisdictions within ROW
- Lack of overhead clearance
- Insufficient separation from adjacent uses, such as active rail line
- Trees, shrubs and landscaping within trail route
- Lack of separation from natural areas
- Inadequate visibility
- Significant elevation changes, including grade changes along bank/berm

**Table 3-1. Opportunities and Constraints
Segment 1: Isabel Avenue to Murrieta Boulevard**

| | |
|--------------------------------|---|
| Rail Corridor | A 100 ft. railroad right of way exists north of Stanley Boulevard between Isabel Avenue and Murrieta Boulevard, as well as an unused parallel rail alignment. A single-track rail line carrying UPRR freight and Altamont Commuter Express (ACE) passenger service is located at the north side of this ROW. |
| Roadways | <p>Stanley runs east-west and connects Livermore with Pleasanton to the west, including the Shadow Cliffs Regional Recreation Area approximately one mile west of the city limits. It has two lanes in each direction, plus turn lanes approaching the Isabel Avenue ramp signal.</p> <p>Isabel (CA-84) runs north-south under Stanley and the rail corridor, with two lanes and bike lanes in each direction. Isabel is Livermore's western city limit at this location.</p> <p>Murrieta runs north-south under the rail corridor at the east end of this segment, intersecting Stanley at a signal. It has two lanes in each direction but no bike lanes; bicycles may optionally use its elevated sidewalks under the railroad.</p> |
| Arroyo Mocho Channel | <p>North of the rail corridor, the Arroyo Mocho runs east-west in a constructed flood control bypass channel flanked by service access roads, owned and managed by Zone 7. The channel crosses east-west under Isabel north of Isabel's undercrossing of the rail corridor and Stanley, and the service roads end on the east side of Isabel. This section is a trapezoidal channel with no opportunities for ped/bicycle/service access under the Isabel Bridge in its current configuration.</p> <p>On the east side of this segment, Arroyo Mocho crosses north-south under the rail corridor and Stanley just west of Murrieta. Within Zone 7's lands, a clear-span bridge crosses the channel just west of its rail undercrossing near Murrieta providing access to the south service road. There is no public access to this area.</p> <p>A sediment removal basin and concrete weir extends across the channel just east of Isabel. This has been identified as a potential barrier to fish passage. This segment is identified in Zone 7's Stream Management Master Plan (Project R3-5) for restoration and enhancement, including:</p> <ul style="list-style-type: none"> ▪ Fish Passage Improvement ▪ Rehabilitate Railroad Bridge for Iron Horse Trail, and ▪ 6,000 ft. of Riparian Enhancement. <p>It is conceivable that IHT implementation could be combined with Zone 7 restoration projects, including placement of a trail within riparian enhancement areas to shade the trail and creek as well as provide ADA accessibility by improving the existing service road(s).</p> |
| Land Use | The area south of Stanley and east of Isabel is single-family residential. The area north of the Arroyo Mocho channel is single-family residential with a continuous soundwall between south edge and the channel's north service road. There are apartments along Murrieta. The northwest quadrant of Isabel / Stanley is vacant, with an office park planned. The southwest quadrant of the Isabel/Stanley crossing is a quarry area and shown as a future water storage lake area on Zone 7 planning maps. |
| Existing Trail Segments | <p>Three trail segments exist in this area.</p> <ul style="list-style-type: none"> ▪ The Iron Horse Trail runs along the south side of Stanley from Pleasanton, past Shadow Cliffs Regional Park, terminating at the southwest corner of the Isabel ramp signal, where the Isabel Avenue Trail to Jack London Boulevard also connects. The Isabel Avenue Trail south of Stanley connects to the signal's southeast corner, directly across the ramp. Stanley has a sidewalk on its south side to the east. ▪ The Isabel Avenue Trail runs along the east side of Isabel Avenue from the southwest corner of the city, across the Isabel ramp crosswalk at Stanley, then under Stanley and the rail corridor, to Jack London Boulevard approximately one mile north. ▪ The Arroyo Mocho Trail runs east-west through the neighborhood north of the Arroyo Mocho flood channel between Isabel and Murrieta, then crosses under the rail corridor and Stanley Boulevard before continuing in a southeasterly direction through the city. A paved spur along the Arroyo Mocho channel's north service road connects to the Isabel Avenue trail. |

| | |
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| <p>Required Connections</p> | <p>The new Iron Horse Trail in this segment should connect to:</p> <ul style="list-style-type: none"> ▪ The Isabel Avenue trail, which connects to the existing Iron Horse Trail. ▪ The Arroyo Mocho Trail at both ends of the neighborhood it traverses. ▪ Murrieta, north of its rail undercrossing and also at the Stanley signal. ▪ The existing Iron Horse Trail segment east of Murrieta. ▪ [Optional] Via Eucalyptus Court into the neighborhood along the Arroyo Mocho north service road. This could be a “neighborhood gate”, installed and operated at the neighborhood request. |
| <p>Plans and Studies</p> | <p>Several planned projects and planning documents address this segment:</p> <ul style="list-style-type: none"> ▪ Caltrans plans to widen Isabel to six lanes under the rail corridor and Stanley. ▪ The City of Livermore plans to widen Stanley Boulevard to six lanes between Murrieta Boulevard and Isabel Avenue ▪ Alameda County Flood Control District Zone 7’s Stream Management Master Plan (SMMP) proposes to modify the Arroyo Mocho channel between Isabel and Murrieta, continuing south of Murrieta. On one side the service road would be replaced by terraces for improved flood capacity (at present, design has not been finalized regarding which side). ▪ West of Isabel and south of Jack London, an office park is planned with north-south trail connections to the Arroyo Mocho channel west of Isabel. ▪ The Bay Area Regional Rail Plan envisions possible High Speed Rail service within the corridor, on an elevated structure on some segments. ▪ East Bay Regional Parks District (EBRPD) envisions a long-term alignment of the Iron Horse Trail west of Isabel along the Arroyo Mocho, i.e. north of Stanley and away from the rail corridor. The Trail would cross Stanley at a signal that serves the Shadow Cliffs recreation area. ▪ Zone 7’s Stream Management Master Plan (SMMP) envisions the Iron Horse Trail running between the north side of Stanley Boulevard and the south side of the Arroyo Mocho channel. The SMMP also envisions modifications to the abandoned railroad bridge over the natural channel between the active rail corridor and Stanley, near Murrieta. |
| <p>Opportunities</p> | <p>The existing grade separated Isabel Avenue Trail segment crosses under Stanley Boulevard and the rail corridor.</p> <p>Between Isabel and the Arroyo Mocho Trail undercrossing of Stanley near Murrieta, the Arroyo Mocho Channel access roads provide a good alignment.</p> <p>The existing Arroyo Mocho Trail undercrossing of the rail corridor near Murrieta provides a way to cross back under the tracks before continuing east.</p> <p>There is an opportunity to develop a small trailhead park in the city-owned parcel bounded by the rail corridor, Murrieta, Stanley, and the Arroyo Mocho.</p> |
| <p>Issues and Constraints</p> | <ul style="list-style-type: none"> ▪ Need to secure agreement with Zone 7 for use of access roads and optionally a bridge for trail purposes ▪ Grade differences between the Isabel Avenue underpass and the west end of the Arroyo Mocho Channel segment, and at the Arroyo Mocho undercrossing of the rail corridor will constrain the location and alignment of connections between trails. ▪ Suitability of existing Arroyo Mocho crossing under tracks near Murrieta. |
| <p>Iron Horse Trail Alignment Options</p> | <p>The Iron Horse Trail segment would likely be located north of the railroad tracks on one of the Arroyo Mocho channel service roads. It would most likely use the existing Arroyo Mocho Trail undercrossing of the rail corridor before continuing east through Downtown along the south side of the rail corridor.</p> <p>Sharing the existing Arroyo Mocho Trail alignment through the neighborhood north of the Arroyo Mocho channel would be inappropriate due to the faster bicycle traffic expected on a regional trail.</p> <p>Aligning the Iron Horse Trail between the rail corridor and Stanley would increase noise and vehicle emission impacts to Trail users compared to an alignment on one of the Arroyo Mocho channel service roads. The preferred service road alignment should be along the north side of the Arroyo Mocho Channel to facilitate connections to the existing neighborhood trail system and the Stanley Trail.</p> |

Segment 1, Isabel Avenue area



Photo 1.1: Existing Iron Horse Trail along south side of Stanley Boulevard west of Isabel Avenue
View: Facing west toward Pleasanton
Opportunities: Area to the left (south of Stanley) is planned for water storage lakes by Zone 7.
Notes: Zone 7 plans show Iron Horse Trail relocated from along Stanley Boulevard to along the Arroyo Mocho channel north of the rail corridor.
See Figure: 1-1, 1-2



Photo 1.2: Existing loop ramp connecting eastern terminus of existing Iron Horse Trail just east of Isabel Avenue, to Isabel Avenue Trail running under Stanley Boulevard and rail corridor.
View: Looking east along south side of Stanley Boulevard bridge over Isabel Avenue.
Notes: Isabel Avenue Trail continues along the east side of Isabel south of Stanley.
See Figure: 1-2

Segment 1, Murrieta Boulevard end of Arroyo Mocho channel



Photo 1.3: Zone 7 north service road along Arroyo Mocho channel
View: Facing west where Arroyo Mocho Trail diverges to the north into neighborhood
Opportunities: Consider improving the open area bounded by the trails, the neighborhood, the rail corridor and Murrieta Boulevard as a city park.
Notes: This area is well used by walkers and bicyclists, individually and in groups.
The tree-shaded ambiance of the Arroyo Mocho Trail through the neighborhood encourages slower speeds, whereas the Iron Horse Trail along the channel would be favored by through bicyclists.
See Figure: 1-3



Photo 1.4: Zone 7 bridge over Arroyo Mocho channel just east of Murrieta Boulevard, connecting north and south service roads.
View: Facing south from north service road. Rail corridor visible beyond.
Opportunities: Trail crossing point across channel if Iron Horse Trail is aligned on south service road.
See Figure: 1-3

Segment 1, Railroad bridges across Arroyo Mocho Trail



Photo 1.5: Arroyo Mocho Trail undercrossing of active UPRR / ACE rail corridor
View: Facing north (Zone 7 service road bridge visible behind rail bridge support at left)
Opportunities: Widen trail by rebuilding east embankment (right side of photo). Iron Horse Trail would extend east across Murrieta Boulevard from just south of this point.
Constraints: Provide 10' clearance under bridge (12' if equestrian use is anticipated). Flooding during storms may necessitate "storm closure" policy.
See Figure: 1-3



Photo 1.6: Arroyo Mocho Trail under abandoned rail bridge north of Stanley Boulevard.
View: Facing south.
Opportunities: Remove bridge if not needed for access to area to the west (north of Stanley, south of rail corridor)
Constraints: Expense of removing or modifying structure
See Figure: 1-3

Segment 1, Murrieta Boulevard crossings



Photo 1.7: Railroad bridge across Murrieta Boulevard
View: Facing east. Senior apartment complex across Murrieta visible at upper right.
Opportunities: Add path bridge across Murrieta. Connect to Arroyo Mocho Trail to west and to the northwest corner of the Stanley / Murrieta signal to the south.
Constraints: Murrieta ramps up toward Stanley, however there appears to be ample clearance for a path bridge to clear the roadway by 15 feet or more. Several trees would be removed.
See Figure: 1-3



Photo 1.8: Apartment complex driveway on west side of Murrieta Boulevard north of railroad bridge.
View: Facing east, gate of private cul-de-sac visible across Murrieta.
Opportunities: Several east side cul-de-sacs connect to Murrieta's east sidewalk either via public walkways or private gates. Access to IHT can be accommodated via stairs or ramp near Stanley Blvd.
Constraints: Existing spur path from Arroyo Mocho Trail intersects Murrieta's west sidewalk south of the apartment driveway, but that location is impractical for a crosswalk due to the northbound left turn pocket serving the driveway.
See Figure: 1-3

**Table 3-2. Trail Opportunities and Constraints
Segment 2: Murrieta Boulevard to Junction Avenue**

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| Rail Corridor | A railroad right of way approximately 100' in width runs along the north (rear) edge of developments along the north side of Stanley Boulevard. Two tracks carry UPRR freight and Altamont Commuter Express (ACE) passenger service. |
| Roadways | Stanley Boulevard runs east-west, splitting west of P Street into Railroad Avenue and First Street, both of which continue east. Railroad Avenue is closest to the rail (and Trail) corridor. L Street, P Street, and Livermore Avenue intersect Stanley / Railroad Avenue from the north. L Street crosses the rail corridor at grade. P Street and Livermore Avenue cross under the rail corridor. Junction Avenue runs northwest-southeast north of the rail corridor, and ends one block south of the rail corridor at Old First Street. |
| Land Use | The area between the rail corridor and Stanley / Railroad / Old First Street is largely one-story commercial, with a mix of larger buildings such as grocery and furniture stores, and small buildings such as banks and offices. Several parcels have been redeveloped as multi-story apartment and townhouse complexes. More redevelopment is planned, including residential development at the bowling alley on the east side of P Street. Between Livermore Avenue and Junction Avenue is a parking garage serving the downtown ACE station, the performing arts center, and the LAVTA bus center. |
| Existing Trail Segments | Two lengths of the Iron Horse Trail have been constructed in this segment. <ul style="list-style-type: none"> • Behind the senior apartment complex just east of Murrieta. • Behind the townhouse development between North N Street and L Street. |
| Opportunities, Plans and Studies | Several planned projects and planning documents address this trail segment: <ul style="list-style-type: none"> • The bowling alley east of P Street will be redeveloped into town homes. Its redevelopment plan includes a trail easement. • The Bay Area Regional Rail Plan envisions possible High Speed Rail service within the rail corridor, possibly on an elevated structure. • The City plans to relocate the historic railroad station building, currently located on a nearby site south of Railroad Avenue, to the south side of the rail corridor just east of the parking garage. One alternative would place it adjacent to the tracks; another would place it within the bus station loop. <p>Many existing land uses and most proposed land uses provide for internal north-south walkways between the rail corridor and Railroad Avenue.</p> |

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| <p>Issues and Constraints</p> | <p>There is currently no crosswalk adjacent to the south side of the rail corridor at P Street.</p> <p>The railroad bridges across L Street and Livermore Avenue have insufficient width for adding a parallel path along the south side of the corridor while providing the required separation from the active rails.</p> <p>There is minimal clearance for a trail between the rail corridor and the rear service driveway that accesses Dollar Tree's rear loading dock.</p> <p>Just east of L Street, a small building is close to the tracks.</p> <p>A line of mature redwood trees defines the north edge of the Bank of America parking lot at 1748 Railroad Avenue, just west of North N Street. There is insufficient width for a trail between these trees and the rail corridor. An easement will have to be obtained through the north edge of the lot, and the lot's circulation may have to be modified to accommodate the Trail.</p> <p>South Oak Street runs parallel to the railway between North K Street and Livermore Avenue. There is minimal room for adding a trail along its north edge. It may be possible to narrow the street without affecting its commercial access function or development potential along its south side.</p> <p>There is no width to align the Trail at ground level between the ACE platform and the parking garage. The Trail may have to be elevated above the platform or rerouted elsewhere.</p> <p>Adding the trail along the bus station would require removing landscape, relocating several lightoliers, and possibly narrowing the loop roadway slightly if that is possible without impeding bus turning movements.</p> <p>An easement may be required along the parcel on the west side of Junction Avenue.</p> |
|--------------------------------------|--|

Segment 2, Murrieta Avenue to South S Street



Photo 2.1: Existing Iron Horse Trail along senior apartments between Murrieta and Fenton
View: Facing west (toward Murrieta)
Opportunities: White stripe could be removed to improve operation when this segment connects to the west and east.
Constraints: Gate(s) swing into paved area of path. Gate(s) could be modified to slide along fence.



Photo 2.2: Parking lot and loading dock area behind 1070 Stanley Boulevard, just east of the senior apartments shown in Photo 2.1.
View: Facing east.
Opportunities: Landscape buffer area in foreground has ample width for Trail.
Constraints: Configuration of loading dock and driveway behind warehouse currently provides no width for Trail. If this building is to remain, consider:

- Moving the loading dock to its west wall (upper right)
- Reconfiguring the north (rear) wall loading operations to side-loading
- Removing the driveway between the warehouse

Segment 2, Behind Dollar Tree and Trader Joe's



Photo 2.3: Loading dock behind Dollar Tree; railroad corridor to the right.
View: Facing west (toward Murrieta)
Opportunities: N/A
Constraints: No width for Trail. No obvious way to reconfigure loading dock to provide width. If this building is to remain, the loading dock may have to be relocated to a different side.



Photo 2.4: Behind Trader Joe's – vacant garden sales area. Railroad corridor is to the right.
View: Facing west (toward Murrieta)
Opportunities: If freestanding brick enclosure is removed, there may be sufficient width to align the Trail along the property fence.
Constraints: Walled area reduces available width for trail to be constructed beside rear driveway.

Segment 2, P Street undercrossing



Photo 2.5: Kragen Auto parking lot on west side of P Street. P Street's raised west sidewalk is visible through the fence, and the roadway to its left.

View: Facing south toward Railroad Avenue

Opportunities: Trail spur to northwest corner of P Street / Railroad Avenue signal could run along fence, replacing several parallel parking stalls (white car occupies one of these stalls). There appears to be sufficient remaining paved width between these stalls and the east face of the building for primary fire access.

Constraints: Need for removal of some parking stalls along fence.

See Figure: 2-1



Photo 2.6: P Street undercrossing of railroad corridor, showing raised walkway between street level and surrounding surface (railroad) grade. This arrangement is also used at Murrieta Boulevard and Livermore Avenue.

View: Facing east through Kragen Auto parking lot fence, toward bowling alley property

Opportunities: Trail bridge can be added adjacent to railroad bridge while maintaining adequate clearance to roadway below.

Staircases can be added between the raised sidewalks and the top of the embankment, on both sides of the street to provide a shorter travel path for able-bodied pedestrians.

Constraints: Trees adjacent to railroad bridge would have to be removed. Two electrical cabinets are at the top of the embankment on the east (bowling alley) side.

See Figure: 2-1

Segment 2, P Street to N Street



Photo 2.7: Northwest corner of bowling alley parking lot, at fence along P Street's east embankment. Railroad right of way is immediately to the right, out of view.
View: Facing west across P Street (Kragen Auto building visible at top left)
Opportunities: Sufficient width to place trail bridge between electrical cabinets and railroad bridge.
Constraints: Electrical cabinets on P Street side of fence (center left in photo)
See Figure: 2-1



Photo 2.8: Bank of America parking lot, back edge.
View: Facing west from N Street
Opportunities: Parking lot – especially rear edge – appears to be underused for current (bank) land use
Constraints: Attractive line of mature redwood trees along railroad fence.
Trail easement through parking lot would be needed.

Segment 2, N Street to L Street



Photo 2.9: Existing trail segment through Railroad Depot condominium complex
View: At midpoint of development beside internal crosswalk, facing east (toward L Street)
Opportunities: Extend trail along railroad edge when an easement can be acquired from the owner of the NE corner property at L Street, currently occupied by an equipment rental business.
Constraints: Business at NE corner of development site currently blocks trail from direct alignment along railroad ROW. Temporary alignment follows project's internal driveways.
See Figure: 2-2



Photo 2.10: Temporary alignment of Trail at east end of Railroad Depot condominium complex
View: Facing east. L Street is just beyond the construction fence. Equipment rental business is behind wall at left.
Opportunities: Shift alignment from this driveway to along railroad when easement is available.
Constraints: While temporary alignment is in effect, trail users would follow L Street's west sidewalk in front of equipment rental business.
See Figure: 2-2

Segment 2, L Street crossing



Photo 2.11: L Street at rail line

View: Facing south (toward Railroad Avenue)

Opportunities: Just south of the railroad, L Street currently has four lanes and no center lane (as shown). It could be restriped to create a median refuge for a pedestrian crossing.

Constraints:

- a) Pedestrian crossing would need to be beyond railroad gates.
- b) Operation of a pedestrian warning device or pedestrian signal adjacent to the railroad would need to be coordinated with the existing railroad signal, or located sufficient distance away as a separate crossing, or located at street intersection
- c) Asphalt walkways across railroad tracks have gaps along concrete flangeway blocks.

See Figure: 2-2



Photo 2.12: L Street at-grade crossing area – existing conditions on both sides of street. Foreground driveway is 30' wide, planter is 5' wide.

View: Facing west from parking lot on east side. Fence at right is along RR ROW.

Opportunities: If an easement can be acquired along the fence through the foreground property, removing the planter and narrowing the adjacent driveway may provide the width needed for the trail while retaining two-way access for business and emergency purposes.

Constraints: Existing driveways and parking lots on both sides of street.

See Figure: 2-2

Segment 2, L Street to Livermore Avenue



Photo 2.13: Parcel on NE corner of L Street / railroad intersection
View: Facing east from L Street
Opportunities: Landscape area along railroad fence occupies part of width needed for trail
Constraints: Insufficient width to align trail along fence without modifying parking lot.
Building along railroad blocks desired trail alignment beyond parking lot.
See Figure: 2-2



Photo 2.14: Rail corridor between L Street and South Oak Street
View: Facing west (toward L Street)
Opportunities: N/A
Constraints: Existing commercial building (behind wall) blocks trail alignment along rail ROW.
See Figure: 2-2

Segment 2, L Street to Livermore Avenue



Photo 2.15: Middle of block between L Street and K Street

View: Facing east (toward K Street)

Opportunities: Possible temporary alignment of trail until easement along railroad ROW is acquired. If parcels are assembled for redevelopment, Opportunity to replace circulation through parking lot near railroad ROW with internal circulation, freeing up area near rails for trail.

Constraints: Small parcels with no through circulation between L and K Streets. Need to assemble a larger parcel if redevelopment is anticipated.

See Figure: 2-2, 2-3



Photo 2.16: Railroad corridor along Oak Street South

View: Facing east (toward Livermore Avenue). Oak Street South is to the right.

Opportunities: Trail may be added along outside of railroad fence by narrowing Oak Street South.

Constraints: Need to preserve access along Oak Street South.

See Figure: 2-2, 2-3

Segment 2, Livermore Avenue and Parking Garage



Photo 2.17: Livermore Avenue undercrossing of railroad corridor

View: Facing west from NW corner of parking garage. City-owned vacant parcel in foreground. Landscaped area is depressed roadway.

Opportunities: a) Add path bridge across Livermore Avenue adjacent to railroad bridge. Livermore Avenue has a median where a bridge support pillar can be located.
b) Add spur paths from path bridge to Railroad Avenue signal (off left side of photo).
c) Add stairways from path spurs down to Livermore Avenue's elevated sidewalks.

Constraints: Existing west side frontage road (Oak Street South) limits options for pedestrian plaza.

See Figure: 2-4

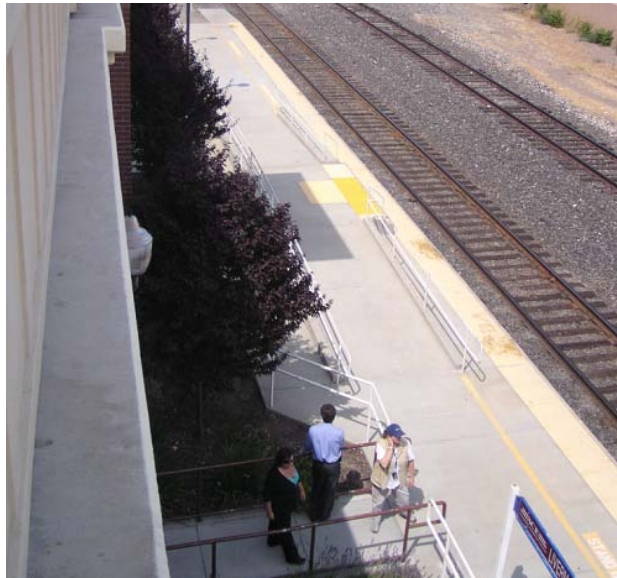


Photo 2.18: Livermore (Downtown) ACE station

View: Looking west from top (third) deck of parking garage. Note raised platform area for wheelchair boarding, with pedestrian bypass behind.

Opportunities: Integration of pedestrian tunnel option shown on High Speed Rail station plans to also provide access to the Trail from the north side of the rail corridor.

Constraints: Existing platform occupies the width that would be needed for a surface trail. Mixing trail and rail boarding operations in this space would not be safe. The width between the boarding platform and face of garage structure is approximately six feet at minimum, which is insufficient width for a Class 1 trail and needed clearance shoulders.

b) HSR plan's "Livermore Station Option 2: Section AP 23.2" shows center-boarding platforms replacing the existing outside (south side) platform, and a possible pedestrian tunnel.

See Figure: 2-4, Appendix

Segment 2: Junction Avenue



Photo 2.19: Junction Avenue Crossing
View: Facing west from west side of Junction Avenue
Opportunities: Property on southwest corner (left side of photo) is vacant along railroad fence
Constraints: Easement may be needed along south side of tracks to connect to bus station, or implemented as part of site redevelopment.
See Figure: 2-5

**Table 3-3. Trail Opportunities and Constraints
Segment 3: Junction Avenue to Arroyo Las Positas channel**

| | |
|---|--|
| Rail Corridor | The railroad right of way runs between mostly large-lot commercial land uses on the north side, and residential developments on the south side. Two tracks carry UPRR freight and Altamont Commuter Express (ACE) passenger service. |
| Roadways | Railroad Avenue runs east-west, ending at First Street. Livermore Avenue intersects Railroad Avenue from the north after crossing under the rail corridor. Junction Avenue crosses the rail corridor at grade on an angled alignment, terminating at Old First Street, which connects to First Street. Old First Street terminates a short distance east of Junction Avenue. First Street runs north-south and passes over the rail corridor on a high roadway bridge. Trevarno Road, a residential street, runs north-south and intersects the rail corridor from the north at an at-grade crossing serving the Hexcel Corporation site. Mines Road runs north-south and passes over the rail corridor on a high roadway bridge. East of the Arroyo Las Positas channel, Las Positas Road runs roughly east-west to the north of the north (unused) rail corridor. East of Mines Road, Patterson Pass Road runs roughly east-west to the south of the south (ACE/UPRR) rail corridor. |
| Land Use | The area between the rail corridor and Railroad Avenue is occupied by a large vacant parcel along the east side of Livermore Avenue, a multi-story parking garage at the ACE rail station platform area, a bus station with a one-way clockwise driveway, and a commercial parcel at Junction Avenue. |
| Existing Trail Segments | None of the Iron Horse Trail has been constructed in this segment. |
| Required Connections | If the Trail runs along the north side of the corridor, connections should be made to the Scott Street / First Street signal, to Trevarno Road, and to the Mines Road / Las Positas Road signal. If the Trail could runs along the south side of the corridor, connections should be made to the neighborhoods to the south, and along Mines Road to Sonia Road and Las Positas Road. |
| Plans and Studies | Several planned projects and planning documents address this segment: <ul style="list-style-type: none"> ▪ The City has plans to redevelop the area bounded by the rail corridor, First Street, and Old First Street. ▪ The Bay Area Regional Rail Plan envisions possible High Speed Rail within the rail corridor, possibly on an elevated structure. |
| Opportunities | There is a large undeveloped railroad parcel on the north side of the rail tracks west of Trevarno Road. |
| Issues and Constraints | Until the area bounded by the rail corridor, First Street, and Old First Street is redeveloped, the Trail's south option would follow sidewalks along Junction Avenue and Old First Street. Any trail within this segment will need to be located on UP railroad lands, subject to easement or land acquisition. If negotiations are not successful, then the trail would need to be routed along First Street to Trevarno Road to connect with existing easements. |
| Iron Horse Trail Alignment Options | The Iron Horse Trail could run on the north side, south side, or both sides of the rail corridor on this segment, depending upon easement/acquisition. The south side has more value as a neighborhood amenity. |

Segment 3: Junction Avenue to First Street overcrossing



Photo 3.1: Junction Avenue crossing
View: Facing north along east side of Junction Avenue rail crossing. School district corporate yard across tracks at top right.

Opportunities: N/A

Constraints: a) Junction Avenue's crossing of the tracks is skewed
b) If the trail switches to the north side at Junction Avenue at-grade; both Junction Avenue and the tracks must be crossed. Pedestrian crossing control may be complex.

See Figure: 2-5



Photo 3.2: East of Junction Avenue (First Street overcrossing visible in distance)

View: Facing east along north side of rail corridor

Opportunities: a) Trail could be aligned on north or south side of corridor in this area. South side is within Downtown Plan
b) Area south of rail corridor may be redeveloped.

Constraints: a) North side: School district corporate yard (fence shown) constrains width available for trail between Junction Avenue and First Street – easement would be needed.
b) South side: Existing building just east of Junction Avenue ("K.A.R. Service" in photo) occupies area immediately adjacent to rail corridor.

See Figure: 2-5

Segment 3: First Street overcrossing



Photo 3.3: North side of rail corridor at west end of Gardella Plaza (corner of Martin Avenue)
View: Facing west. Bicyclist rode down Gardella Plaza and is headed to Junction Avenue.
Opportunities: Connection to Gardella Plaza, which extends the Old First Street alignment
Constraints: Available width along Valley Storage south wall
See Figure: 3-1



Photo 3.4: First Street overcrossing
View: Facing east along north side of rail corridor
Opportunities: Ample width for trail to stay 25' from centerline of active tracks, except along closest building to northwest corner of overcrossing (U-Haul)
Constraints: Closest building in U-Haul yard may constrain width on north side.
See Figure: 3-1

Segment 3: First Street overcrossing



Photo 3.5: North side of rail corridor at First Street overcrossing
View: Facing east. U-Haul fence at left side.
Opportunities: N/A
Constraints: Embankment may need modifications to accommodate trail while providing 25' of separation to centerline of outer tracks.
See Figure: 3-1



Photo 3.6: South side of rail corridor at First Street overcrossing
View: Facing east
Opportunities: N/A
Constraints: Embankment may need modifications to accommodate trail while providing 25' of separation to centerline of outer tracks.
See Figure: 3-1



Photo 3.7: First Street overcrossing north embankment, east side
View: Facing south toward rail corridor
Opportunities: Spur path to Scott Street signal, with staircase to First Street east sidewalk above
Constraints: Regrading and possible cut and fill may be needed to create bench for spur path.
See Figure: 3-1

Segment 3: First Street to Trevarno Road



Photo 3.8: South side of rail corridor east of First Street overcrossing
View: Facing west. Fence at left runs along north side of Silver Oaks Way
Opportunities: Corridor owned by UPRR is very wide on this stretch. South-side trail alignment is desirable to connect with neighborhood via Silver Oaks Way. Existing tracks are approximately 35-50 feet from existing fences along Silver Oaks.
Constraints: If trail is on south side, the trail must be located on UP lands or be routed onto surface streets to connect to lands east of Vasco Road, necessitating easement or ROW acquisition.

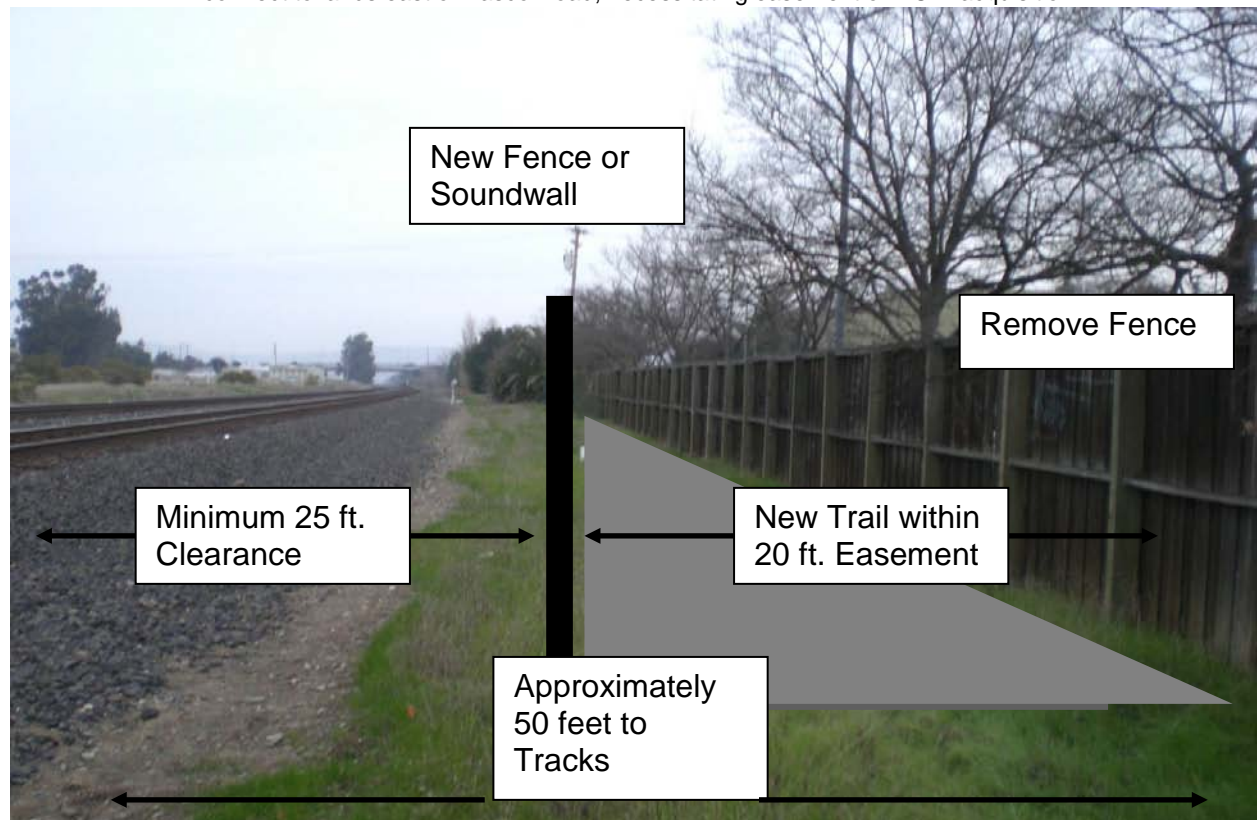




Photo 3.9: Rail corridor and vacant UPRR parcel between First Street and Trevarno Road
View: Facing southwest (toward First Street) from north-side property fence
Opportunities: Between Trevarno Road and First Street the tracks form a large-radius curve along the south side of the corridor, with no tracks near the north property boundary.
Constraints: Trail would be located on parcels along First Street at time of development or redevelopment to connect to existing easements east of Trevarno Road. Trail would be located along the back of industrial parcels, not near residential users. Trail could also be located on UP ROW if easement or lands were acquired.



Photo 3.10: Trevarno Road at-grade crossing
View: Facing south toward Hexcel Corporation facility
Opportunities: Existing at-grade crossing could possibly be used to switch trail from south to north side if a south-side trail is feasible between this point and First Street.
Constraints: Operating restrictions on at-grade crossing may not accommodate increased crossing volume if this became a trail crossing. There would be significant crossing improvements and signalization needed to utilize this crossing, and it would be subject to CPUC approval, which is generally not supported.



Photo 3.11: Contractors Place extension west of Mines Road (Mines Road overcrossing in distance)
View: Facing east toward Mines Road from just east of Trevarno Road at-grade crossing
Opportunities: Between this point and Mines Road, trail easements exist along the utility pole line.
Constraints: Some of the easements are only 10-15 feet wide.



Photo 3.12: Rail corridor east of Mines Road. Contractors Place runs along north (left) side.
View: Facing east along centerline of rail corridor, under Mines Road bridge
Opportunities: Width is available for a trail along the south edge of Contractors Place. There is an existing EBRPD easement for trail along edge of Contractors Place, north of rail ROW.
Constraints: If trail is on south side, the trail would need to be located on UP lands or be routed onto surface streets to connect to lands east of Vasco Road, necessitating easement or ROW acquisition. Bridge supports would need to be modified to provide sufficient width at toe of embankment.
See Figure: 3-2



Photo 3.13: South side of rail corridor east of Mines Road
View: Facing west (toward Mines Road). Trees at left are along the north wall of Shawna Street, which with Maureen Circle further east form the north boundary of neighborhoods on this stretch.
Opportunities: Approximately 50 is available for trail along south side
Constraints: Railroad signal control building along edge of ROW near Mines Road (center of photo). Trail would need to be located on UP lands or be routed onto surface streets to connect to lands east of Vasco Road, with easement or ROW acquisition if trail on south side.
See Figure: 3-2



Photo 3.14: Shawna Street at Fawn Drive, just east of Mines Road, on south side of rail corridor
Opportunities: If the trail were aligned on the south side of the rail corridor with periodic connections to Shawna Street and Maureen Circle, residents of this neighborhood would benefit. To retain the privacy and noise protection would require relocating the concrete wall that separates it from the rail corridor.
Constraints: Trail would need to be located on UP lands or be routed onto surface streets to connect to lands east of Vasco Road, with easement or ROW acquisition. There is insufficient width for the trail to replace the north sidewalk of Shawna Street because of the adjacent block wall that separates it from the rail corridor and landscaping along the wall.
See Figure: 3-2



Photo 3.15: Maintenance road along east side of Mines Road embankment south of rail corridor
View: Facing south. House at left is at corner of Shawna Street and Fawn Drive.
Opportunities: Maintenance road could become a trail spur to Mines Road / Sonia Street intersection and possibly also to the Mines Road / Patterson Pass Road intersection.
See Figure: 3-2



Photo 3.16: Shawna Street just east of Fawn Drive
View: Facing west toward Fawn Drive, showing sidewalk and landscaping along soundwall
Opportunities: Move soundwall toward rail corridor, replace sidewalk with trail
Constraints: Approximately 30 feet is available along rail corridor. Expense of relocating sound wall. Trail would need to be located on UP lands or be routed onto surface streets.
See Figure: 3-2



Photo 3.17: Landscaping along sound wall on north side of Maureen Circle east of Cassidy Court
View: Maintenance access through to Arroyo Seco behind parked car.
Opportunities: Move soundwall toward rail corridor, construct trail behind existing line of trees.
Constraints: Approximately 30 feet is available along rail corridor. Trail would need to be located on UP lands or be routed onto surface streets. Expense of relocating sound wall.
See Figure: 3-3



Photo 3.18: Maintenance / emergency vehicle access between Arroyo Seco and Maureen Circle
View: Facing west from Arroyo Seco
Opportunities: Align trail on maintenance roadway.
Constraints: Potential neighborhood concerns, depending on trail design and location of soundwall. Trail would need to be routed onto surface streets to connect to Zone 7 lands, to Vasco Road.
See Figure: 3-3

**Table 3-4. Trail Opportunities and Constraints
 Segment 4: Arroyo Las Positas channel to Greenville Road**

| | |
|--------------------------------|---|
| Rail Corridors | East of the Arroyo Las Positas channel a " " spur rail corridor runs parallel to and south of Las Positas Road to that street's intersection with Greenville Road. This alignment has been identified for future High Speed Rail or activation for freight use. To the south, an active rail corridor carrying ACE commuter service and UPRR freight runs roughly parallel to and north of Patterson Pass Road to the vicinity of Marathon Drive, where it turns to the north and passes under Greenville Road on its way to I-580 and the Altamont Pass beyond. |
| Roadways | Vasco Road runs north-south and passes over the rail corridor on a high roadway bridge. Greenville Road runs north-south and forms the eastern limit of the study. It intersects Las Positas Road at a signal and Patterson Pass Road at an all-way stop. East of the Arroyo Las Positas channel, Las Positas Road runs roughly east-west to the north of the north (spur) rail corridor. East of Mines Road, Patterson Pass Road runs roughly east-west to the south of the south (ACE/UPRR) rail corridor. |
| Land Use | North of the south rail corridor, most parcels are either vacant or warehouse. South of the south rail corridor there are single-family residential developments west of the Arroyo Las Positas channel's crossing of Patterson Pass Road. East of this point there are warehouses to the north; Lawrence Livermore National Laboratory occupies the area to the south. |
| Existing Trail Segments | Neither the Iron Horse nor Arroyo Las Positas Trails have been constructed in this segment. |
| Required Connections | The Phase I Iron Horse Trail would follow the creek corridor, along Arroyo Las Positas. The Phase II or long-term alignment would be adjacent to or within the north rail corridor. The trail should connect to all major streets, with spur paths if desirable. It should connect to all fronting parking lots of adjacent warehouse uses. |

Segment 4: Arroyo Las Positas channel



Photo 4.1: Arroyo Las Positas channel south of rail corridor
View: Facing south (toward Patterson Pass Road)
Opportunities: Future regional trail. Direct access to Iron Horse Trail without traversing Maureen Circle neighborhood.
See Figure: 3-3



Photo 4.2: Arroyo Seco channel north of railroad corridor
View: Facing north from railroad bridge. Contractor storage yards on both side of waterway.
Opportunities: East-west crossing location for Iron Horse Trail north option. Future regional trail to North Livermore.
Constraints: North embankment of railroad between channel and Contractors Place.
See Figure: 3-3

Segment 4: Arroyo Las Positas channel



Photo 4.3: North (unused) rail corridor east of Arroyo Las Positas channel. Potential future High Speed Rail corridor or expansion of rail freight trackage.
View: Facing east from southeast corner of parking lot of a north-side building
Opportunities: Wide swath of vacant land on both sides of track. Obtain trail easements and condition new construction to add trail segments.

Figure 4-1



Photo 4.4: North (unused) rail corridor between Las Positas Road and La Ribera Street. Potential future High Speed Rail corridor or expansion of rail freight trackage.
View: Facing east (toward Vasco Road)
Opportunities: Obtain trail easements and condition new construction to add trail segments.
Constraints: Obtain trail easements and condition new construction to add trail segments.

Segment 4: Vasco Road ACE Station area



Photo 4.5: Arroyo Las Positas channel west of Vasco Road ACE Station
View: Facing west from Zone 7 service road bridge near Vasco Road. The north maintenance road, visible through the gate, would be preferred for the Arroyo Las Positas Trail. The road on the south side ends at Patterson Pass Road and would not provide a needed connection to the IHT.
Opportunities: Maintenance road is ready to be surfaced for trail.
See Figure: 4-2



Photo 4.6: Arroyo Las Positas channel continuing east past Vasco ACE station
View: Facing east from Zone 7 service road bridge. Vasco Road above. Vasco ACE station across tracks at left. This maintenance road would carry the Arroyo Las Positas Trail.
Opportunities: Maintenance road is ready to be surfaced for trail.
Constraints: Access control needed along rail line.
Figure 4-3

Segment 4: South of Las Positas Road, west of Greenville Road



Photo 4.7: North (spur) rail corridor south of Las Positas Road, west of Greenville Road
View: Facing west (toward Vasco Road)
Opportunities: Wide swaths of open land south of existing track.
Constraints: a) Several buildings along north side have features close to the tracks, served by sidings.
b) Potential High Speed Rail/expanded freight corridor. Coordinate with HSR cross section.
Figure 4-4, Appendix



Photo 4.8: North (spur) rail corridor south of Las Positas Road, west of Greenville Road
View: Facing south from parking lot of a north-side building. Note two sets of tracks, separated.
Opportunities: Wide swaths of open land south of existing track.
Constraints: Potential High Speed Rail/expanded freight corridor. Coordinate with HSR cross section.

