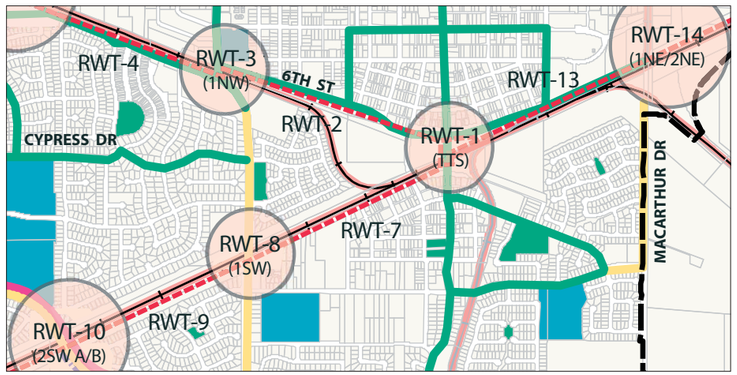
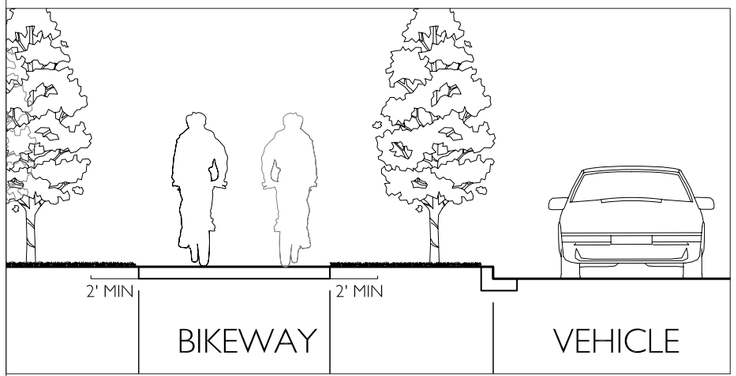
Tracy Bikeways Master Plan Design Supplement

Roadside, Rail-with-Trail and Irrigation Right-of-Way Bikeways





Final

Tracy Bikeways Master Plan Design Supplement

Roadside, Rail-with-Trail and Irrigation Right-of-Way Bikeways

Adopted

City of Tracy | February 3, 2009

DESIGN, COMMUNITY & ENVIRONMENT

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Over the last decade, the City of Tracy has demonstrated a commitment to maintaining a high quality of life for residents while accommodating rapid growth. To promote the development of a healthy community, the 2005 City of Tracy Bikeways Master Plan was adopted to serve as a guide to create a cohesive, community-oriented network of bikeways and trails throughout the City.

The Bikeways Master Plan is a vital complement to the City vision laid out in the General Plan. This vision includes preserving a hometown feel with strong residential neighborhoods; meeting transportation challenges through the provision of safe bike and pedestrian travel; strengthening the downtown area; protecting public health by reducing air pollution and providing desired recreational amenities.

A. Tracy Bikeways Master Plan Design Supplement Approach

Over the last decade, the City of Tracy has experienced significant growth and has planned the development of the bikeways and trail network to coincide with that growth. However, some areas of the City have not developed as rapidly, resulting in gaps to the existing bikeway network. These gaps are key opportunities for creating a comprehensive bikeways facility and each area presents unique design challenges.

To meet these challenges, a modular, segmented trail design was created to give the City a variety of options that can be utilized throughout Tracy depending on specific project site opportunities and challenges. For each trail segment design, careful consideration was made to ensure trail visibility and connectivity while allowing for flexible design standards.

1. Trail Visibility and Connectivity

During the development of each trail project, consideration was given to ensure visibility and accessibility while adhering to required design standards. The integration of the trail project into the existing urban environment has been achieved through a combination of aesthetically consistent design detail and specific engineering for each type of trail segment. Additionally, these designs take into account where trails intersect, based on their origin and destination points, to integrate functionality with existing roadways and land uses. Finally, trails are routed in a way that is visible and encourages frequent and regular use. Plans for signage and trail information were also carefully considered and included in preparation of this document.

2. Flexible Design Standards

The Bikeways Master Plan Amendment is intended to support multi-use trail development through a design approach that responds to a variety of trail types and is flexible enough to harmonize with neighboring land uses. The trail designs have been grouped into typical modular segments that ensure adaptability to varying rights-of-way connections and to existing routes and land types. Similarly, the project designs are created in a manner that will guide users safely through residential neighborhoods and commercial areas while responding to other local circulation needs including access to private properties and intersections with local and collector streets.

B. Tracy Bikeways Master Plan Design Supplement Focus Areas

The City of Tracy Bikeways Master Plan Design Supplement: Roadside, Rail-with-Trail and Irrigation Right-of-Way Bikeways is the next step toward implementing Tracy's community vision. The Tracy Bikeways Master Plan Design Supplement expands upon the Bikeways Master Plan by identifying specific projects that the City can prioritize over the next several years to establish key linkages and complete the development of a strong bikeway and trial network that extends throughout the entire City.

To achieve this goal, the Tracy Bikeways Master Plan Design Supplement builds upon the existing trail design standards and incorporates supplementary standards to ensure consistency with the community's vision and current best practices. Bikeways and trail project improvements focus on key locations in the City that are currently underserved or lack cohesive connectivity to the existing bikeway and trail network. These areas are generally located within existing neighborhood Landscape Maintenance Districts (LMD), the Union Pacific Union Pacific Railroad (UPRR) corridor and the Westside Irrigation District (WID) channels and canals. The Tracy Bikeways Master Plan Design Supplement provides general cost estimates and identifies potential sources of grant funding that may be available to assist in implementation and construction of upgraded improvements and new trails.

The Tracy Bikeways Master Plan Design Supplement is organized by topic areas:

1. Design Standards

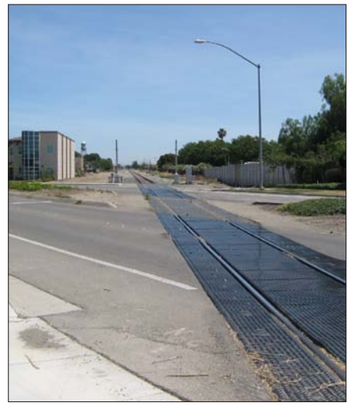
The City of Tracy has an existing bikeway facility, which prescribes a specific design standard that any new or upgraded bikeway facilities should adhere to in order to achieve a seamless bikeway design. The existing bikeway facility currently lacks connectivity in the east-west direction and most importantly, to the proposed Tracy Transit Center in the downtown bowtie region. In addition to incorporating the existing trail design, all proposed bikeway facility improvements adhere to Caltrans' bikeway design standards. Projects identified in this Design Supplement will not result in any road encroachments, thus preserving existing lane configurations throughout the City of Tracy.

2. Roadside Bikeways

The LMD areas in the City of Tracy have been identified as primary areas for improving roadside bikeway facilities such that they better connect to the existing network. These improvements are focused in areas that have higher concentration of City residents. Additionally, these LMD areas contain potential sources of funding to help in the construction of the identified upgrades.

3. Rail-with-Trail Bikeways

Two major UPRR rail line corridors run southwest/northeast and northwest/southeast and cross near the proposed Tracy Transit Station in the downtown bowtie region of the City. These rail corridors, with wide areas of right-of-way, provide excellent opportunities for east-west connectivity in the Tracy bikeway facility. The "rail-with-trail" is intended to be a multi-use bikeway facility that will be seamlessly incorporated with the rest of the Tracy bikeway network.



4. Irrigation Right-of-Way Bikeways

The WID has existing right-of-ways in the City of Tracy that include maintenance access roads suitable for use as a multi-use trail. Although the route is largely determined by the existing canal, bikeway connections to the existing trail network are possible. These may result in the development of more opportunities for east-west connectivity.

5. Implementation and Funding

With the spread of local transportation sales tax measures and the continuing availability of State and Federal funds for non-motorized transportation projects, California communities are building more extensive trail networks. Despite this fact, trail funding remains competitive and proposed trail projects must be clearly justified and meet appropriate design standards in order to be funded. The Tracy Bikeways Master Plan Design Supplement includes general cost estimates and identifies potential grant funding sources. Additionally, criteria to meet these trail projects requirements have been considered in project design in a way so as to minimize maintenance costs, as most grant programs do not fund maintenance and operations.