Segment 4: Greenville Road



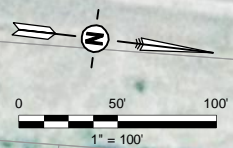
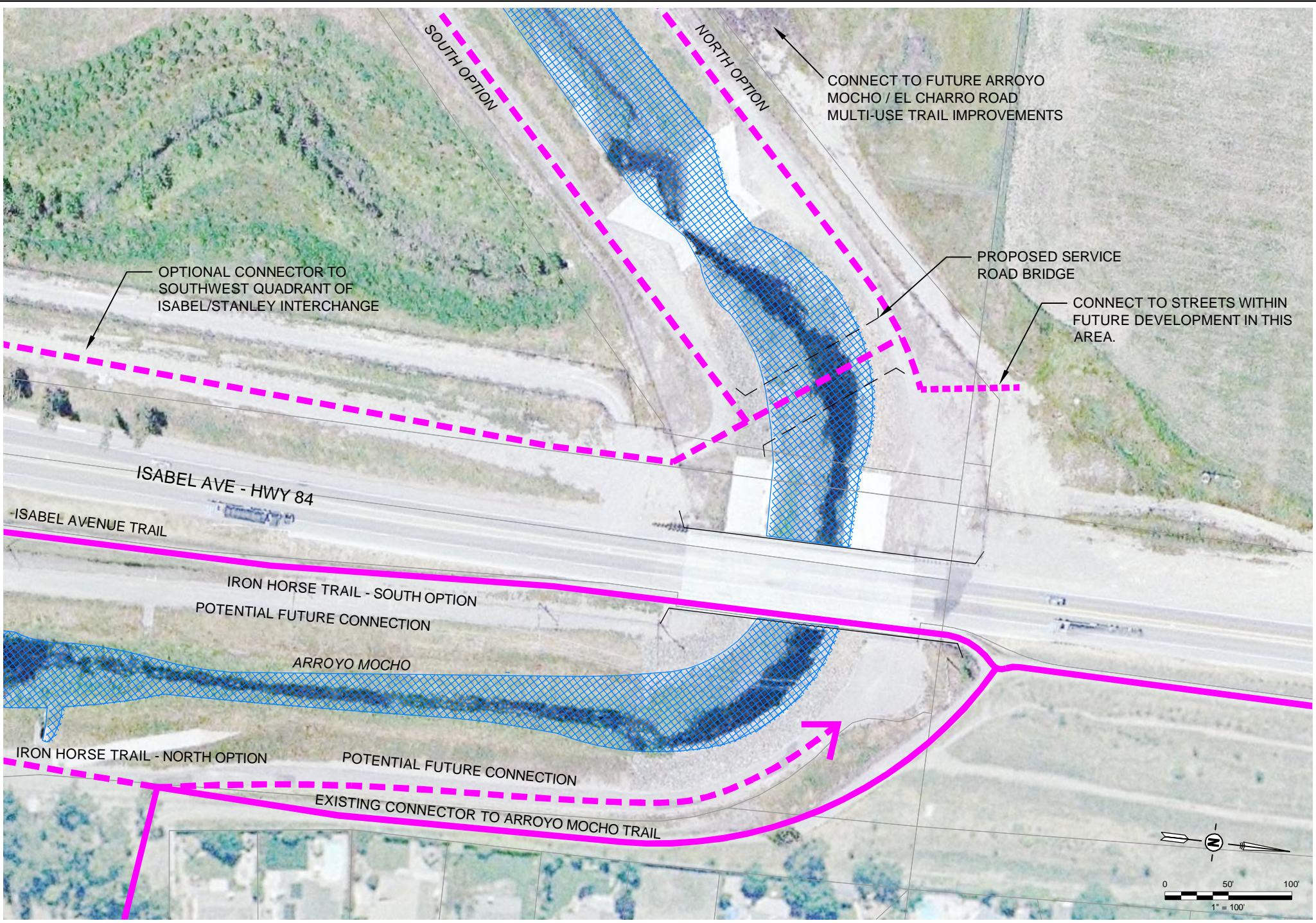
Photo 4.9: East end of north rail corridor at Greenville Road

View: Facing north (toward Las Positas Road)

Opportunities: a) With modifications to parking lot and landscape of building closest to Greenville Road, trail could reach the southwest corner of the Greenville Road / Las Positas Road signal.
b) A spur could connect directly to Greenville Road's southbound bike lane.

Constraints: a) Parking lot of building closest to Greenville Road.
b) Potential High Speed Rail/expanded freight corridor. Coordinate with HSR cross section.

See Figure: 4-5



IRON HORSE TRAIL
LIVERMORE, CA

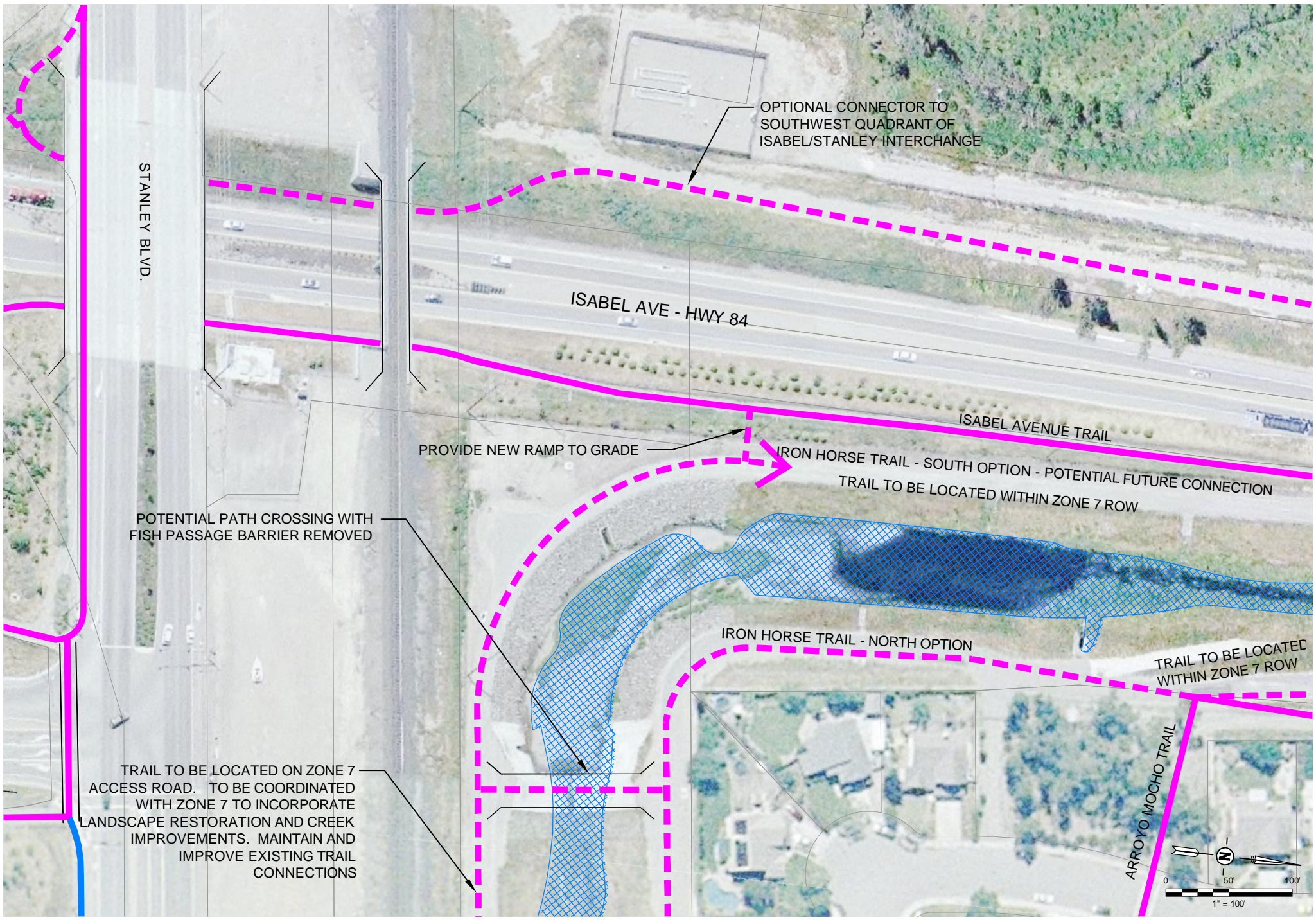
| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

WATERWAY
BRIDGE OR TUNNEL
CROSSWALK
ACCESS POINT

**ISABEL AVENUE /
ARROYO MOCHO TRAIL
TERMINUS**

FIGURE
1-1



IRON HORSE TRAIL
LIVERMORE, CA

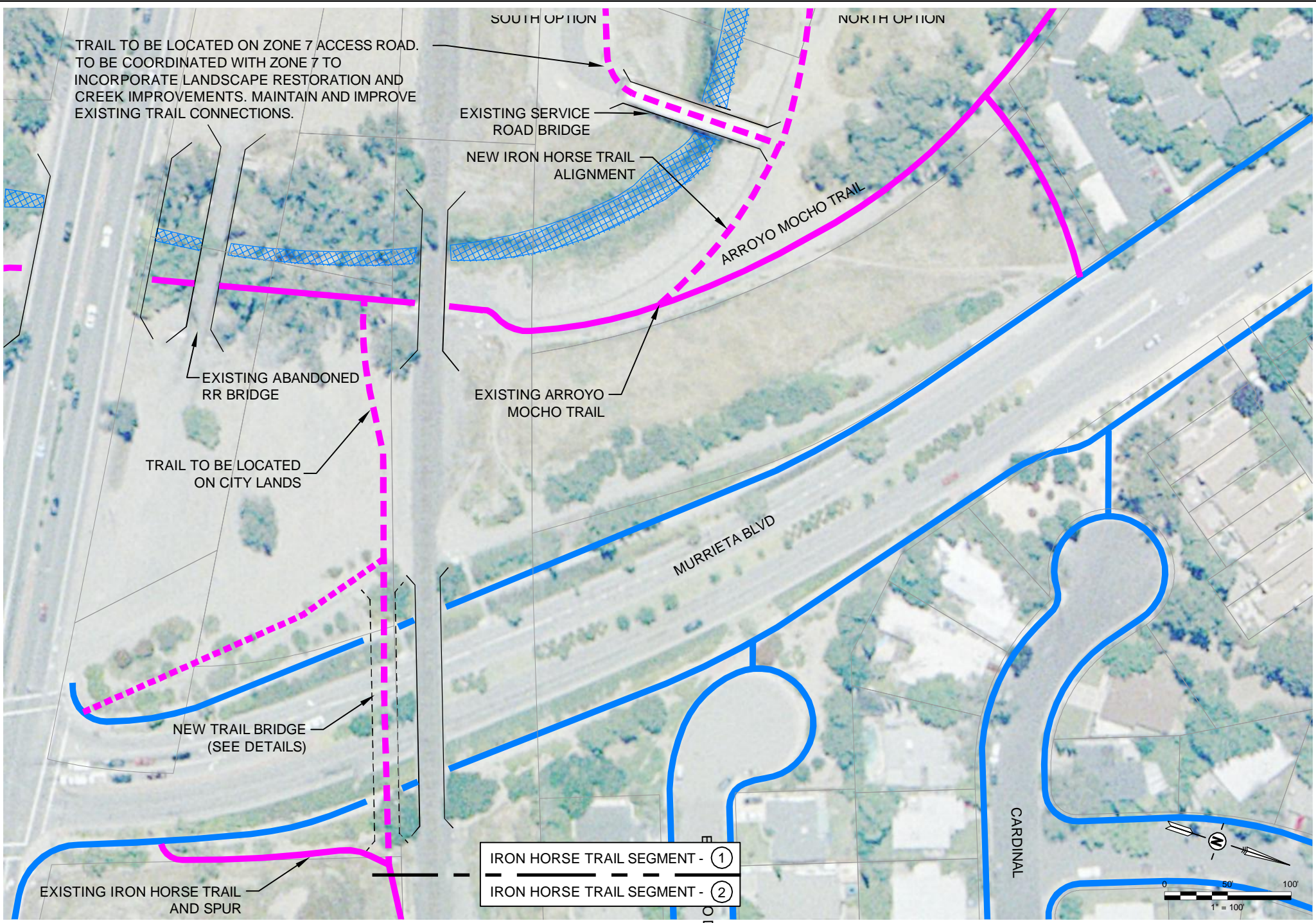
| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

WATERWAY
BRIDGE OR TUNNEL
CROSSWALK
ACCESS POINT

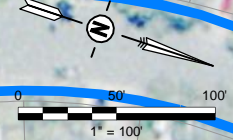
ISABEL AVE UNDERCROSSING

FIGURE
1-2



TRAIL TO BE LOCATED ON ZONE 7 ACCESS ROAD. TO BE COORDINATED WITH ZONE 7 TO INCORPORATE LANDSCAPE RESTORATION AND CREEK IMPROVEMENTS. MAINTAIN AND IMPROVE EXISTING TRAIL CONNECTIONS.

IRON HORSE TRAIL SEGMENT - ①
 IRON HORSE TRAIL SEGMENT - ②



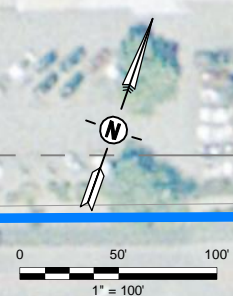
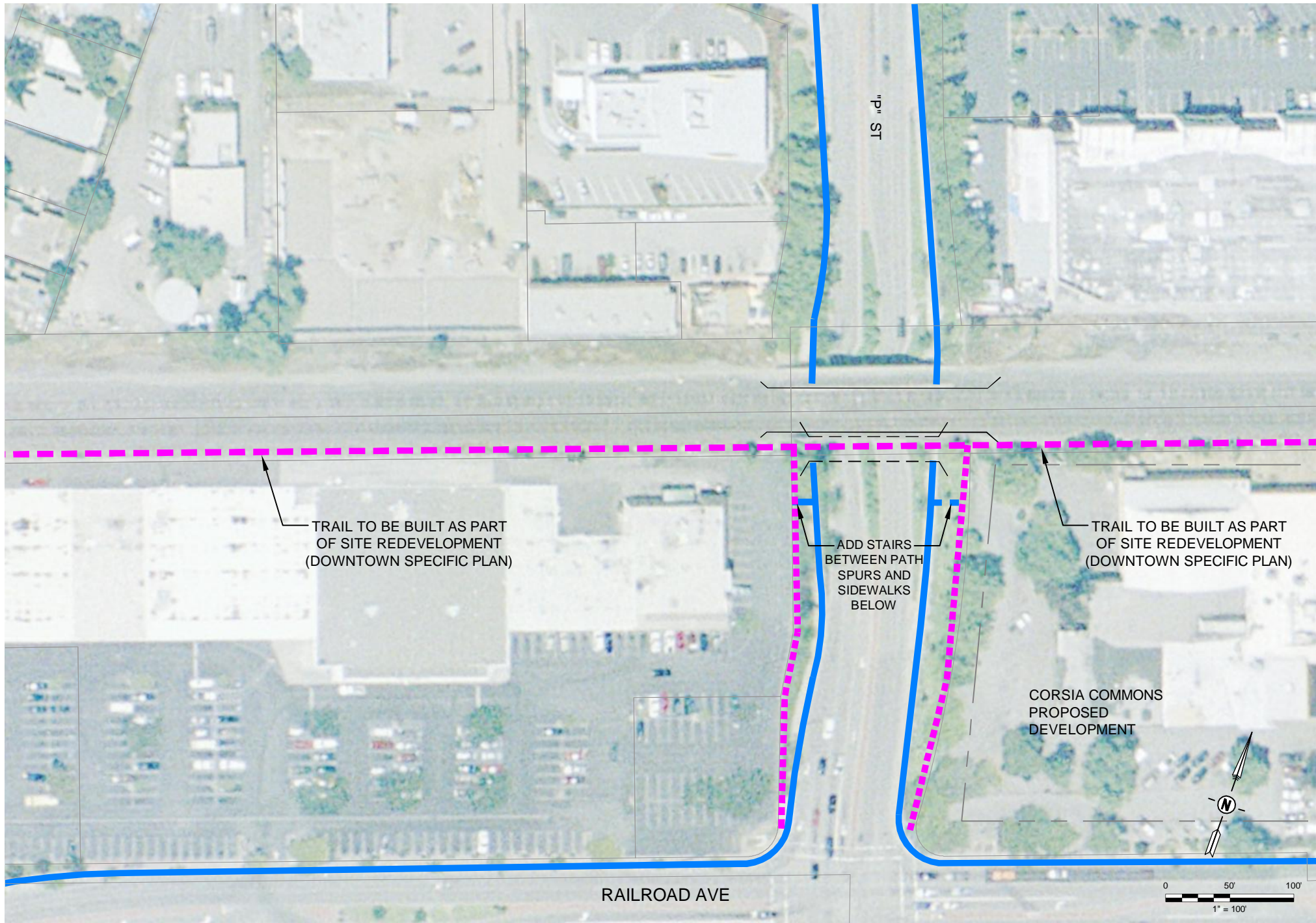
IRON HORSE TRAIL
 LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|------------|
| | | TRAIL SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

MURIETTA AVE RR OVERCROSSING

FIGURE
 1-3



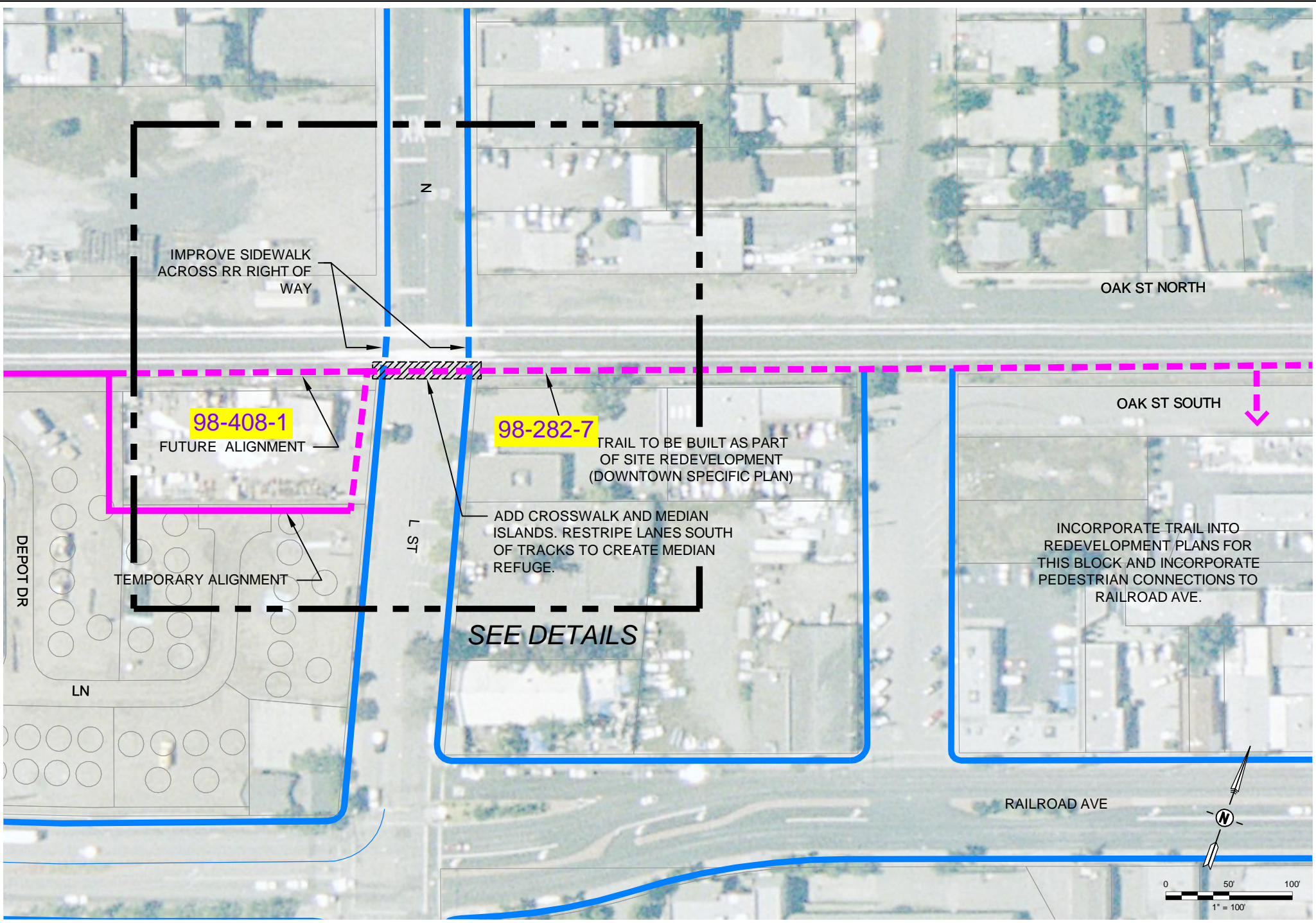
IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

P STREET OVERCROSSING

FIGURE
2-1



IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

L STREET AT GRADE CROSSING

FIGURE
2-2

AUTOMATIC GATE

PEDESTRIAN GATE

SIDEWALK

XING

SIDEWALK

PEDESTRIAN GATE

AUTOMATIC GATE

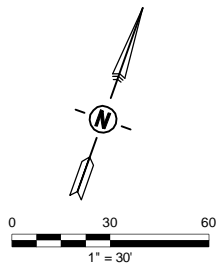
PEDESTRIAN GATE



SIDEWALK

XING

SIDEWALK



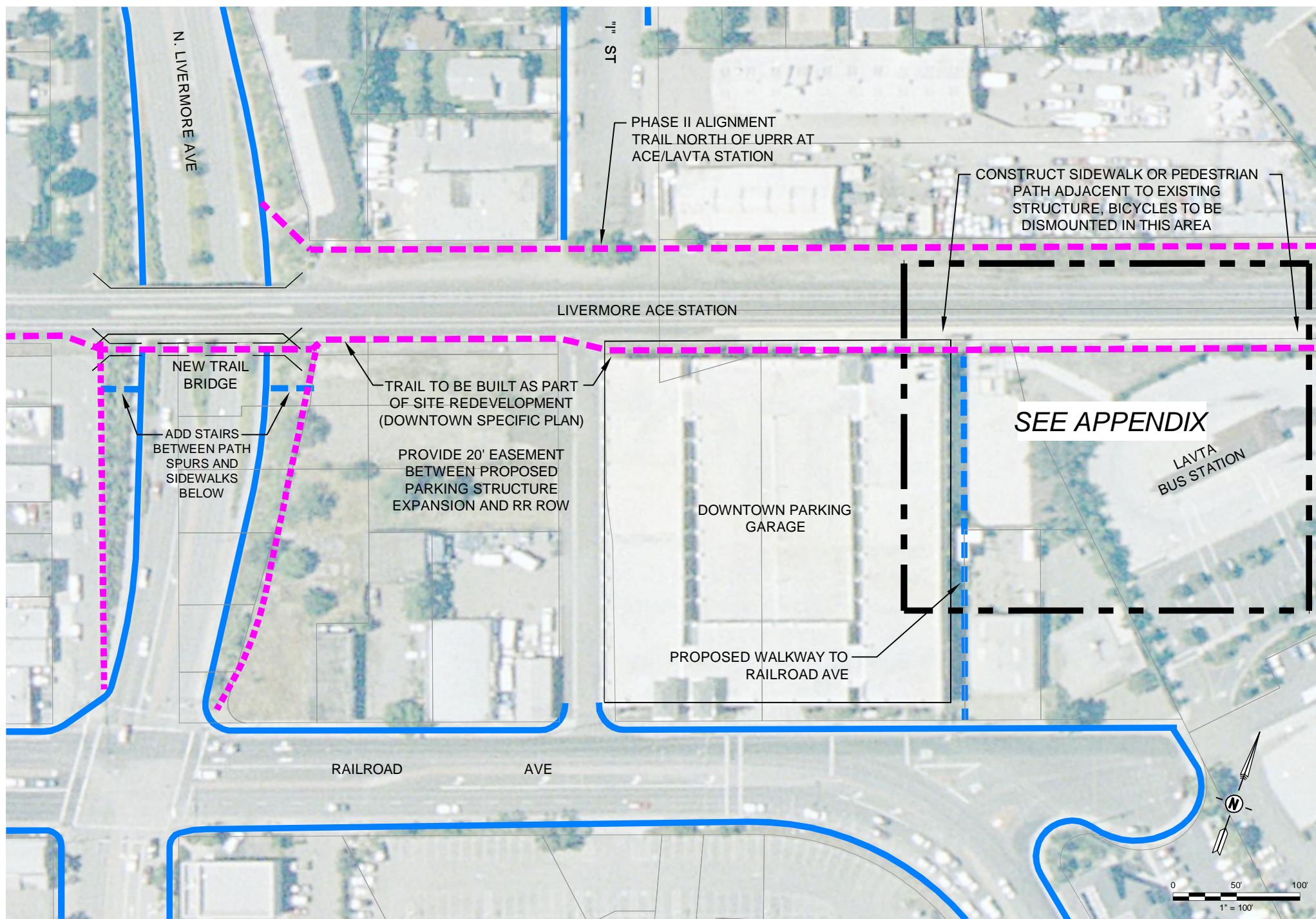
IRON HORSE TRAIL LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|--------------------|
| | | TRAIL SPUR |
| | | SIDEWALK BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|---------------------------|
| | | WATERWAY BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

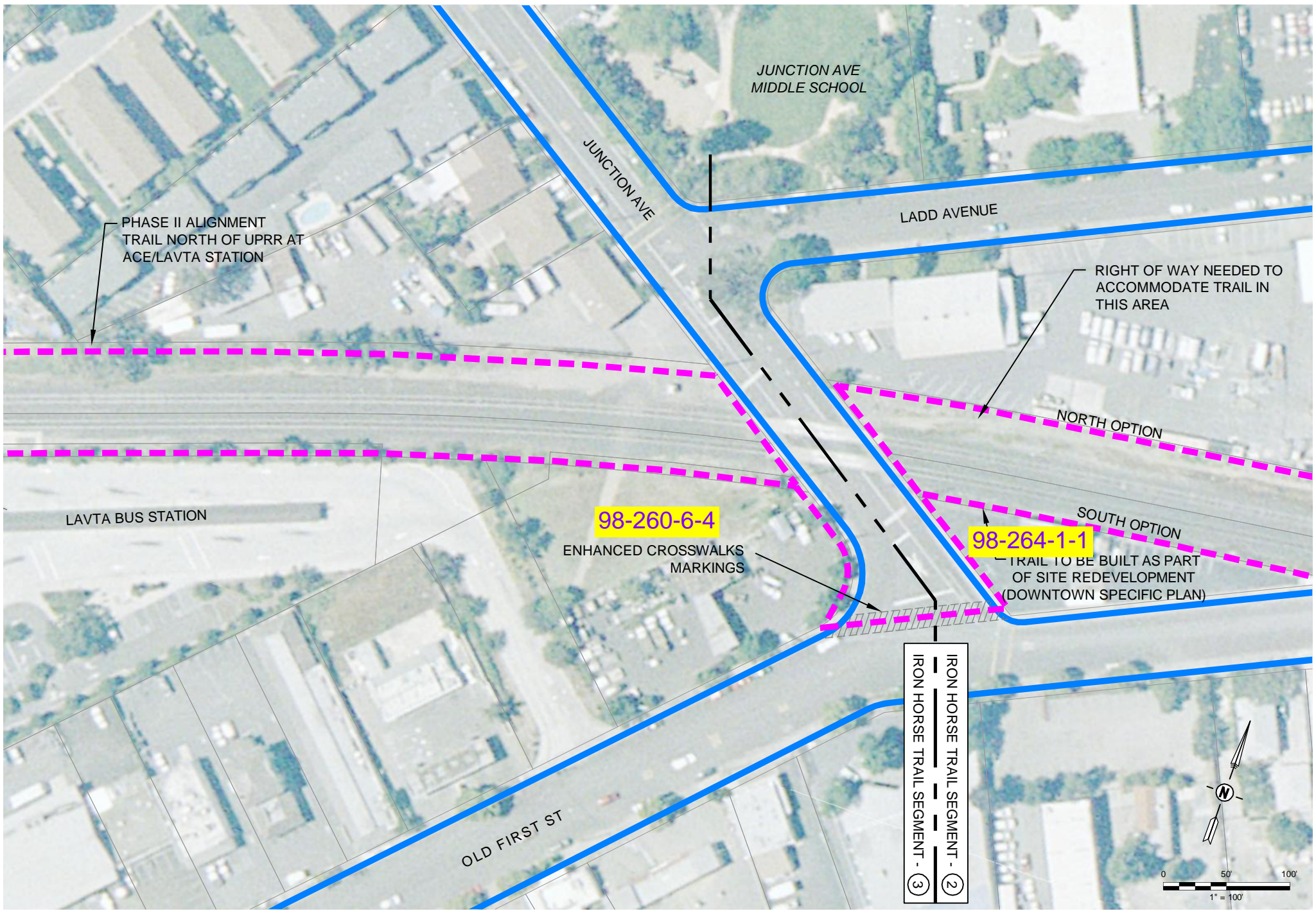
L STREET TRAIL CROSSING TRAFFIC CONTROL DIAGRAM

FIGURE 2-3



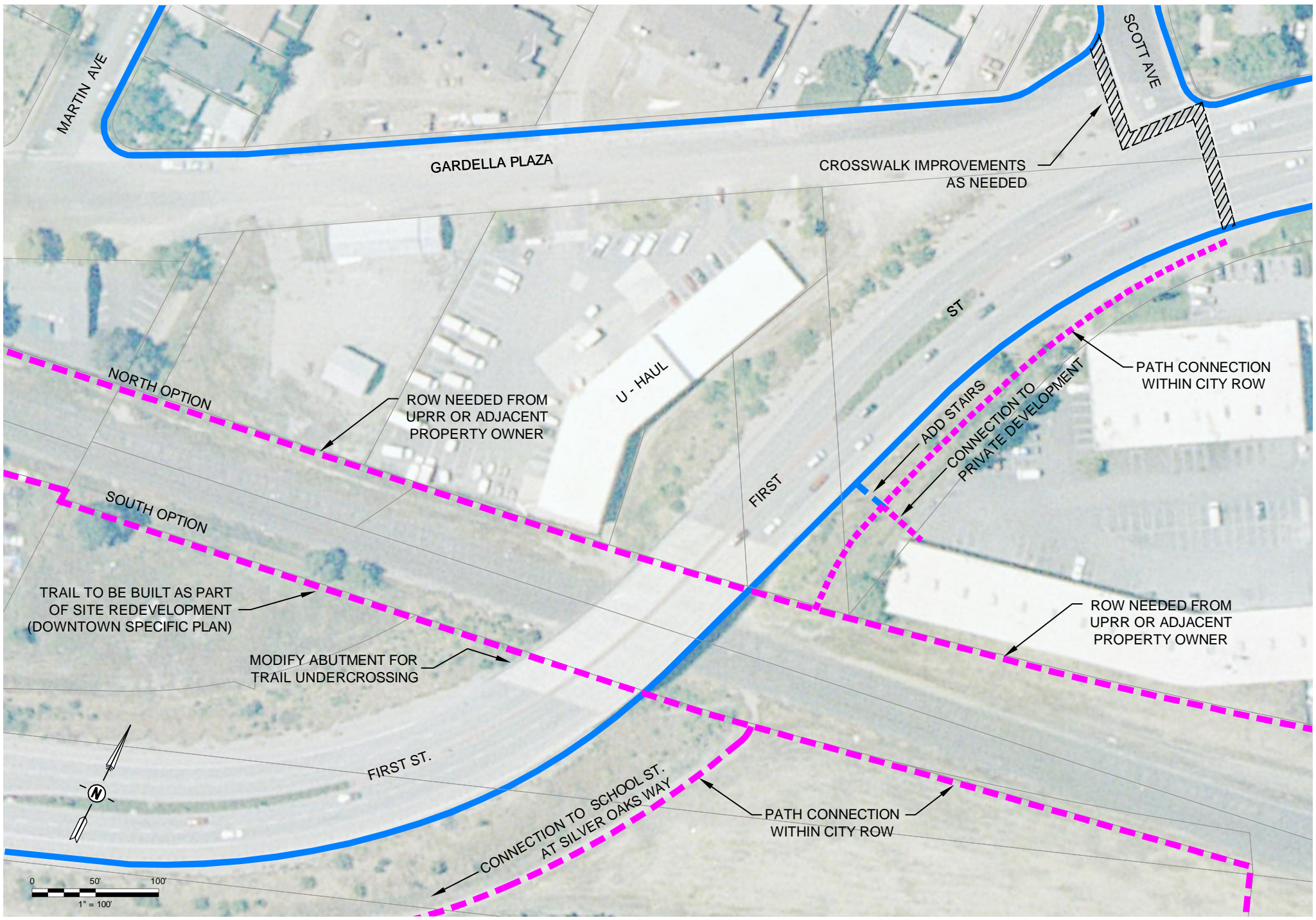
| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |



| EXISTING | PROPOSED | |
|----------|----------|------------|
| | | TRAIL |
| | | TRAIL SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |



IRON HORSE TRAIL
LIVERMORE, CA

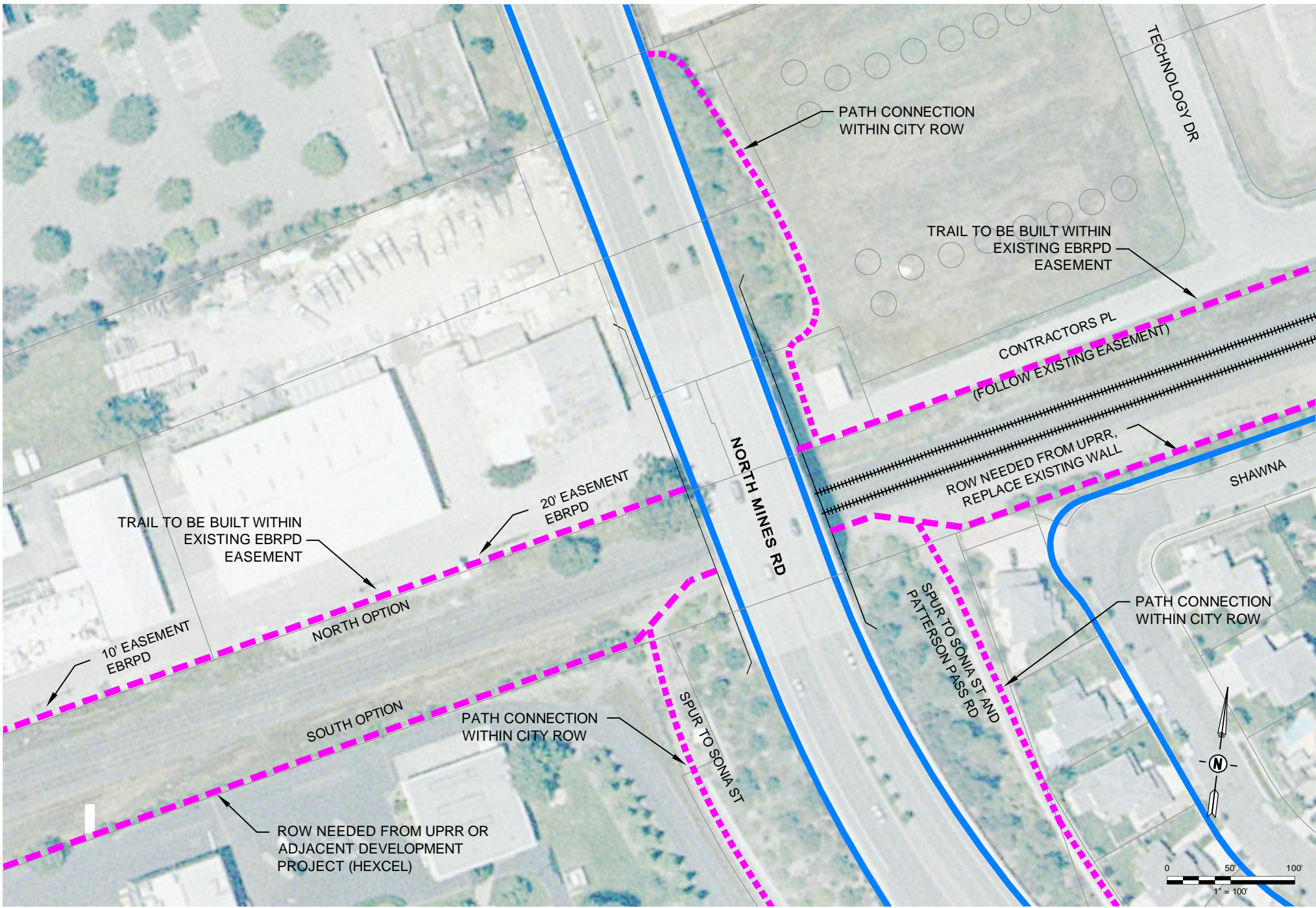
| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

WATERWAY
BRIDGE OR TUNNEL
CROSSWALK
ACCESS POINT

FIRST ST. OVERCROSSING

FIGURE
3-1



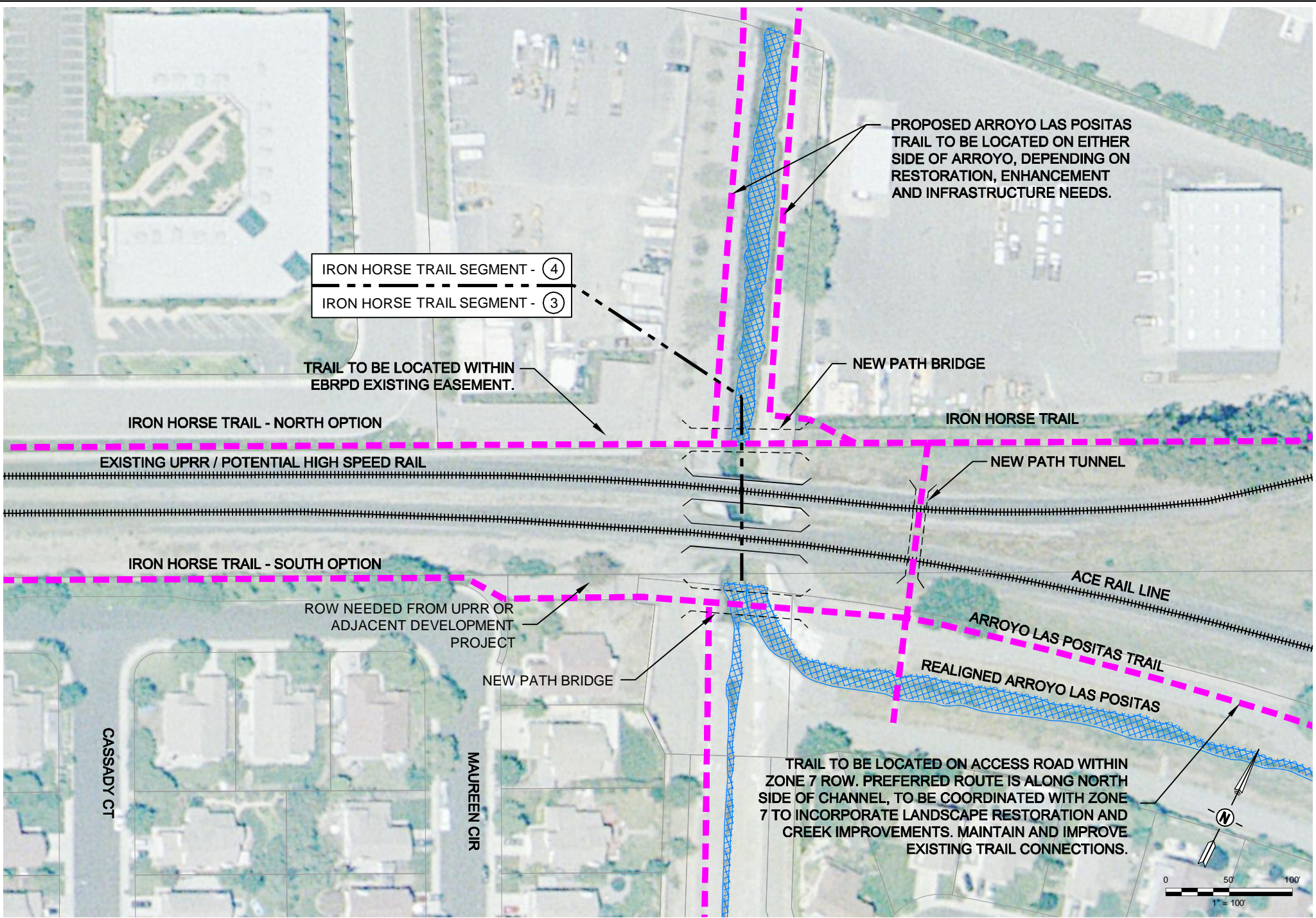
IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

NORTH MINES RD OVERCROSSING

FIGURE
3-2



PROPOSED ARROYO LAS POSITAS TRAIL TO BE LOCATED ON EITHER SIDE OF ARROYO, DEPENDING ON RESTORATION, ENHANCEMENT AND INFRASTRUCTURE NEEDS.

IRON HORSE TRAIL SEGMENT - ④
 IRON HORSE TRAIL SEGMENT - ③

TRAIL TO BE LOCATED WITHIN EBRPD EXISTING EASEMENT.

NEW PATH BRIDGE

IRON HORSE TRAIL - NORTH OPTION

IRON HORSE TRAIL

EXISTING UPRR / POTENTIAL HIGH SPEED RAIL

NEW PATH TUNNEL

IRON HORSE TRAIL - SOUTH OPTION

ACE RAIL LINE

ROW NEEDED FROM UPRR OR ADJACENT DEVELOPMENT PROJECT

NEW PATH BRIDGE

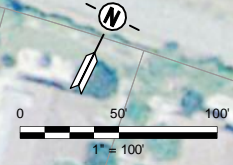
ARROYO LAS POSITAS TRAIL

REALIGNED ARROYO LAS POSITAS

TRAIL TO BE LOCATED ON ACCESS ROAD WITHIN ZONE 7 ROW. PREFERRED ROUTE IS ALONG NORTH SIDE OF CHANNEL, TO BE COORDINATED WITH ZONE 7 TO INCORPORATE LANDSCAPE RESTORATION AND CREEK IMPROVEMENTS. MAINTAIN AND IMPROVE EXISTING TRAIL CONNECTIONS.

CASSADY CT

MAUREEN CIR



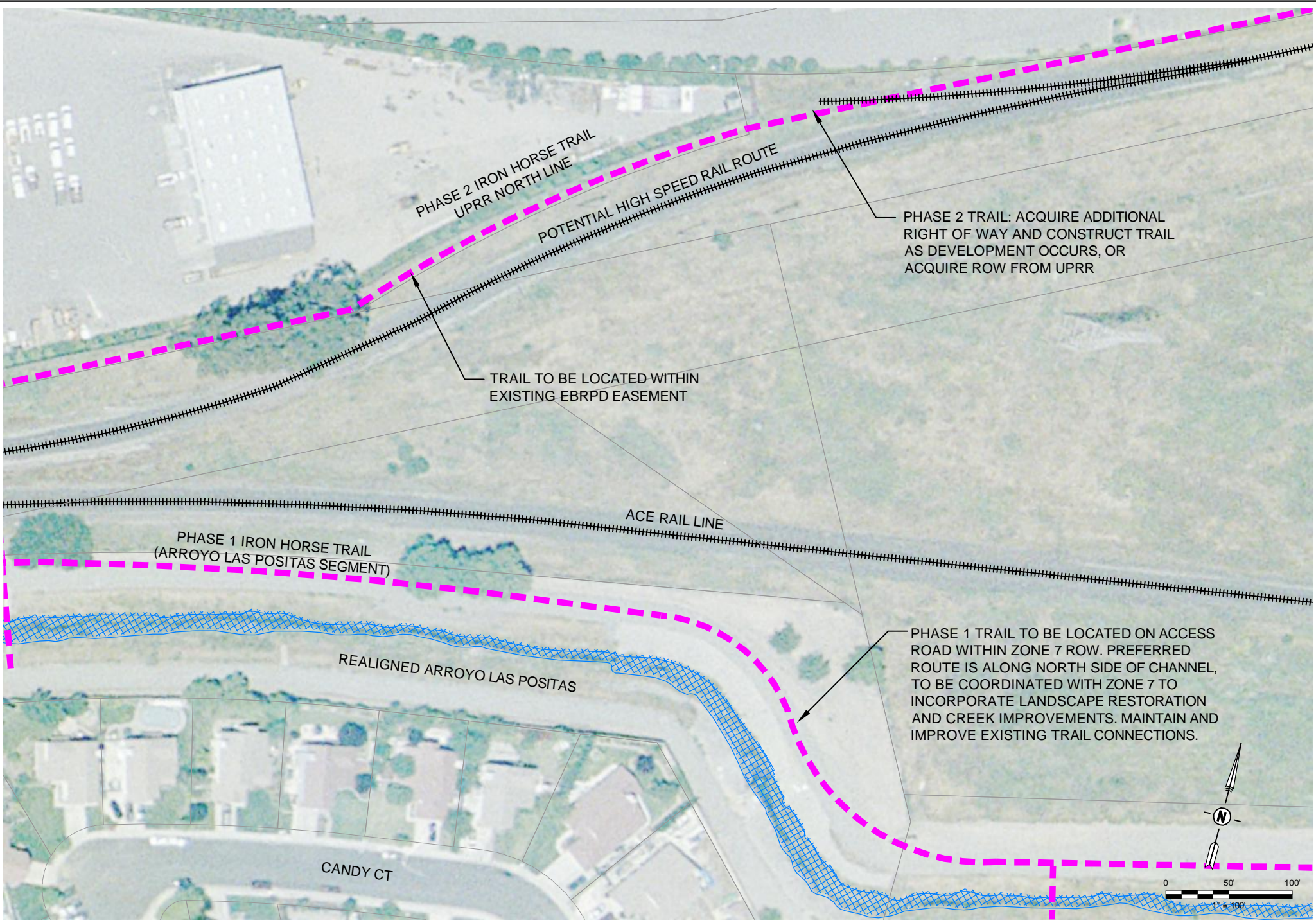
IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|------------|
| | | TRAIL |
| | | TRAIL SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

ARROYO LAS POSITAS RAILROAD CROSSINGS

FIGURE 3-3



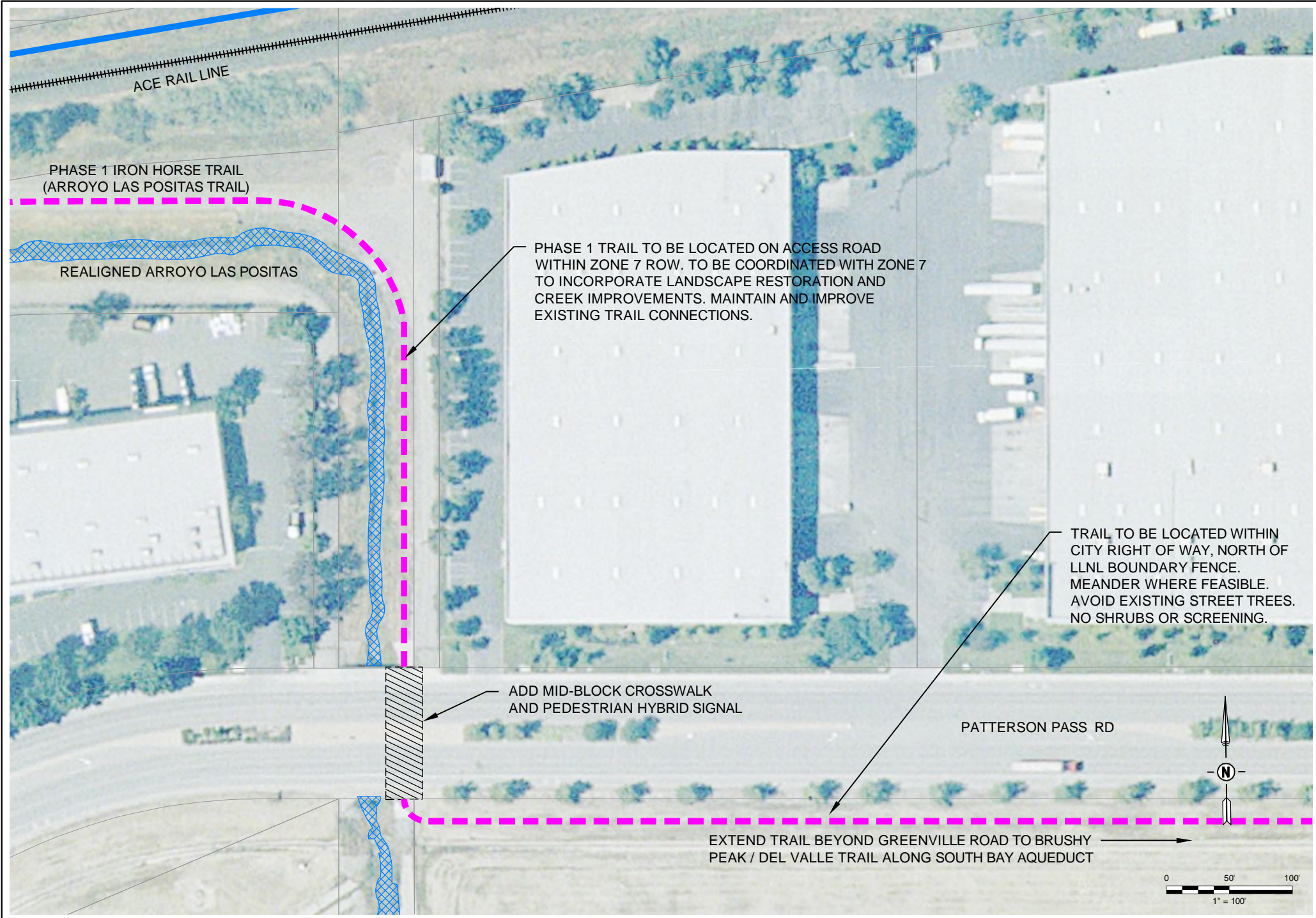
IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

ARROYO LAS POSITAS NORTH OF PATTERSON PASS ROAD

FIGURE
4-1



PHASE 1 IRON HORSE TRAIL
(ARROYO LAS POSITAS TRAIL)

REALIGNED ARROYO LAS POSITAS

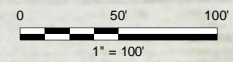
PHASE 1 TRAIL TO BE LOCATED ON ACCESS ROAD WITHIN ZONE 7 ROW. TO BE COORDINATED WITH ZONE 7 TO INCORPORATE LANDSCAPE RESTORATION AND CREEK IMPROVEMENTS. MAINTAIN AND IMPROVE EXISTING TRAIL CONNECTIONS.

TRAIL TO BE LOCATED WITHIN CITY RIGHT OF WAY, NORTH OF LLNL BOUNDARY FENCE. MEANDER WHERE FEASIBLE. AVOID EXISTING STREET TREES. NO SHRUBS OR SCREENING.

ADD MID-BLOCK CROSSWALK AND PEDESTRIAN HYBRID SIGNAL

PATTERSON PASS RD

EXTEND TRAIL BEYOND GREENVILLE ROAD TO BRUSHY PEAK / DEL VALLE TRAIL ALONG SOUTH BAY AQUEDUCT



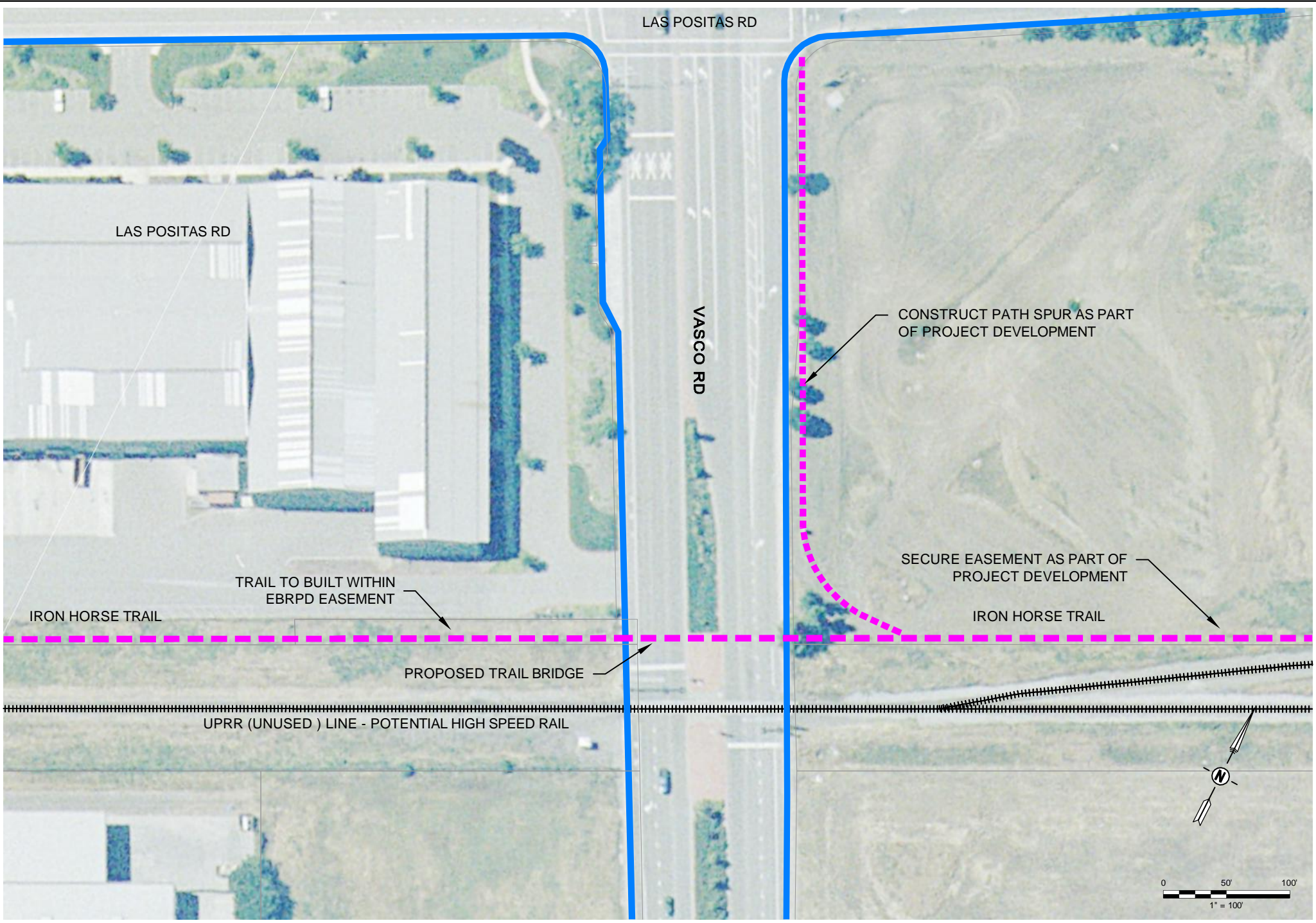
IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

PHASE 1 TRAIL AT PATTERSON PASS ROAD

FIGURE
4-3



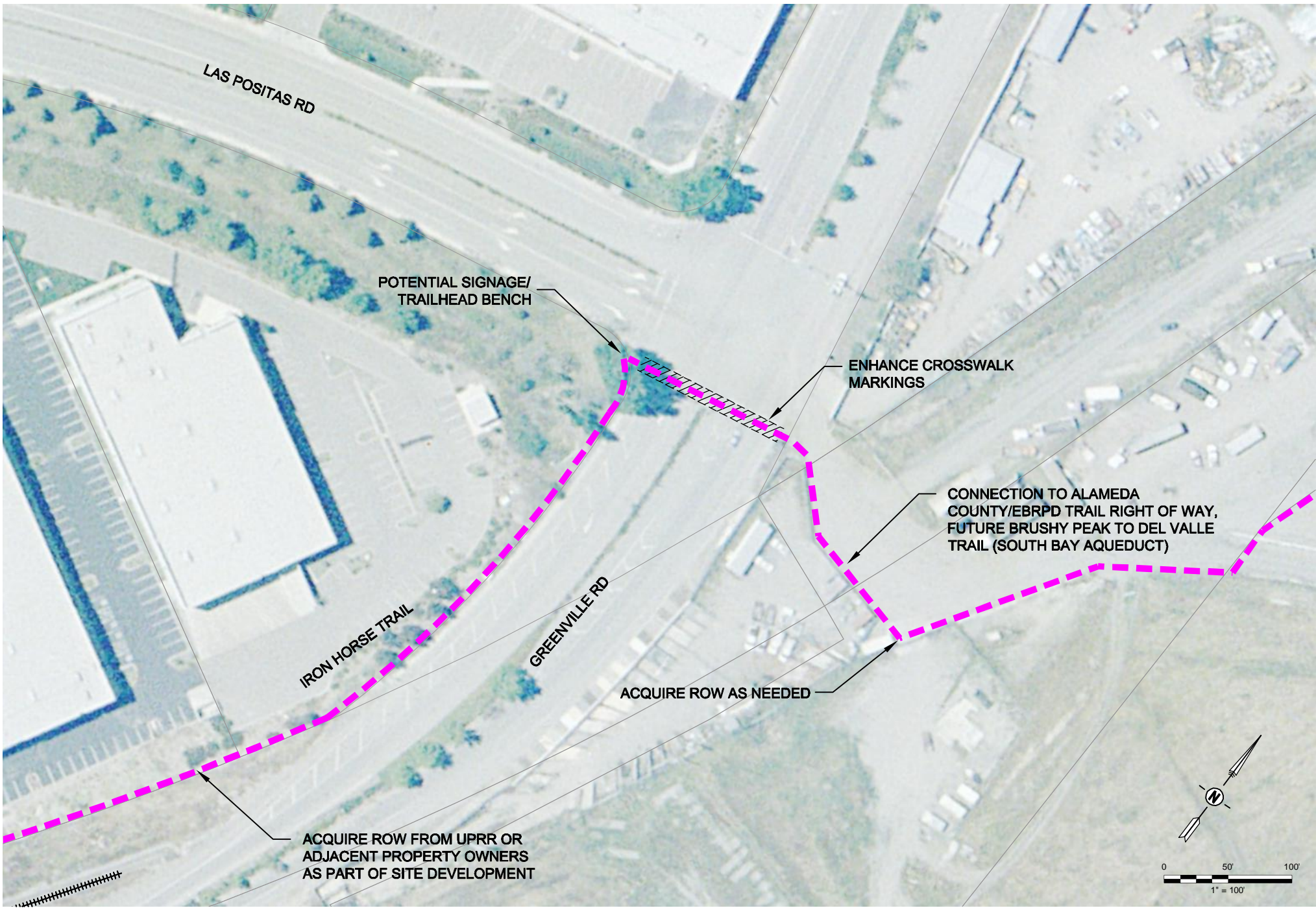
IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|------------|
| | | TRAIL SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

**VASCO RD
FUTURE OVERCROSSING**

FIGURE
4-4



IRON HORSE TRAIL
LIVERMORE, CA

| EXISTING | PROPOSED | |
|----------|----------|-----------|
| | | TRAIL |
| | | SPUR |
| | | SIDEWALK |
| | | BIKE LANE |
| | | RAILROAD |

| EXISTING | PROPOSED | |
|----------|----------|------------------|
| | | WATERWAY |
| | | BRIDGE OR TUNNEL |
| | | CROSSWALK |
| | | ACCESS POINT |

WATERWAY
BRIDGE OR TUNNEL
CROSSWALK
ACCESS POINT

**PHASE 2 TRAIL
GREENVILLE RD
AT LAS POSITAS RD**

FIGURE
4-5

4. Preliminary Alignment and Alternatives

this Section summarizes possible alignments for the IHT on each of the four study segments (see **Preliminary Alignment Sheets 1 through 8** at the end of this Section):

- Segment 1: Isabel Avenue to Murrieta Boulevard
- Segment 2: Murrieta Boulevard to Junction Avenue
- Segment 3: Junction Avenue to Arroyo Las Positas
- Segment 4: Arroyo Las Positas to Greenville Road

Within each segment, the preferred alignment is shown in the table, followed by a discussion of alternatives, temporary alignment options, and alternatives or obstacles to the preferred alignment.

4.1 Segment 1: Isabel Avenue to Murrieta Boulevard

Table 4-1. Segment 1 Overview

| Segment 1: Isabel Avenue to Murrieta Blvd. | |
|---|--|
| Length | 5,200 feet |
| Property Ownership | Zone 7, Livermore Redevelopment Agency, City of Livermore |
| Trail Type | Paved Trail on Zone 7 Access Road; utilize existing bridge and creek crossings to connect to new trail. |
| Bridge | Bicycle/Pedestrian bridge over Murrieta Blvd. |
| Other Features | This area may be combined with creek enhancement and restoration, including shaded riparian canopy along trail. Signage, benches, trash receptacles. ADA ramp to existing crossing under railroad tracks. |
| Notes | Requires operating agreement with Zone 7. |
| Section | 5-1 Typical Trail Section Adjacent to Creek 5-2 Typical Trail Section near Railroad |

In Segment 1, there are five possible alignments: two along Stanley Boulevard south of the rail corridor, two along the Arroyo Mocho channel north of the rail corridor, and the existing Arroyo Mocho Trail alignment through the neighborhood north of the Arroyo Mocho channel.

a) South Edge of Stanley Blvd. The existing IHT reaches Livermore from the west along the south side of Stanley Boulevard. East of the Isabel Avenue ramp signal, that alignment would continue along what is currently the south sidewalk of Stanley Boulevard. A “sidepath” trail there would have several operational/safety issues and other disadvantages. Although it is adjacent to a neighborhood, those residences are behind a wall so their presence would not contribute to the trail environment. Shared-use paths closer than 5 feet to a roadway require a safety barrier such as a concrete “K-rail”. Widening the sidewalk area into Stanley Boulevard would be impractical. In addition, the future IHT west of Isabel Avenue is envisioned to follow the Arroyo Mocho channel north of the railroad corridor. Reaching that future alignment would require looping under Stanley Boulevard and the railroad via the Isabel Avenue Trail.

This alignment option is substantially less desirable than other options.

b) North of Stanley Boulevard / South of rail corridor. The 2006 Livermore Bikeways Map shows the IHT on the north side of Stanley Boulevard between Isabel and Murrieta. There is currently a wide vacant parcel on this stretch, a portion of which would be suitable for trail use. A trail in this area could connect to the existing IHT and the Isabel Avenue Trail at the Isabel ramp signal, and could use the existing abandoned railroad bridge over the Arroyo Mocho to continue east toward Segment 2. Residents of the neighborhood south of Stanley could reach it by crossing Stanley Boulevard at the Murdell Lane, El Caminito, or Wall Street signals. However, Stanley will be widened in the future, and the rail corridor east of Murrieta Boulevard is envisioned as a 4-track layout plus High Speed Rail, so it is likely that the wide vacant strip would be narrowed substantially to add tracks south of the existing single-track line. The existing single-track bridge over Isabel Avenue would likely be widened to four tracks. In light of the IHT's future relocation north of the railroad corridor, and the rail corridor's probable widening and intensified use, this alignment option is not optimal.

c) Arroyo Mocho Channel north maintenance road, d) south maintenance road. The Arroyo Mocho channel runs north of the rail corridor and south of the Summertree Drive neighborhood, which is bounded on its south side by a soundwall. The channel has wide unpaved maintenance roads on both sides, each suitable for trail improvement, and Zone 7 is open to this use. Zone 7's 2006 Stream Management Master Plan (SMMP) describes modifying one side of the channel to create a vegetated terrace, reduce flood speeds and add riparian habitat, which would further increase the attractiveness of these alignment options. One of the access roads would be modified, and the remaining road could be improved for a trail. The channel connects under Isabel Avenue to the future alignment of the IHT to the west.

If the north access road is utilized, it can connect directly to the Isabel Avenue trail via an existing paved spur. At its midpoint, a possibly gated opening in the soundwall at Eucalyptus Court could create a connection to the neighborhood. If the south access road were utilized, a paved spur would be needed to connect to the Isabel trail. Placement of the alignment on the south side of the channel would be less disruptive to existing residents, and could use the existing bridge west of Murrieta.

The preferred alignment (which side of the channel to locate the trail) should be determined in conjunction with Zone 7's restoration plans for this area, so that the trail alignment can be included in project restoration.

e) Existing Arroyo Mocho Trail through neighborhood north of channel. The existing Arroyo Mocho Trail provides a paved path through the neighborhood north of the channel. It connects to the Isabel Avenue trail via a paved spur at its west end. It could continue under Isabel Avenue to link to the future IHT west of Isabel. Within the neighborhood the trail runs near Hagemann Park on the north side of Daisyfield Drive. At the east end the Arroyo Mocho Trail turns south and passes under the active and abandoned railroad bridges and Stanley Boulevard, then continues east to Holmes Street and points east.

There are three local street crossings within the neighborhood – one at Rockrose Street and two across Summertree Drive. These would be the only street crossings encountered by eastbound IHT users east of the Shadow Cliffs signal several miles to the west.

The ambiance of the Arroyo Mocho Trail through this neighborhood is suitable for walking and moderate speed bicycle travel. In contrast, the existing IHT west of Isabel Avenue carries

intercity commuter bicycle traffic in addition to recreational users. Routing this higher-speed wheeled traffic through the neighborhood trail segment may introduce user conflicts.

Because of the Arroyo Mocho Trail's street crossings and slow-to-moderate user speed environment, aligning the IHT through the neighborhood was considered less desirable than a nearby alignment on one of the Arroyo Mocho channel maintenance roadways.

Preferred Alignment. The preferred alignment would follow the realigned Arroyo Mocho channel. The north maintenance road has an existing paved spur to the Isabel Avenue trail, and the potential for a neighborhood connection at Eucalyptus Court. A trail on the south side would connect via a paved ramp to the Isabel trail and utilize the existing Zone 7 bridge to connect to the Arroyo Mocho Trail. At the east end of this segment the Trail would cross Murrieta Boulevard on a new path bridge just south of the existing railroad bridge. The exact alignment (which side of the channel will be used for the creek access and trail location) should be coordinated with Zone 7 restoration plans.

Table 4-2. Segment 1 Alignment Options

| Alignment Option | Advantages | Disadvantages |
|--|---|--|
| a) South edge of Stanley Boulevard | <ul style="list-style-type: none"> Good connections to neighborhood south of Stanley Blvd. Oak Knoll Pioneer Memorial Park on west side of Arroyo Mocho at east end Arroyo Mocho crossing and trail connection at east end Connects to Murrieta Blvd sidewalk | <ul style="list-style-type: none"> Not desirable for two-way bicycle travel (intersection conflicts) No obvious way to widen for trail Trail adjacent to road would need barrier Stanley Blvd. road noise and pollution |
| b) North edge of Stanley Boulevard /south of rail corridor (2006 BIKE MAP) | <ul style="list-style-type: none"> Wide vacant area (planned for street and rail widening) Could connect to existing IHT at Isabel ramp signal Would connect to south neighborhood at traffic signals Abandoned railroad bridge across Arroyo Mocho at east end | <ul style="list-style-type: none"> Future rail corridor may be 4-track section 100' wide, with HSR Awkward connectivity to future IHT alignment north of railroad west of Isabel Not adjacent to neighborhood Stanley may be widened to the north. Road noise and pollution Train noise and vibration if near RR Railroad noise and vibration |
| c) Arroyo Mocho Channel south maintenance road OR d) Arroyo Mocho Channel north maintenance road | <ul style="list-style-type: none"> Unpaved maintenance roads have ample width and suitable base for trail construction Zone 7 open to dual use of roads Riparian environment: water, waterfowl, and fish. Zone 7 may enhance this by naturalizing one side of stream Connection under Isabel Avenue to future Arroyo Mocho Trail and IHT alignments Use existing Arroyo Mocho Trail connection under railroad to where a bridge over Murrieta Blvd. would connect to Segment 2 Good connection to west side of Murrieta Boulevard at east end | |
| e) Existing Arroyo Mocho Trail through neighborhood north of Arroyo Mocho channel | <ul style="list-style-type: none"> Existing paved trail Existing spur to Isabel Avenue trail Access to Hagemann Park across Daisyfield Drive Good connection to west side of Murrieta Boulevard at east end | <ul style="list-style-type: none"> Three street crossings Higher speed regional bicycle travel may impact existing ambiance for walking. |

4.2 Segment 2: Murrieta Boulevard to Junction Avenue

Table 4-3. Segment 2 Overview

| Segment 2: Murrieta Blvd. to Junction Avenue | |
|--|---|
| Length | 7,000 feet |
| Property Ownership | Private ownership. Trail to be constructed during redevelopment. |
| Trail Type | Paved trail with soundwall, landscaping, shoulder, curb and gutter. |
| Bridge | Bicycle/pedestrian bridge over North P Street. Bicycle/pedestrian bridge over Livermore Avenue. |
| Other Features | Pedestrian connector trail spurs to be provided to local developments and at each street intersection. Design and location should be finalized as part of project development review. At-grade mid-block crossing and traffic warning devices at N. L Street. |
| Notes | Easement acquisition may be needed if trail is built before redevelopment occurs. Retrofit/redesign may be needed to accommodate trail in vicinity of Downtown Transit Center. Downtown Transit Center should be considered for grade-separated crossing of railroad if transit uses are intensified. |
| Section | 5-3 Typical Trail Section Downtown Area Appendix, HSR Options |

Between Murrieta Avenue and Livermore Avenue, the preferred alignment is along the south edge of the rail corridor as shown on the City's 2006 Bicycle Map and Downtown Specific Plan. Two lengths of the trail are already constructed on this sub-segment and another is planned. Existing obstacles such as loading docks and rear driveways are expected to be eliminated during site redevelopment.

Between Livermore Avenue and Junction Avenue, the configuration of the existing ACE station platform, the adjacent parking garage, and the bus station just to the east impose several constraints to IHT alignment that may justify its departing from the south-side alignment. Additional constraints and opportunities are imposed by two potential projects: relocation of the historic depot building from its current off-site location to near the bus station, and the long-term possibility of the current outside-boarding platform being replaced by a two-level center-boarding structure to accommodate High Speed Rail.

Alternative alignments and typical cross sections of the trail if High Speed Rail is implemented are included in the **Appendix**.

a) Murrieta Avenue to Livermore Avenue. Between Murrieta Avenue and Livermore Avenue, the preferred alignment for the IHT is adjacent to the south side of the railroad corridor. Two paved sections are already constructed on this alignment – one along the senior housing complex just east of Murrieta Avenue and the other through a new condominium complex between N Street and L Street.

The following obstacles currently block implementation of the Trail on the rail-side alignment:

Table 4-4. Segment 2 Obstacles

| Location | Obstacle | Options |
|--|--|--|
| a) 1070 Stanley Blvd. | Rear loading dock and driveway | Consider moving dock to side of building. Consider removing rear driveway (may be needed for fire access). |
| b) Dollar Tree (west of P St.) | Rear loading dock and driveway | Consider moving dock to side of building. Consider removing rear driveway (may need for fire access). |
| c) Trader Joe's (west of P St.) | Wall of unused garden sales area | Consider demolishing walled enclosure |
| d) Bowling alley just east of P St. | Proximity of building to rail corridor | Bowling alley would be replaced by proposed Corsia Commons development, which incorporates a trail dedication |
| e) Bank of America parking lot on west side of N St. | Line of mature redwood trees along rail corridor fence | Obtain easement along trees through back edge of parking lot. Lot is underutilized for existing bank use. |
| f) NW corner at L St. | Equipment rental business | Temporary alignment enters Depot Drive condominium complex via first driveway south of this business |
| g) NE corner at L St. | Parking lot along rail corridor | It may be possible to obtain enough width for the trail by replacing the 5' wide landscape strip along the north fence and reducing the width of the driveway. However, the next obstacle to the east blocks further progress. |
| h) Between L St. and Oak Street South | Building along rail corridor fence | Evaluate entire block between L St. and Livermore Avenue for redevelopment. |
| i) Oak Street South | Street is adjacent to rail line | Evaluate feasibility of narrowing street. Evaluate entire block for redevelopment. |

Obstacles (c), (d), (e), and (i) can be resolved fairly easily. The remaining items may require redevelopment or significant changes to the functionality of the respective parcels.

b) Livermore Avenue to Junction Avenue. At some point, the rail alignment must transition from the south side of the railroad tracks to the north side. The preferred location for this crossover is to ramp up to the First Street overcrossing within City lands, cross on the existing overpass, and ramp down to the trail south of First Street.

Table 4-5. Segment 2 Issues and Options

| Location | Issues | Options |
|---|---|---|
| ACE station platform (south side of tracks) | Platform is directly in line with desirable trail alignment, and has walkways into the 3-story parking garage immediately to the south. The parking garage prevents trail alignment just south of the platform. | Trail could be narrowed to sidewalk, with restrictions on bicycles, or ramp up and pass over the platform. An elevated trail could shelter passengers waiting on the platform, but would be expensive and problematic if historic depot is relocated. |
| LAVTA bus station loop driveway just east of parking garage | Narrow strip of lampposts (platform lighting) and trees between loop driveway and railroad fence is on the desirable trail alignment. | Replace landscape strip with trail. Reconfigure lighting to accommodate trail and to light both platform and trail. |
| Northwest corner of bus station area (northeast corner of parking garage) | City plans to relocate historic depot building to either this location or to the center of the bus station loop. | Depot building location along tracks would preclude trail alignment along tracks. However, trail could meander through new plaza area created as part of depot building relocation. |
| Station platform | High Speed Rail station concept plans show center-boarding platforms at ground level (for ACE) and at an elevated level (HSR). Current HSR station concept plan does not show location of existing parking garage. | If combined ACE / HSR station was constructed entirely within the existing rail corridor, the existing south-side station platform would no longer block the desirable south-side alignment of the trail – unless the rail corridor would be expanded to the south toward the face of the parking garage. If the space between the existing rail corridor and the parking garage were made unavailable, one option would be to elevate the trail and run it through the north end of the second level of the parking garage. |
| Station area | Current HSR station concept plan shows a possible pedestrian undercrossing to serve the center boarding platforms | The undercrossing could incorporate a parallel trail undercrossing to link to a north-side trail segment east of this point. This would eliminate the need for a complex at-grade crossing at Junction Avenue or a separate tunnel near that street. |

If High Speed Rail is not factored in, the current configuration of the station platform and the downtown parking garage are primary constraints to the IHT alignment. The existing platform is on the south side of the rail corridor, roughly centered on the north face of the parking garage, with walkways between the platform and the ground level of the parking garage. A raised platform area facilitates wheelchair boarding of ACE trains, and an at-grade bypass allows platform users to pass behind this raised area. Together the raised area and the bypass occupy almost all of the available width between the railroad right of way and the parking garage, with six feet of available landscape width for a trail connection.

This area is congested with persons congregating on the platform and crossing to and from the parking garage. The preferred alignment will be to construct a sidewalk or path within the available landscape area, with bicycles to be dismounted through the Station and Parking Structure.

Although this alignment does not meet Class I standards, in this pedestrian-oriented destination, it is appropriate to create a sidewalk/path where bicycles can be walked through the congested

area. A six-foot path may be created within available space, to provide connections and a continuous path through the transit center.

Construction of the new parking structure should include a sufficient setback to accommodate the recommended width and design section of the IHT in the Downtown area (20 feet). In addition, future improvements to the ACE loading platforms, access ramps and other infrastructure should consider providing sufficient space to accommodate the trail.

Relocation of the Depot structure, downtown pedestrian paths, and kiss and ride layout should consider the IHT and potential connections when this work is implemented.

Other alternatives considered include the following options (**Appendix**):

- Detour to the south around the parking garage on Railroad Avenue’s north sidewalk.
- Cross the rail corridor at N Street and continue to the east along the north side.
- Elevate the Trail over the south platform and continue to the east.

4.3 Segment 3: Junction Avenue to Arroyo Las Positas

Table 4-6. Segment 3 Overview

| Segment 3: Junction Avenue to Contractor’s Place/Arroyo Las Positas | |
|--|---|
| Length | 9,600 feet (north side of tracks) 9,500 feet (south side of tracks) |
| Property Ownership | Private ownership. Trail to be constructed during redevelopment. Some existing EBRPD-owned easements can be constructed. |
| Trail Type | Paved trail with soundwall (if adjacent to residential uses), landscaping, shoulder, curb and gutter (if applicable) |
| Bridge | Pedestrian bridge, Arroyo Las Positas |
| Other Features | At-grade mid-block street crossing/traffic warning devices at Junction Avenue. Railroad tunnel undercrossing or bridge near Mines Avenue should be considered as part of area redevelopment. |
| Notes | Zone 7 proposes regional trail connection at Arroyo Las Positas/Arroyo Seco to north Livermore. If agreement with UP is unsuccessful, then the trail would need to be routed along First Street parcelsto Trevarno Road. |
| Section | Typical Trail Section near Railroad, Appendix, HSR Options |

In this segment, a north-side and south-side alignment both appear valuable enough for further consideration. East of First Street are neighborhoods on the south side of the rail corridor, making a south-side alignment more valuable in terms of enhancing the mobility and recreational options of Livermore residents. Some sections of the trail could be accommodated on local streets such as Silver Oaks Way, Shawna Street or Maureen Circle. However, some sections south of the rail tracks would likely require acquisition of an easement, ROW, and/or a licensing agreement from the UP railroad in order to form a continuous trail. A trail along the

south side of the UP ROW would facilitate access from residential uses and eliminate short-term crossing needs further east at Arroyo Las Positas. However, the UP tracks in this segment are approximately 30-50 feet from adjacent ROW to the south. This is sufficient for placement of a trail and associated fencing or soundwalls; however, UP has indicated that this may not be acceptable for future rail planning considerations.

If the trail is located north of the tracks, the trail would cross from Segment 2 to the north side via the First Street overpass, and be located on parcels south of First Street as part of development or redevelopment projects. In this area, UP owns a large parcel that does not contain trackage and is separated by up to 200 feet from active rail lines, that could be considered for acquisition of a linear easement if UP planning or change of use occurs East of Trevarno Road, on the north side of the tracks, EBRPD has acquired an easement on several parcels adjacent to the UP ROW, which can be utilized for trail without encroaching on railroad lands.

Alignment Options. The IHT alignment between Junction Avenue and Arroyo Las Positas includes:

- Junction Avenue to Silver Oaks Way east of First Street
- Silver Oaks Way to Trevarno Road
- Trevarno Road to Arroyo Las Positas

a) Junction Avenue to the Silver Oaks Way bend east of First Street. Junction Avenue crosses the rail corridor at-grade at an angle. To the north, Ladd Avenue intersects Junction Avenue from the east at a T intersection. Junction Avenue Middle School occupies the north “corner” of the T. Part of the school’s attendance area is south of the rail corridor. A school district maintenance yard occupies the corner bounded by Ladd Avenue and the tracks. On the north side of the tracks west of Junction Avenue is a small one-story office building with informal parking along the un-fenced rail corridor.

On the south side of the tracks, Junction Avenue intersects Old First Street at a modified T intersection one parcel to the south. Old First Street dead-ends a short distance to the east. On the west side of the Junction / Old First intersection is a service business with parking lots on Old First Street. The property owner recently fenced the vacant northern part of the parcel to prevent pedestrians from cutting across the tracks and through the property to reach Old First Street. The northern segment of that property fence also restricts pedestrian access along the south side of the rail corridor.

The shallow triangular parcel bounded by the east side of Junction Avenue, the north side of Old First Street, and the south side of the rail corridor is occupied by an automotive service business consisting of a small building surrounded by parking. The area south of Old First Street is occupied by low-density business uses, set back from the street behind parking lots.

The City is considering redevelopment of the area between Junction Avenue and First Street, including the Old First Street segment.

Incorporating the trail into redevelopment plans and utilizing excess city right of way east of the First Street overcrossing, to continue the trail on the south side of the tracks adjacent near Silver Oaks Way would utilize City ROW and would ramp up to the First Street Overcrossing.

First Street Overpass. At First Street, the street passes over the tracks on a high bridge supported by embankments and two sets of columns, one on either side of the rail corridor. The toes of the north and south embankments reach the respective sets of columns. If the Trail cannot be aligned on the rail side of the columns while maintaining the 25-foot separation, the space between the bottom of each embankment and the “back” side of the adjacent columns could be adapted to carry the Trail under the bridge, possibly requiring the Trail to ramp up and down slightly to cross the modified embankment areas within city ROW.

First Street to Silver Oaks Way. This area logically ends where Silver Oaks Way – the closest parallel street in the neighborhood to the south – bends and begins running close to the rail corridor. The neighborhood’s pool and a marked crosswalk are at this location. East of this point there is between 30 and 50 feet of separation between the railroad tracks and the existing fence, with a 5-10 foot landscaped strip between the street and the fence. This provides sufficient area for moving the fence back and incorporating the trail into the landscaped area. This would be subject to UP negotiation and approval, which has indicated it does not support.

On the north side of the tracks between First Street and Silver Oaks, the alignment would run north along the east side of the First Street embankment to the south side of the Scott Street signal, at which point First Street has returned to surface grade. Crosswalks at this signal provide access to neighborhoods north of First Street. A stairway to First Street’s east sidewalk on the embankment above would provide additional access opportunities.

b) Silver Oaks Way to Trevarno Road. Between First Street and Trevarno Road the railroad tracks follow a gentle curve toward the northeast. This curve brings the south side of the rail corridor close and parallel to the north fence of the neighborhood to the south along Silver Oaks Way. On the north side of the curve is a wide parcel owned by Union Pacific, which appears to be a former rail yard. This parcel widens away from the railway as it proceed to the east, ending squarely at Trevarno Road. To the north are deep commercial parcels fronting on First Street.

Trevarno Road runs south from First Street toward the rail corridor through a unique and historic residential pocket with mature trees. Its extension crosses the tracks as a gated at-grade vehicular crossing serving Hexcel Corporation’s complex on the south side of the railway.

A north alignment would be located on adjacent parcels and completed as part of land redevelopment unless an agreement was reached with UP for some of the former railyard lands. A south alignment in this segment would require acquisition of some ROW from UP to maintain a continuous trail, due to existing residential development. Interim solutions would require using sidewalks along existing streets between First Street and Trevarno Road.

On the north side of the corridor the optimal alignment for the Trail would follow the north edge of the vacant UPRR parcel to preserve its development potential. At the east end of the UPRR parcel this would align the Trail with EBRPD trail easements to the east along the west extension of Contractors Place.

If it were possible to implement the Trail on the south side of the corridor, this would create a significant recreational and transportation amenity for the residents of the south-side neighborhoods, preliminary correspondence from UP does not support this route

A new solid barrier wall could be constructed 15-20' north of the existing fence, and the Trail aligned on its south side, i.e. along the north side of Silver Oaks Way. This would preserve the neighborhood's privacy and provide noise reduction equal to or greater than the current fence. It would also "incorporate" the Trail into the neighborhood, which would likely produce substantially more acceptance, monitoring, upkeep, and use than if it ran behind a wall or fence.

c) Trevarno Road to Arroyo Las Positas

North option. On the north side of the corridor east of Trevarno Road, Contractors Place parallels the tracks, passing under Mines Road overcrossing and continuing to Contractors Street just before the Arroyo Las Positas channel. EBRPD trail easements are already acquired in this area. There are no parcels between this street and the tracks so there would be no crossing conflicts.

A trail access point (marked crosswalk with curb cut) should be located at the intersection of Technology Drive and Contractors Place, approximately 300 feet east of the Mines Road bridge. Another such access point would be useful at the intersection of Contractors Street, and this point would also serve as an access point to a future trail along the Arroyo Las Positas channel. Additional access points should be added immediately east and/or west of the Mines Road overcrossing if it was feasible to extend a spur path north along Mines Road's north embankment to the Technology Drive signal. Such spurs would enable persons traveling between the Trail west of Mines Road and Mines Road north of the railway to avoid the extra distance to Technology Drive.

South option. On the south side of the corridor east of Trevarno Road and west of Mines Road there is approximately 30-50 feet of separation from the property line to the railroad tracks, which is sufficient width for a trail along the Hexcel parcel. If possible, addition of a trail segment could be made a condition of redevelopment.

On the south side at Mines Road, maintenance roadways run southward along the foot of the Mines Road bridge embankment. Trail spurs on these alignments could connect the south-side mainline Trail to the Sonia Street signal on both sides of Mines Road, and possibly extend to the Patterson Pass Road signal on the east side.

On the south side east of Mines Road there is a neighborhood behind a soundwall. Shawna Street and Maureen Circle run immediately parallel to the soundwall inside the neighborhood. There is a sidewalk and a narrow landscape strip between the north curb of Shawna Street and the soundwall, which is covered with vegetation. Along the north curb of Maureen Circle there is a line of mature (but shallow) trees but no sidewalk. It does not appear that either street could be narrowed enough to add a trail south of the soundwall while preserving parking along their south curb and two-way travel.

If the south-side Trail reached the area east of Mines Road, at a minimum it could connect to the west end of Shawna Street. East of this point, additional UP ROW would need to be acquired to accommodate a trail. In addition, this area has a solid soundwall. Design and siting of the trail should avoid creating a tunnel with two walls, and use open wire fencing if additional ROW is acquired. The only obstacle is a large equipment enclosure next to a railroad signal

“bridge” just east of Medina Street. That enclosure could presumably be relocated, perhaps to the north side of the corridor.

If the Trail was implemented on the south side between Mines Road and the Arroyo Las Positas channel and the existing neighborhood soundwall remained in place, periodic access openings through the soundwall could provide access for the neighborhood. However, a Trail implemented in this way would have several less than optimal features:

- It could not be monitored by residents or police from adjacent streets
- Adult users might feel less comfortable than if it was on the south side of the wall.
- Parents would be less likely to allow children to use it than if it was visible.

If there is neighborhood support for the trail, then incorporating it into the streetscape by moving the wall should be considered as a long-term option. The Trail would become part of the neighborhood, security (including illumination) would be improved, and usage by all ages should be higher than with the wall separating the Trail from the street. The addition of the trail in this configuration would be more likely to be perceived by residents as adding value to their neighborhood.

At Arroyo Las Positas, a new pedestrian bridge would be needed to cross to the existing maintenance access road, which will become the Phase I IHT alignment.

4.4 Segment 4: Arroyo Las Positas to Greenville Road

Table 4-7. Segment 4 Overview

| Segment 4: Arroyo Las Positas to Greenville Road | |
|---|--|
| Length | Phase I: Arroyo Las Positas Alignment: 13, 100 feet Phase II: North UP alignment: 12,500 feet |
| Property Ownership | Zone 7—Arroyo Seco and Realigned Arroyo Las Positas, City of Livermore (Patterson Pass Road) |
| Trail Type | Paved trail with shoulder. |
| Bridge | Phase II: Bicycle/pedestrian bridge, Vasco Road |
| Other Features | Phase I Arroyo Las Positas Alignment: <ul style="list-style-type: none"> ▪ At-grade mid-block crossing and traffic warning devices at Patterson Pass Road/Arroyo Las Positas. ▪ Improved crosswalk at Greenville/Patterson Pass intersection. ▪ Optional tunnel connection to Vasco Road ACE Station Phase II IHT Alignment: <ul style="list-style-type: none"> ▪ Tunnel under railroad tracks east of Arroyo Las Positas ▪ Grade separated crossing of Vasco Road ▪ Improved crosswalk at Greenville Road/Las Positas intersection. |
| Notes | Easement acquisition may be needed if trail is built before redevelopment occurs in industrial areas. Segment along Realigned Arroyo Las Positas requires operating agreement with Zone 7. Trail segment along Patterson Pass Road should be within street ROW to avoid security conflicts with LLNL. |
| Section | 5-1 Typical Trail Section Adjacent to Creek 5-2 Typical Trail Section near Railroad, Appendix, HSR Options |

The Arroyo Las Positas channel intersects the rail corridor from the north. To the south this waterway splits in to the Realigned Arroyo Las Positas, which turns eastward and heads toward a culvert under Patterson Pass Road some distance to the east, and the Arroyo Seco, which continues south to pass under Patterson Pass Road a short distance from the rail corridor.

East of the Arroyo Las Positas channel the rail corridor splits. An inactive single-track branch runs east-northeast parallel to and south of Las Positas Road, terminating just west of Greenville Road. If High Speed Rail were implemented through Livermore it would follow that branch. It is also being considered for reactivation for freight service. A trail along this corridor would carry the IHT designation, and would connect with regional trails east of Greenville Road.

An active single-track line carrying ACE commuter trains and UPRR freight trains runs eastward, roughly parallel to and north of Patterson Pass Road until it bends northward at Marathon Drive before crossing under Greenville Road. A trail along this corridor would carry the Arroyo Las Positas Trail designation. It could also connect to regional trails east of Greenville Road.

The discussion of this Segment includes:

- Arroyo Las Positas channel junction area
- Phase I IHT, along Arroyo Las Positas
- Phase II IHT, along north railroad alignment

Arroyo Las Positas channel junction. The Arroyo Las Positas trail is planned along the Arroyo Las Positas north/south channel north of the rail corridor. This side of the channel on which this trail will run has yet to be determined. South of the rail line the Arroyo Las Positas Trail would follow a maintenance road along the Arroyo Las Positas channel, and the Arroyo Seco Trail would begin and run south along the Arroyo Seco channel. This would become the Phase I alignment, until a long term alignment can be constructed to connect with proposed trail improvements east of Greenville Road.

The Zone 7 description of the Arroyo Las Positas trail calls for a pedestrian overcrossing of the rail line. However, the waterway passes under the railroad, which is embanked above surface grade at this point. In addition, if High Speed Rail were considered, it would be on an elevated structure at this location, with electric catenary wires on supports above it. For these reasons, having the Arroyo Las Positas Trail cross the tracks on a path bridge appears inadvisable, if not infeasible, and a path tunnel is preferable. Because a large sewer line passes under the railroad embankment just west of the channel, the preferred tunnel location would appear to be just east of the channel.

Such a tunnel could be constructed by briefly removing a length of track and dropping in a box culvert section. Because the tracks are embanked up above surrounding surface grade, the tunnel need not be fully depressed. The two tracks are separated, so a skylight could illuminate the tunnel's midpoint. There are two examples of such skylight-equipped pedestrian tunnels along the Caltrain corridor.

The IHT would cross the Arroyo Las Positas channel on a short path bridge parallel to the tracks. If the Trail ran on both sides of the railway to the west, there would be two such bridges. The south-side bridge would also connect the adjacent neighborhood along Maureen Circle to the Arroyo Las Positas Trail and the Arroyo Seco Trail.

Any of these improvements would need to be negotiated with UP.

IHT Phase I (parallel to ACE Corridor). East of the Arroyo Seco channel, the realigned Arroyo Las Positas channel runs east, passes under Vasco Road at the Vasco ACE station, then continues east before turning south, passing under Patterson Pass Road, and into Lawrence Livermore National Laboratory (LLNL). The Arroyo Las Positas Trail would be located on one of the channel access roads to Patterson Pass Road, then would continue east along the south side of Patterson Pass Road to Greenville Road and potentially one mile east to the South Bay Aqueduct. Starting east from its junction with the Iron Horse and Arroyo Seco trails, the Arroyo Las Positas trail would have the following connections.

Joyce Street. A short distance east of the Arroyo Seco, between Candy Court and Joyce Street, the Arroyo Las Positas channel's south maintenance roadway reaches Patterson Pass Road for the first time. At this location Patterson Pass Road has a wide landscaped median that can serve as a pedestrian refuge. A path bridge across the channel and a connection to Joyce Street should be considered.

Recreation complex west of Vasco Road. At Vasco Road there is an existing service road bridge between the channel's north and south maintenance roadways. A trail spur would cross this bridge and continue south along the west side of the Vasco Road embankment, ending at the northwest corner of the Vasco Road / Patterson Pass Road signal and serving a playing field complex on the north side of Patterson Pass Road west of Vasco Road.

Vasco ACE station. The Vasco ACE rail station is located under Vasco Road's high bridge over the railway. Its parking lot is on the west side of Vasco Road, accessed from southbound Vasco Road by a right-in/right-out driveway. The station platform is just east of Vasco Road on the north side of the tracks, along a service road that is being extended under Vasco Road from the west parking lot. A new parking lot is being added east of Vasco Road and north of the tracks, adjacent to a planned residential development.