This chapter presents basic design standards for the projects presented in this Bikeways Master Plan Design Supplement. The design standards presented here are consistent with the 2005 City of Tracy Bikeways Master Plan and provide supplemental guidance on topics specific to the roadside, rail-with-trail and irrigation right-of-way bikeways.

A. Bikeway Design Standards

Bikeway projects developed with federal or State transportation funding are required to conform to the Caltrans Highway Design Manual (HDM). Advisory and mandatory design standards and guidelines for Class I shared use paths, Class II bike lanes, and Class III bike routes (defined below) are illustrated in Chapter 1000 of the HDM. The American Association of State Highway and Transportation Officials (AASHTO) provides additional guidance on the development of multi-use trails (Class I) and on-street bicycle facilities (Class II). In addition, the Manual of Uniform Traffic Control Devices (MUTCD) California Supplement provides guidance on signage, striping and railroad crossings that are directly applied to the Bikeways Master Plan Design Supplement.

1. Class I Bikeway – Shared Use Path

A Class I shared use path allows for non-motorized travel in both directions on a paved right-of-way separate from any road or highway. Chapter 1000 of the Caltrans HDM requires that a Class I shared use path have a minimum width of 2.4 meters with 0.6 meters graded on either side and a vertical clearance of 2.1 meters across the entire width, as specified by figure 1003.1A of the HDM. Generally, this results in a Class I bikeway that is approximately 8-feet wide paved with 2-foot clear graded shoulders on either side. The bikeway envelope must be clear of any obstacles including structures, signage and planting, and must comply with grading, surface, and stopping site distance requirements.

2. Class II Bikeway – Bicycle Lane

Bicycle lanes must be one-way in the direction of vehicle traffic and separated from the vehicle right-of-way from the bicycle right-of-way with striping. Bicycle lanes are typically located along roadways with significant bicycle demand and where there is sufficient lane width. Chapter 1000 of the Caltrans HDM requires a 5-foot width with a ½-foot wide white stripe delineating the bike lane from the vehicle lane.

3. Class III Bikeway – Bicycle Route

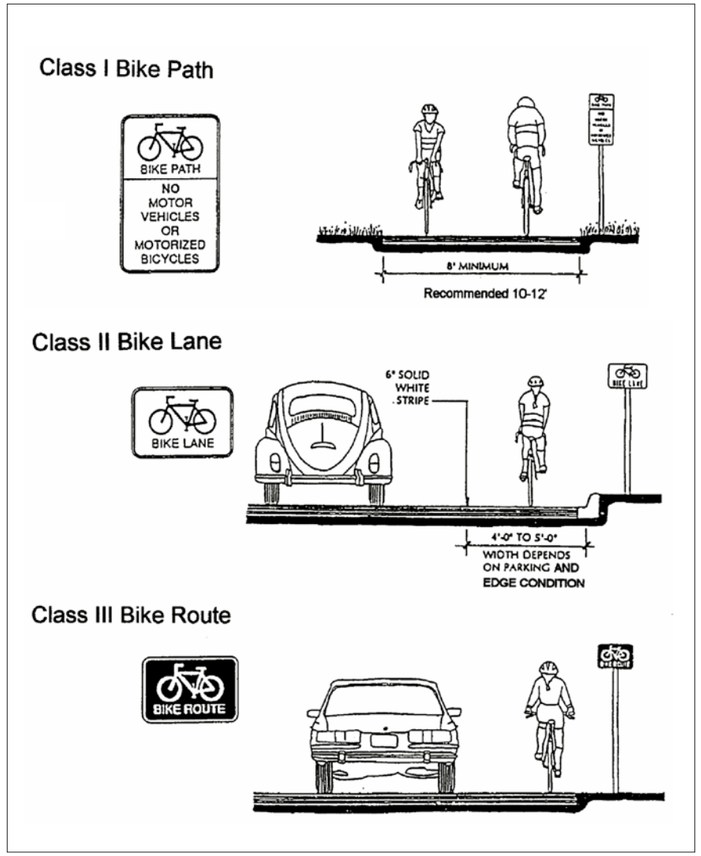
Bicycle routes are designated roadways that share vehicular and bicycle traffic in one shared right-of-way. Bicycle routes serve two main functions: they provide connections between other bikeways (typically Class II), and they allocate preferred routes through corridors with high usage.