The Arroyo Las Positas channel runs south of the single-track railway at this point, with a swale between the embanked rail line and the channel's north maintenance road. To connect the trail to the station, a path spur could either bridge the swale or ramp down and up through it, and a short path tunnel could be placed under the ACE/UPRR tracks just east of the platform. A spur could also connect the platform area to the north along the east side of Vasco Road, to the southeast corner of the Brisa Street signal just to the north.

Patterson Pass Road west of Shannon Court. East of the Vasco ACE station, the Arroyo Las Positas Trail would reach Patterson Pass Road. At that point, this trail could:

- Terminate with a midblock crosswalk and median refuge to provide access from both directions of Patterson Pass Road;
- Cross Patterson Pass Road at a midblock crosswalk and median refuge, then continue east to Greenville Road along the south side of the street within the city right of way north of LLNL's north boundary fence; or
- Continue as a sidepath (a close-running path along a roadway) along the north side of Patterson Pass Road to Greenville Road

On the north side between the channel and Greenville Road are Shannon Court, Marathon Drive, and warehouse buildings with a total of nine driveways – i.e. eleven cross-traffic conflict points. On the south side there are no driveway and no intersecting streets. If the trail ran along the south side of Patterson Pass Road, LLNL requires that there be no screening (opaque landscape).

Greenville Road and points east. East of Greenville Road the Arroyo Las Positas Trail could continue east along the south side of Patterson Pass Road, which narrows to a two-lane rural section and crosses the South Bay Aqueduct about one mile to the east.

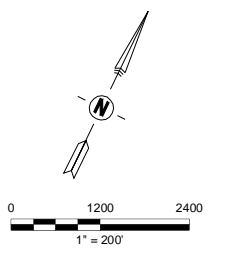
IHT Phase II (IHT, potential future High Speed Rail, or intensified rail use). East of the Arroyo Las Positas channel, the IHT would run along the north side of the rail corridor, cross Vasco Road and continue along the north side to Greenville Road. The High Speed Rail system envisions a station at Vasco Road. A grade separated overpass would likely be needed at Vasco Road. Implementation of this alignment is dependent on acquiring easements/ROW from individual property owners as a result of development or redevelopment of these industrial parcels. In some cases, there is a separate parcel that includes rail spurs to the parcels. If rail freight service is reinstated along this line, then it is unlikely that these spurs would become

available for a trail. However, if this line is not used, then acquisition of the ROW, a portion of the alignment, or an easement parallel to the railroad should be considered.

Potential trail alignments should be reviewed for all projects where the City has discretionary review of potential use or development. It is envisioned that implementation of this segment of the IHT is a long-term effort; pedestrian and bicycle mobility in this area should be reviewed as part of any transportation planning efforts in this area, including ACE expansion, UP rail use, HSR, and BART.

Livermore's section of the IHT would terminate at the southwest corner of the Las Positas Road/Greenville Road signal. The Trail could continue across the signal's south crosswalk and from there run east to access trails along the South Bay Aqueduct and to the Brushy Peak Regional Preserve north of I-580.

The IHT alignment would be along the north side of the existing tracks, or within the ROW if abandoned or acquired for trail use. Existing spur alignments would need to be acquired from individual property owners if the alignment is outside the current rail ROW. This could be partially accomplished if properties are redeveloped or uses changed as part of discretionary planning and review.



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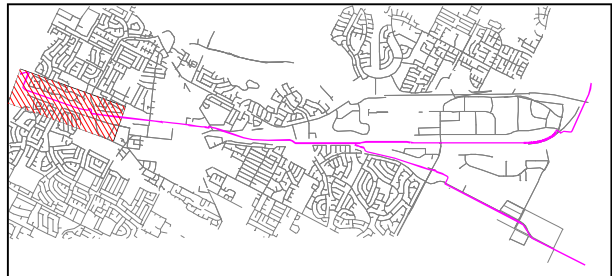
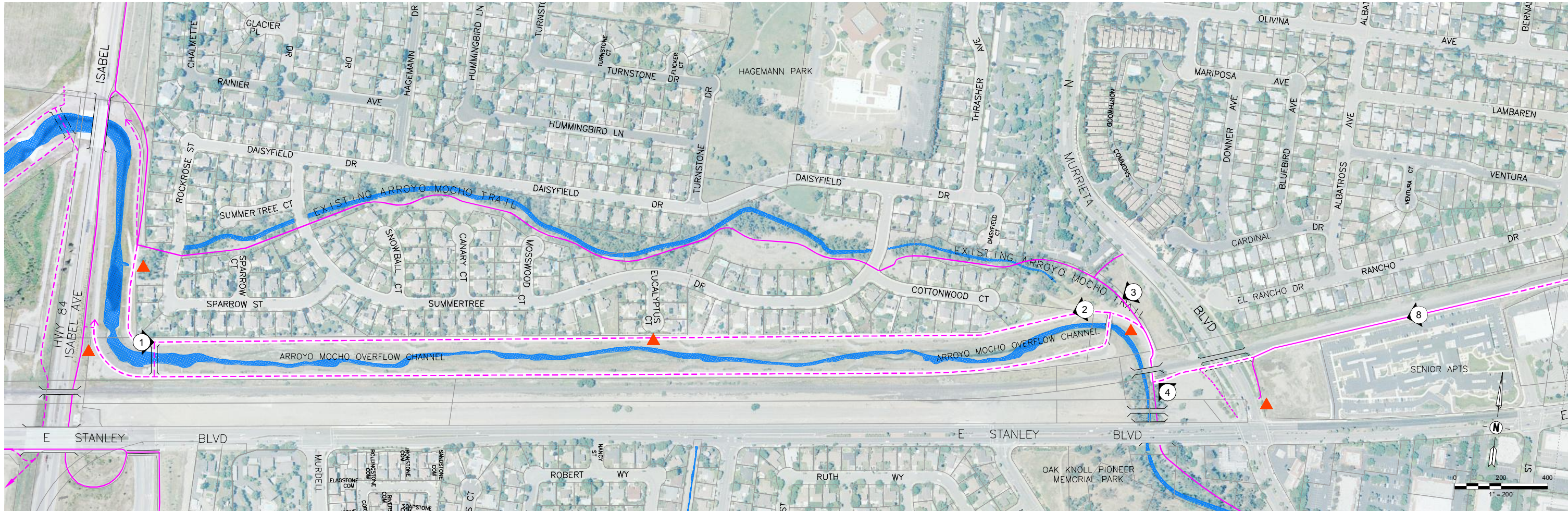
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| EXISTING | | PROPOSED | |
|----------|------------------|----------|------------------|
| | TRAIL | | PHASE I |
| | SPUR | | PHASE II |
| | SIDEWALK | | SPUR |
| | BIKE LANE | | SIDEWALK |
| | RAILROAD | | BIKE LANE |
| | WATERWAY | | CROSSWALK |
| | BRIDGE OR TUNNEL | | BRIDGE OR TUNNEL |
| | | | ACCESS POINT |

**CORRIDOR VIEW
PROPOSED TRAIL**
LIVERMORE, CA

**CITY OF LIVERMORE
IRON HORSE TRAIL
FEASIBILITY STUDY**

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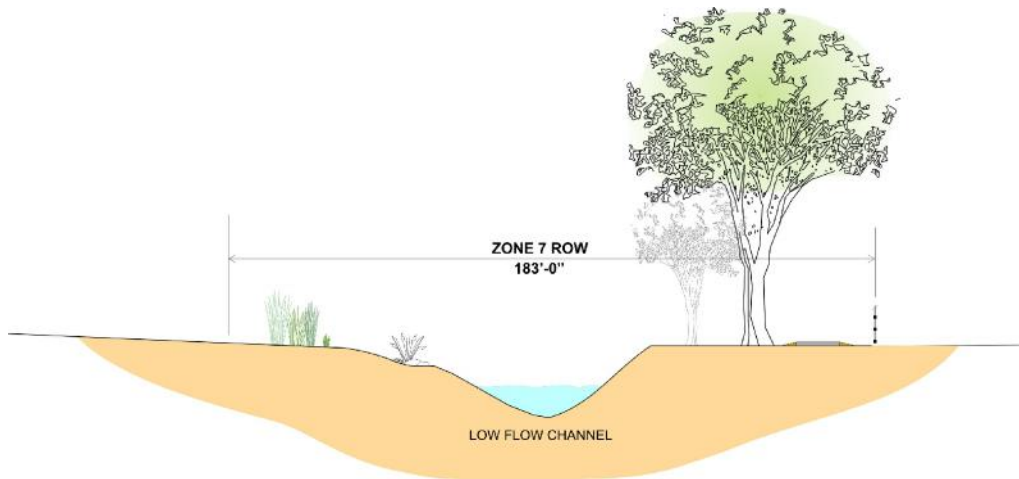
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TRUSSED STEEL TRAIL BRIDGE AT MURIETTA BLVD.



STEEL GIRDER TRAIL BRIDGE AT MURIETTA BLVD.



TYPICAL TRAIL SECTION ADJACENT TO CREEK



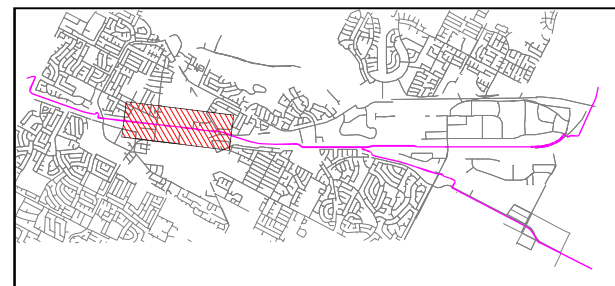
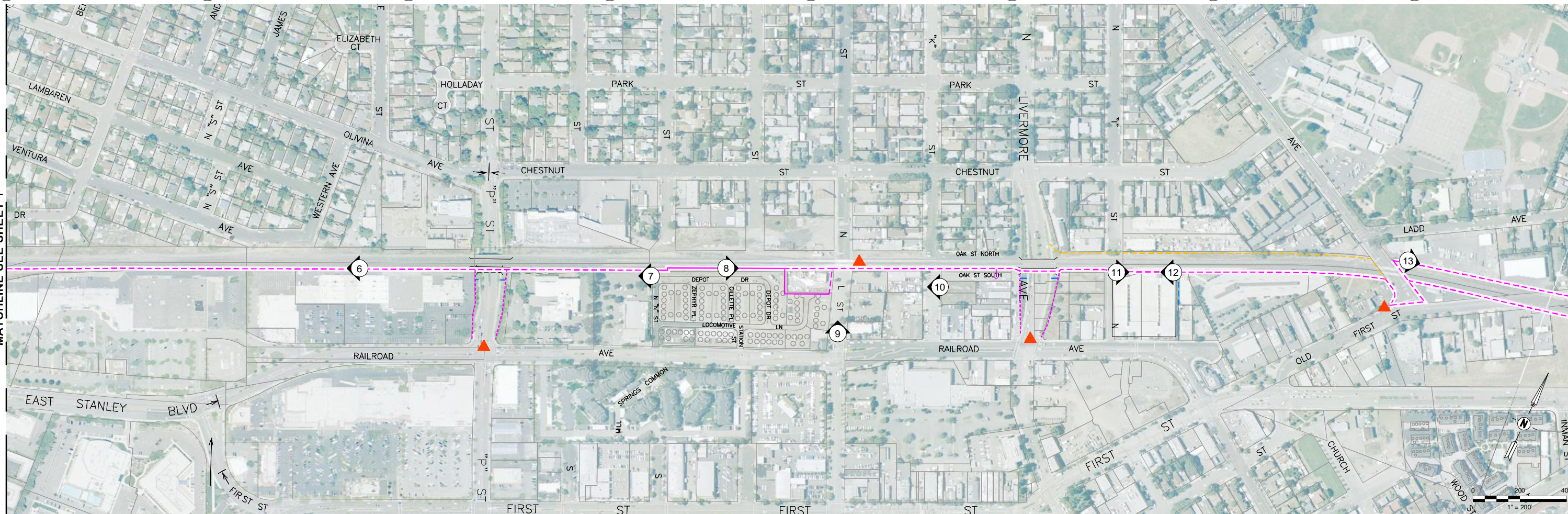
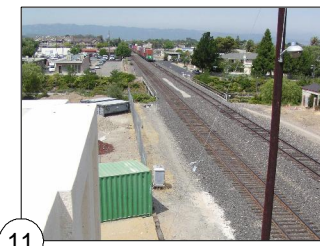
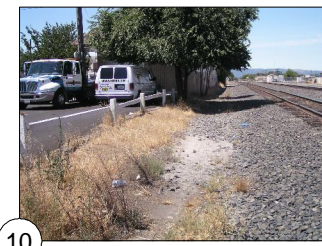
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| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

CORRIDOR VIEW PROPOSED TRAIL
LIVERMORE, CA

CITY OF LIVERMORE
IRON HORSE TRAIL
FEASIBILITY STUDY

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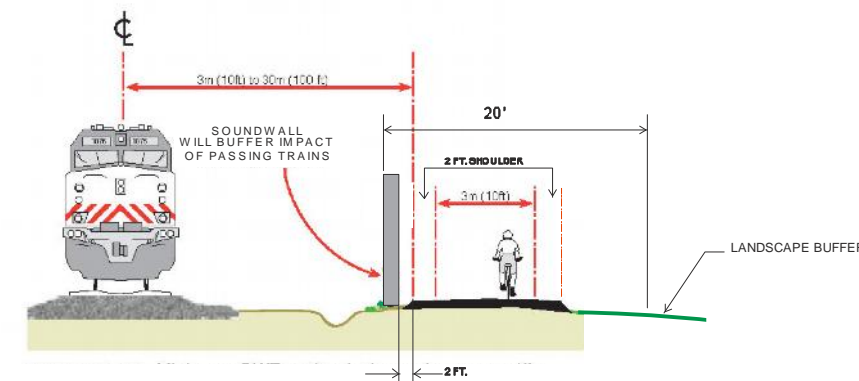
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TRUSSED STEEL TRAIL BRIDGE AT N. LIVERMORE AVE.



STEEL GIRDER TRAIL BRIDGE AT N. LIVERMORE AVE.



TYPICAL DOWNTOWN TRAIL SECTION



| EXISTING | PROPOSED |
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| TRAIL | PHASE I |
| SPUR | PHASE II |
| SIDEWALK | SPUR |
| BIKE LANE | SIDEWALK |
| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

**CORRIDOR VIEW
PROPOSED TRAIL**
LIVERMORE, CA

**CITY OF LIVERMORE
IRON HORSE TRAIL
FEASIBILITY STUDY**

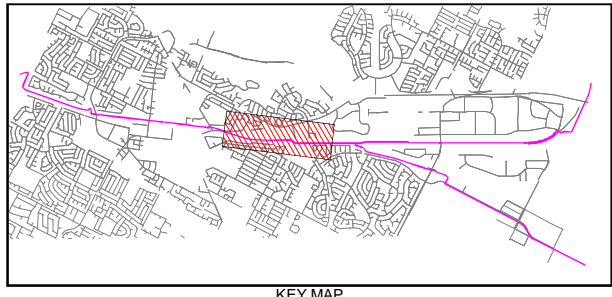
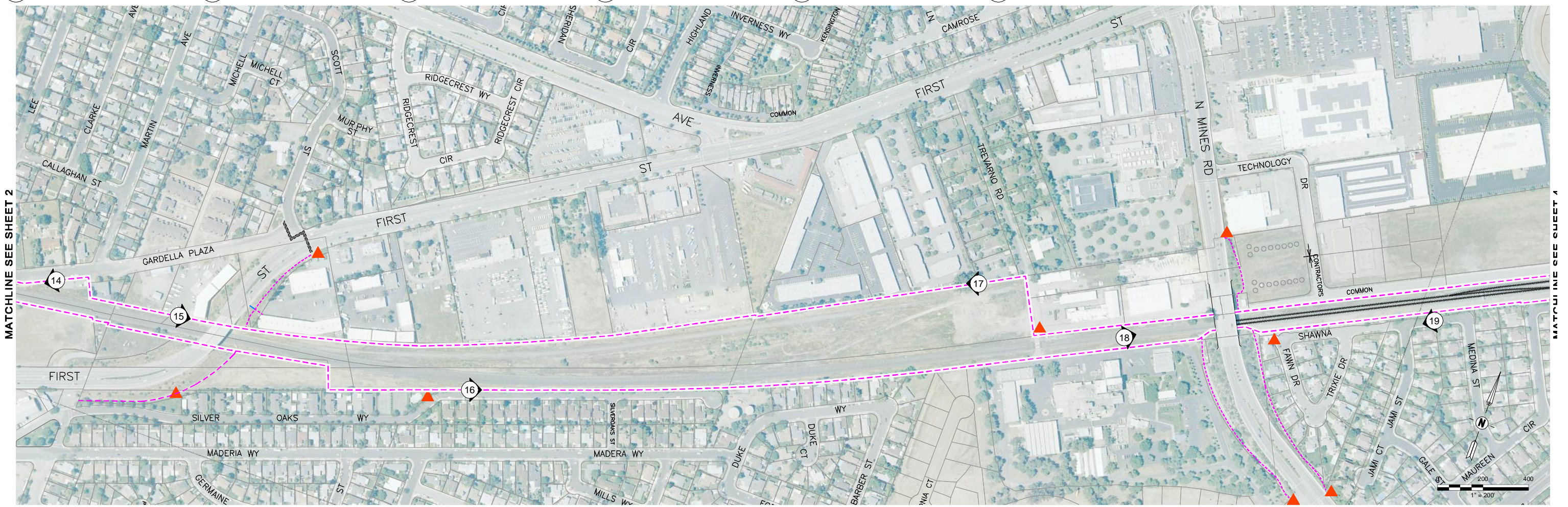
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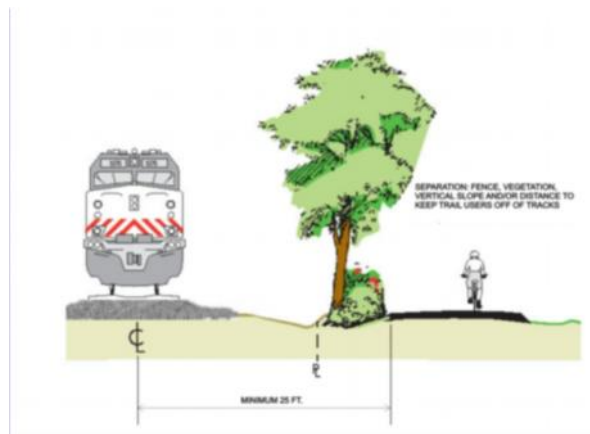
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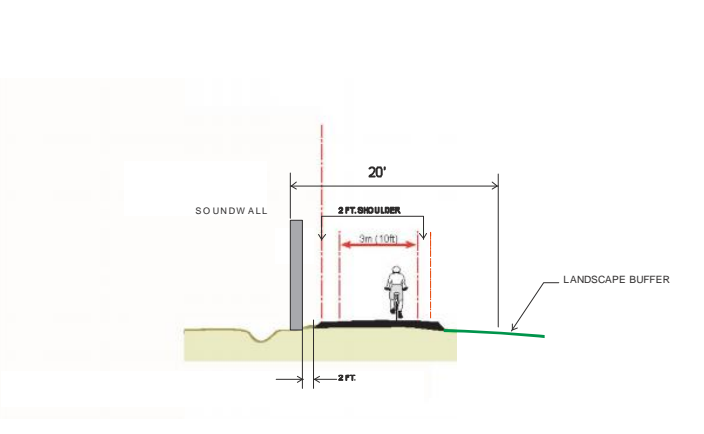
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KEY MAP



TYPICAL TRAIL SECTION



TRAIL WITH SOUND WALL

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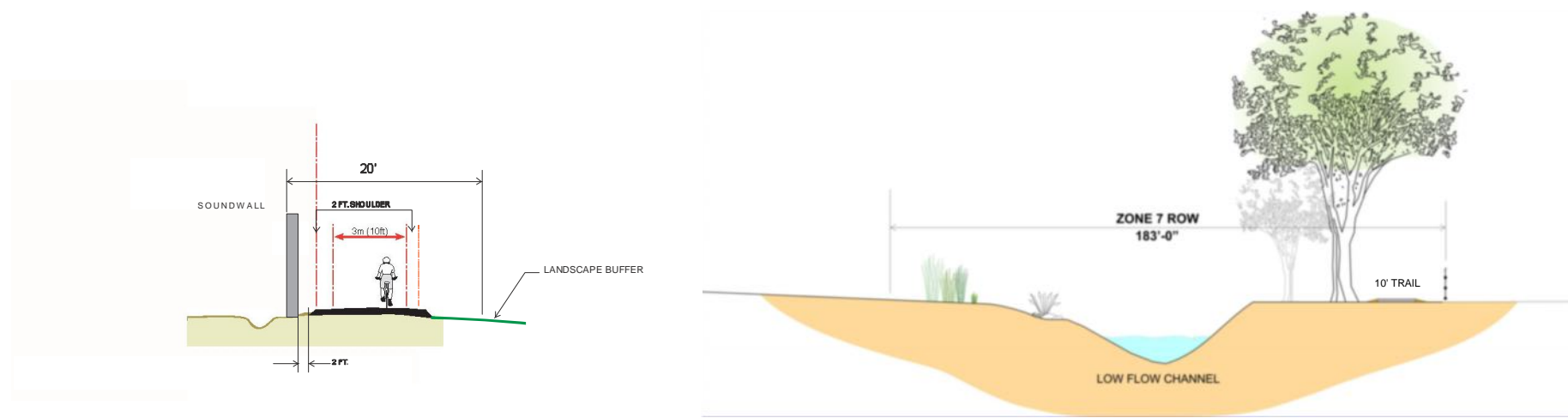
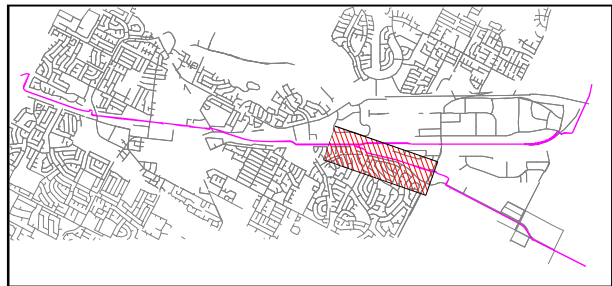
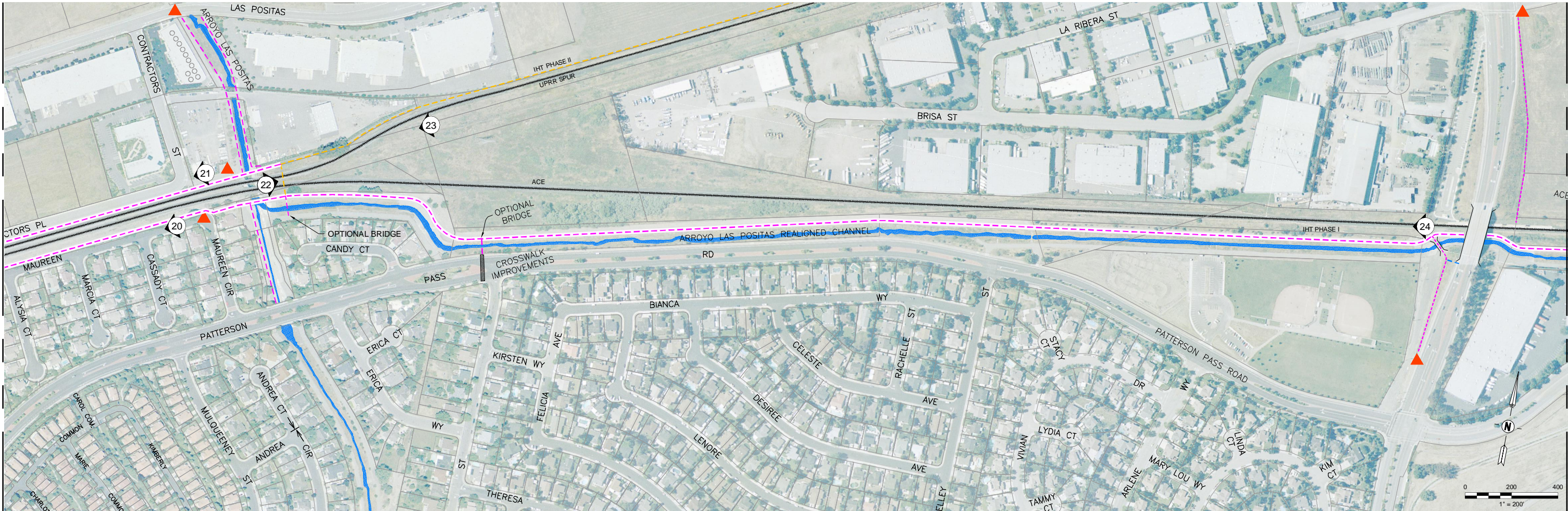


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| SIDEWALK | SPUR |
| BIKE LANE | SIDEWALK |
| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

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IRON HORSE TRAIL
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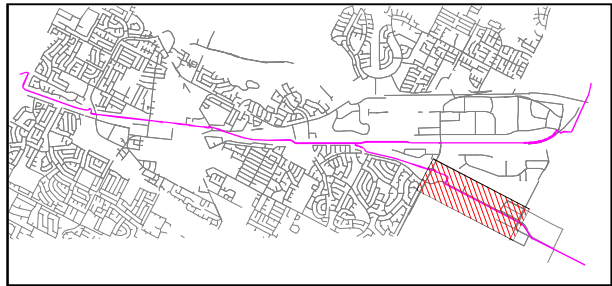
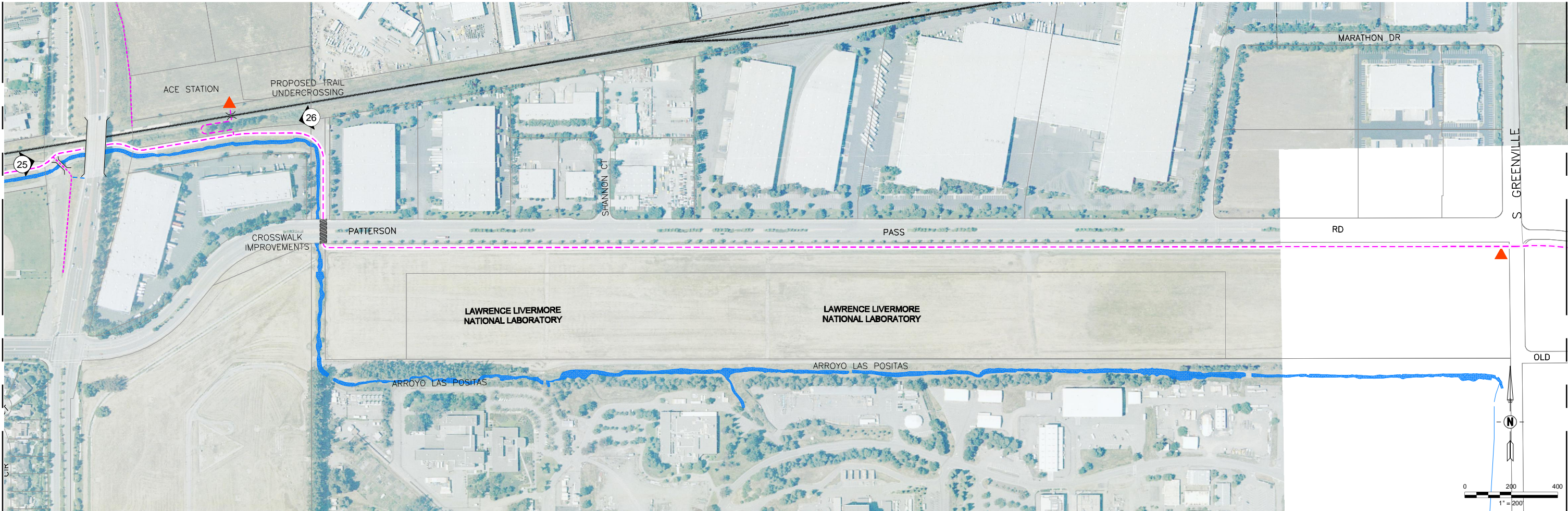


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| WATERWAY | CROSSWALK |
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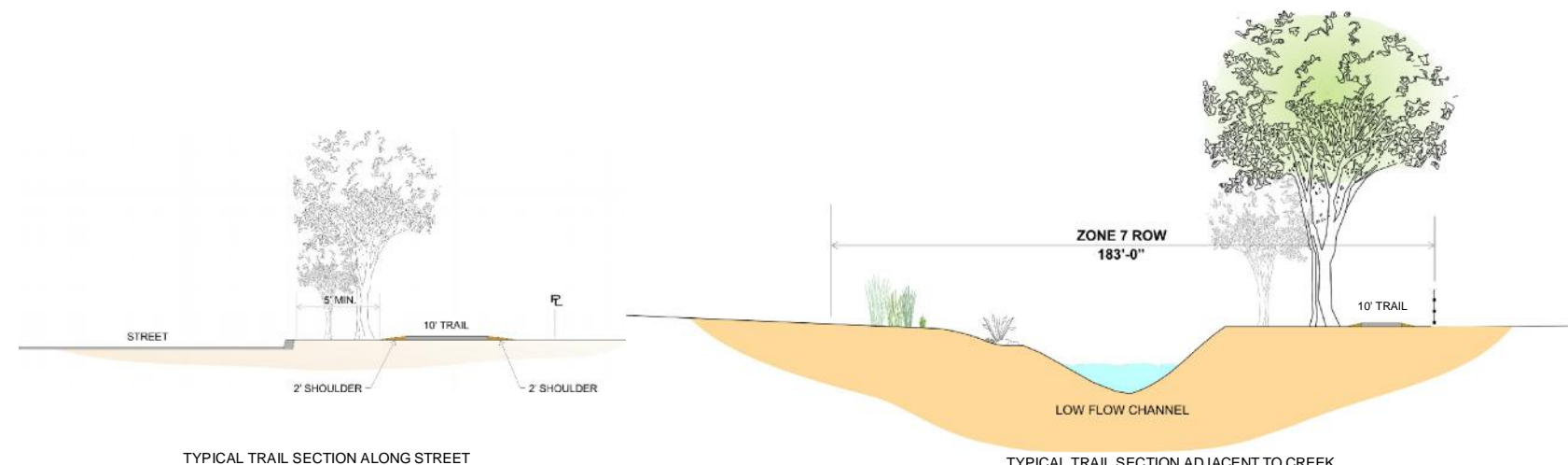
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PROPOSED TRAIL**
LIVERMORE, CA

**CITY OF LIVERMORE
IRON HORSE TRAIL
FEASIBILITY STUDY**

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KEY MAP



| EXISTING | PROPOSED |
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| TRAIL | PHASE I |
| SPUR | PHASE II |
| SIDEWALK | SPUR |
| BIKE LANE | SIDEWALK |
| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

**CORRIDOR VIEW
PROPOSED TRAIL**
LIVERMORE, CA

**CITY OF LIVERMORE
IRON HORSE TRAIL
FEASIBILITY STUDY**

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| PROJECT NO. |
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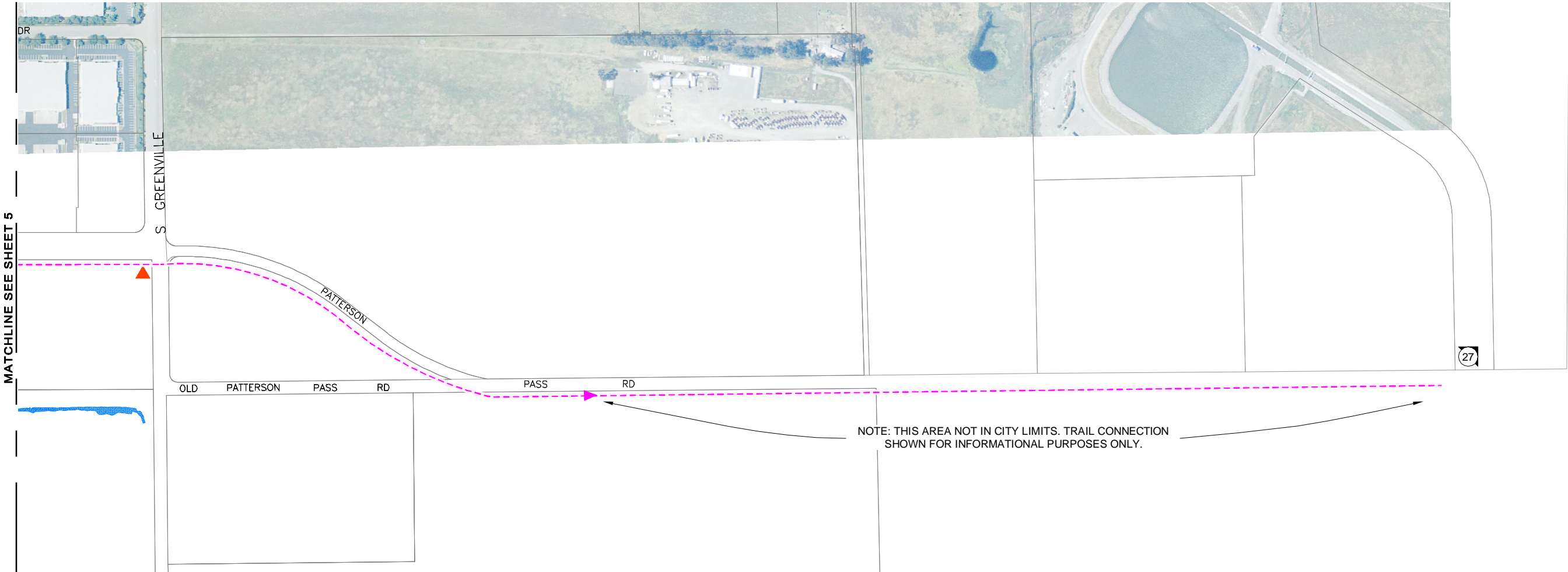


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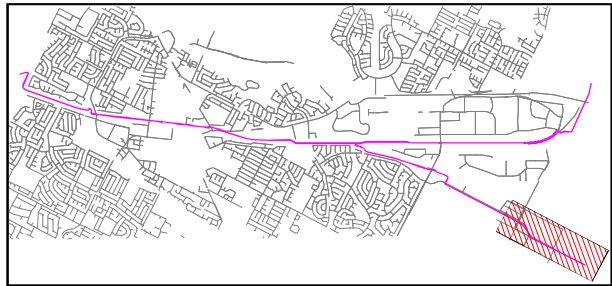
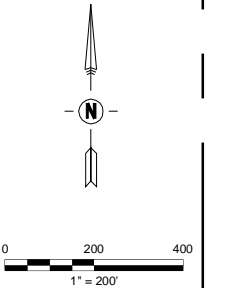
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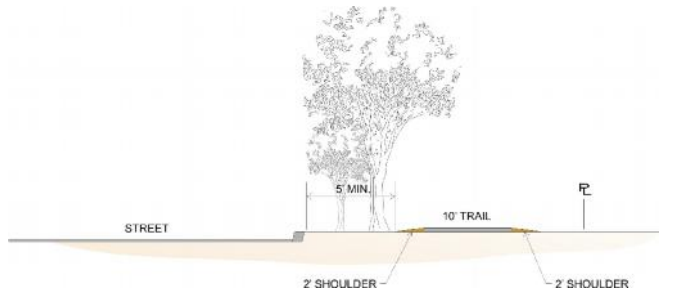
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NOTE: THIS AREA NOT IN CITY LIMITS. TRAIL CONNECTION SHOWN FOR INFORMATIONAL PURPOSES ONLY.



KEY MAP



TYPICAL TRAIL SECTION ALONG STREET

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| EXISTING | PROPOSED |
|------------------|------------------|
| TRAIL | PHASE I |
| SPUR | PHASE II |
| SIDEWALK | SPUR |
| BIKE LANE | SIDEWALK |
| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

**CORRIDOR VIEW
 PROPOSED TRAIL**
 LIVERMORE, CA

**CITY OF LIVERMORE
 IRON HORSE TRAIL
 FEASIBILITY STUDY**

SHEET

6

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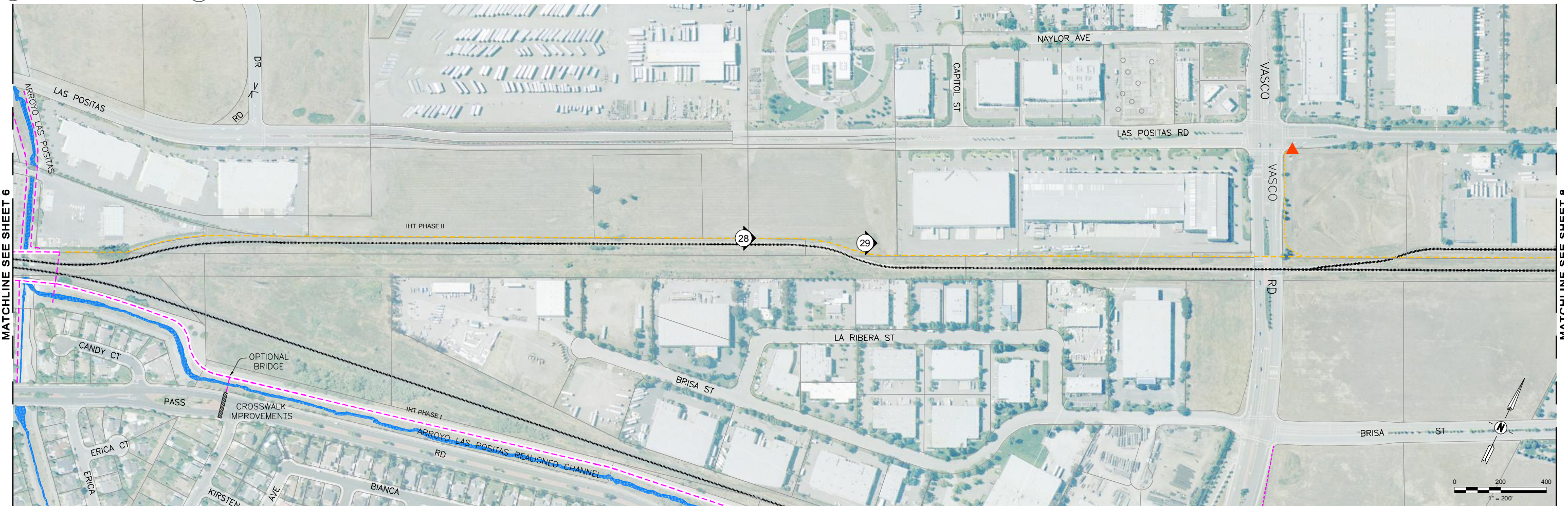
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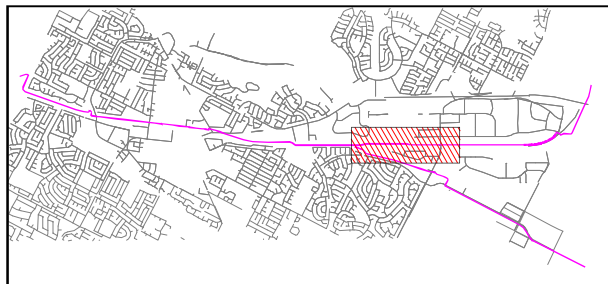


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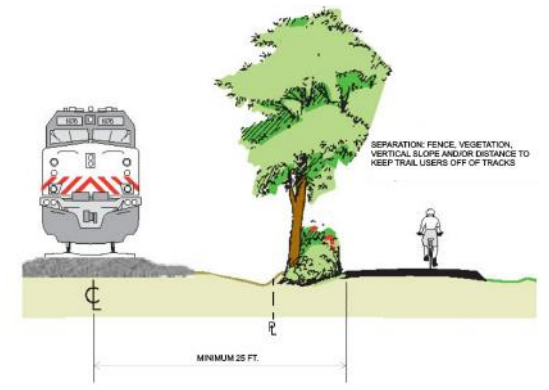


MATCHLINE SEE SHEET 6

MATCHLINE SEE SHEET 8



KEY MAP



TYPICAL TRAIL SECTION

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| EXISTING | PROPOSED |
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| TRAIL | PHASE I |
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| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

**CORRIDOR VIEW
 PROPOSED TRAIL
 LIVERMORE, CA**

**CITY OF LIVERMORE
 IRON HORSE TRAIL
 FEASIBILITY STUDY**

SHEET

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PROJECT NO.

270029



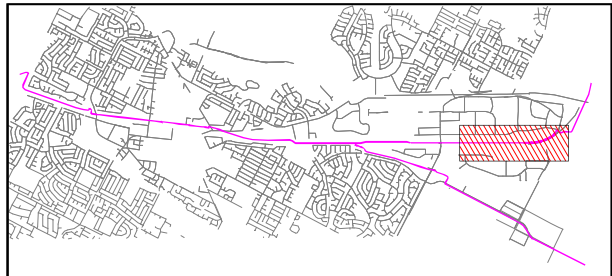
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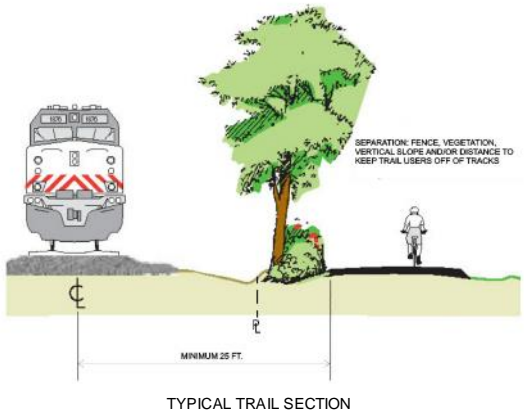
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MATCHLINE SEE SHEET 7



KEY MAP



TYPICAL TRAIL SECTION

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| EXISTING | PROPOSED |
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| TRAIL | PHASE I |
| SPUR | PHASE II |
| SIDEWALK | SPUR |
| BIKE LANE | SIDEWALK |
| RAILROAD | BIKE LANE |
| WATERWAY | CROSSWALK |
| BRIDGE OR TUNNEL | BRIDGE OR TUNNEL |
| | ACCESS POINT |

**CORRIDOR VIEW
PROPOSED TRAIL**
LIVERMORE, CA

**CITY OF LIVERMORE
IRON HORSE TRAIL
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5. Trail Design

The Livermore IHT will provide a universally accessible recreational route for trail users, providing for bicycle and pedestrian nonmotorized travel on a surfaced right-of-way separated where possible from the rail alignment and adjacent streets. The design of a workable trail alignment needs to consider:

- Providing for the safety and security of trail users
- Provide connections to existing trails, streets, transit centers and pedestrian/bicycle use areas
- Providing for future connections to the west and east, to make a continuous trail with logical transitions
- Providing a trail surface that conforms to ADA requirements
- Allowing the user to enjoy a pleasant, off-highway and environmentally informative trail experience
- Minimizing intrusion into adjacent creeks, habitat areas and restoration sites
- Minimize pedestrian crossings of streets (where possible)
- Provide crosswalks and traffic warning devices where street crossings are necessary

The trail will be designed as an all-weather, multi-use pathway, capable of accommodating pedestrians, bicycles, and universally accessible modes, as well as providing for emergency and maintenance vehicle access in some areas. The trail will be designed in accordance with ADA requirements, which require a firm, stable surface for trails. There are many design standards that provide guidance regarding trail design, including:

- Caltrans: Highway Design Manual (HDM) (Chapter 1000: Bikeway Planning and Design)
- Americans with Disabilities Act (ADA) Accessibility Guidelines (ADAAG)
- AASHTO: *A Policy on Geometric Design of Highways and Streets*
- *Manual of Uniform Traffic Control Devices*
- USDOT/FHWA: *Conflicts on Multiple-Use Paths*
- ITE: *Design and Safety of Pedestrian Facilities*

If portions of the trail are funded from transportation sources, it may need to conform to Caltrans standards for a Class I bike 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. The trail will likely be completed as a series of planned, individual projects, depending on right of way acquisition and funding allocation. Trail design will be critical to successful project implementation. Trail design issues include:

- Width and surfacing to accommodate multi-use goals.
- Trail width, vertical clearance, drainage and surface needs.

- Vehicular load rating for emergency access and routine maintenance.
- Fencing, screening and soundwalls adjacent to trail and adjacent to rail.
- Safety of trail users on a trail facility located at or near an active rail ROW, including separation from active rail lines by distance and/or fencing.
- Safe crossings at existing streets and roads.
- Liability and operational concerns of freight and passenger rail operators.
- 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 that abut the alignment.

5.1 Trail Design Elements

The City of Livermore Downtown Specific Plan contains guidelines for trail implementation through the Downtown area, and EBRPD also has its own recommended trail cross-section. In the Downtown area, constructed trail sections within a 20-foot-wide easement include:

- Soundwall (not included in 20 ft.)
- 2 ft. graded/gravel shoulder—clear zone
- 10-12 ft. asphalt paved trail
- 2 ft. minimum shoulder—clear zone
- 4 ft. minimum landscaped area, including an unpaved area to allow drainage (City of Livermore)
- Curb and gutter, adjacent to parking or street areas
- Fencing, signage, benches - as needed

Other segments of the trail will have different cross-sections, depending upon adjacent uses, shared use by other entities (such as Zone7), proximity to railroad tracks, etc. **Typical Trail Cross Sections** are included in this Section (**Figures 5-1** through **5-5**).

Trail design elements, including signs, crossings, site furnishings and design sections should conform to applicable Downtown design standards as well as EBRPD guidelines.