B. Rail-with-Trail Standards

Rail-with-trail facilities are distinct from other multi-use trails. The safety, liability and operational concerns associated with active railroads require that rail-with-trail facilities respond to several unique considerations. These include but are not limited to trail setbacks from the rail tracks, separation and barriers designed to discourage trail users from approaching or crossing the rail tracks, and design for required at-grade trail crossings of the railroad tracks. This section presents basic guidance and supports the rail-with-trail designs in Chapter 4.

1. Setbacks

The term “setback” refers to the distance between the edge of a rail-with-trail and the centerline of the closest active railroad track, while “separation” refers to the treatment of the space between the rail-with-trail and the closest active railroad tracks, including fences, vegetation, ditches and other items.



When determining the minimum setback for a rail-with-trail, factors to consider include train speed and frequency, maintenance needs, applicable State standards, separation techniques, historical problems, track curvature, topography, and engineering judgment.

The UPRR rights-of-way under consideration in this Design Supplement are low frequency, low speed, straight track alignments with clear sightlines. Based on field observations, relatively frequent trespassing does occur in the right-of-way and should be addressed in the trail development strategy.

Some private railroads have established minimum standards. The Burlington Northern Santa Fe (BNSF) established the following in their "Trails with Rails" statement:[1]

- Trails may be constructed between 15 m (50 ft) and 30 m (100 ft) where main line train speed is 80 km/h (50 mi/h) to 113 km/h (70 mi/h).
- Trails may be constructed 15 m (50 ft) from centerline of track where train speeds are 40 km/h (25 mi/h) to 80 km/h (50 mi/h).
- Trails may be constructed 9 m (30 ft) from any branchline track with speeds of 40 km/h (25 mi/h) or less.
- No trails less than 9 m (30 ft) from centerline of track for any reason.

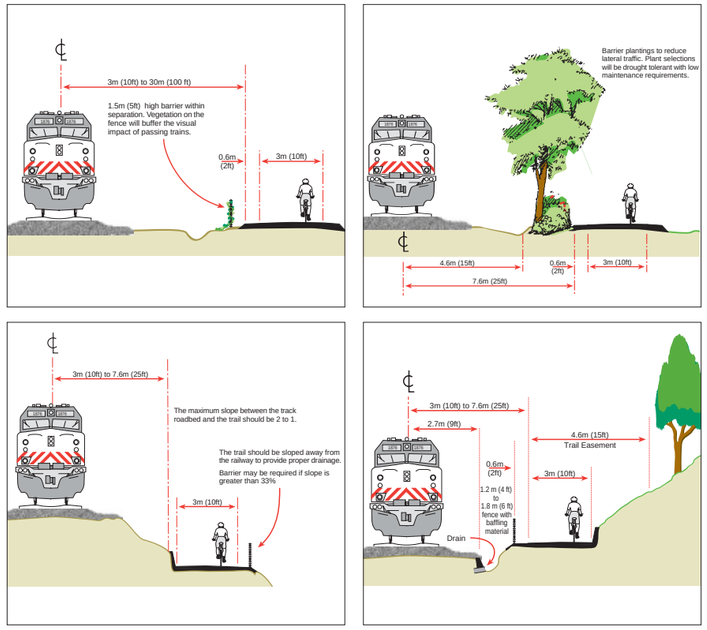
a. Standard Setbacks

City of Tracy communications with the UPRR have established that the UPRR preferred minimum setback is 50 feet. This minimum standard is achievable for a significant percentage of the proposed rail-with-trail alignments presented in Chapter 4.

b. Constrained Areas

The UPRR minimum setback of 50 feet cannot be achieved in the vicinity of most trail roadway crossings in the City of Tracy due to narrowing of the railroad right-of-way and in other instances the geometry of the rail-roadway intersection. In these instances, the 50-foot standard would need to be relaxed in order to provide for a continuous trail facility. There are several segments (depicted in Chapter 4) where typical setbacks are in the 30- to 40-foot range. Given the low frequency, low speed rail traffic on this branchline the achievable setbacks for these constrained areas are consistent with standards established by other freight railroads and exceed the setback of many existing constructed rail-with-trail facilities.