5.1.1 Trail Width, Vertical Clearance and Surface Needs

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. The trail width should conform to constructed portions of the trail in Downtown areas, with a 10-12 ft. section and (2) two-foot wide shoulders. The trail will need to fully comply with Americans with Disabilities Act (ADA) requirements, which are currently being finalized.

The trail should be surfaced with a durable material that complies with universal access needs, generally asphalt paving. If the trail is constructed adjacent to creek channels or associated with creek restoration and habitat enhancement, then permeable pavement should be considered. 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 10-12 foot wide asphalt pathway using 3 inches of asphalt concrete, with (2) two-foot wide (minimum) shoulders of quarry fines (QF) over 4 to 6 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 five feet wide to separate trail users from vehicular travel.

5.1.2 Fencing

Fencing design should reflect the character of adjacent development, to direct trail users to designated crossing areas without compromising the safety and security of trail users.

In trail segments adjacent to creek areas, if fencing is needed, it should be designed to meet the habitat and flood management needs of the site.

All fencing, signage, gates and security measures should be designed to reflect the adjacent setting and be as unobtrusive as possible.

Barrier Posts and Bollards. Posts at trail intersections and entrances may be necessary to keep vehicles from entering. Posts should be designed to be easily moveable by emergency vehicles, including bollards or pipe gate and bollard. Removable, drive-over or fold-down bollards are appropriate at trail locations where access control is important but regular entry is anticipated by maintenance, law enforcement, or emergency services vehicles.



Bollards

5.1.3 Lighting

Trail illumination may be appropriate in some Downtown locations, at access points, and at tunnels or undercrossings. Lighting design should conform to Specific Plan guidelines. Lighting along trails in Segments 1 and 4 is generally not considered appropriate.

5.1.4 Signs and Site Furnishings

Uniform signs, markings, and traffic control devices must conform to Section 2376 of the Streets and Highways Code. 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 motorists.

In general, all signs and site furnishings 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. The designs (though not the size) of signs and markings should be the same as used for motor vehicles.

Interpretive/educational signage should be posted at trail access points in addition to directional signs. Signs should include indicators of site location for use by emergency personnel, such as a USGS benchmark, GPS coordinates, or other commonly available technology 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. Other trail information regarding ADA accessibility and trail length and difficulty can be included if appropriate.

Sign design and site furnishings should be consistent throughout the project, and signage elements should be grouped and designed to minimize visual intrusion. Sign elements will include EBRPD, LARPD and City standards, as appropriate.



Trail Signs and Interpretive Displays

5.2 Street Crossings

At Murrieta Boulevard, P Street, and Livermore Avenue, trail bridges are proposed to cross the respective roadways. At Isabel Avenue, First Street, Mines Road, and Vasco Road (south option / ACE station), the trail would pass under existing roadway overpasses. At-grade crossings of roadways were considered for four remaining locations, listed in **Table 5-1** in order of increasing peak-period traffic volume.

Table 5-1. Potential At-Grade Roadway Crossings

| Street | Proposed crossing location | Posted speed, mph | Peak 15 minute volume | Seconds per vehicle | Predicted queue, vehicles (ft.) | Distance to nearest intersection | Proposed crossing type |
|---------------------------|-------------------------------|-------------------|-----------------------|---------------------|---------------------------------|----------------------------------|--------------------------------------|
| Junction Avenue | Old First Street, north leg | 25 | 151* (8:30 am) | 11.5 | 2 vehicles (40') | 0' (Old First St.) | Enhanced crosswalk markings |
| North L Street | At tracks, south side | 30 | 100 (5:00 pm) | 9.0 | 3 vehicles (60') | 300' (Railroad Ave.) | Enhanced markings plus median refuge |
| Patterson Pass Road | Arroyo Las Positas, east side | 45 | 190 (6:00 am) | 4.7 | 6 vehicles (120') | 1,300' (Vasco Rd.) | Ped. Hybrid Signals plus refuge |
| Vasco Road (north option) | At tracks, north side | 45 | 523 (7:45 am) | 1.7 | 15 vehicles (300') | 800' (Brisa St.) | Trail bridge |

| | | |
|---------------------------|---|---|
| <i>Peak 15 min volume</i> | = | <i>Highest 15-minute count observed in 2 days in either direction. *At Junction Ave., sum of both directions' 15-min peaks (assume crossing full street)</i> |
| <i>Secs / vehicle</i> | = | <i>900 (seconds in 15 minutes) / peak 15-minute volume</i> |
| <i>Predicted queue</i> | = | <i>Estimated #vehicles in queue after a "worst case" group crosses from curb to median refuge. (*For Junction Ave., assume both vehicular directions would stop.)</i> |
| | | <i>(Assumes 12' lanes, bike lane if present, 3 ft./sec walk speed, 5 seconds for group to begin crossing, 10 seconds for group to finish leaving curb)</i> |

The following sections describe each site.

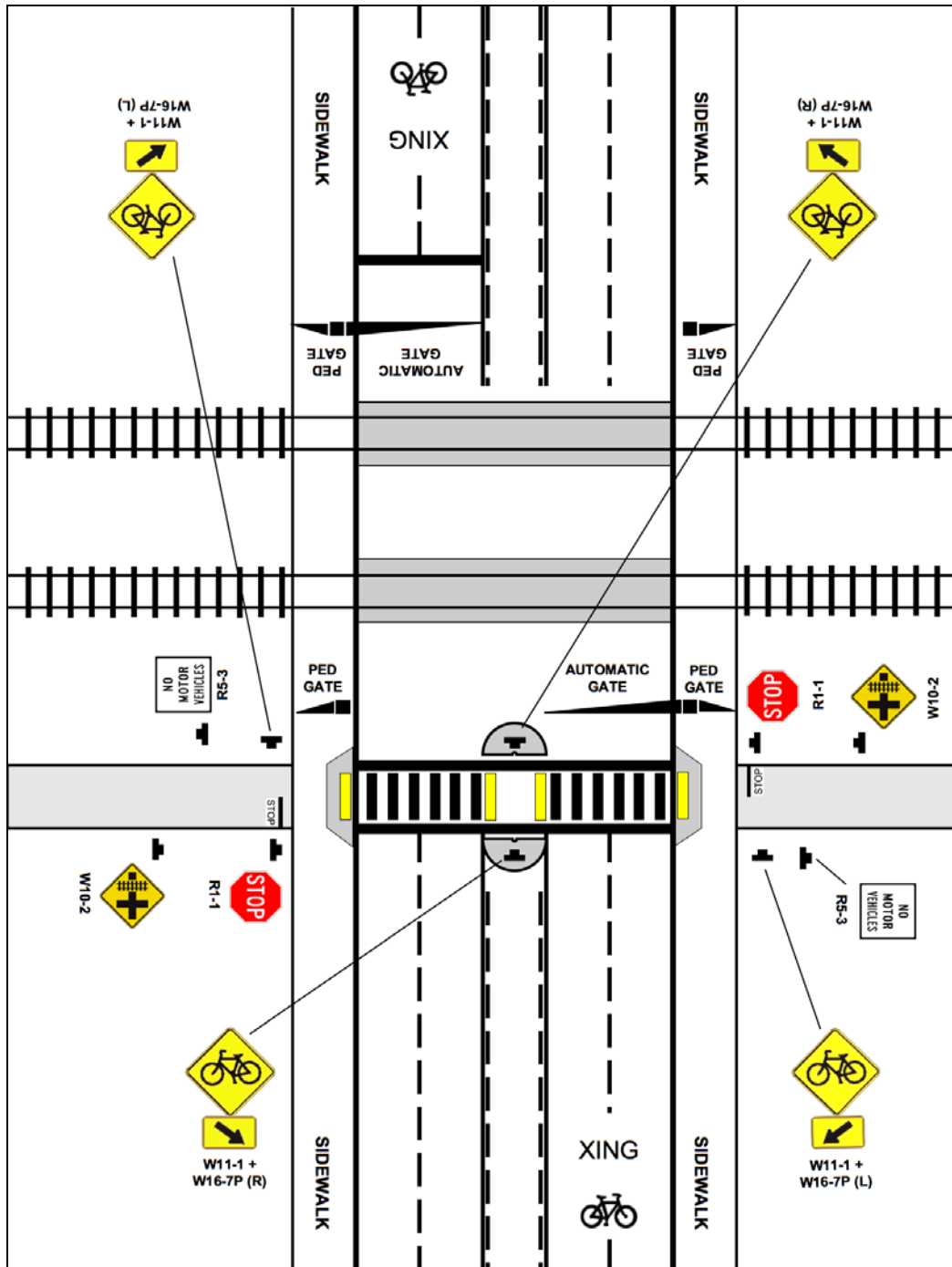
Junction Avenue. Junction Avenue is 46' wide at the UPRR tracks, and is currently striped with one travel lane, a bike lane, and a parking lane in each direction. The Trail is proposed to cross at the north crosswalk of the all-way stop controlled T intersection at Old First Street. Trail users will take their turn as pedestrians do at any other stop-controlled intersection. The crosswalk should be enhanced with high-visibility markings.

This intersection is within a future City redevelopment area. When redevelopment occurs, if Junction Avenue remains a two-lane street, the crosswalk should be narrowed as much as possible with curb extensions while retaining 4' on each side for bike lanes.

North L Street. North L Street is 56' wide at the UPRR tracks, and is currently striped with four travel lanes and no center lane. Peak 15-minute volume is not much higher than at Junction Avenue, but because there are two travel lanes in each direction it is recommended to restripe the roadway south of the tracks and add a pair of median refuge islands to enable crossing one half of the roadway at a time. The protected area would be the width of the center lane, i.e. 10' to 12'. The mid-block street crossing would be located at least 25 feet south of the railroad property.

The North L Street mid-block crossing (reproduced below) shows the proposed markings, signage, and median island configuration. Advance “bicycle crossing” markings would inform roadway users that they are about to cross both a railroad and trail crossing. Each half-street crossing would be bracketed by pedestrian warning signs with inward-pointing arrows. Signs on each trail approach would inform users of the railroad crossing to one side, and would require that they stop before crossing. Pedestrian gate arms would deter sidewalk users from crossing when a train is approaching or present.

Median refuge and traffic control devices proposed for L Street



Patterson Pass Road At Patterson Pass Road the roadway is four lanes wide, with an existing wide raised median suitable for constructing a crossing refuge. Peak 15-minute volume is almost double that of North L Street (190 vs. 100), the posted speed is higher (45 mph vs. 30 mph) and the nearest signal is much further away (1,300' vs. 300'). To maximize trail user safety while minimizing vehicular delay, it is recommended to control each half-street crossing with a Pedestrian Hybrid Signal – a new traffic control device described in the following section. Because predicted queue lengths are still reasonable (120'), no eastbound signal coordination should be needed with the Vasco Road signal ¼ mile to the west.

Vasco Road. At Vasco Road the peak 15-minute traffic volume is sufficiently high (522 vehicles in either direction) that even if two half-street Pedestrian Hybrid Signals controlled the trail crossing, the vehicle queue length (approximately 300') and associated vehicle delay would be unacceptable. A trail bridge is indicated at this location.

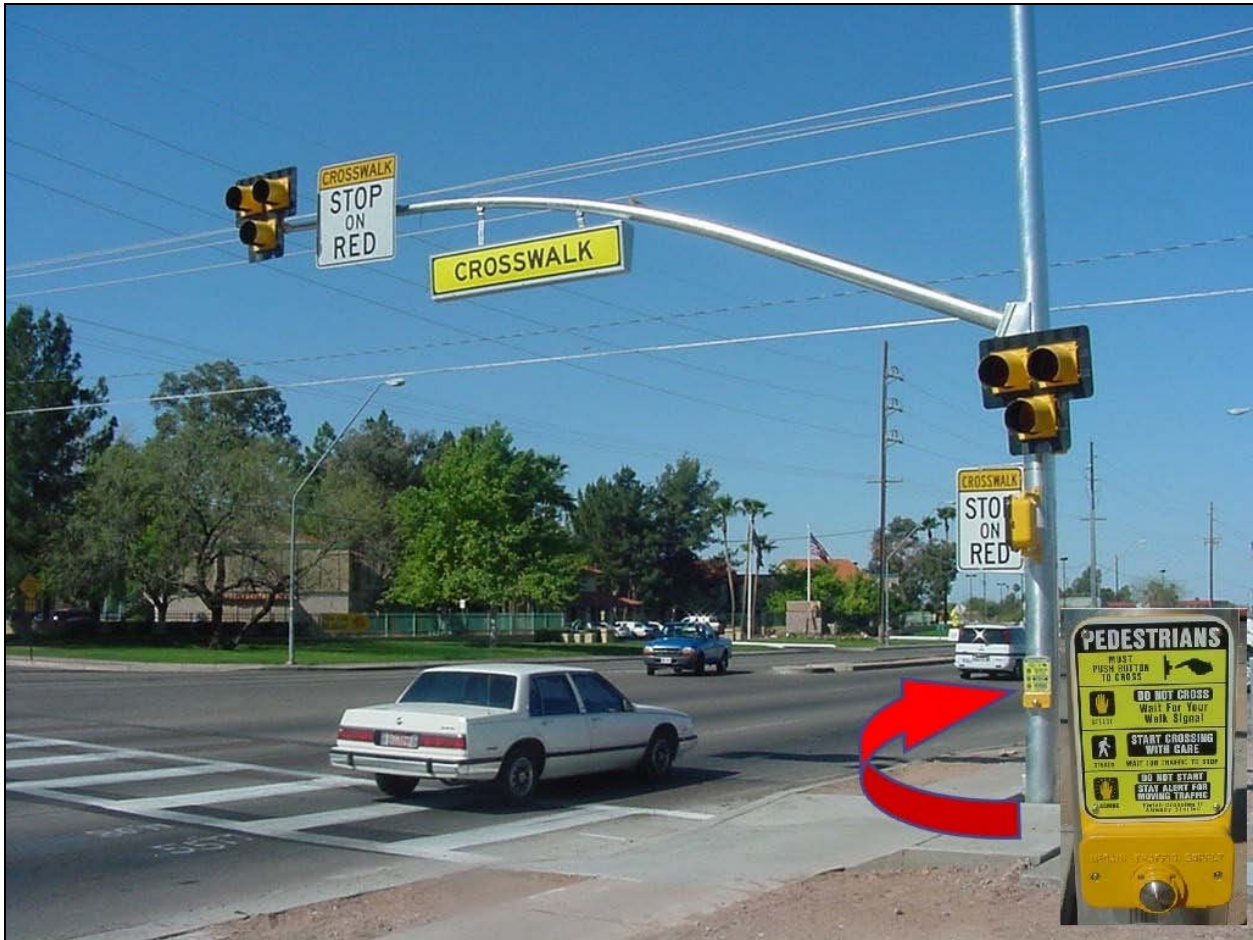
As a short-term accommodation, sidewalk paths to the Brisa Road signal's south crosswalk, approximately 450' to the north, could be considered. However, once trail use is established, the "desire line" to cross Vasco Road in line with the trail may be strong enough that a median fence will be required to deter crossings at that location, especially by pedestrians. 450' is approximately a two-minute walk at an adult walking speed of 4 ft/sec, so the delay from detouring to Brisa Street would be approximately four minutes, plus the wait for the WALK phase, plus the crossing time, less the time that would be required to walk across where the Trail intersects the road.

Bicyclists may be more willing than pedestrians to cross at Brisa Street, because at a moderate cycling speed of 12 mph (18 ft/sec), 450 feet is only 25 seconds, for a "detour delay" of 50 seconds, adjusted for crossing time as described above.

Pedestrian Hybrid Signal. The Pedestrian Hybrid Signal is a new option for pedestrian crossings that do not meet warrants for a full traffic signal. It is described in the December 2007 Federal Notice of Proposed Amendment (NPA) for the Manual on Uniform Traffic Control Devices (MUTCD), the U.S. Federal Highway Administration (FHWA) handbook that governs the design and application of signals, signs, markings, and other traffic control devices. If approved, as is likely, its description would become a new Chapter 4F of the 2009 MUTCD, within Part 4: Signals.







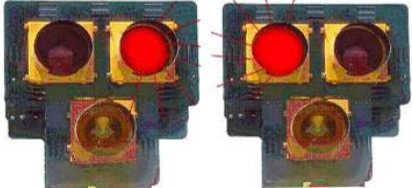

This new device was developed in Tucson, AZ to improve the safety of pedestrian crossings of moderately high-speed multi-lane arterial roadways, some like Patterson Pass Road. It was originally known as the HAWK ("High intensity Activated crossWalk flasher"). The illustration below shows an installation in Tucson; the proposed MUTCD configuration differs in several details.

Prototype Pedestrian Hybrid Signal installation in Tucson, AZ



This Pedestrian Hybrid Signal has a three-section face with two red sections above a yellow section. It is dark until activated by a pedestrian who wishes to cross the street. It then sequences through four active states that in turn inform approaching drivers to prepare to stop, to stop, and then to proceed after stopping. These states correspond to the states of the pedestrian signal phases seen by the pedestrian. The sequence is illustrated below.

Pedestrian Hybrid Signal / Pedestrian Signal Sequence

| Pedestrian Hybrid Signal (Seen by roadway user) | Meaning | Pedestrian Signal (Seen by crossing user) | Meaning |
|---|--|---|--|
|  Dark until activated | Proceed without stopping. Same as green light. |  Solid Hand | DON'T WALK (Don't start across) |
|  Flashing Yellow | Prepare to STOP | | |
|  Solid Yellow | Prepare to STOP | | |
|  Solid Red | STOP |  Walking Man | WALK |
|  Alternating Flashing Red | STOP, and then proceed when clear. Same as STOP sign. |  Flashing Hand and/or Countdown | If not already started across, don't start. If already started across, finish crossing. |

MUTCD R10-23 sign for use with Pedestrian Hybrid Signal



5.3 Railroad/Trail Design Issues

Portions of the trail within the Study Area could be located parallel with active rail lines. Rail with trail design guidelines typically recommend a minimum setback of 25 feet between the rail centerline and the trail. Most of the proposed trails would be outside the rail corridor, and well beyond the 25 ft. setback. However, a continuous trail on the south side of the tracks between the Downtown area in the vicinity of First Street to Mines Road would need to be located partially within railroad right of way. Preliminary discussions with UPRR representatives indicated that they generally do not give up right of way within an active rail corridor (see Section 7.2). It is also conceivable that the trail could be located on privately-owned spur parcels east of Vasco Road to complete the Phase II segment. This Section discusses the physical issues associated with rail-with –trail design.

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. 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. Three pedestrian/bicycle bridges were evaluated as part of this Study (see **Appendix**): Murrieta, North P Street and Livermore Avenue.

In addition, there are two potential sites for an underpass or tunnel to provide grade separation at Arroyo Las Positas and to connect to the Vasco Road ACE station. PUC is unlikely to approve any new at-grade crossings, especially given the expected level of use of the Livermore IHT. **Table 5-2** provides some general guidelines to determine the appropriate use of underpasses vs. overpasses for grade separation:

Table 5-2. Grade Separation Crossing Issues

| Design Issue | Underpass | Overpass |
|---------------------|--|--|
| Vertical Clearance | 9-10 ft. + 3 ft. cover | 26 ft. + |
| Access Ramp | 100 ft.+ | 208 ft. + |
| Utility Conflict | Possible | No |
| Drainage | May need pump system | No |
| Security/Visibility | Maybe (depends on location and security) | No (but crossing must be enclosed to prevent falling debris) |
| Cost | \$300K + | \$1M+ |
| Vandalism | Yes | Yes (need enclosed crossing) |

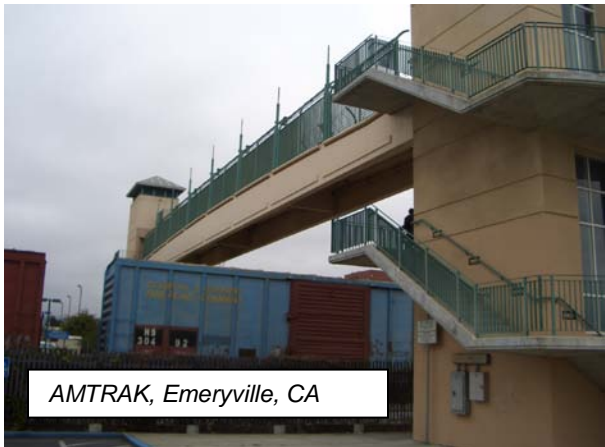
Overpasses. In general, overpasses are utilized to separate high volume/high speed pedestrian and motorized traffic. A typical overcrossing of a railroad is elevated at least 26 feet above the tracks, with approach ramps for ADA access at a maximum grade of 1:20, or 5% slope, with limited allowance for ramps at 8% grade with landing areas.

Federal research also indicates that the 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 (instead of underpasses) 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.

An overpass to cross to the north side of the rail ROW should be considered if there is a major expansion of the Downtown Transit Center.

An overpass at Arroyo Las Positas, currently proposed as part of Zone 7's Streamwise Program, would be further constrained if High Speed Rail were considered, since HSR proposes to use an elevated track in this area.



AMTRAK, Emeryville, CA



AMTRAK, San Luis Obispo, CA



Stevens Creek Trail
Santa Clara

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, and there are some opportunities to utilize grade to reduce tunnel impacts at Arroyo Las Positas and at Vasco Road. At these locations, the tracks are generally at least six feet above existing grade.

Design. The proposed trail connection at Arroyo Las Positas will require careful design to accommodate trail users along the IHT as well as north-south trail users. Although Zone 7's SMMP called for a bridge overpass at



Santa Clara CalTrain









Fremont, CA

this location, it may be problematic to attain the effective 26 ft. clearance required over the railroad tracks.

Skylights for Trail Tunnels. Skylights are often incorporated into tunnels to improve visibility. Two pedestrian undercrossings of the Caltrain line in Santa Clara County have skylights to provide natural daylighting. At the site shown in the left column, light rail transit is accessed via a tunnel under the adjacent Caltrain (commuter rail) corridor. This tunnel has a single large skylight. At the site shown in the right-hand column, a trail tunnel with four skylights connects the west end of Homer Avenue (at Alma Street) to a trail west of the Caltrain line.

Pedestrian Tunnels with Skylights

| VTA Evelyn Avenue Light Rail Station Mountain View, CA | Homer Avenue Caltrain Undercrossing Palo Alto, CA |
|---|---|
|  <p>a) Tunnel</p> |  <p>d) West portal – note skylight boxes above</p> |
|  <p>b) Bottom of skylight</p> |  <p>e) Bottom of skylight – 1 of 4</p> |
|  <p>c) Top of skylight</p> |  <p>f) Tops of skylights</p> |

Warrants for Grade Separation. 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. Design considerations include:

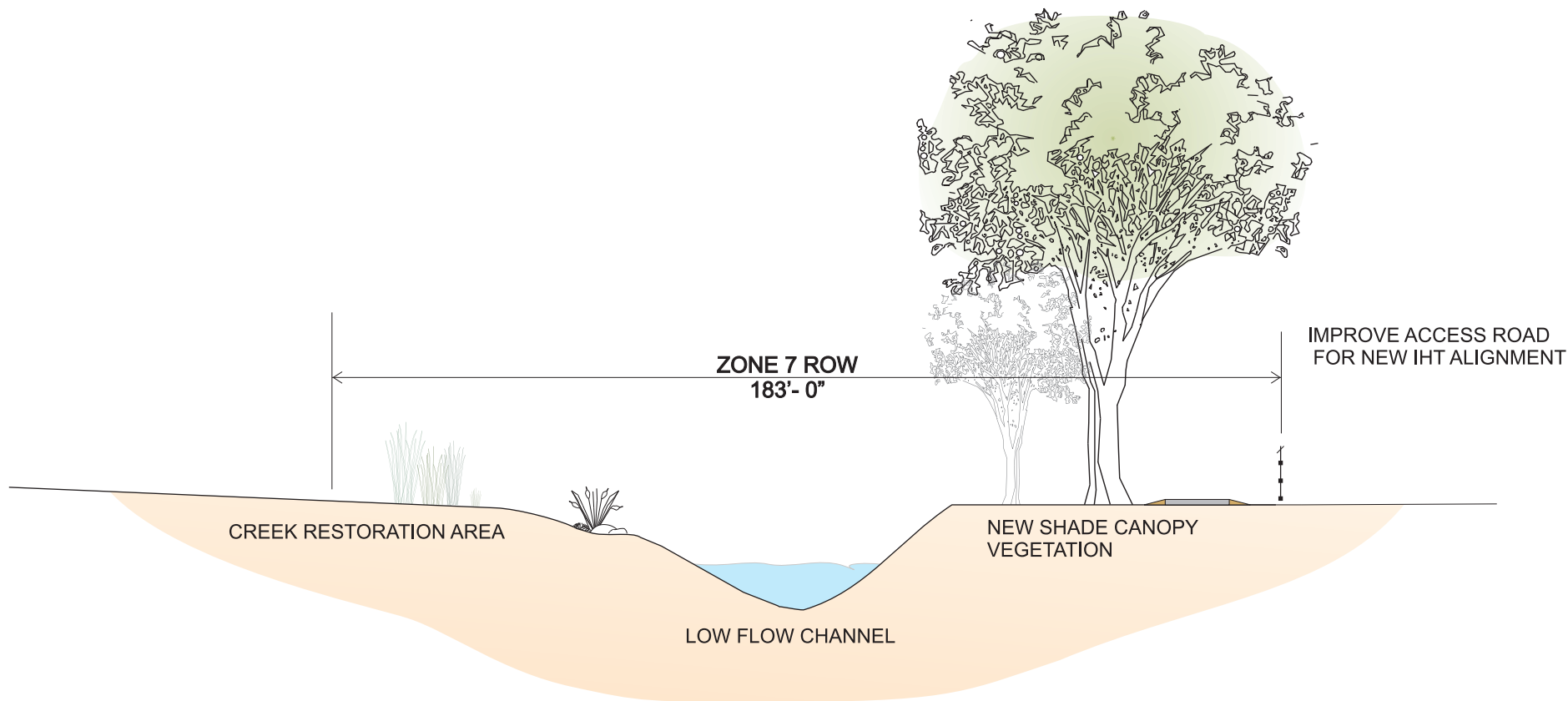
- Pedestrian volumes over 100 persons per hour;
- Average Daily Traffic (ADT) vehicular volume greater than 25,000;
- The site is at least 600 feet from the nearest alternative safe crossing;
- There should be a physical barrier to prevent at-grade crossing;
- Artificial lighting of underpasses is recommended;
- 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 pedestrian usage and traffic volumes;
- School crossings.

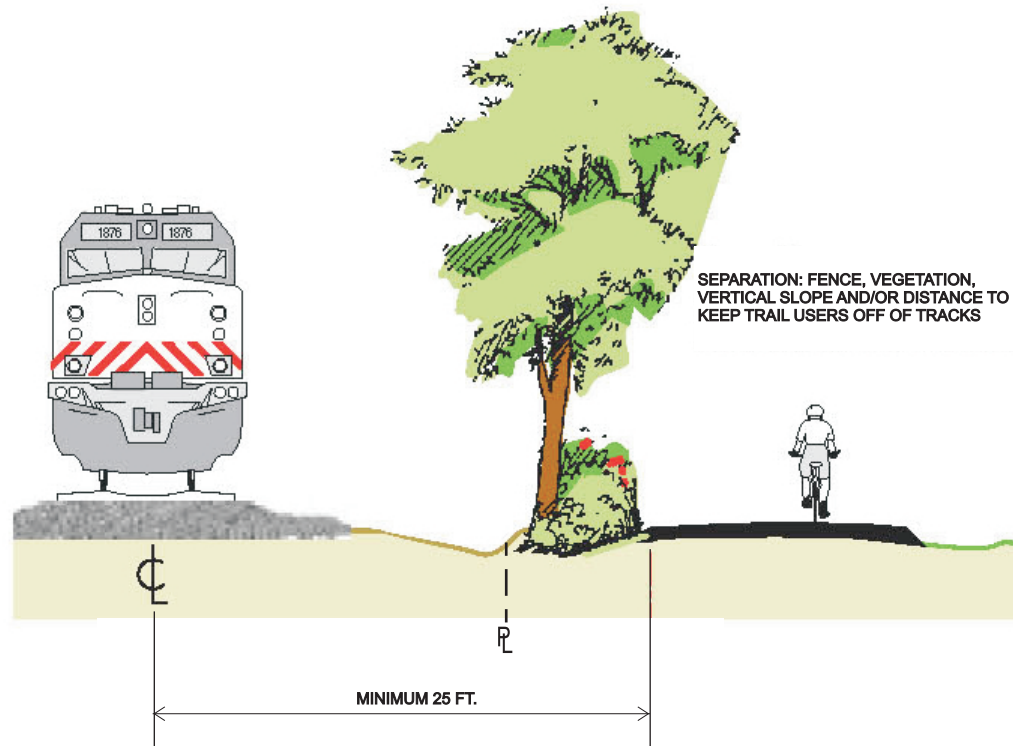
Recommendation. The Livermore IHT will likely meet more than one of the design warrants listed above, and (in addition to the bridge crossings evaluated as part of this Study) additional grade separation will need to be considered when extending the trail east of Downtown. Grade separation will be needed at the Arroyo Las Positas trail crossing, if an interim or connecting trail is provided along the realigned Arroyo Las Positas channel. Grade separation would also be desirable associated with a major expansion of transit services in the Downtown area, where the proximity of schools and transit connections would increase the volume of pedestrian users. This grade separation could be combined with a potential future vehicular grade separation project in this area, or expansion of the Downtown Transit Center. A third potential location for grade separation is at the ACE station east of Vasco Road, along the Arroyo Las Positas channel, which would provide direct access from the train station to employee centers such as Lawrence Livermore. The existing rail clearance of approximately 6 vertical feet would require significant improvements for the minimum 8.5-foot vertical clearance necessary for a trail undercrossing, as well as a ramp to adjacent trail sections. Approach ramps at a maximum 5% slope supported by a combination of vertical retaining walls and earthen embankments would likely be needed to accommodate the tunnel. The undercrossing and sections of the approach ramps below would need to be drained by a system of strip drains, sumps and/or automatic pumping equipment, and the area should be well illuminated. The floor of the undercrossing and portions of the approach ramps below grade would likely consist of reinforced concrete slab. The possible presence of utilities may further complicate the implementation of an undercrossing structure.

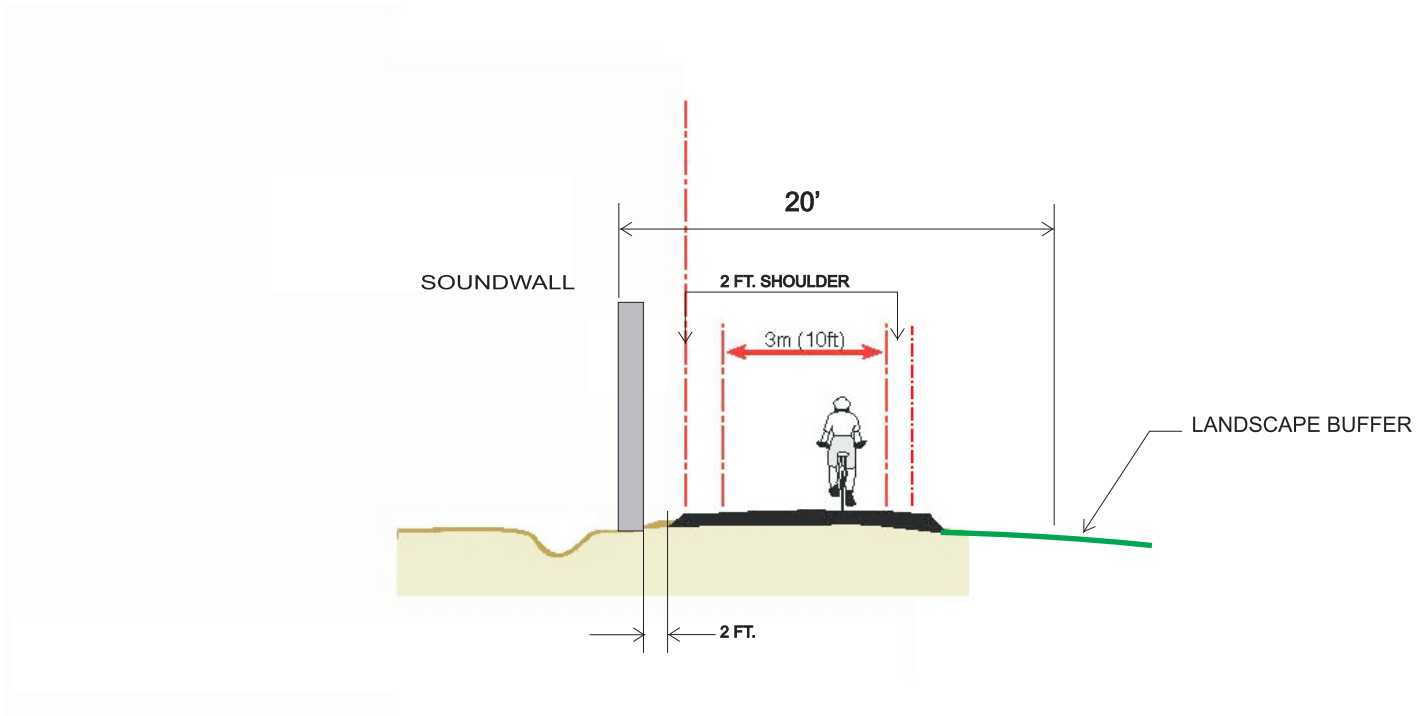
PUC typically requires fully engineered design drawings to be submitted for evaluation of the crossing options and recommendations. Conversion of a private crossing to a public crossing (such as the Hexcel site) requires full PUC review and approval, and is not recommended.

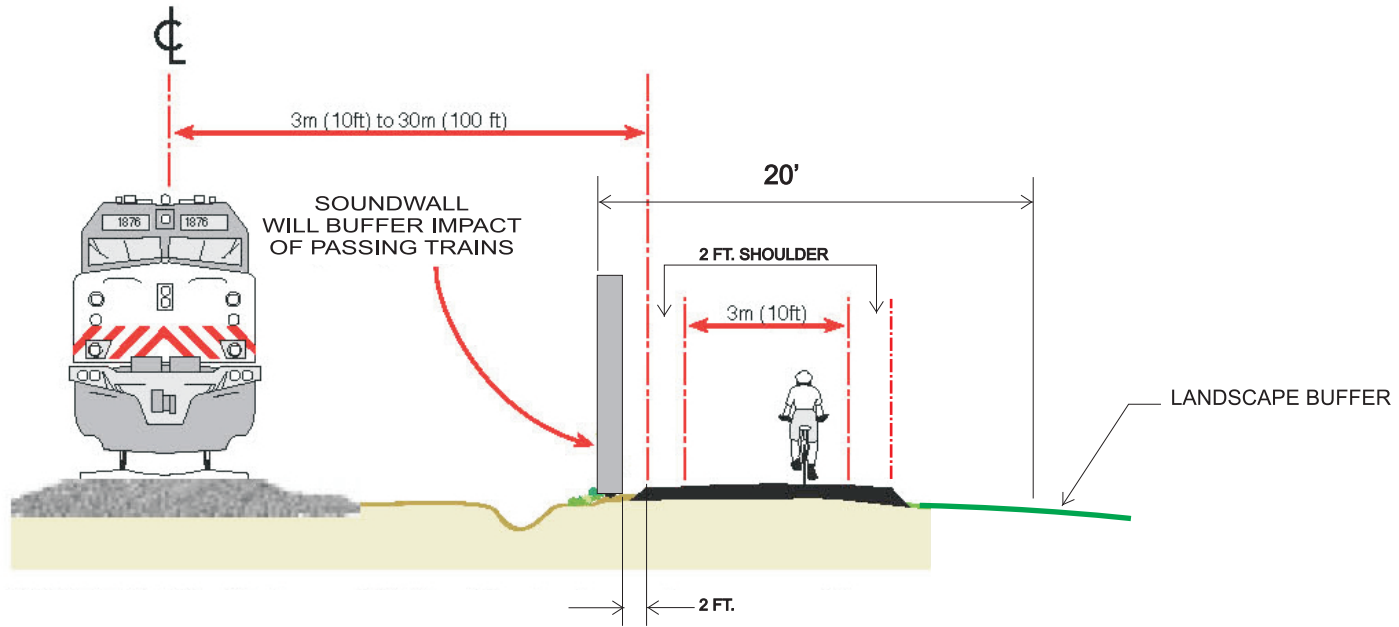
5.4 Bridge Crossings

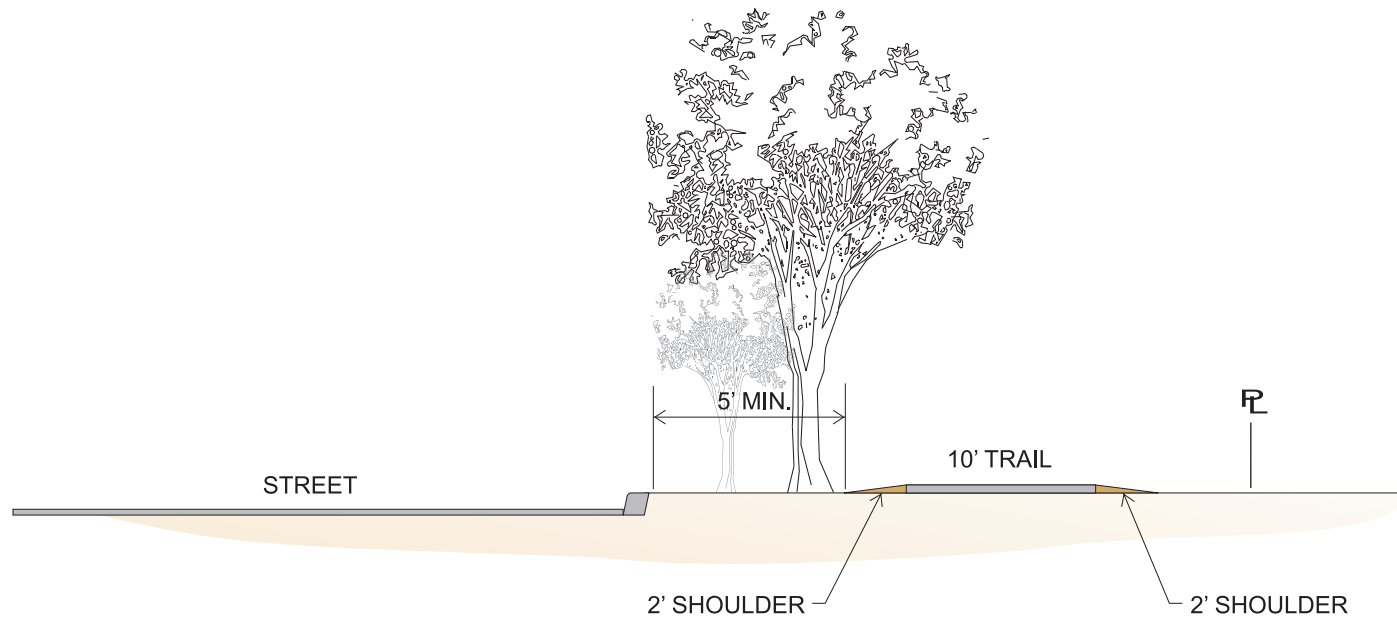
Trail grade separation includes three proposed pedestrian/bicycle bridges over existing streets at Murrieta Blvd., North P Street and Livermore Avenue. Design issues, costs and preliminary designs are contained in the **Appendix**.











6. Trail Implementation

This Section addresses issues associated with implementing the Livermore IHT, as well as trail phasing and financing options.

6.1 Preliminary Trail Costs

Planning level cost estimates have been developed to reflect the preliminary alignment identified in this report. Because the estimates have been developed without the benefit of specific design drawings, they are to be considered preliminary and subject to change as specific projects move forward in the planning and implementation process. It is likely that the eventual Livermore IHT Trail will be constructed as a series of individual projects, either associated with individual site development, as part of regional transportation projects, or as land is acquired and as funding is obtained.

Trail implementation includes three primary components:

- Acquisition of land or easement to use the land for a public trail,
- Engineering design, permitting and environmental review, and
- Construction improvements, including bridges, utility relocation, fencing and other improvements.

Land acquisition and construction cost estimates will need to be updated and refined as each of the individual projects being considered progress from project identification and conceptual design, grant application preparation and securing of funding, through final design and construction planning. This may include completion of real estate appraisal reports for those lands where right of way acquisition will be required. Discussions will need to be initiated with property owners, potentially including negotiations with UPRR using this Feasibility Report as the initial basis for review of land needs.

Typical trail implementation costs for each segment are provided for the standard trail design common to the segment. This includes a 14-foot wide trail section, with 10 feet of 3-inch asphalt concrete (ac) paving, 2, 2-foot wide, 4" thick decomposed granite (dg) shoulders, placed over 6 inches of Class 2 aggregate base (AB). Per the typical cross sections provided for each of the segments, the trail may also include 6 foot chain link security fencing or 12 foot high concrete block soundwall. Security fencing is typically shown where the trail is immediately adjacent to industrial and commercial land uses, with soundwall where the trail is adjacent to residential areas, and in the downtown area.

Table 6.1. Preliminary Cost per Lineal Foot

| Description | Unit | Est. Qty. | Unit Price | Total |
|--|------|-----------|--------------|----------------|
| Mobilization (approx. 5% of overall Constr. Cost) | LS | 1.00 | \$4.00 | \$4.00 |
| Demolition, Clearing & Grubbing (approx. 15% of Grading) | LS | 1.00 | \$14.00 | \$14.00 |
| Site Work | | | | |
| a. Grading | CY | 0.30 | \$15.00 | \$4.50 |
| b. Class 2 AB - Avg. 6" Placement (14' sect./LF) | CY | 0.30 | \$85.00 | \$25.50 |
| c. AC Paving - Avg. 3" Placement (10' sect./LF) | SF | 10.00 | \$3.75 | \$37.50 |
| d. DG shoulders - 2' wide each side | CY | 0.05 | \$90.00 | \$4.50 |
| | | | Total | \$90.00 |

Planning-level cost allowances are also provided for such items as utility relocation, landscaping, erosion control and stormwater management, as well as for trail signage, and for site furnishings such as benches. Special construction cost estimates are provided for items such as pedestrian bridges and intersection improvements, while an 18% estimate is used for engineering design and environmental services, and 10% for construction management. These trail construction costs are shown as Item **A** in **Tables 6.3** through **6.8**. Items **B** and **C** provide separate estimates by trail segment for pedestrian and bicycle over-crossings and Right of Way (ROW) acquisition. ROW acquisition is discussed further in **Section 6.2**.

Trail estimates for Segment 1 along Arroyo Mocho, as well as along Arroyo Las Positas in Segment 4 include costs for actual trail improvements only, as it is assumed that ROW will be utilized via agreement with Zone 7. It is also assumed that trail improvements in the Downtown area, Segment 2, will be completed as a requirement of development approvals, consistent with the Downtown Specific Plan.