[1] Rails-with-Trails: Lessons Learned. Literature Review, Current Practices and Conclusions. U. S. Department of Transportation. August 2002. p. 63.



Standard sections for rails-with-trails bikeway facilities from Rails-With-Trails Lessons Learned
Top Left: Minimum rail-with-trail setback depending on specific situation.
Top Right: Trail separation using vegetation as a separation technique.
Bottom Left: Minimum rail-with-trail setback for fill sections (depending on situation).
Bottom Left: Minimum rail-with-trail setback for constrained sections (depending on situation).

2. Utilities and Easements

The UPRR corridor in Tracy contains various underground utilities. These utilities must be considered when designing detailed construction documents and in any instance where the proposed trail alignment intersects a utility easement. The utility company and/or overseer of that utility will retain full enjoyment and access to their easement. The City of Tracy will be responsible for any trail reconstruction necessary as the result of any utility easement disturbance or demolition.

3. Separation and Barriers

When on railroad property, rail-with-trail implementing agencies must adhere to the request or requirements for fencing by the railroad company or agency. When not on railroad property, rail-with-trail planners still should coordinate with the railroad to determine appropriate fencing. On all existing rail-with-trails, the trail implementing agency is responsible for barrier installation and maintenance. The UPRR is consistent with most railroad companies that require rail-with-trails to provide fencing.

This Design Supplement assumes that a continuous chainlink fence at a 4-foot height is appropriate given prevailing setback, existing trespass patterns and adjacent land uses. Fencing at trail entries and higher use areas should be coordinated with other landscape features and may be used in combination with other barrier types. A fence separation is proposed for sections of the rail-with-trail alignments presented in Chapter 4.

4. At-Grade Railroad Track Crossings

Where the trail must cross the railroad tracks, either along the primary trail alignment or to connect to other facilities or the City sidewalk network, there are numerous design and safety standards that must be addressed. Any at-grade crossings must comply with State regulations promulgated by the California Public Utilities Commission and must also comply with State and local design standards for pedestrian walkways.

The rail-with-trail designs recommended in this Design Supplement do not require new at-grade rail crossings. Recommended improvements at the existing at-grade sidewalk and multi-use trail crossing of the railroad are shown in the plans presented in Chapter 4.

All improvements of at-grade railroad crossings should be designed at the time of project implementation in order to be consistent with the MUTCD California Supplement and FHWA's Guidance on Traffic Control Devices at Highway-Rail Grade Crossings. Selection of passive or active warning devices at each location should be made based on engineering judgment and on current rail volumes and speeds at the time the project is being designed and constructed.

C. Bikeway and Rail-with-Trail Roadway Crossings

Trail roadway crossings require careful consideration in order to address potential conflicts in those areas where pedestrians and bicyclists leave the dedicated multi-use trail right-of-way and mix with vehicular traffic. Additionally, rail-with-trail facilities often require at-grade rail crossings at or in close proximity to trail roadway crossings. General guidelines for these conditions are provided here to supplement the site-specific design provided in this Design Supplement.

There are three typical methods for handling rail-with-trail roadway crossings:

- Reroute shared use path users to nearest signalized intersection
- Provide new signal across roadway
- Provide unprotected crossing

1. Route to Existing Intersection

Routing trail users to the nearest existing roadway intersection is recommended when the existing crossing is no greater than 350 feet from the proposed trail. Greater distances result in significant added travel times for trail users and may create situations where trail users cross high volume or high speed roadways in an unprotected location in order to maintain shorter travel distances. Trail user desire lines should be considered in the design and selection of appropriate crossing types. Where existing intersections are distant from the proposed trail and where existing vehicle volumes are greater than 20,000 vehicles per day, grade separation of the trail crossing should be considered.[2]