Table 6.2. Preliminary Cost Summary

| | Segment | | | | | |
|----------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | 1 | 2 | 3 - North | 3 - South | 4 - Phase I | 4 - Phase II |
| Total Segment Length | 5,200 LF | 7,000 LF | 9,600 LF | 9,500 LF | 13,100 LF | 12,500 LF |
| Existing Trail | - | 1,800 LF | - | - | - | - |
| Public Trail* | 5,200 LF | 1,700 LF | 9,600 LF | 9,500 LF | 13,100 LF | |
| Privately Funded Trail** | - | 3,500 LF | - | - | - | 12,500 LF*** |
| Trail Implementation Cost | \$ 848,500 | \$ 1,409,000 | \$ 2,060,550 | \$ 3,331,700 | \$ 3,334,000 | \$ 2,752,700 |
| Bridges/Structures | \$ 1,500,000 | \$ 2,500,000 | \$ 250,000 | \$ 250,000 | \$ 25,000 | \$ 3,000,000 |
| Construction Total | \$ 2,348,500 | \$ 3,909,000 | \$ 2,310,550 | \$ 3,581,700 | \$ 3,359,000 | \$ 5,752,700 |

* Trail to be implemented as part of capital improvement or other publicly funded project

** Trail to be implemented as part of site redevelopment

*** Trail to be implemented as part of site redevelopment or capital improvement project

**Table 6.3. Preliminary Costs - Segment 1
(Isabel Ave. to Murrieta Blvd.)**

| A. TRAIL CONSTRUCTION | | | | | |
|-----------------------|--|------|-----------|--|------------------|
| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
| 1 | Traffic Control \$7,500/week @ 1 week | LS | 1 | \$7,500.00 | \$7,500 |
| 2 | Utility Location/Relocation (allow) | LS | 1 | \$10,000.00 | \$10,000 |
| 3 | Trail | LF | 5,200 | \$90.00 | \$468,000 |
| 4 | Spur Connections | | | | |
| | a. Concrete Sidewalk - 300 LF | SF | 1,800 | \$5.50 | \$9,900 |
| | b. Ramp/Stairs (allow) | LS | 1 | \$10,000.00 | \$10,000 |
| | <i>Subtotal (Items 4a and 4b)</i> | | | | \$19,900 |
| 5 | Pavement Striping & Marking | LF | 5,000 | \$2.50 | \$12,500 |
| 6 | Signage & Wayfinding | LS | 1 | \$5,000.00 | \$5,000 |
| 7 | Fencing/Barriers (security fence) | LF | 200 | \$35.00 | \$7,000 |
| 8 | Site Furnishings (allow) | EA | 5 | \$1,500.00 | \$7,500 |
| 9 | Landscaping & Erosion Control (allow) | LS | 1 | \$15,000.00 | \$15,000 |
| 10 | Intersection Safety Improvements (N/A) | | | | |
| | | | | <i>Subtotal All Items</i> | \$552,400 |
| | | | | Contingency: 20% | \$110,500 |
| | | | | Total Construction | \$662,900 |
| | | | | Professional Services | |
| | | | | Environmental Review, Design and Permitting: 18% | \$119,300 |
| | | | | Construction Management: 10% | \$66,300 |
| | | | | <i>Subtotal</i> | \$185,600 |
| | | | | TOTAL PROJECTED COSTS | \$848,500 |

| B. PEDESTRIAN & BICYCLE OVERCROSSINGS | | | | | |
|---------------------------------------|-----------------------------|------|-----------|----------------|-------------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | 209' Murietta Overcrossing* | LS | 1 | \$1,500,000.00 | \$1,500,000 |

* Bridge/Overcrossing cost estimate includes design fees

| C. ROW ACQUISITION | | | | | |
|--------------------|-------------------------|------|-----------|------------|-------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | ROW Acquisition - N/A** | | | | |

** Cost assumes ROW provided by Zone 7 through MOU

**Table 6.4. Preliminary Costs - Segment 2
(Murrieta Blvd. to Junction Ave.)**

| A. TRAIL CONSTRUCTION | | | | | |
|-----------------------|---|------|-----------|--|--------------------|
| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
| 1 | Traffic Control \$7,500/week @ 6 weeks | LS | 1 | \$45,000.00 | \$45,000 |
| 2 | Utility Location/Relocation (allow) | LS | 1 | \$40,000.00 | \$40,000 |
| 3 | Trail (1,800' existing trail not included) | LF | 5,200 | \$90.00 | \$468,000 |
| 4 | Spur Connections | | | | |
| | a. Concrete Sidewalk - 1,100 LF | SF | 6,600 | \$5.50 | \$36,300 |
| | b. Ramp/Stairs (allow) | LS | 1 | \$20,000.00 | \$20,000 |
| | <i>Subtotal (Item 4e)</i> | | | | \$56,300 |
| 6 | Pavement Striping & Marking | LF | 1,000 | \$2.50 | \$2,500 |
| 7 | Signage & Wayfinding | LS | 1 | \$15,000.00 | \$15,000 |
| 8 | Fencing/Barriers (security fence) | LF | 1,000 | \$35.00 | \$35,000 |
| 9 | Site Furnishings (installed benches @ 1,000') | EA | 2 | \$1,500.00 | \$3,000 |
| 10 | Landscaping & Erosion Control (allow) | LS | 1 | \$2,500.00 | \$2,500 |
| 11 | Intersection Safety Improvements - Mid-Block Crossing | LS | 1 | \$250,000.00 | \$250,000 |
| | | | | <i>Subtotal All Items</i> | \$917,300 |
| | | | | Contingency: 20% | \$183,500 |
| | | | | Total Construction | \$1,100,800 |
| | | | | Professional Services | |
| | | | | Environmental Review, Design and Permitting: 18% | \$198,100 |
| | | | | Construction Management: 10% | \$110,100 |
| | | | | <i>Subtotal</i> | \$308,200 |
| | | | | TOTAL PROJECTED COSTS | \$1,409,000 |

| B. PEDESTRIAN & BICYCLE OVERCROSSINGS | | | | | |
|---------------------------------------|------------------------------------|------|-----------|----------------|--------------------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | Bridges & Structures* | | | | |
| | a. 189' Bridge - North P St. | LS | 1 | \$1,370,000.00 | \$1,370,000 |
| | b. 156' Bridge - N. Livermore Ave. | LS | 1 | \$1,130,000.00 | \$1,130,000 |
| | | | | <i>Total</i> | \$2,500,000 |

* Bridge/Overcrossing cost estimate includes design fees

| C. ROW ACQUISITION | | | | | |
|--------------------|-------------------------|------|-----------|------------|-------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | ROW Acquisition - N/A** | | | | |

** Cost assumes all trail construction, including ROW, except parking, crossing improvements, and bus station, provided by adjacent development.

**Table 6.5. Preliminary Costs - Segment 3, North Option
(Junction Ave. to Contractor's Place/Arroyo Las Positas)**

| A. TRAIL CONSTRUCTION | | | | | |
|-----------------------|--|------|-----------|--|--------------------|
| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
| 1 | Traffic Control \$7,500/week @ 2 weeks | LS | 1 | \$15,000.00 | \$15,000 |
| 2 | Utility Location/Relocation (allow) | LS | 1 | \$25,000.00 | \$25,000 |
| 3 | Trail | LF | 9,600 | \$90.00 | \$864,000 |
| 4 | Spur Connections | | | | |
| | a. Concrete Sidewalk - 400 LF | SF | 2,400 | \$5.50 | \$13,200 |
| | b. Ramp/Stairs (allow) | LS | 1 | \$10,000.00 | \$10,000 |
| | <i>Subtotal (Item 4a and 4b)</i> | | | | \$23,200 |
| 5 | Pavement Striping & Marking | LF | 9,500 | \$2.50 | \$23,750 |
| 6 | Signage & Wayfinding (allow) | LS | 1 | \$10,000.00 | \$10,000 |
| 7 | Fencing/Barriers (security fence) | LF | 9,500 | \$35.00 | \$332,500 |
| 8 | Site Furnishings | EA | 2 | \$1,500.00 | \$3,000 |
| 9 | Landscaping & Erosion Control (allow) | LS | 1 | \$25,000.00 | \$25,000 |
| 10 | Intersection Safety Improvements (Junction Ave. - allow) | LS | 1 | \$20,000.00 | \$20,000 |
| | | | | <i>Subtotal All Items</i> | \$1,341,450 |
| | | | | Contingency: 20% | \$268,300 |
| | | | | Total Construction | \$1,609,750 |
| | | | | Professional Services | |
| | | | | Environmental Review, Design and Permitting: 18% | \$289,800 |
| | | | | Construction Management: 10% | \$161,000 |
| | | | | <i>Subtotal</i> | \$450,800 |
| | | | | TOTAL PROJECTED COSTS | \$2,060,550 |

| B. PEDESTRIAN & BICYCLE OVERCROSSINGS | | | | | |
|---------------------------------------|---|------|-----------|--------------|-----------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | Bridges & Structures - 150' Bridge - Arroyo Las Positas | LS | 1 | \$250,000.00 | \$250,000 |

| C. ROW ACQUISITION | | | | | |
|--------------------|---|------|-----------|------------|-------------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | ROW Acquisition*** <i>This cost would be reduced if trail improvements are provided by adjacent development/redevelopment.</i> | SF | 120,000 | \$30.00 | \$3,600,000 |

**Table 6.6. Preliminary Costs - Segment 3, South Option
(Junction Ave. to Contractor's Place/Arroyo Las Positas)**

| A. TRAIL CONSTRUCTION | | | | | |
|---------------------------------------|---|------|-----------|--|--------------------|
| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
| 1 | Traffic Control \$7,500/week @ 2 weeks | LS | 1 | \$15,000.00 | \$15,000 |
| 2 | Utility Location/Relocation (allow) | LS | 1 | \$50,000.00 | \$50,000 |
| 3 | Trail | LF | 9,500 | \$90.00 | \$855,000 |
| 4 | Spur Connections | | | | |
| | a. Concrete Sidewalk @ First St. - 900 LF | SF | 5,400 | \$5.50 | \$29,700 |
| | b. Concrete Sidewalk @ Mines Rd. - 800 LF | SF | 4,800 | \$5.50 | \$26,400 |
| | c. Ramp/Stairs (allow) | LS | 1 | \$10,000.00 | \$10,000 |
| | <i>Subtotal (Item 4a through 4c)</i> | | | | \$66,100 |
| 5 | First St. Abutment Modification (120' sect./LF) | LS | 1 | \$120,000.00 | \$120,000 |
| 6 | Rail Equipment @ Mines Rd. - Signal Modification | LS | 1 | \$150,000.00 | \$150,000 |
| 7 | Pavement Striping & Marking | LF | 8,000 | \$2.50 | \$20,000 |
| 8 | Signage & Wayfinding | LS | 1 | \$10,000.00 | \$10,000 |
| 9 | Fencing/Barriers | | | | |
| | a. Soundwall* | LF | 5,000 | \$150.00 | \$750,000 |
| | b. Security Fence** | LF | 3,000 | \$35.00 | \$105,000 |
| | <i>Subtotal (Items 11a and 11b)</i> | | | | \$855,000 |
| 10 | Site Furnishings | EA | 2 | \$1,500.00 | \$3,000 |
| 11 | Landscaping & Erosion Control (allow) | LS | 1 | \$25,000.00 | \$25,000 |
| 12 | Intersection Safety Improvements (N/A) | | | | |
| | | | | <i>Subtotal All Items</i> | \$2,169,100 |
| | | | | <i>Contingency: 20%</i> | \$433,800 |
| | | | | <i>Total Construction</i> | \$2,602,900 |
| | | | | <i>Professional Services</i> | |
| | | | | Environmental Review, Design and Permitting: 18% | \$468,500 |
| | | | | Construction Management: 10% | \$260,300 |
| | | | | <i>Subtotal</i> | \$728,800 |
| | | | | TOTAL PROJECTED COSTS*** | \$3,331,700 |
| B. PEDESTRIAN & BICYCLE OVERCROSSINGS | | | | | |
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | Bridges & Structures @ 150' Bridge - Arroyo Las Positas | LS | 1 | \$250,000.00 | \$250,000 |
| C. ROW ACQUISITION | | | | | |
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | ROW Acquisition | SF | 160,000 | \$30.00 | \$4,800,000 |

* To replace wood fence at Silver Oaks Way

** North of Soundwall, east of Mines Road

*** Portion between Junction Ave. and First St. assumed to be built associated with Downtown Plan redevelopment; not included in project costs

**Table 6.7. Preliminary Costs - Segment 4, Phase I
(Arroyo Las Positas)**

| A. TRAIL CONSTRUCTION | | | | | |
|-----------------------|---|------|-----------|--|--------------------|
| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
| 1 | Traffic Control \$7,500/week @ 2 weeks | LS | 1 | \$15,000.00 | \$15,000 |
| 2 | Utility Location/Relocation (allow - railroad signal) | LS | 1 | \$50,000.00 | \$50,000 |
| 3 | Trail | LF | 13,100 | \$90.00 | \$1,179,000 |
| 4 | Spur Connections | | | | |
| | a. Concrete Sidewalk @ Mines Rd. - 800 LF | SF | 4,800 | \$5.50 | \$26,400 |
| | b. Concrete Sidewalk @ Vasco Rd. - 900 LF | SF | 5,400 | \$5.50 | \$29,700 |
| | c. Tunnel @ Vasco Rd., ACE Station (allow) | LS | 1 | \$750,000.00 | \$750,000 |
| | <i>Subtotal (Item 4a through 4c)</i> | | | | \$806,100 |
| 5 | Pavement Striping & Marking | LF | 13,000 | \$2.50 | \$32,500 |
| 6 | Signage & Wayfinding | LS | 1 | \$10,000.00 | \$10,000 |
| 7 | Fencing/Barriers | LF | 200 | \$35.00 | \$7,000 |
| 8 | Site Furnishings | EA | 4 | \$1,500.00 | \$6,000 |
| 9 | Landscaping & Erosion Control (allow) | LS | 1 | \$40,000.00 | \$40,000 |
| 10 | Intersection Safety Improvements - Patterson Pass Rd. | LS | 1 | \$25,000.00 | \$25,000 |
| | | | | <i>Subtotal All Items</i> | \$2,170,600 |
| | | | | Contingency: 20% | \$434,100 |
| | | | | Total Construction | \$2,604,700 |
| | | | | Professional Services | |
| | | | | Environmental Review, Design and Permitting: 18% | \$468,800 |
| | | | | Construction Management: 10% | \$260,500 |
| | | | | <i>Subtotal</i> | \$729,300 |
| | | | | TOTAL PROJECTED COSTS* | \$3,334,000 |

| B. PEDESTRIAN & BICYCLE OVERCROSSINGS | | | | | |
|---------------------------------------|--|------|-----------|-------------|----------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | Bridges & Structures - Modify Exist. Zone 7 Bridge @ Sports Park | LS | 1 | \$25,000.00 | \$25,000 |

* Cost does not include:
 Tunnel under railroad @ Arroyo Las Positas (\$750,000 to \$1 million)
 or alternate:
 Elevated bridge over railroad @ Arroyo Las Positas (\$1.5 to \$2 million)

| C. ROW ACQUISITION | | | | | |
|--------------------|-------------------------|------|-----------|------------|-------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | ROW Acquisition - N/A** | | | | |

** Cost assumes ROW provided by Zone 7 through MOU

**Table 6.8. Preliminary Costs - Segment 4, Phase II
(Arroyo Las Positas to Greenville Road)**

| A. TRAIL CONSTRUCTION | | | | | |
|-----------------------|---|------|-----------|--|--------------------|
| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
| 1 | Traffic Control \$7,500/week @ 4 weeks | LS | 1 | \$30,000.00 | \$30,000 |
| 2 | Utility Location/Relocation (allow - railroad signal) | LS | 1 | \$40,000.00 | \$40,000 |
| 3 | Trail | LF | 12,500 | \$90.00 | \$1,125,000 |
| 4 | Spur Connections | | | | |
| | a. Concrete Sidewalk @ Mines Rd. - 400 LF | SF | 2,400 | \$5.50 | \$13,200 |
| | b. Trail Spur @ Arroyo Las Positas - 800 LF | SF | 4,800 | \$5.50 | \$26,400 |
| | c. Concrete Sidewalk @ Vasco Rd. - 500 LF | SF | 3,000 | \$5.50 | \$16,500 |
| | <i>Subtotal (Item 4a through 4c)</i> | | | | \$56,100 |
| 5 | Pavement Striping & Marking | LF | 12,400 | \$2.50 | \$31,000 |
| 6 | Signage & Wayfinding | LS | 1 | \$20,000.00 | \$20,000 |
| 7 | Fencing/Barriers (security fence) | LF | 12,400 | \$35.00 | \$434,000 |
| 8 | Site Furnishings | EA | 4 | \$1,500.00 | \$6,000 |
| 9 | Landscaping & Erosion Control (allow) | LS | 1 | \$25,000.00 | \$25,000 |
| 10 | Intersection Safety Improvements - Greenville Rd. (allow) | LS | 1 | \$25,000.00 | \$25,000 |
| | | | | <i>Subtotal All Items</i> | \$1,792,100 |
| | | | | Contingency: 20% | \$358,400 |
| | | | | Total Construction | \$2,150,500 |
| | | | | Professional Services | |
| | | | | Environmental Review, Design and Permitting: 18% | \$387,100 |
| | | | | Construction Management: 10% | \$215,100 |
| | | | | <i>Subtotal</i> | \$602,200 |
| | | | | TOTAL PROJECTED COSTS* | \$2,752,700 |

| B. PEDESTRIAN & BICYCLE OVERCROSSINGS* | | | | | |
|--|---------------------------------|------|-----------|----------------|-------------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | Elevated Structure @ Vasco Rd** | LS | 1 | \$3,000,000.00 | \$3,000,000 |

* Cost does not include:

1) Tunnel under railroad @ Arroyo Las Positas (\$750,000 to \$1 million)

or alternate:

Elevated bridge over railroad @ Arroyo Las Positas (\$1.5 to \$2 million)

2) Elevated structure over Vasco Rd. (\$1.5 to \$2 million)

** Interim trail alignment would use existing sidewalks to access trail @ Arroyo Las Positas intersection signal

| C. ROW ACQUISITION | | | | | |
|--------------------|--------------------|------|-----------|------------|-------------|
| | Description | Unit | Est. Qty. | Unit Price | Total |
| | ROW Acquisition*** | SF | 230,000 | \$30.00 | \$6,900,000 |

*** ROW could be acquired associated with redevelopment/development or from Railroad. This cost assumes ROW.

6.2 Right of Way and Easements Needed

Acquisition of trail easements or fee title for land that may be purchased for construction of the Livermore IHT can be one of the primary costs of a trail implementation project. Costs for right of way purchase also vary depending upon whether an entire parcel would need to be purchased or whether a 20-30 foot strip is acquired. The recommended alignment acquisition areas are shown on the **Right of Way Easement Maps** (see **ROW Sheets 1 through 5** at end of this Section). Portions of the Livermore IHT have been built within the Downtown area as part of individual redevelopment projects. For commercial and industrial projects east of Downtown, right of way acquisition has occurred in limited areas as part of individual development projects, but actual trail construction has not been completed as a component of project approval.

Shared use and construction of trails is proposed for linear segments along Arroyo Mocho and the realigned Arroyo Las Positas channels, which would not involve right of way acquisition, but would entail entering into a licensing agreement with Zone 7 for operation and maintenance of the trail. The party responsible for capital construction will also need to be negotiated.

Development of land within the Downtown area (and codified as part of Downtown Plan adoption) typically includes the obligation to provide trail access associated with site redevelopment. Trail implementation can also be included as part of transportation improvements, especially where provisions for bicycle and pedestrian improvements are a required part of the project.

Acquisition of Private Right of Way. Where trail ROW needs to be purchased from Union Pacific Railroad or adjacent industrial/commercial properties, a quick measure of potential ROW acquisition costs can be estimated based on what has been paid for rail corridor right of way in similar situations. In San Jose, Fremont and Milpitas, Santa Clara Valley Transportation Authority (VTA) purchased the UPRR corridor for a cost of approximately \$14.55 per square foot for the BART extension project. This represents the low end bracket of what a trail planning level cost estimate of land acquisition may be, as this cost does not include a number of other factors, including VTA's obligation to provide for or relocate active rail tracks, costs associated with hazardous waste cleanup that VTA will be sharing, or costs associated with utility relocation and purchase of easements.

The upper end bracket of land acquisition costs represents the value of land "across the fence" from the trail alignment. According to discussions with realtors in the Livermore area, vacant lot land values may range from \$40.00 to \$55.00 or more per square foot in areas of existing mid-range residential property, and upwards of \$100.00 per square foot for high value commercial property. Where there are property improvements associated with easements that need to be purchased (such as areas with fencing, landscaping, or paved parking), land costs can be increased by \$ 5.00 to \$ 10.00 a square foot, or more. (This does not include building improvements).

A simple comparative analysis has a number of problems that potentially limits its usefulness. Narrow linear parcels obviously have limited usefulness for development, and so comparison of adjacent developed or developable parcels presents problems. Several additional factors can conceivably further complicate this "across the fence" comparative basis for approximation of ROW costs for feasibility planning analysis. One factor that can be argued along a corridor is that there is added value to the fact that a long corridor has been assembled that can serve

various purposes needing a linear parcel, such as utility location. This is likely not a factor as utilities already exist within the corridor, and purchasing only the trail surface rights would not preclude placing additional utilities within existing easements, or expanding existing easements.

In summary, ROW acquisition costs are difficult to estimate at a feasibility planning level, but considering the fact that the UPRR corridor has little development potential and presumably little appeal to immediately adjacent property owners for lot expansion, acquisition costs will likely be in the \$20.00 to \$40.00 per square foot range. A median range of \$30.00 per square foot is used here for purposes of providing a planning level or order of magnitude cost to understand the cost implications and funding requirements of trail implementation where a 20-foot wide railroad right of way must be purchased in Segment 3, and possibly in Segment 4. A summary of ROW needs and potential costs is included below.

Table 6.9. Right of Way Summary

| Segment | ROW Needed (SF) | Preliminary Cost |
|------------|-----------------|------------------|
| 1 | N/A | Zone 7 MOU |
| 2 | N/A | Downtown Plan |
| 3-North | 120,000 | \$3.6 million |
| 3-South | 160,000 | \$4.8 million |
| 4-Phase I | N/A | Zone 7 MOU |
| 4-Phase II | 230,000 | \$6.9 million |

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

Acquisition of the needed ROW from Union Pacific will be challenging. The ROW needed is generally unused land generally outside of active trackage. In all cases the 20 to 25 feet of ROW that would need to be acquired is beyond the typical minimum 25-foot setback from center of outer track that is considered the standard Best Practice in Rails with Trails design. Preliminary discussions with UP representatives indicate that they typically oppose public access trails within their ROW, and in some cases object to trails adjacent to their ROW. Their primary concern is potentially increased liability exposure, but they also have a policy of protecting/reserving potentially valuable linear ROW for possible future purposes, such as utility placement or track modernization and repair.

Currently there is considerable pedestrian trespass within and across railroad ROW in several areas of the IHT study area, where social trails provide short cuts to destinations that avoid use of more distant legal crossings. Acquisition of ROW from UP may need to be completed as part of a larger plan for this area that involves making existing at-grade railroad crossings safer, convincing UP that a dedicated trail separated from the active railroad by secure fencing and walls will be superior in terms of greatly reduced liability over the existing pedestrian trespass situation, or perhaps extending greater liability protection for pedestrian use of acquired ROW through some form of indemnification, construction of physical barriers and/or other measures.

Although very challenging, the issue does not appear to be insurmountable. For instance, East Bay Regional Park District, a partner with the City and LARPD in the development of the IHT, has successfully negotiated an linear agreement with UP to construct a segment of the San Francisco Bay Trail along active UP ROW in the San Pablo- Pinole-Hercules area along and near the San Pablo Bay shoreline. This agreement allows use of the outer 25 ft. of rail right of way for trail purposes.

6.3 Project Phasing and Priorities

Implementation of the trail in a planned and prioritized manner is a logical means to construct portions of the trail, especially when funding is available from a variety of sources. In general, implementation priorities include:

- 1) Segments that can be completed, and are (at least) partially funded as part of a larger project (e.g. project development, redevelopment, creek restoration, or roadway/capital improvement project)
- 2) Segments that are nearest to residential users and that implement the Downtown Specific Plan
- 3) Segments that minimize or mitigate public access safety hazards
- 4) Segments that provide connections to schools, parks, destination centers and other trails

By applying these criteria to the Livermore IHT segments, the recommendation priorities for trail implementation include:

- 1) **Segment 2, Downtown.** where individual trail sections are being completed as part of redevelopment projects. Completion of public portions of the trail at the Downtown Parking Garage, parking garage expansion, and the LAVTA Bus Station should be included as part of the capital improvements for these projects. Funding for overcrossings within the Downtown area may need to be allocated as part of overall transportation improvement projects within the redevelopment area. In the interim, the trail can be completed along individual blocks, with interim use of sidewalks and bicycle lanes to cross the three grade separated streets until funding for the overcrossings is secured.
- 2) **Segment 1, and Segment 4, IHT Phase I.** These trail segments are along Zone 7's right of way, where creek restoration along Arroyo Mocho and the realigned Arroyo Las Positas, as well as public access trails, are planned as part of Zone 7's Streamwise program. Trails in these areas will serve adjacent residents, parks and schools with a continuous trail. A cooperative partnership with agency stakeholders, and nonprofits encourages creative funding opportunities that are available for creek restoration, environmental education and open space/public access enhancement. In addition, the need for ROW acquisition in these segments is minimal.
- 3) **Segment 3.** Completion of this trail segment will be dependent on redevelopment of large parcels on the south side of First Street to Trevarno, or negotiation with the railroad for access and right of way, as well as procurement of ROW acquisition funding. Although some trail easements have been acquired, they are not continuous. This area

serves a significant residential population, and provides connections to parks and schools, so sections of the trail should be implemented if opportunities arise as part of individual development projects. Interim routing along North First Street sidewalks and bicycle lanes to Trevarno Road can provide a continuous route until trail implementation occurs.

- 4) **Segment 4, IHT Phase II.** This segment will provide a connection to the future IHT trail east of Livermore. However, this segment is constrained by numerous future planned projects such as High Speed Rail, freight expansion, ACE expansion, potential BART expansion, etc. If a trail along Arroyo Las Positas and Patterson Pass Road is built as the Phase I segment, it will provide a connection to the area east of Livermore. However, if major projects such as BART, HSR or other significant projects are implemented along the Phase II route, then the IHT ROW identified as being needed in this segment should be set aside and included as part of the larger project implementation to provide the required nonmotorized component of the project. This alignment will be subject to further review as regional transit options are refined.

6.4 Funding Opportunities

Funding for the Livermore IHT can come from a variety of sources. This Section of the Feasibility Study identifies specific programs from which the trail could potentially receive funding. Funding varies according to the pool of applicants and project significance. However, receiving grant funding is generally more successful when the following components are in place:

1. The project is a component or element of a larger regional system and has been addressed in a feasibility study or master plan, prepared among cooperating agencies and with stakeholder input
2. The project has demonstrated local community support.
3. Environmental review and certification has been completed, including a Notice of Determination from the Lead Agency (City).
4. A Resolution from the City Council and/or County Board of Supervisors authorizing application for grant funding has been accepted.
5. Partner nonprofit or community organizations have a demonstrated history working with the City to implement a project, and are involved in implementing the grant request (such as Zone 7, ACTIA, EBRPD and the Livermore area trails group, etc.)

6.4.1 Federal Funding Programs

The primary federal source of surface transportation funding is the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU), which authorizes federal surface transportation (including bicycle and pedestrian facilities) programs until 2009. Funding is administered through the state (California Transportation Commission) and regional governments such as the Metropolitan Transportation Commission. A total of \$5 million was allocated to California in 2006, with annual program allocations growing steadily over the last 5 years.

In the past, most funding programs emphasized transportation rather than recreation, with priority for reducing auto trips and creating inter-modal connections. Funding criteria usually includes adoption of a bicycle master plan, identification of the costs and benefits of the system (including saved vehicle trips, reduced air pollution), support by the local agency and community, California Environmental Quality Act (CEQA) / National Environmental Policy Act (NEPA) compliance, right of way access, and commitment of local resources. SAFETEA-LU program funds can be used for both land acquisition and trail design and construction.

Two programs included in the SAFETA-LU legislation are the STP (Surface Transportation Program) and CMAQ (Congestion Management and Air Quality Improvements). Other programs include the National Recreational Trails Fund, Section 402 (Safety) funds, Scenic Byways funds, and Federal Lands Highway funds.

A match is required of non-federal transportation funds of 20 percent. These are federal funds, and therefore federal rules must be followed in the environmental document preparation, the project design process, ROW acquisition procedures, and bid package preparation and bidding for construction.

A specific funding program under SAFETEA-LU that may apply to Iron Horse trail is Category 8 funding (part of bicycle and pedestrian planning) for preservation of abandoned railway corridors (including the conversion or use thereof for pedestrian or bicycle trails). This would be applicable only in the portion of the alignment east of Arroyo Seco, not the active ACE corridor (see discussion of Railroad Planning in Section 3). Federal funds also supply the State-administered Recreational Trails Program: (\$370 million nationally through 2009 for non-motorized trail projects) and Caltrans' administered Safe Routes to School Program (\$612 million nationally through 2009).

Other potentially applicable federal programs include:

- **Rivers, Trails and Conservation Assistance Program.** The National Park Service's Rivers, Trails and Conservation Assistance program (RTCA) provides planning and technical support for local recreation and conservation planning. The program does not provide grant funding, but facilitation and planning assistance.
- **Community Development Block Grants.** Administered by the Department of Housing and Urban Development, the CDBG program provides communities with resources to address a wide range of unique community development needs. The State also administers CDBG, with funds available for acquisition of property for public purposes, construction or reconstruction of streets, recreation facilities, and other public works; demolition, and other public benefit projects.
- **Environmental Education Grants (EPA).** These grants are intended for environmental education projects that enhance the public's ability to make informed decisions that affect environmental quality. Most grants are for less than \$15,000, out of an average annual funding between \$2 and \$3 million.

6.4.2 Funding Programs Administered by the State of California

State funding programs include disbursement of federal allocations (such as the Recreational Trails Program), or funds authorized by the State Legislature to fund trails. Trails can be implemented as stand-alone projects, or combined with other projects to increase grant

success, such as creek restoration, habitat and water quality improvement or environmental education. With most state-administered funding, documentation of environmental review is typically required as part of the grant application.

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, 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. The program requires a 12% local agency match. Trails completed along the creek corridors and cooperatively with Zone 7 would be applicable.

Land and Water Conservation Fund Program (LWCF). The LWCF Program administered by the California Department of Parks and Recreation provides matching grants for acquisition, development, operation, and maintenance of lands and facilities that provide for public outdoor recreation. Local units of government, including cities, counties, and districts that are authorized to acquire, develop, operate and maintain park and recreation areas are eligible to apply. In 2007, approximately \$1.27 million was available for projects statewide.

Local Grant Programs. The State Department of Parks and Recreation funds local programs from miscellaneous sources, such as the General Fund, Environmental License Plate Fund, River Protection, etc. Some trail funding could be considered from this source.

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

1. Bicycle Transportation Account, provides 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.
2. 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.
3. Safe Routes to School (extended to 2009) 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 Downtown area near Junction Avenue School, Portola School and connections to Livermore High School.
4. Partnership, Statewide, and Transit Planning grants for improvements to the state or regional transportation system. This could conceivably be used for trail segments and connections to planned BART facilities, ACE improvements or other planned regional rail improvements.
5. Environmental Justice Planning Grants are available to fund planning activities in low-income and minority communities, and could be considered for some segments of the trail.

6. 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, such as trail segments in the Downtown area that could link to the Transit Center.

Recent Bond Acts. Proposition 84, the “Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006” was approved in November 2006. This Safe Drinking Water Bond will provide approximately \$400 million for parks and trails. Proposition 1B, the “Highway Safety, Traffic Reduction, Air Quality and Port Security Act of 2006” was also approved in November 2006 which allocates 11.3 billion for congestion reduction, highway and local road improvements.

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:

1. Protect, restore, and enhance natural habitats and other open-space resources of regional significance throughout the nine-county area;
2. 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
3. Promote projects that provide open space that is accessible to urban populations for recreational and educational purposes.

Conceivably, funding could be allocated for acquisition of ROW in selected areas, implementation of projects associated with creek restoration (jointly with Zone 7), especially if environmental restoration of lands were included as part of the project components.

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:

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

It is conceivable that some of the trail improvements in the Isabel/Stanley area along Hwy 84 could be completed in association with implementation of that project.

Metropolitan Transportation Commission. MTC established the Transportation for Livable Cities program in 1998 to provide incentives for pedestrian- and transit-oriented developments,

streetscape improvements, and other projects that strengthen the link between transportation, land use, and community goals.

Transportation Funds for Clean Air Program (TFCA). The Bay Area Air Quality Management Districts (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%).

California Center for Physical Activity Grant Program. The California Center for Physical Activity offers small grants of less than \$5,000 to public health departments for projects related to walking.

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 Alameda County Congestion Management Agency (CMA).

Habitat Conservation Fund. 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. This fund could be utilized for trails, parks and restoration enhancement in cooperation with ACFCWCD/Zone 7.

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.

6.4.3 Local and Regional Funding Programs

Local funding for trail projects may include a commitment of funds from local capital improvement programs or CIPs. 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 with developer fees and other funding. Due to budgetary constraints, capital improvement funding is often committed to major infrastructure and deferred maintenance needs.

Measure B Bicycle and Pedestrian Funding (ACTIA). Measure B was an Alameda County (and incorporated cities) proposition on the Nov. 2000 ballot that was devoted to transportation improvement funding, including expanding BART, the Altamont Commuter Express, and local and feeder bus service in Alameda County. It also would fund improvement programs for pedestrian and bicycle safety. The measure passed with 81.4% voting yes. Measure B devotes \$80 million over a 20-year period to bicycle and pedestrian improvements, largely collected through a ½ cent sales tax devoted to transportation projects and programs. This funding is distributed through two systems, 1) a "pass through" funding system, by which 75% of Measure B funding is distributed to Alameda County cities and county unincorporated areas, and 2) through competitive grants, by which the remaining 25% is available for capital projects,

programs, and plans of countywide significance. For fiscal year 2006/2007 ACTIA distributed \$61 million dollars to programs in Alameda County.

TDA Article III (SB 821). Transportation Development Act (TDA) Article III funds are state block grants that are awarded annually to local jurisdictions for construction and engineering of bicycle and pedestrian projects in California. Based on local population, these funds are generated from the state sales tax and are distributed through the Alameda County Congestion Management Agency (ACCMA). In 2006/07, \$1.4 million of TDA Article III funds were allocated to Alameda County. The ACCMA was formed in 1991 with the goals of (1) positioning Alameda County jurisdictions to better compete for state and federal transportation dollars, (2) seek consensus on transportation improvements and (3) foster communication about transportation among jurisdictions.

Developer Fees. The Quimby Act (Section 66477 California Planning, Development and Zoning Laws) allows a City to collect fees from developers as part of residential project development, in-lieu of development of park lands, or recreational facilities. Impact fees can also be assessed as part of a development project as is required in the Downtown area as part of Downtown Specific Plan implementation.

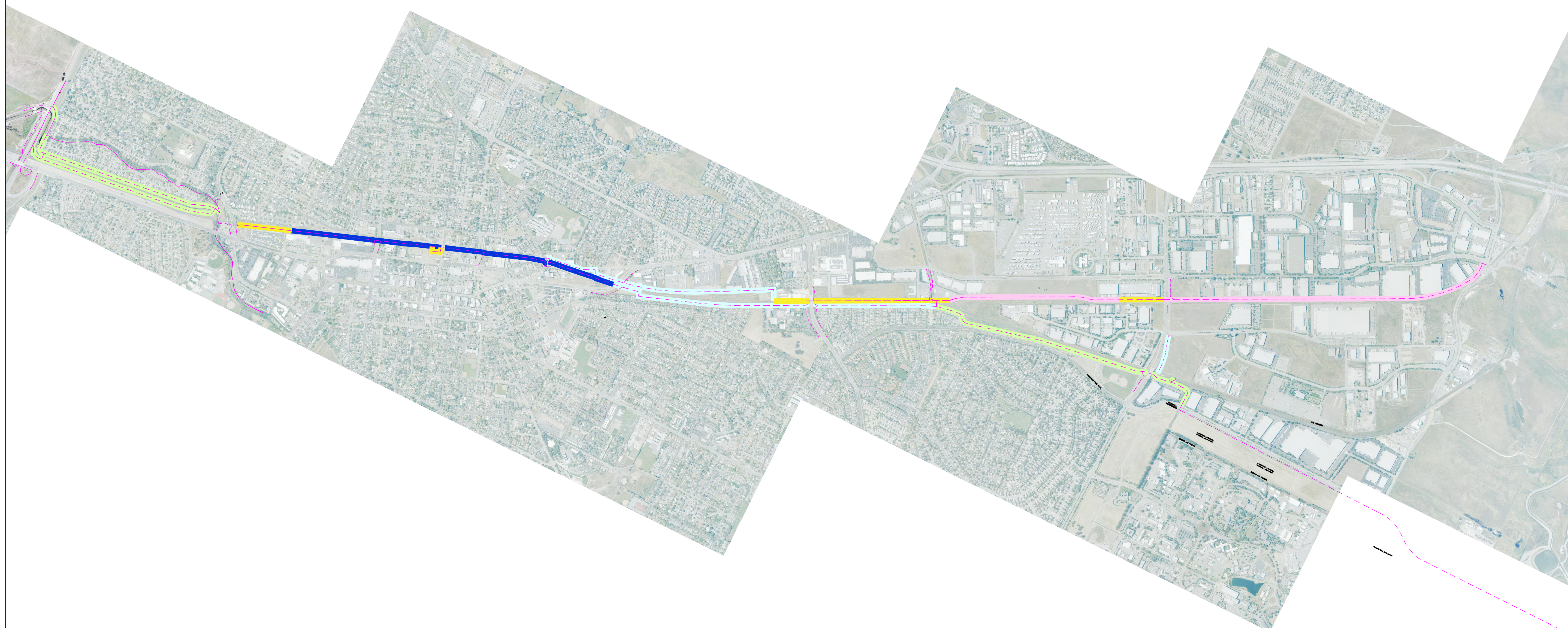
Mello-Roos Community Facilities Act. Bike paths and bike lanes can be funded as part of a local assessment or benefit district.

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. It is based on the concept of assessing only those properties that benefit from the improvements.










Redevelopment Agencies. These agencies utilize tax revenue to eliminate blight within the redevelopment agency's plan area. Preserving open space and improving roads and public facilities are often identified in local redevelopment plans. Redevelopment Agency lands within the Downtown area will be constructed with trail improvements as a part of site development.

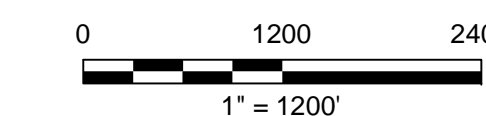
Bikes Belong Coalition, Ltd Grants Program. This private organization gives grants of up to \$10,000 for projects in two categories: 1. Facilities 2. Advocacy. For the facility category, Bikes Belong will accept applications from public agencies and departments at the national, state, regional, and local levels. For the advocacy category, Bikes Belong will fund organizations whose mission is expressly related to bicycle advocacy. Trail funding from this source might be possible if a local constituency partnered with the City for advocacy (e.g. a newly formed "Friends of the Iron Horse Trail").

Alameda County Flood Control and Water Conservation District (Zone 7). This District is responsible for building and maintaining flood control structures and maintaining and repairing existing facilities and to minimize impacts of new development. The District's funding sources include benefit assessment revenue and property taxes. Trails along Zone 7's flood control channels could be implemented as part of their creek restoration and enhancement projects, consistent with the goals of the Streamwise Program.



LEGEND

-  TRAIL WITHIN ZONE 7 CREEK
-  20' EASEMENT NEEDED
-  30' EASEMENT NEEDED
-  DOWNTOWN SPECIFIC PLAN 20' DEDICATION REQUIRED
-  EXISTING EASEMENTS / ROW
-  PARCEL BOUNDARY
-  PROPOSED TRAIL AND SPURS
-  EXISTING TRAIL AND SPURS
-  RAILROAD TRACKS

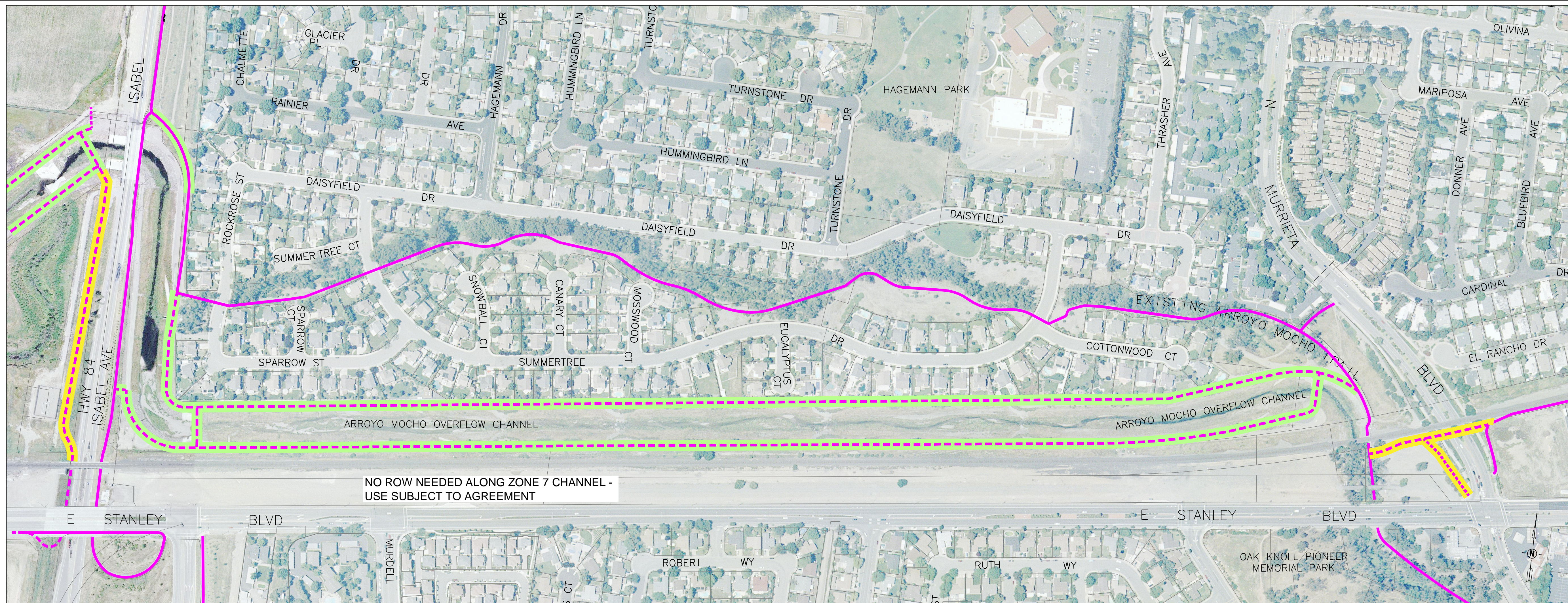


**CORRIDOR VIEW
PROPOSED TRAIL
LIVERMORE, CA**

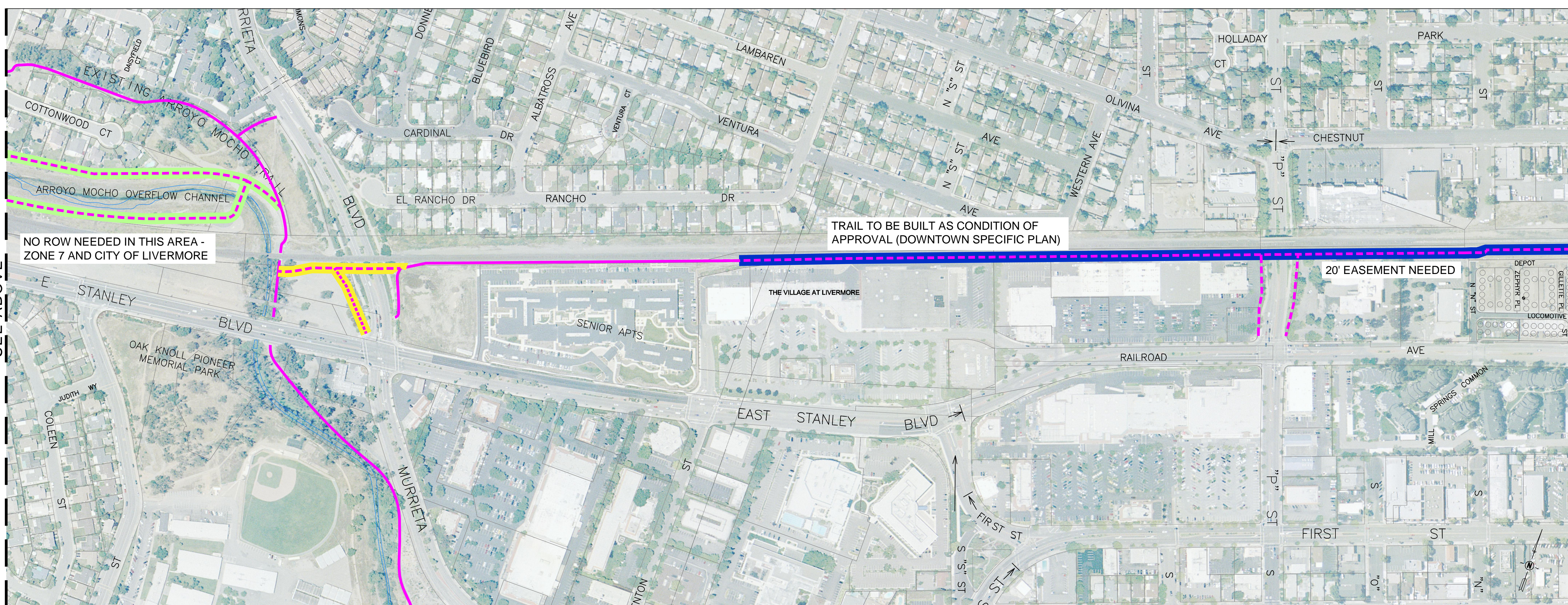
**CITY OF LIVERMORE
IRON HORSE TRAIL
TRAIL RIGHT OF WAY**

SOURCE BASE MAP PROVIDED BY CITY OF LIVERMORE

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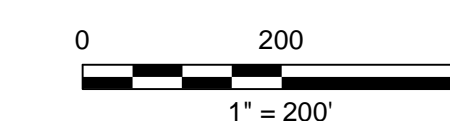


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LEGEND

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- - - DOWNTOWN SPECIFIC PLAN 20' DEDICATION REQUIRED
- - - EXISTING EASEMENTS / ROW
- PARCEL BOUNDARY
- - - PROPOSED TRAIL AND SPURS
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- RAILROAD TRACKS

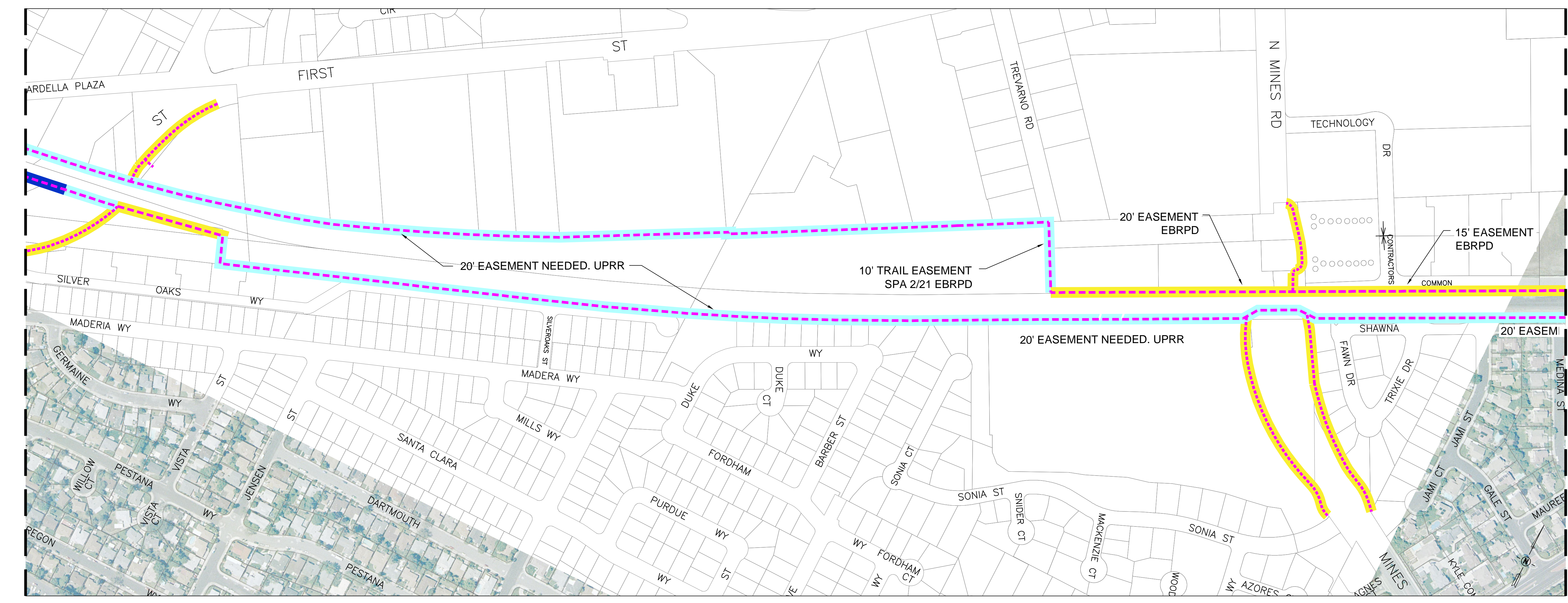
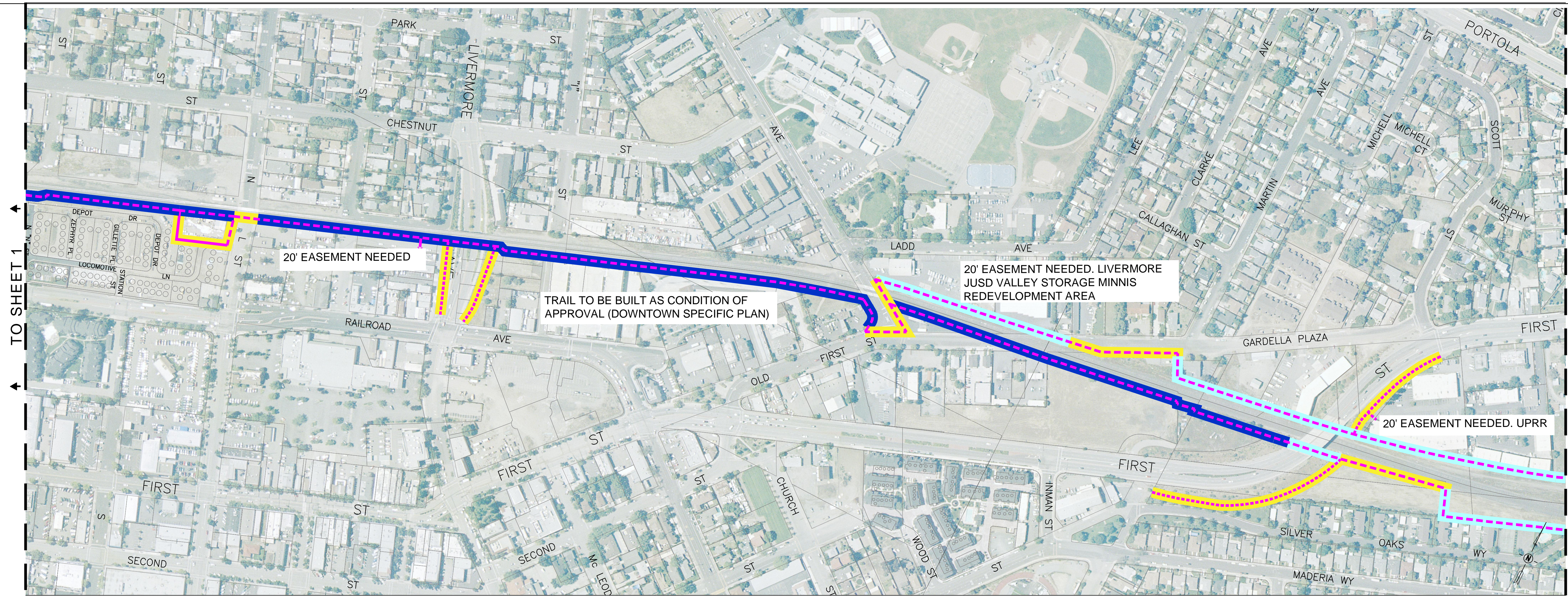


**CORRIDOR VIEW
 PROPOSED TRAIL
 LIVERMORE, CA**

**CITY OF LIVERMORE
 IRON HORSE TRAIL
 TRAIL RIGHT OF WAY**

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SOURCE BASE MAP PROVIDED BY CITY OF LIVERMORE



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- - - 20' EASEMENT NEEDED
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- - - DOWNTOWN SPECIFIC PLAN 20' DEDICATION REQUIRED
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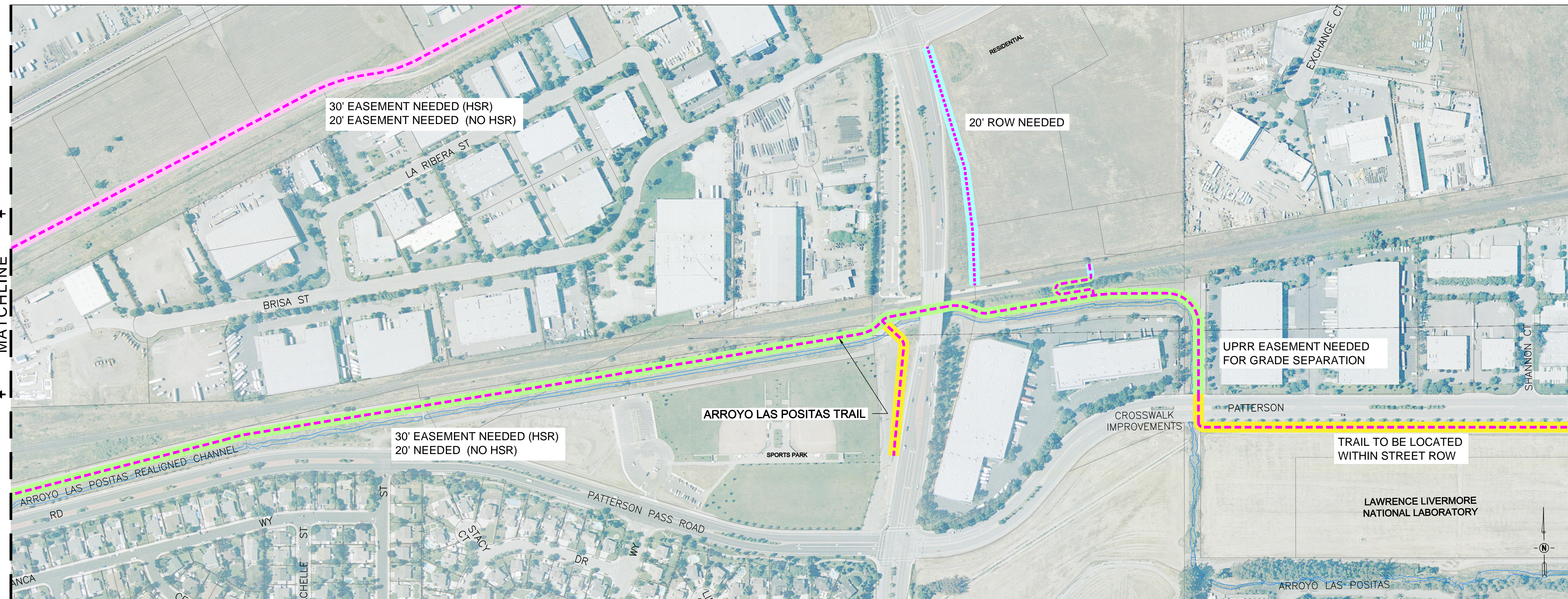
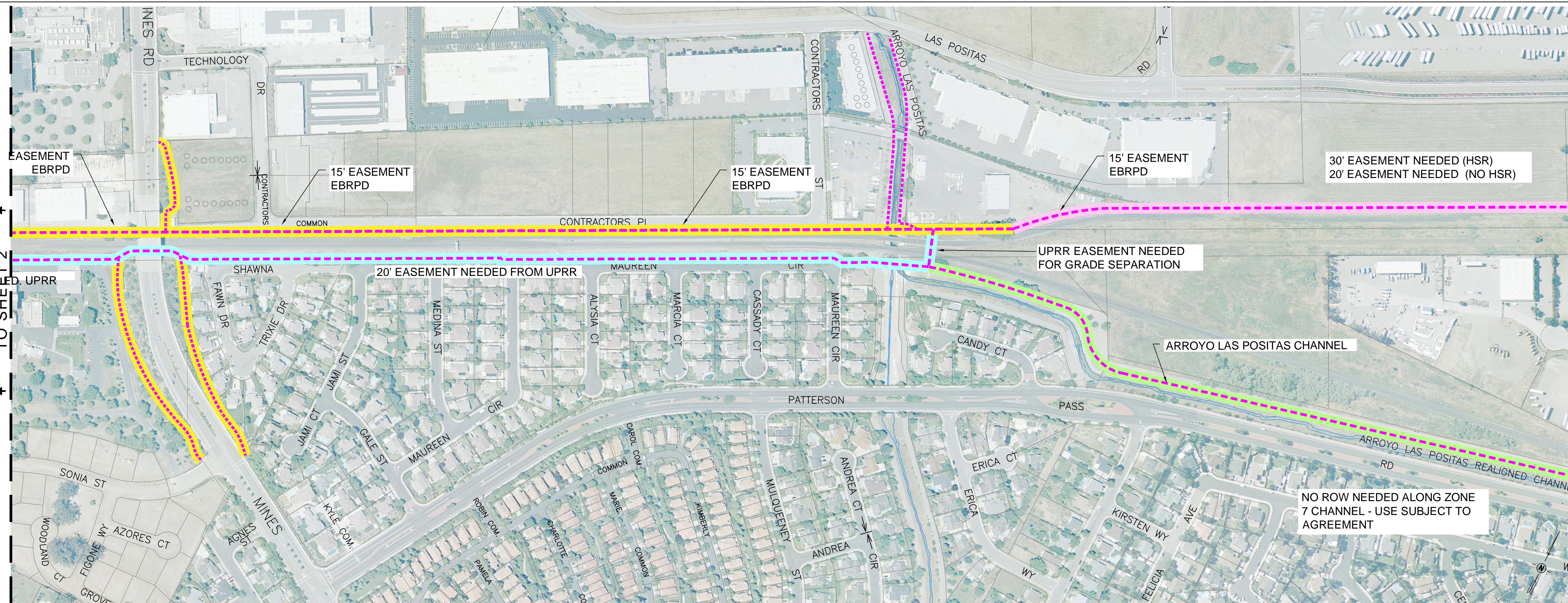
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**CORRIDOR VIEW
 PROPOSED TRAIL**
 LIVERMORE, CA

**CITY OF LIVERMORE
 IRON HORSE TRAIL
 TRAIL RIGHT OF WAY**

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| Checked: | PROJECT NO. |
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SOURCE BASE MAP PROVIDED BY CITY OF LIVERMORE



LEGEND

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- EXISTING TRAIL AND SPURS
- RAILROAD TRACKS

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1" = 200'

**CORRIDOR VIEW
PROPOSED TRAIL**
LIVERMORE, CA

**CITY OF LIVERMORE
IRON HORSE TRAIL
TRAIL RIGHT OF WAY**

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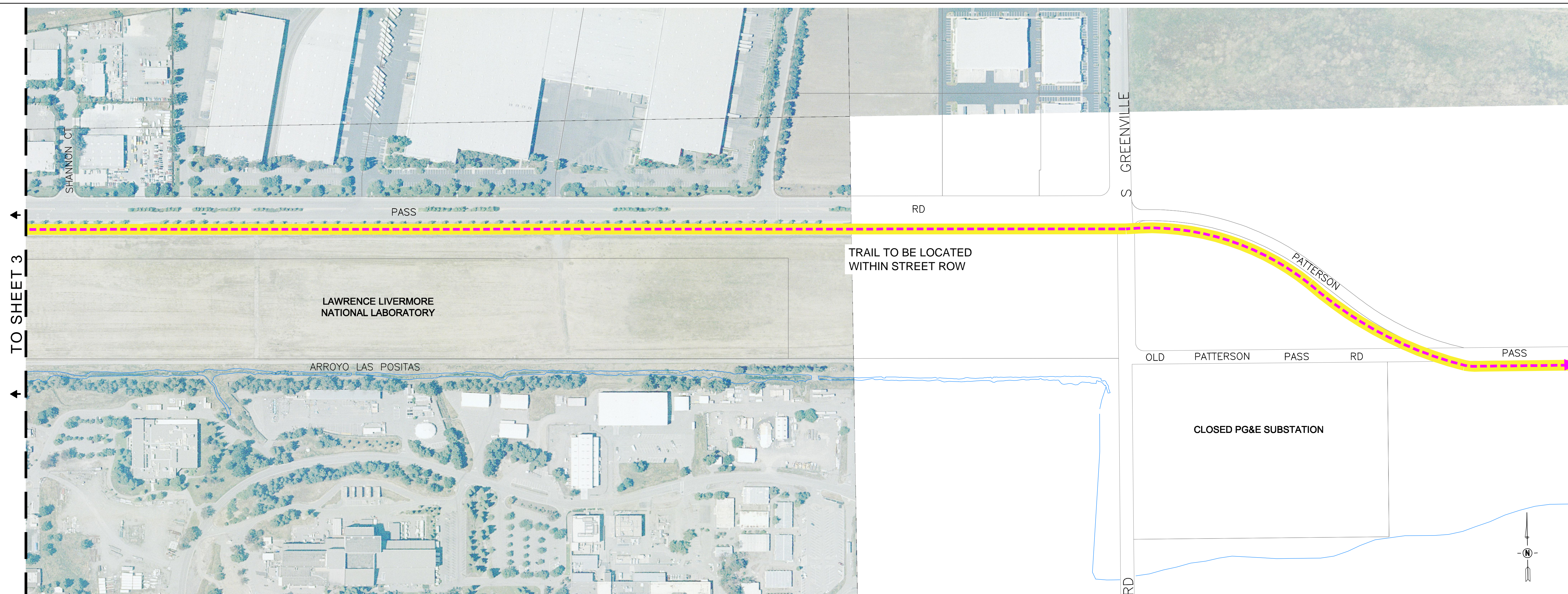
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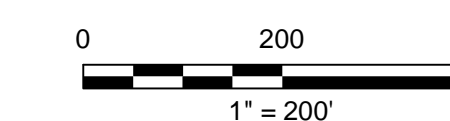
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LEGEND

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- DOWNTOWN SPECIFIC PLAN 20' DEDICATION REQUIRED
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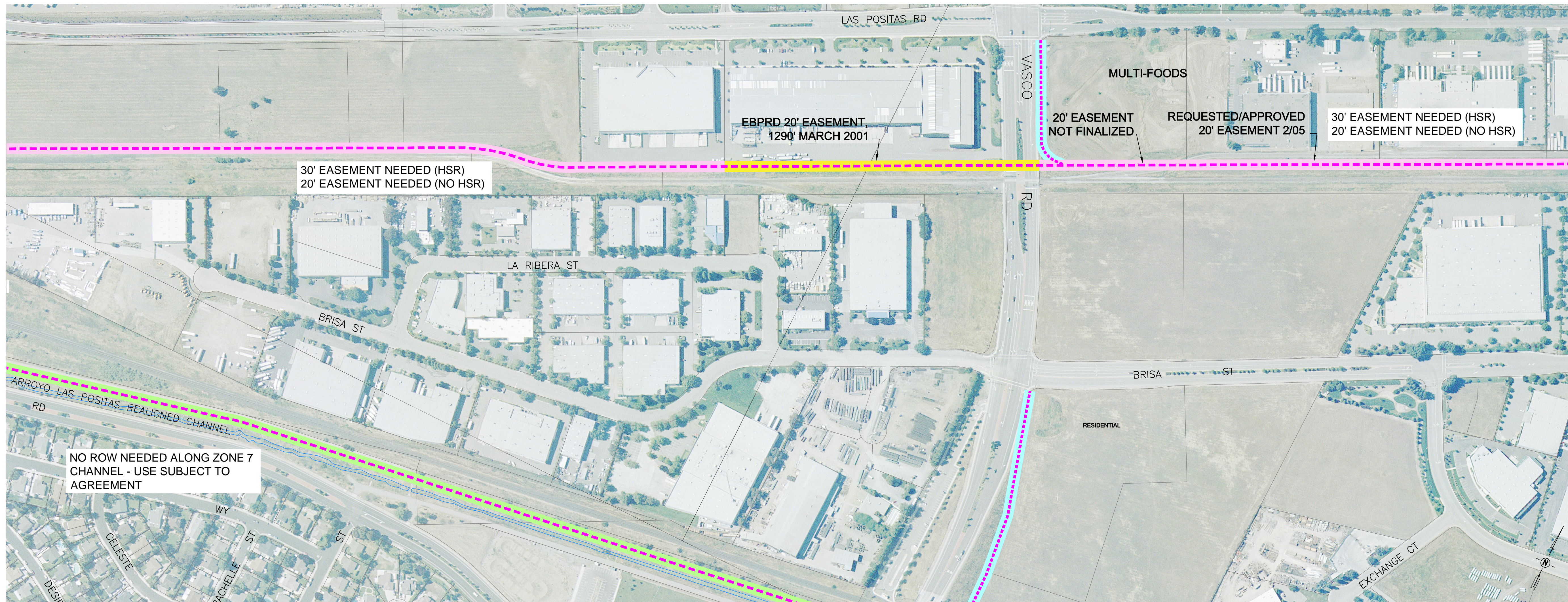


**CORRIDOR VIEW
PROPOSED TRAIL**
LIVERMORE, CA

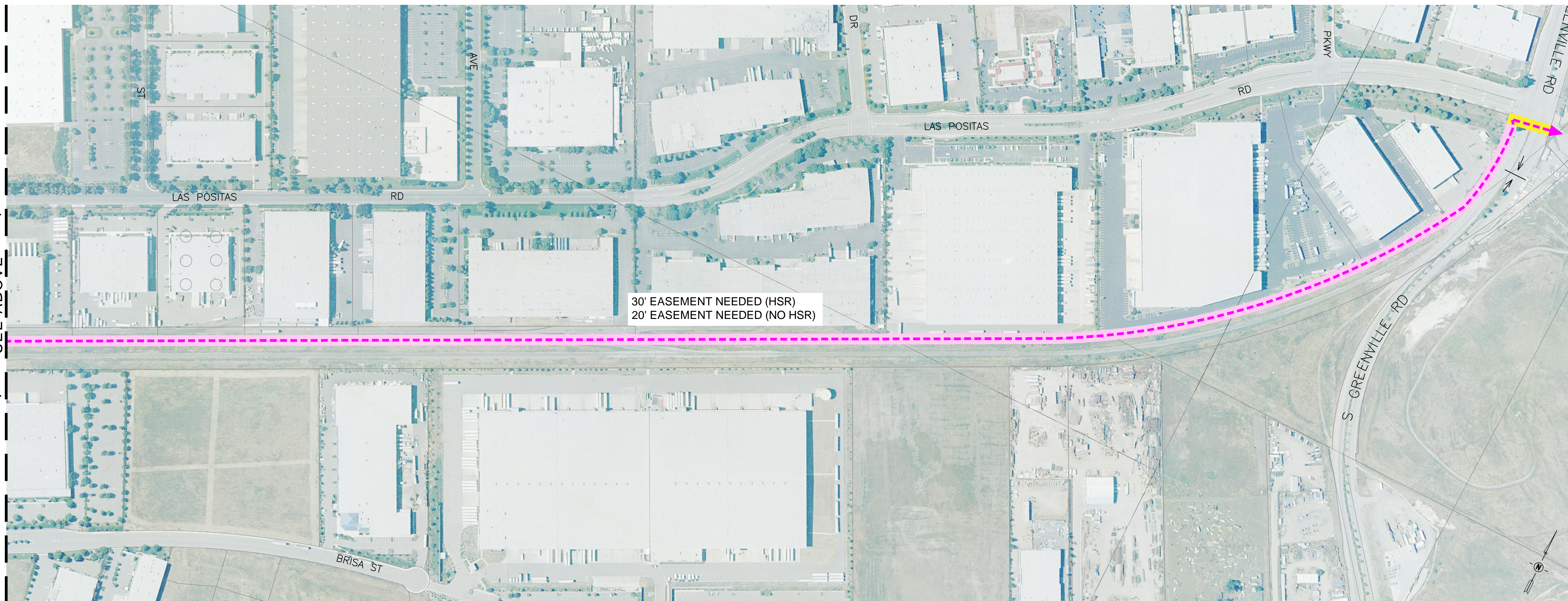
**CITY OF LIVERMORE
IRON HORSE TRAIL
TRAIL RIGHT OF WAY**

SOURCE BASE MAP PROVIDED BY CITY OF LIVERMORE

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- TRAIL WITHIN ZONE 7 CREEK
- 20' EASEMENT NEEDED
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**CORRIDOR VIEW
PROPOSED TRAIL
LIVERMORE, CA**

**CITY OF LIVERMORE
IRON HORSE TRAIL
TRAIL RIGHT OF WAY**

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SOURCE BASE MAP PROVIDED BY CITY OF LIVERMORE

7. Next Steps

Implementation of the Livermore IHT is a multi-step process. In addition to land ownership issues, regulatory challenges, competing uses and project costs, implementation of the trail will need community support, funding and City Council approval to proceed. Council approval of the project concept is necessary to obtain grant funding, and incorporation into local and regional planning efforts. The following steps outline the near-term process for trail planning.

Project Approval. Finalize the Livermore IHT Feasibility Study, incorporating community input. The implementing agency (City of Livermore) needs to formally accept the project design concepts and any preferred alternatives, in a hearing open to the public. This will involve presentation of the Feasibility Study to the Planning Commission and City Council, and with concurrent or subsequent approval and adoption of a California Environmental Quality Act (CEQA) environmental document.

Aside from accepting this report's recommendations, the City will need to decide which segments to complete. It may be desirable to incorporate the project recommendations into any forthcoming General Plan Update, Capital Improvement Program, and Transportation Plan, as appropriate, if implementation is to occur over a long period of time.

Project Sponsor. The implementing agency, if different than the City of Livermore, needs to take responsibility for the next steps. Although the City of Livermore is anticipated to be the Lead Agency, it is conceivable that portions of the trail could be completed by other entities, such as Zone 7, EBRPD or LARPD.

Environmental Review. An environmental analysis needs to be conducted per CEQA requirements. For portions of the trail implemented as part of separate development projects (such as Downtown), the project impacts and consistency will be completed as part of the project approval. If portions of the trail are implemented as a continuous trail segment, then a CEQA Initial Study Checklist will be prepared to determine if there are potential significant environmental impacts. If there are potential impacts, then an expanded environmental assessment will be prepared, most likely focusing on the specific project issues. Mitigation measures may be incorporated into the project design (such as fencing, separation or other measures), to reduce the potential environmental impacts. The public will have several opportunities to review and comment on the project and potential impacts in this process. If the project involves federal funding, then environmental review must comply with National Environmental Policy Act (NEPA) guidelines. If the environmental review identifies feasible mitigation measures that adequately address project impacts, then a Mitigated Negative Declaration can be adopted by the City Council, along with a Mitigation and Monitoring Plan.

Easement Acquisition. The City in negotiations can complete the easement acquisition process with project stakeholders and private property owners, as well as cooperative agreements with ACFCWCD for joint use of flood control access roads. The City will also want to continue to coordinate with EBRPD to facilitate easement acquisition and regional trail connections.

Grant Applications. Grants and other funding requests must be completed and funding secured prior to trail implementation. Possible sources of funding for trail and easement acquisition were identified earlier.

Design. The design process can often proceed at the same time as the environmental work is being completed. Next steps include title searches, surveying, review of “as-built” drawings, soil borings, and preliminary trail design. Bridge overpass design will also need to be completed in coordination with City Engineering and ACTIA.

Typically a design proceeds through several stages of preparation and review, from concept drawings to a final construction bid package. Preparation of plans, specifications and bid packages can be completed for construction-ready segments. 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.

For some portions of the proposed trail, trail design and construction can be incorporated into Capital Improvement Projects, or trail implementation can be a condition of development projects as a condition of approval, and constructed privately. The City can also condition contribution towards implementation of trail segments associated with development projects, consistent with the Downtown Plan.

Permitting. Preparation of permits and requests for permit approvals from applicable regulatory agencies can be initiated. In addition to environmental permits, the project will also need grading plan and landscape improvement approval, as well as building permits for structures such as bridges and overcrossings, retaining walls, railings and stairways, issued by City departments. Potential wetlands-associated permits might be required for trail work along Arroyo Mocho or Arroyo Las Positas, but would be expected to be completed in conjunction with Zone 7 environmental enhancement projects.

Trail Implementation. Construction of the trail route in segments will provide interim point access as well as an opportunity to monitor trails use and security needs. Securing funding to implement portions of the trail (such as Segment 1, in conjunction with Zone 7 implementation) is typical in such projects, and may provide impetus for grants and private contributions for trail implementation. Depending on size and complexity, a trail construction project can take from one to three or four months.

8. References

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- Metropolitan Transportation Commission, 2007. MTC Regional Rail Plan.
- Zone 7 Water Resources Management, 2006. Zone 7 Stream Management Master Plan and Stream Management Master Plan Master Environmental Impact Report.

Persons Contacted

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Mohammad Pournia
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Linda Chavez

Alameda County Flood Control, Zone 7

Joe Seto

Altamont Commuter Express

Brian Schmidt

Union Pacific Railroad

Terrel Anderson
David Thatcher

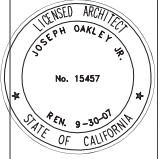
Appendices

A: Concept Bridge Crossings

B: Alignment Alternatives

Appendix A

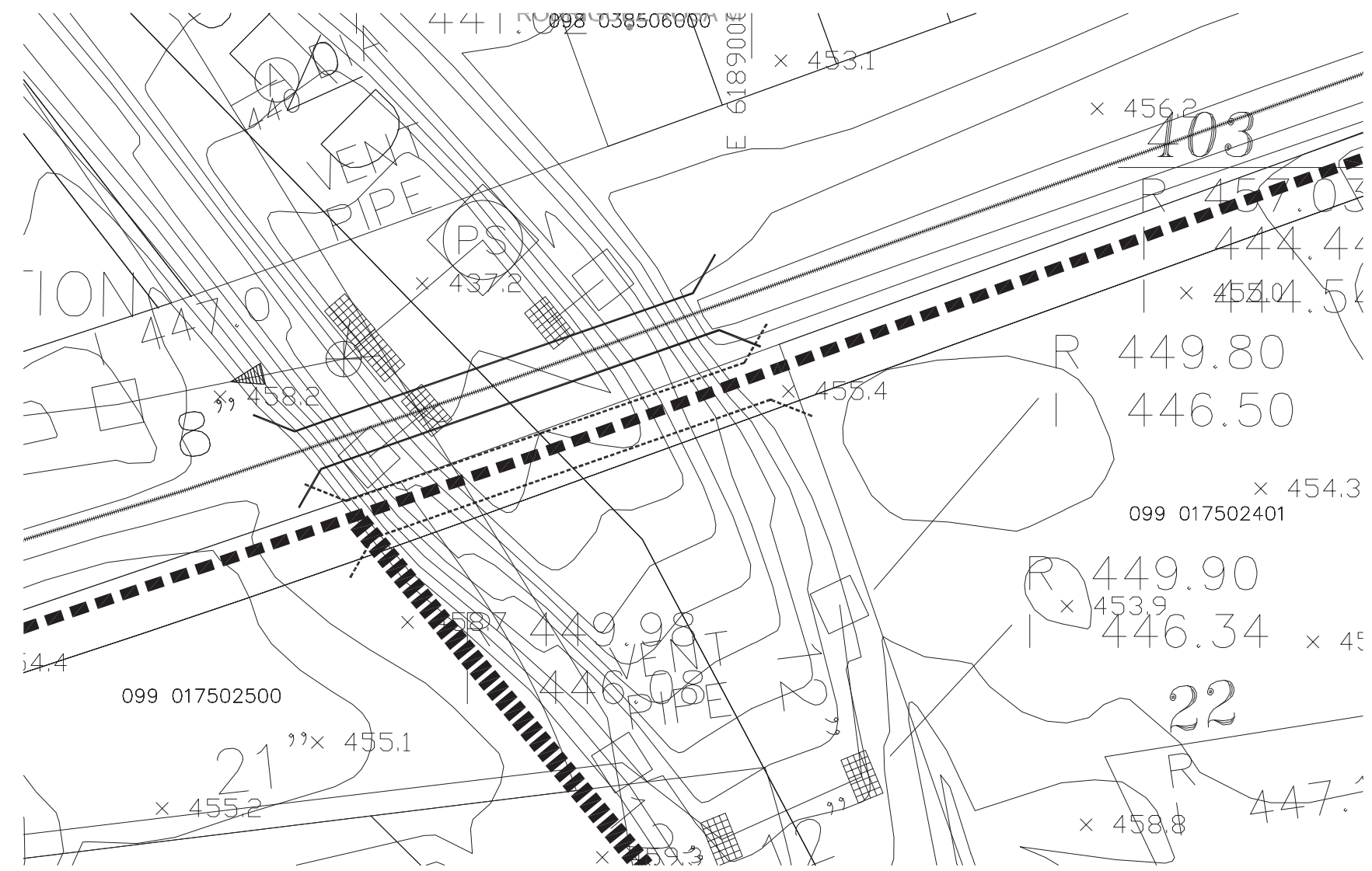
Concept Bridge Crossings



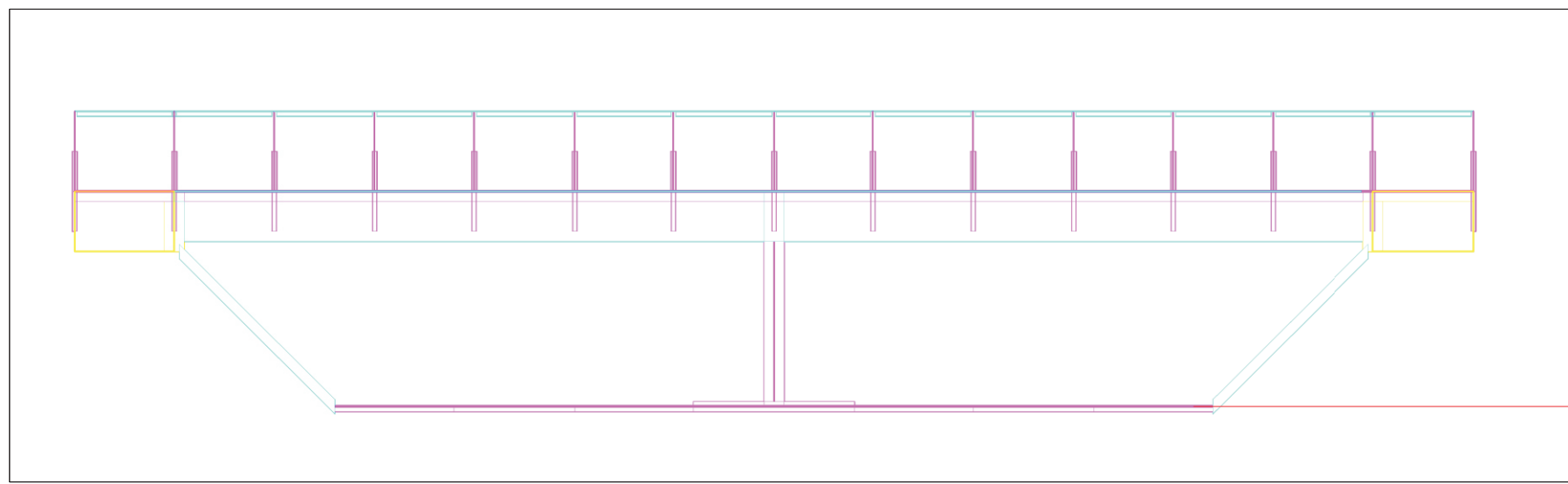
QUESTA ENGINEERING CORPORATION
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IRON HORSE TRAIL
 3 SITES FOR BRIDGES
 LIVERMORE, CALIFORNIA

Date: 10-15-07
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 Job No.: 2007-64
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① SITE PLAN
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ELEVATION-STEEL GIRDER OPTION
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IRON HORSE TRAIL PEDESTRIAN BRIDGE
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STEEL GIRDER OPTION

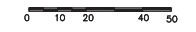
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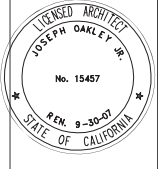
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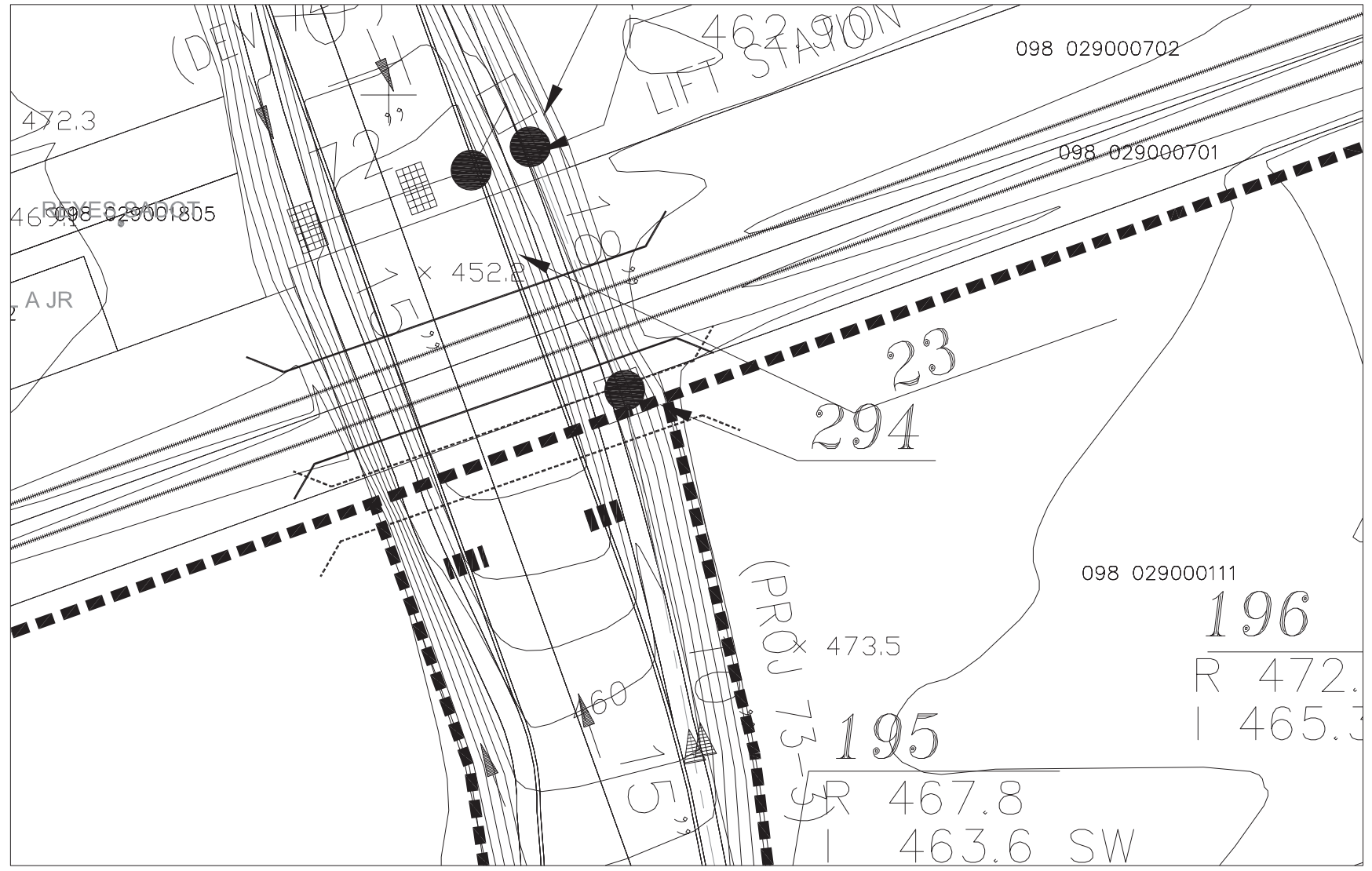
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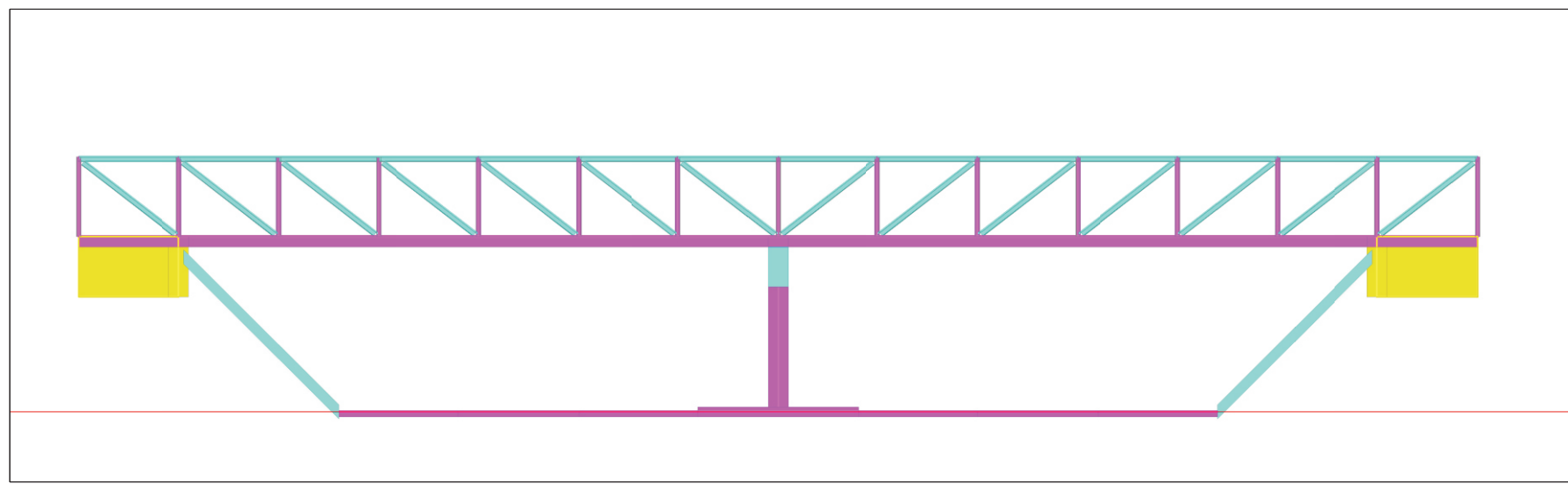
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① ELEVATION-TRUSSED STEEL BRIDGE OPTION
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IRON HORSE TRAIL PEDESTRIAN BRIDGE
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① ELEVATION-TRUSSED STEEL BRIDGE OPTION

TRUSSED STEEL BRIDGE
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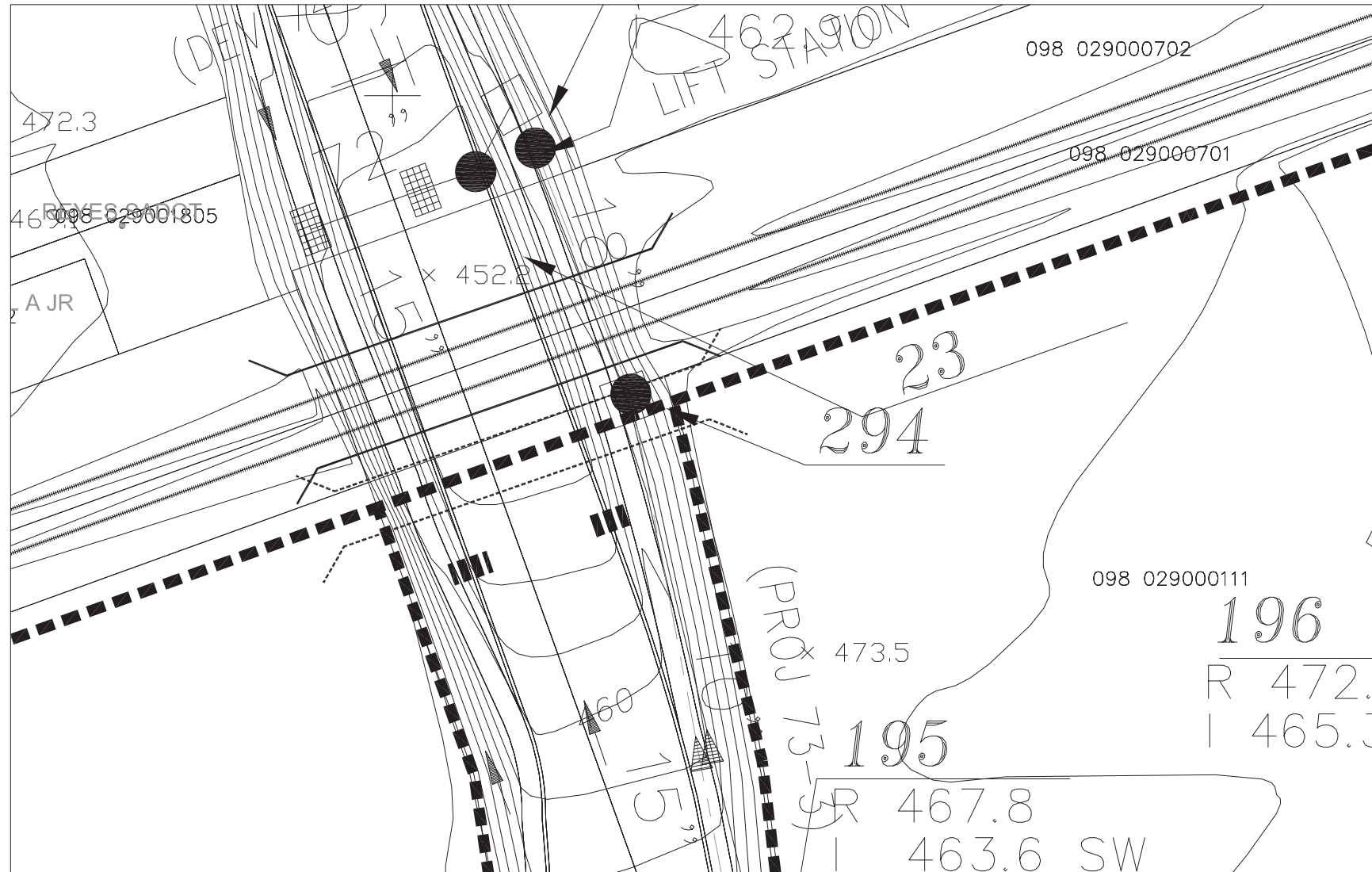
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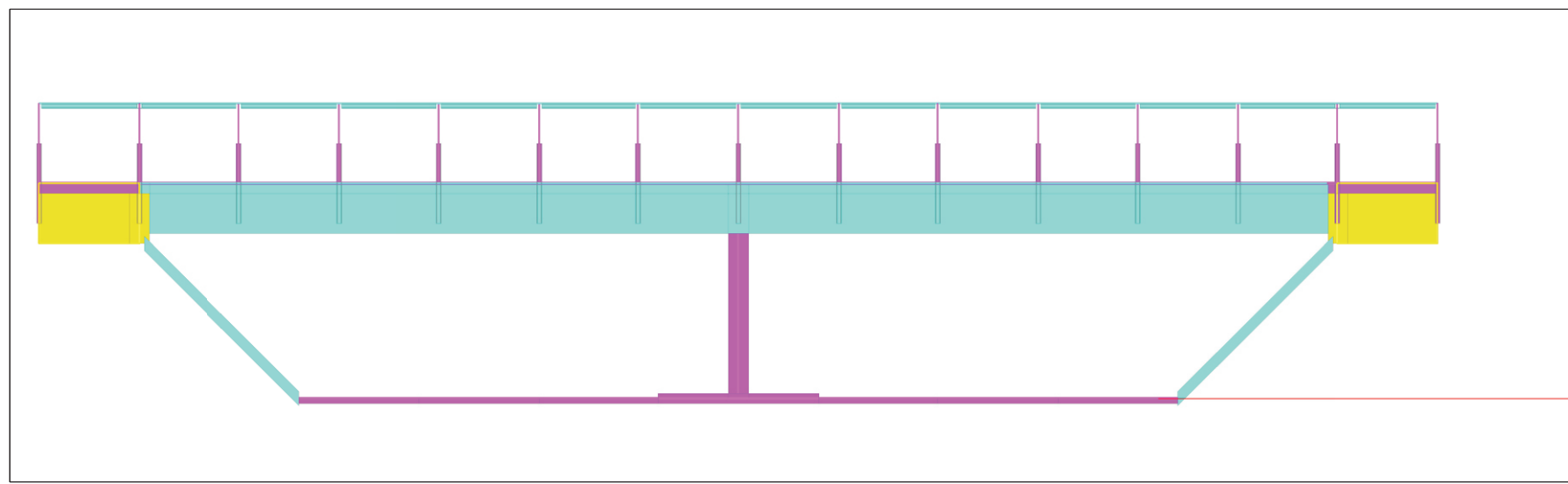
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STEEL GIRDER OPTION