2. New Signalized Intersection

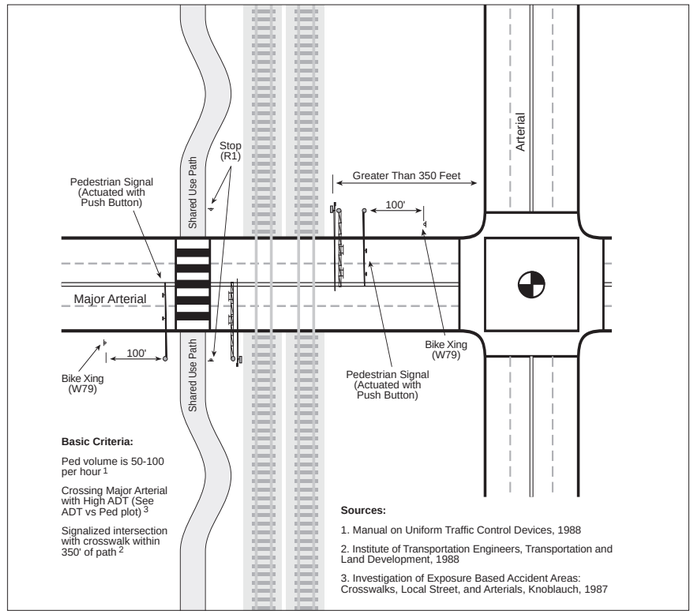
New signalized intersections should be used based on engineering judgment. Selection of appropriate signal type and location and integration with existing signals, must be completed by a licensed traffic engineer and in consultation with City of Tracy traffic engineering. Potential new signal locations are presented in the rail-with-trail plan diagrams in Chapter 4.

3. Unprotected Crossings

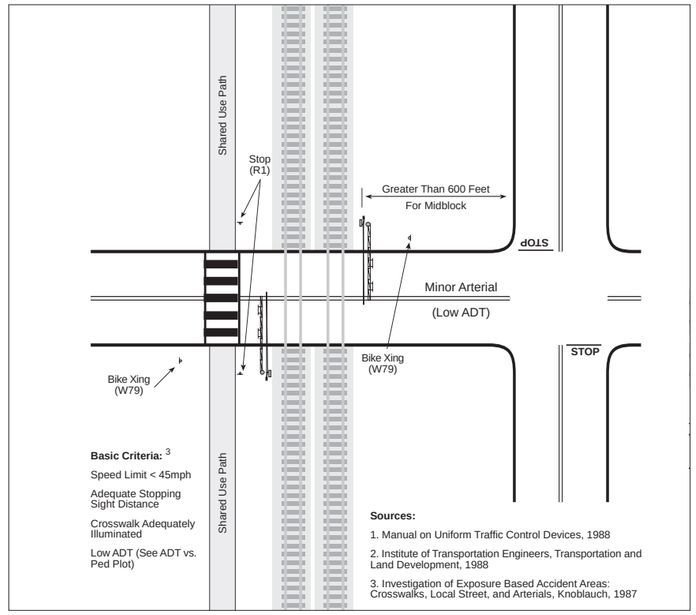
Unprotected crossings of existing roadways may be used where daily traffic volumes are low, vehicle travel speeds are low, and where both motorist and trail user sightlines are sufficient to allow clear visual inspection and adequate stopping distance at the crossing location. Local traffic engineers must decide where unprotected crossings are acceptable in their community. Unprotected crossings should be perpendicular to the roadway and should not directly follow rail alignments where they cross existing roadways at an angle. Crossing design and associated signage must be consistent with Caltrans, AASHTO and MUTCD standards.

D. Vehicular Access

Maintenance and emergency vehicles are required to have access to all Class I bikeways. This requirement will limit tree spacing and other landscape options as well as require specific weight loads for proposed facilities. The HDM recommends that all tree canopies' be limbed up to maintain a minimum 7-foot clearance for vehicular access. Additionally, all rail-with-trail areas must be accessible to emergency and maintenance vehicles at all times. UPRR vehicles, City of Tracy maintenance vehicles and emergency vehicles will have full access to the proposed rail-with-trail facility.



Roadway crossing standard for new signals, from Rails-With-Trails Lessons Learned



Roadway crossing standard for unprotected crossing, from Rails-With-Trails Lessons Learned

[2] Rails-with-Trails: Lessons Learned. Literature Review, Current Practices and Conclusions. U. S. Department of Transportation. August 2002. p. 83.