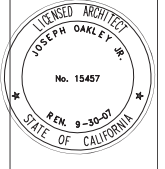
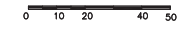
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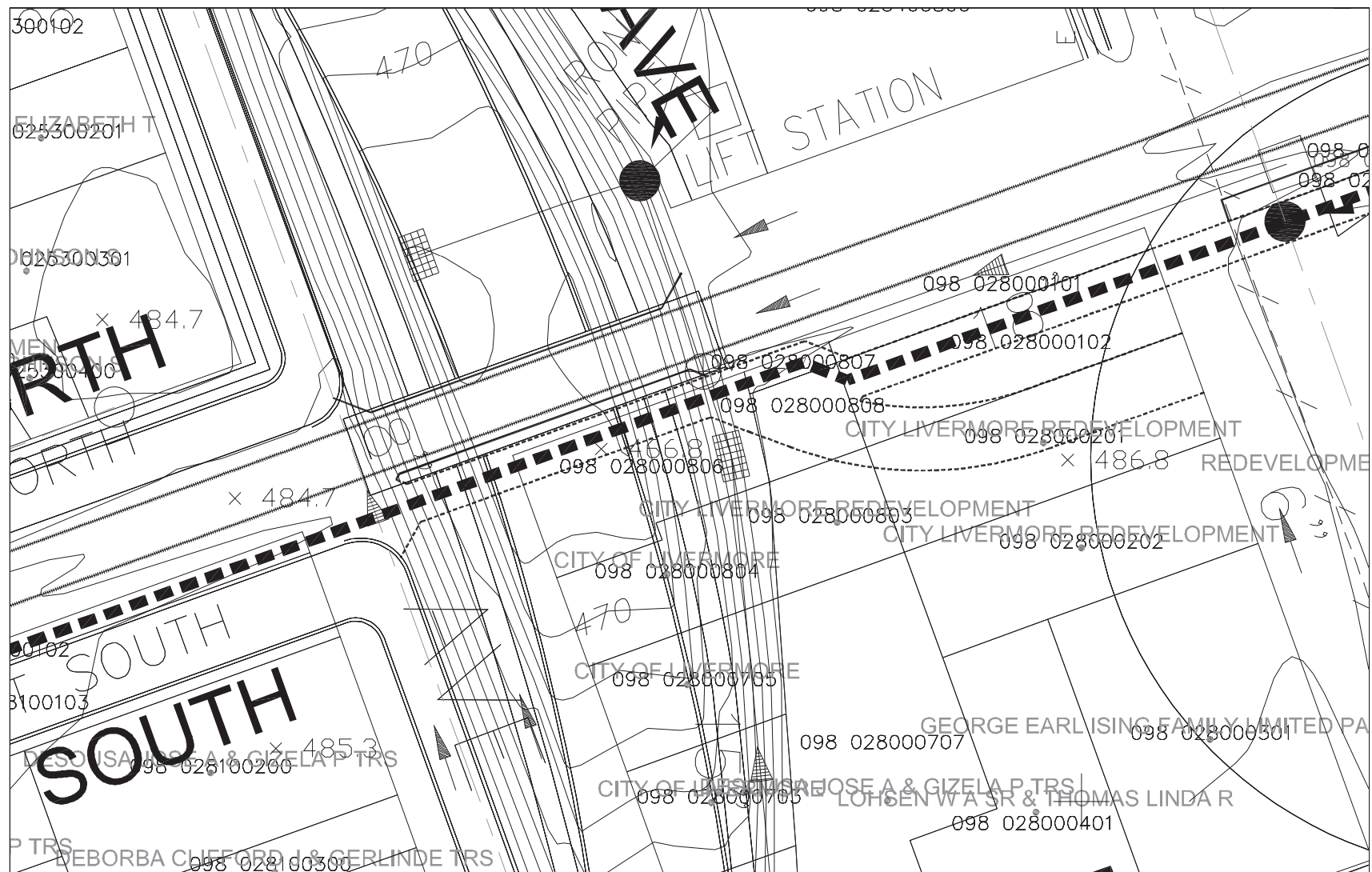
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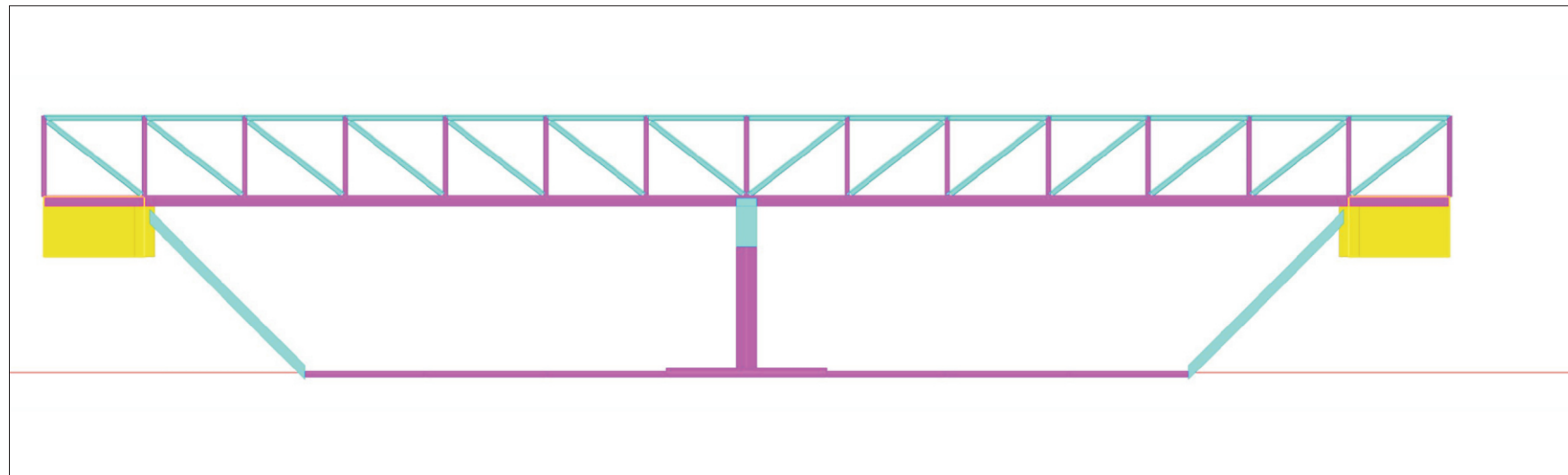
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IRON HORSE TRAIL PEDESTRIAN BRIDGE
LIVERMORE AVENUE



ELEVATION-TRUSSED
STEEL BRIDGE OPTION
1 NO SCALE

TRUSSED STEEL BRIDGE

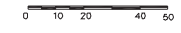
THIS OPTION IS BASED ON A DESIGN THAT IS READILY AVAILABLE FROM A SEVERAL BRIDGE PREFABRICATORS WITH PLANTS IN CALIFORNIA, AND THE WESTERN UNITED STATES. BRIDGE COMPONENTS ARE FABRICATED AT OFFSITE PLANTS AND SHIPPED TO THE BRIDGE SITE.

DESCRIPTION

THIS OPTION IS A TRUSSED STEEL BRIDGE WITH A CONCRETE DECK. THE PATHWAY IS ENCLOSED BY A 8' HIGH WELDED WIRE FABRIC SCREEN SUPPORTED BY THE TOP 7 BOTTOM TRUSS CHORD AND TRUSS VERTICAL AND DIAGONAL WEB MEMBER. THE TRUSS SHAPE IS BASED ON THE HOWE TRUSS, A SHAPE FREQUENTLY USED IN RAILROAD CONSTRUCTION. THE TRUSSES REST OF CONCRETE ABUTMENTS AT EACH END, AND A RECTANGULAR CONCRETE PIER AT THE INTERIOR MEDIAN OF THE STREET. THE SPAN IS APPROXIMATELY 156' AND THE TRUSSES ARE 8' DEEP BETWEEN THE TOP AND BOTTOM CHORD. THE TOP CHORDS ARE BRACED BY CROSS MEMBERS LOCATED AT 16' INTERVALS TO ALLOW THE TRAIL USES TO LOOK UP INTO THE OPEN SKY AS MUCH AS POSSIBLE. CROSS BEAMS SPAN ACROSS BETWEEN THE TRUSS BOTTOM CHORDS TO SUPPORT THE CONCRETE DECK THAT FORMS THE WALKWAY FOR PEDESTRIANS. THE AND SUPERSTRUCTURE STEEL TUBE TOP & BOTTOM RAILS, AND VERTICAL POSTS. THE FINISH PAVING COULD BE DECORATIVE TILES OR OTHER MATERIALS DEEMED APPROPRIATE BY THE CITY AND COMMUNITY. OTHER JURISDICTIONS HAVE USED THE SALE OF INDIVIDUAL TILES FOR FUND RAISING.

COST ESTIMATE

THIS OPTION IS IS EXPECTED TO COST \$873 THOUSAND DOLLARS. THIS COST INCLUDES ALL BRIDGES COSTS EXCEPT ANY UNDERGROUND UTILITY RELOCATION'

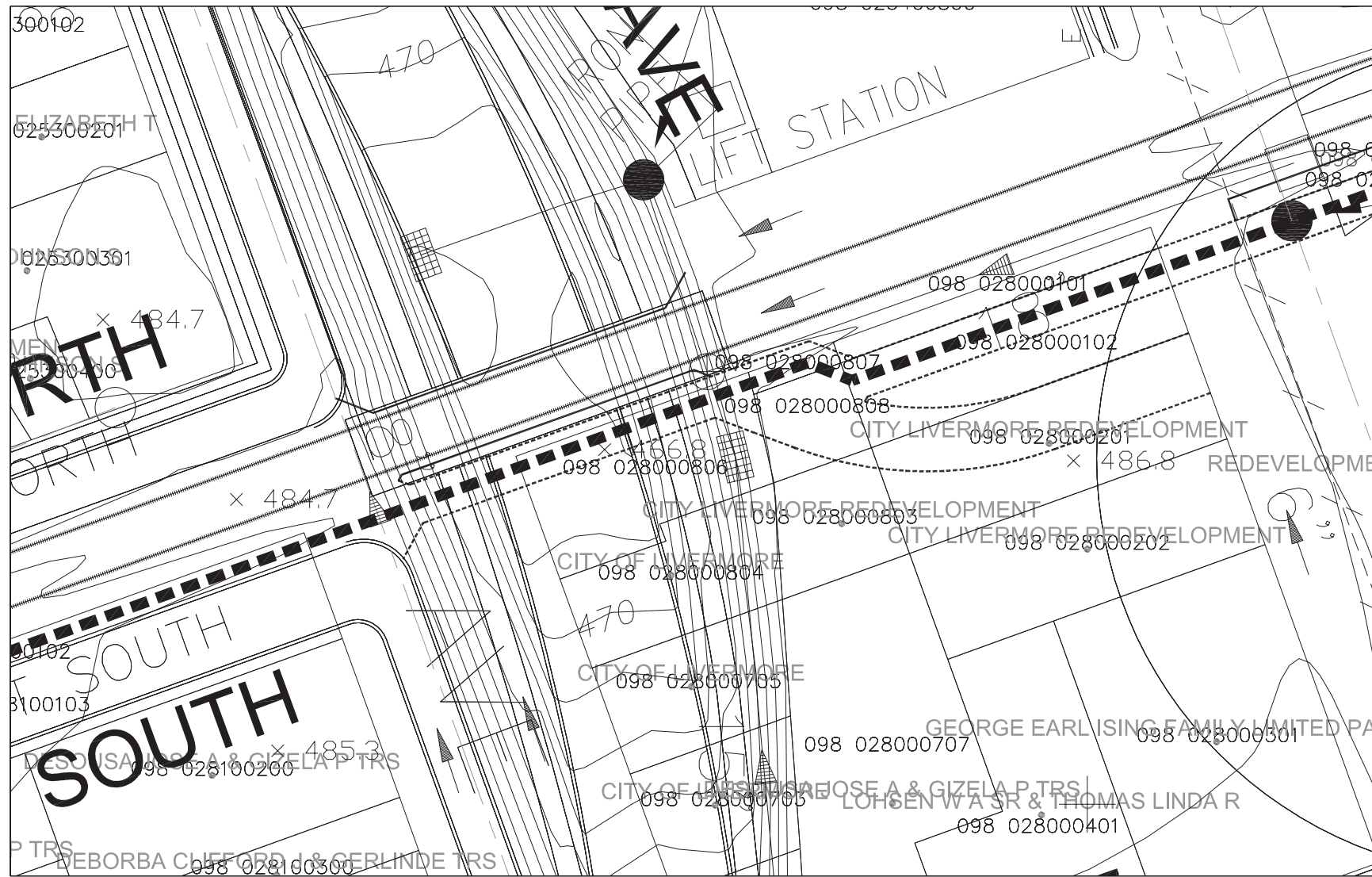


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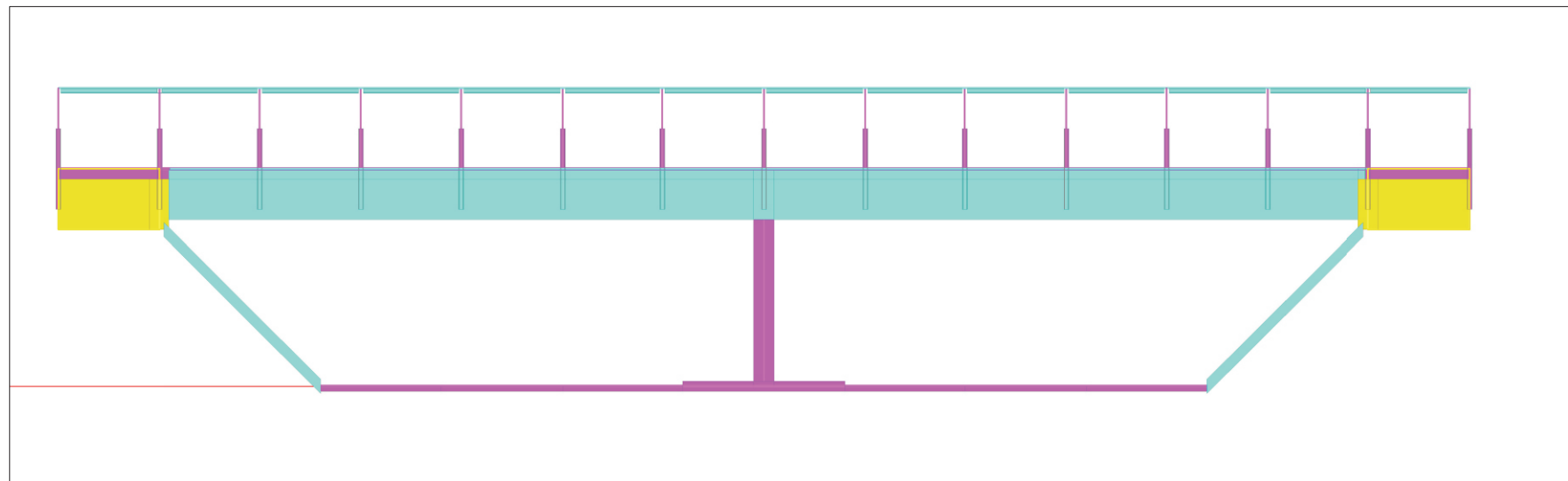
QUESTA ENGINEERING CORPORATION
CIVIL ENGINEERS
1220 BIRCHWOOD COVE ROAD, SUITE 2, RICHMOND, CA 94801
(510) 238-6114 FAX (510) 238-2423

IRON HORSE TRAIL
3 SITES FOR BRIDGES
LIVERMORE, CALIFORNIA

Date: 10-15-07
Scale: AS NOTED
Drawn: STAFF
Checked:
Job No.: 2007-64
Sheet: BS5
Of Sheets



① SITE PLAN
NOT TO SCALE



① ELEVATION-STEEL GIRDER OPTION
NOT TO SCALE

IRON HORSE TRAIL PEDESTRIAN BRIDGE
LIVERMORE AVENUE



ELEVATION-STEEL GIRDER OPTION

① NO SCALE

STEEL GIRDER OPTION

THIS OPTION IS BASED ON A DESIGN THAT IS SYMPATHETIC TO THE EXISTING STEEL GIRDER USED BY THE RAILROAD.

DESCRIPTION

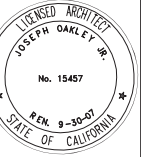
THIS OPTION IS A CONCRETE OR STEEL OR GIRDER BRIDGE WITH A SPAN OF 156'. THE WALKWAY IS A CONCRETE DECK. THE PATHWAY IS ENCLOSED BY A 8' HIGH WELDED WIRE FABRIC SCREEN SUPPORTED BY STRUCTURAL STEEL TUBE TOP & BOTTOM RAILS, AND VERTICAL POSTS. THE FINISH PAVING COULD BE DECORATIVE TILES OR OTHER MATERIALS DEEMED APPROPRIATE BY THE CITY AND COMMUNITY. THE OTHER JURISDICTIONS HAVE USED THE SALE OF INDIVIDUAL TILES AS FUND RAISERS.

COST ESTIMATE

THIS OPTION IS IS EXPECTED TO COST \$1.13 MILLION DOLLARS. THIS COST INCLUDES ALL BRIDGES COSTS EXCEPT ANY UNDERGROUND UTILITY RELOCATION'



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QUESTA ENGINEERING CORPORATION
CIVIL ENGINEERS
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(916) 328-8114 F.A.X. (916) 328-2423

IRON HORSE TRAIL
3 SITES FOR BRIDGES
LIVERMORE, CALIFORNIA

Date: 10-15-07

Scale: AS NOTED

Drawn: STAFF

Checked:

Job No.: 2007-64

Sheet:

BS6

Of Sheets

Appendix B

Alternative Alignments

Downtown Transit Center Alternatives

As discussed in **Section 3**, the area around the Downtown Transit Center is highly constrained, with little available room for the IHT. The current configuration of the station platform and the downtown parking garage are primary constraints. The existing platform is on the south side of the rail corridor, roughly centered on the north face of the parking garage, with walkways between the platform and the ground level of the parking garage. A raised platform area facilitates wheelchair boarding of ACE trains, and an at-grade bypass allows platform users to pass behind this raised area. Together the raised area and the bypass occupy almost all of the available width between the railroad right of way and the parking garage, with six feet of available landscape width for a trail connection.

This area is congested with persons congregating on the platform and crossing to and from the parking garage. The preferred alignment will create a pedestrian-only sidewalk with bicycles to be walked in this area, with consideration of future improvements to make the trail wider if and when infrastructure modifications or station amenities are remodeled.

Other options considered for the IHT alignment in this area include:

Detouring around the parking garage. The first approach (“detour”) is undesirable because it would introduce its own pedestrian and vehicular conflicts along Railroad Avenue and the sides of the parking garage. In this scenario the trail would also require additional surface area around the garage that would be better used for pedestrian circulation and other high-value purposes. This option is not recommended.

Crossing the rail corridor at N Street. This option would entail constructing an underpass west of the parking garage to route the IHT to the north side of the tracks. There are many examples of pedestrian tunnels incorporated into rail stations throughout California and the rest of the U.S. These include Caltrain’s Palo Alto, California Avenue (Palo Alto), San Antonio Road (Mountain View), and downtown San Jose stations.

Because it is unlikely that the California Public Utilities Commission would permit a new at-grade crossing, the track crossing would be a tunnel or a bridge. However, a bridge would not be compatible with the proposed High Speed Rail station design, which incorporates a two-level structure with high speed trains on the second level with overhead electric catenary supports above it. Any bridge would have to clear the overhead electrical system, and would be so tall that its ADA-compliant ramp structures would be enormous and very costly.

For these reasons, the crossing would have to be a tunnel, and the High Speed Rail station conceptual cross section does indicate a pedestrian undercrossing. However, because the garage structure would be tied to the existing garage, there is no room for a ramp to access an underpass (approximately 200 feet) at N Street.

This option is not feasible, but could be reconsidered if additional rail station improvements are completed.

Elevating over the south platform. Another option considered was to elevate the IHT along the south side of the tracks to Junction Avenue by passing above the station platform on an elevated section. This elevated path could provide shelter for the platform below. There

would be no cross-traffic conflicts because parking garage patrons use only ground level access points.

Ramps to this elevated section at its west and east ends would need to fit available space, and their respective alignments should minimize negative impacts to surface uses and circulation. West of the station, the IHT would cross Livermore Avenue on a new path bridge parallel to the railroad bridge, at the same grade as the station platform. The east end of that path bridge would be a surface-level access point for a spur to the northeast corner of the Livermore Avenue / Railroad Avenue signal and for pedestrian and bicycle access into future development west of the parking garage. An ADA-compliant ramp beginning near this point could easily reach the elevation needed to pass above the platform in the available distance, even if the platform was lengthened to the west somewhat.

East of the platform is the LAVTA bus station, with a clockwise bus driveway loop that comes close to the rail corridor. On this end, ramp design would need to be coordinated with surface and airspace constraints associated with the planned relocation of the historic depot building into this area. Independent of the IHT, that relocation will impact pedestrian, bus, and private vehicle circulation on the east side of the parking garage.

The Depot relocation plan describes two alternatives for placement of the historic building – one along the tracks and one in the center of the bus terminal. The latter alternative would impose fewer constraints on IHT alignment but may not be as advantageous for active reuse of the depot as an integral feature of the multimodal station complex.

If the east ramp of an elevated Trail were to stay close to the rail corridor, as might be the case if the historic depot building was sited away from the tracks, the ramp would touch down within what is now a narrow (10') landscape strip at the north edge of the bus driveway loop. The Trail would replace the landscape strip and would probably require replacement of a line of lightoliers that illuminate the east end of the rail platform. Relocation plans for the depot structure should include consideration of the IHT location.

This elevated structure would serve pedestrian needs, but would not provide for bicycle travel due to the lack of suitable turning and maneuvering area. In addition, this route would require complex structural improvements, redesign of the kiss and ride lot, LAVTA access and structure relocation plans. This alternative is considered infeasible.

UPRR

IRON HORSE TRAIL AT SECOND LEVEL, PROVIDE ACCESS CONNECTIONS

ACE Station Platform

Extend Platform to Edge of Bldg

10' Setback

Historic RR Station Bldg
Proposed Location

Bldg Overhang
5' Walkway

IHT ALIGNMENT
PROVIDE 5' SEPARATION

NEW CROSSWALK

RECONFIGURE BUS
TURNAROUND AS
NEEDED

Bus Transfer Bldg

WALKWAY
UNDER IHT

RAMP TO GRADE
MAX 5% SLOPE

NEW
CROSSWALK

RECONFIGURE
FOR TWO WAY
TRAFFIC

RECONFIGURE
DROP-OFF AREA

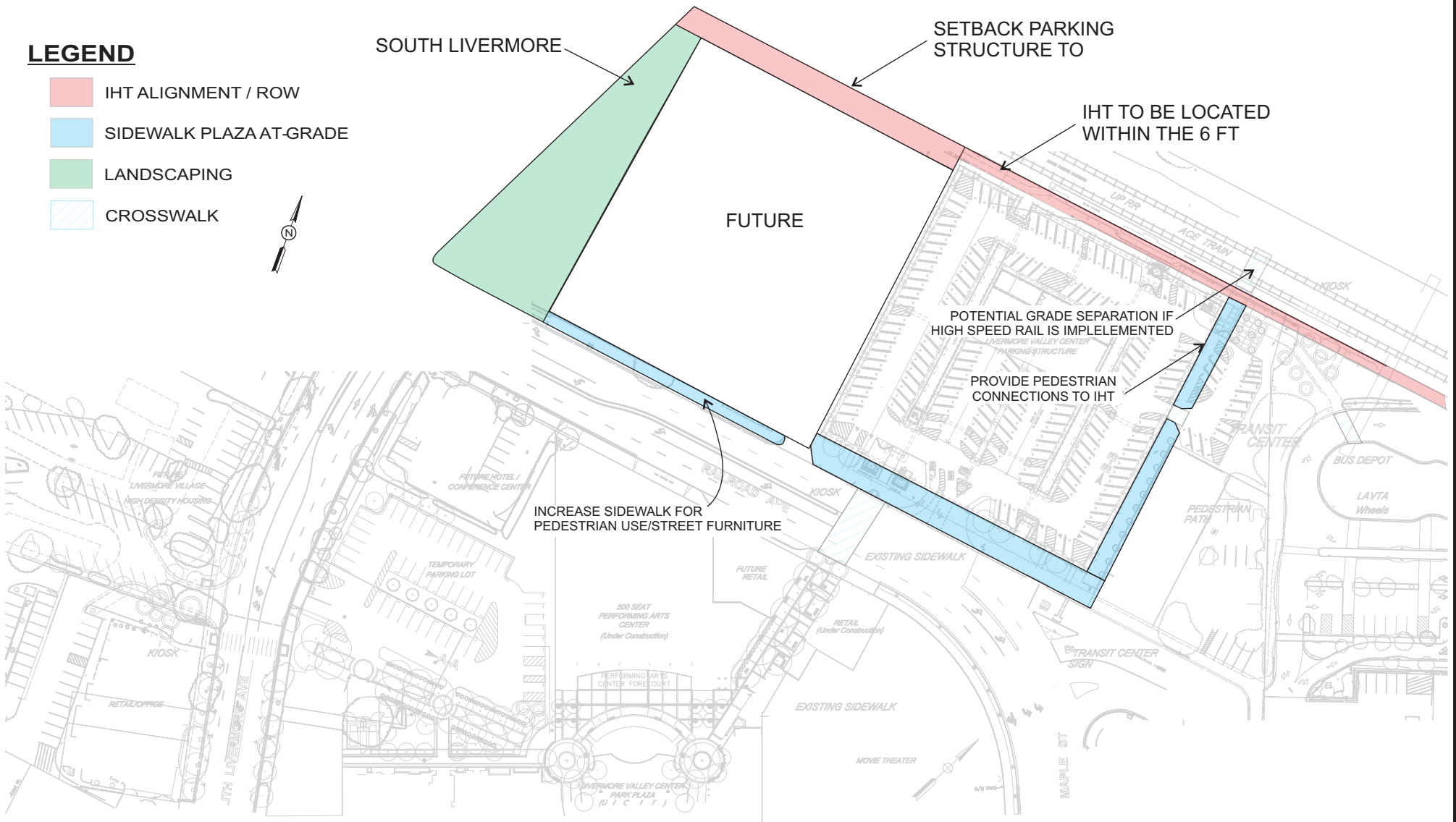
LEGEND

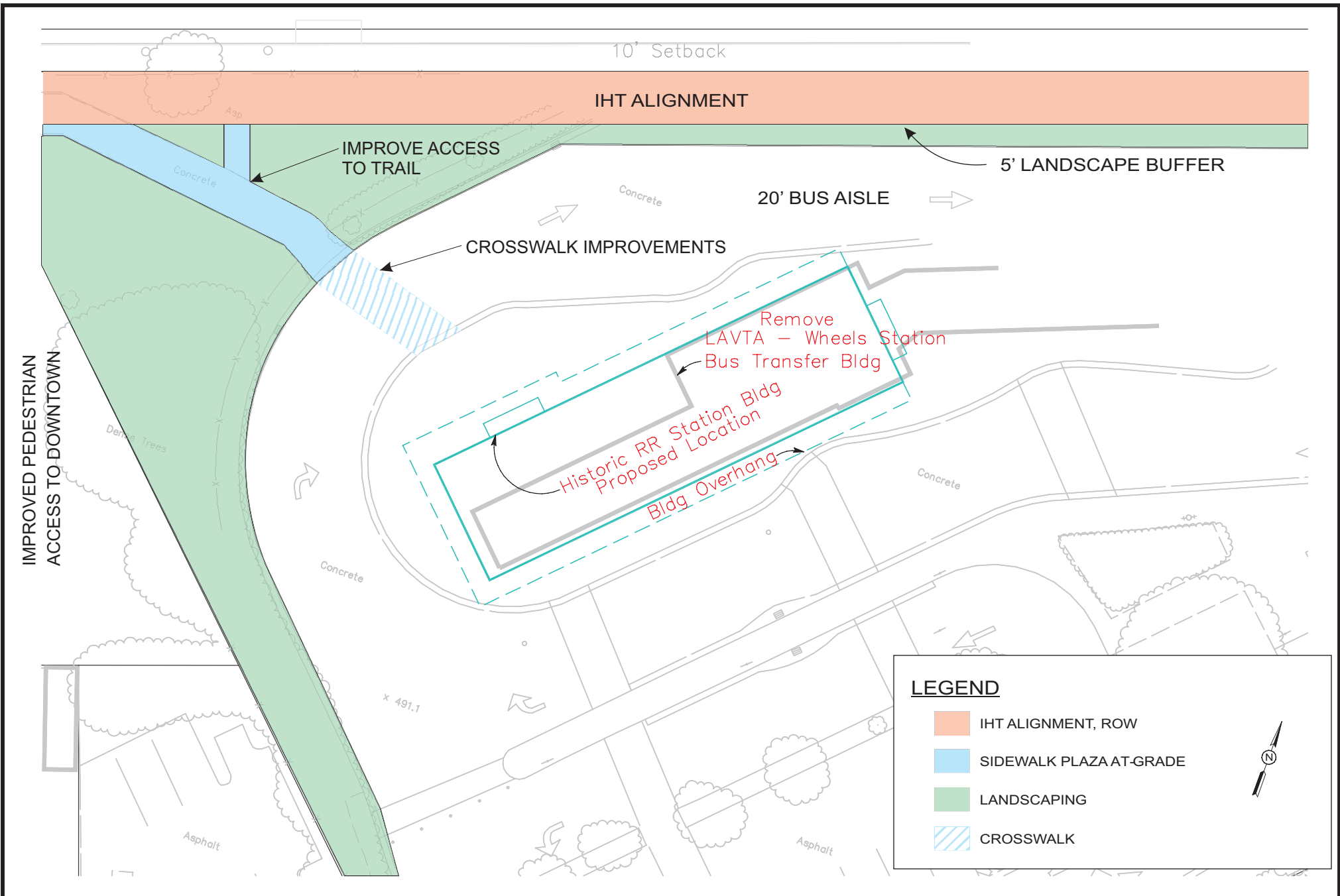
- IHT ALIGNMENT, ROW
- SIDEWALK PLAZA AT-GRADE
- LANDSCAPING
- CROSSWALK



LEGEND


- IHT ALIGNMENT / ROW
- SIDEWALK PLAZA AT-GRADE
- LANDSCAPING
- CROSSWALK





LEGEND

- IHT ALIGNMENT, ROW
- SIDEWALK PLAZA AT-GRADE
- LANDSCAPING
- CROSSWALK



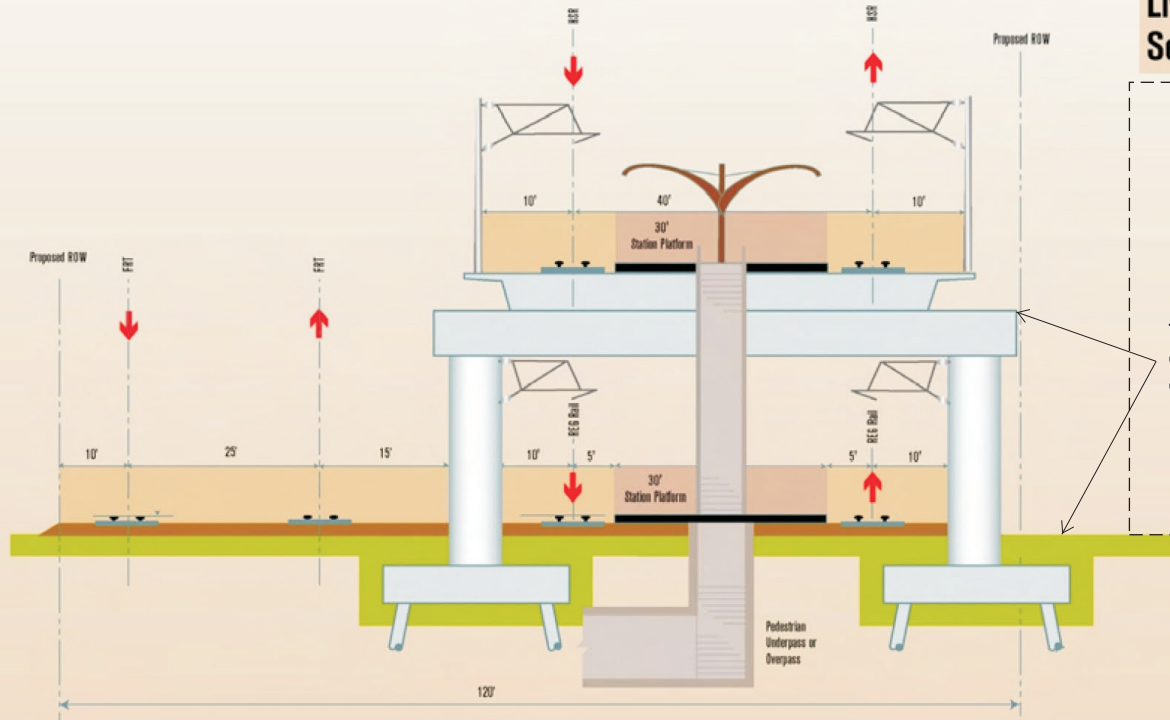
ACTIA
LIVERMORE
CALIFORNIA

QUESTA
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Environmental
& Water Resources
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questa@questaec.com

RAILROAD STATION ALTERNATIVE "C"
IRON HORSE TRAIL ALIGNMENT

APPENDIX
3

**Livermore Station Option 2
Section AP-23.2**



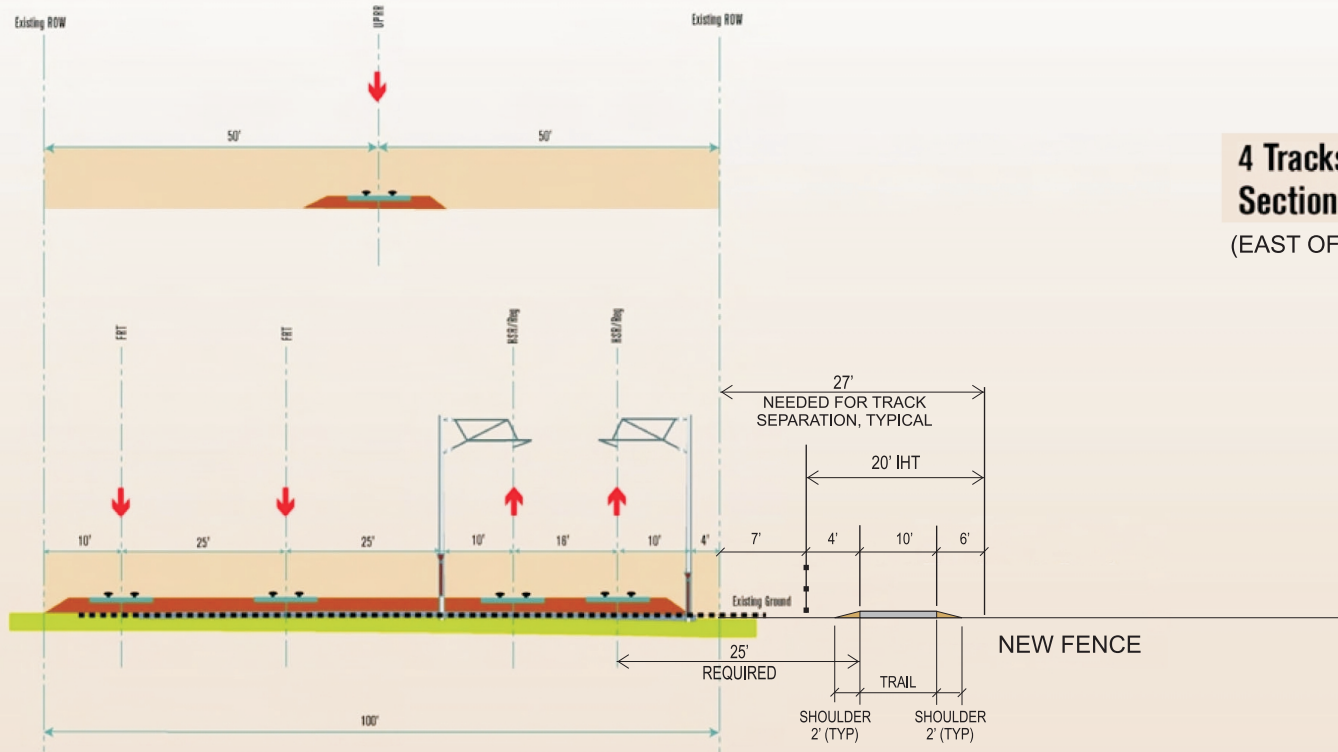
EXISTING PARKING STRUCTURE

TRAIL MAY NEED TO BE RELOCATED OR INTEGRATED INTO HSR DESIGN OR ADJACENT PARKING GARAGE

J05-082 sec23.2.ai 7.11.08

Existing Condition
FACING EAST

4 Tracks at Grade
Section AP-8
(EAST OF MINES RD)



J05-082 secAP8.ai 7.11.08

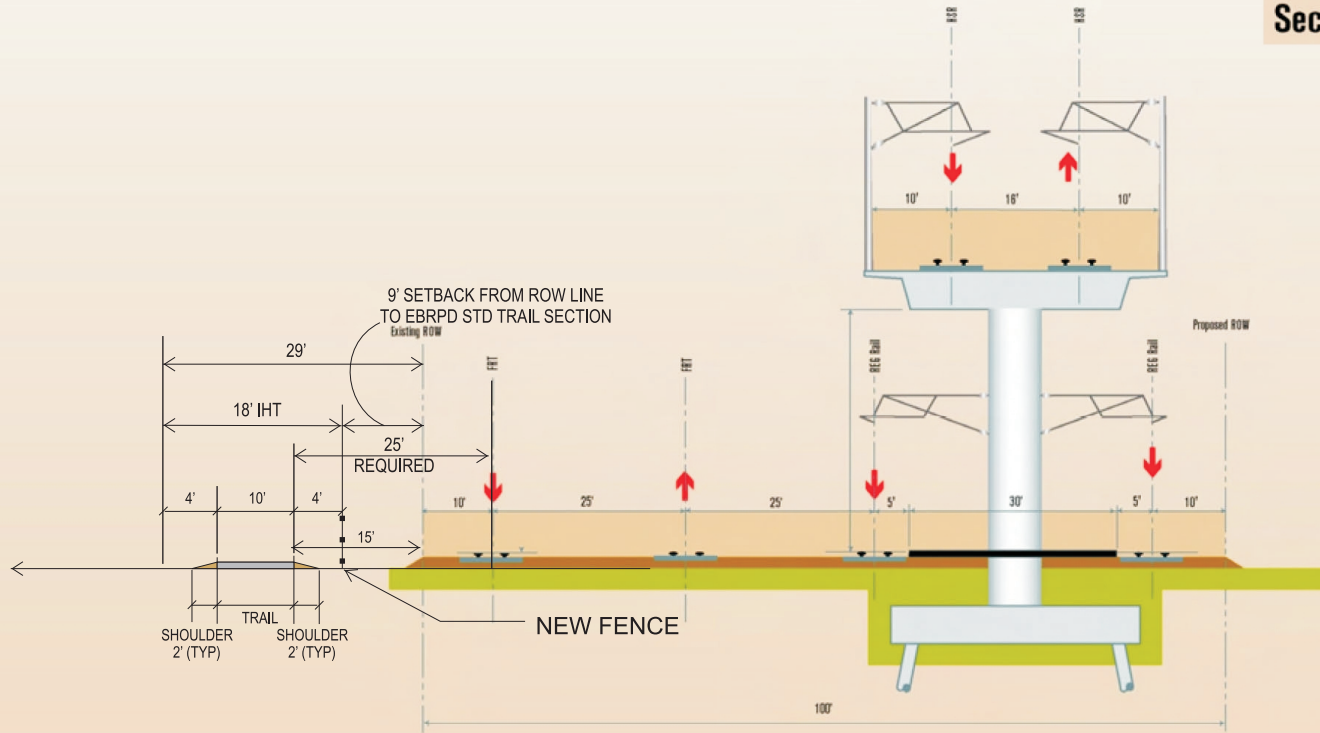


EAST OF MINES RD.
IRON HORSE TRAIL
WITH HIGH SPEED RAIL

APPENDIX

6

**Vasco Road and Pleasanton Station
Section AP-22**

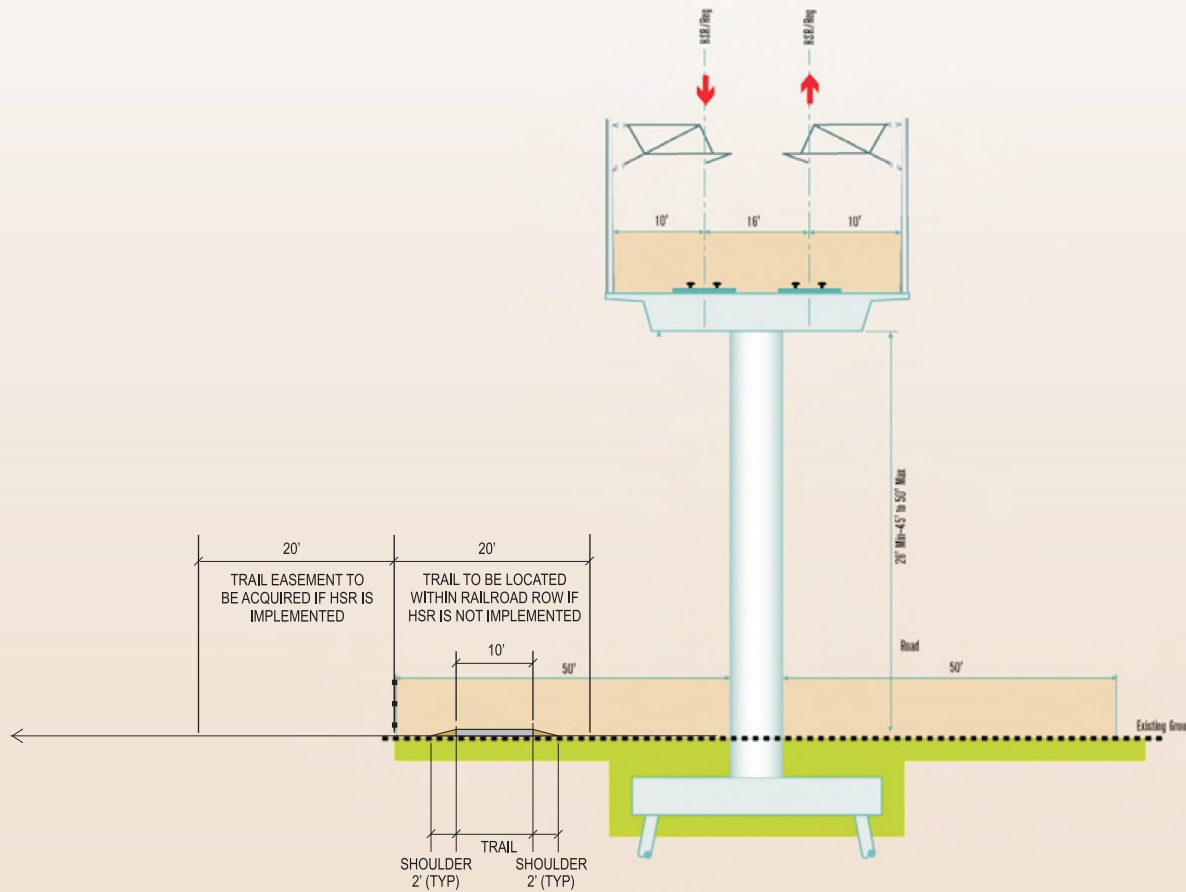


TRAIL ALONG NORTH SIDE OF RAIL CORRIDOR

J05-082nacAP22.n 7.11.06

2 Tracks on Elevated Structure Section AP-3

(EAST OF VASCO ROAD)



J05-062.eacAP3.ai 7.11.06

EarthTech
tyco International Ltd. Company

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**EAST OF VASCO RD.
IRON HORSE TRAIL
WITH HIGH SPEED RAIL**

APPENDIX

8