E. Trail Features

1. Gateways and Wayfinding

The Tracy bikeway facility should include distinct landmarks at all major bikeway entry points, which are easily recognizable by bikeway users. These "gateways" will create a consistent design vernacular that calls out bikeway entries with unique landscape elements, which become more familiar with further use. Such elements could include overhead gateway structures, vertical landscape elements such as pilasters, or a specific plant palette, which is easily recognizable.

2. Landscape Design

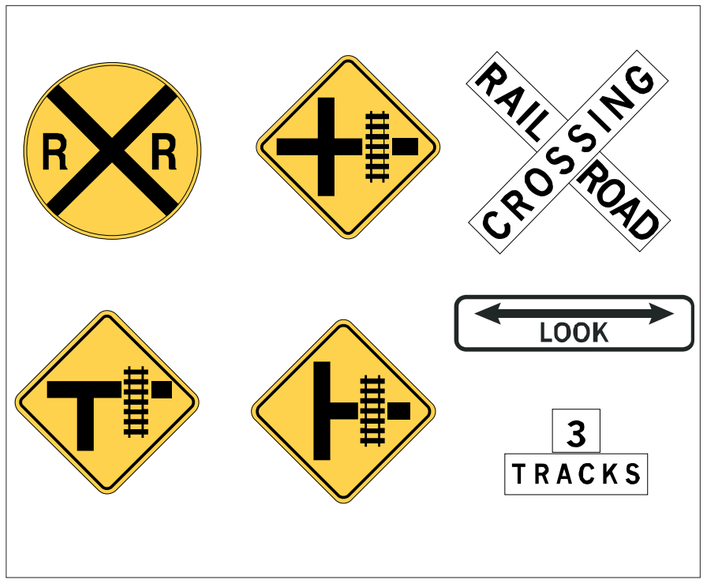
The landscaped areas buffering the Class I bikeway facilities should be consistent throughout the City of Tracy in order to heighten the visual recognition of the bikeway. The plant palette of the project areas should be simple and consistent so that it is easily recognizable to trail users. The proposed Class I bikeway hardscape design should resemble the existing, newly constructed Class I bikeways with the same width, similar radii and similar concrete finish. The trees in the Class I bikeway landscape buffer, some of which are relatively new, should be relocated only if necessary to clear the bikeway envelope. The existing and proposed Class I shrub and groundcover planting, however, should be modified to greatly improve the longevity of the hardscape elements and significantly reduce irrigation and maintenance costs. Much of the landscape buffering in the existing Class I bikeway in Tracy is composed of shrubs that have a medium to high water use and require shearing and turf with overhead spray irrigation, which can result in overspray onto the hard surfaces, ultimately shortening the lifetime of the concrete.

To increase the lifetime of the proposed Class I bikeway facilities, it is recommended that most of the turf buffering the path be removed and replaced with drought tolerant groundcovers. Many drought tolerant groundcovers have a lush appearance and have much lower maintenance costs than that of turf. The irrigation design and installation are vital to the success of the landscaped area and to the longevity of any surrounding hardscape elements, including fencing. An appropriately designed irrigation system prevents runoff and overspray. Irrigation design should consider soil types, infiltration rates and design the irrigation systems to match the plant type without exceeding the maximum water allowance for the plant type. Landscaped areas should also have low volume irrigation for planting strips less than eight feet wide and a separate valve for all trees. All of these recommendations will help the City of Tracy greatly increase the lifetime of the bikeway facilities and reduce the maintenance costs of the landscaped areas.

F. Signage

Bikeway signage must provide clear direction of the path of travel within the overall trail network, inform users of their exact location at key intersections, and warn users of any obstacles and/or railroad crossings. All signage is to meet the requirements of Chapter 1000 of the Caltrans HDM. There are five main categories of signage proposed for the City of Tracy. These include:

- **Bikeway Facility Map Signs**: A consistent facility map that shows the entirety of the Tracy Bikeway network and the corresponding bikeway Class, with "you are here" locations illustrated.
- **Bikeway Trail Marker Signs:** Standard bikeway signage spaced along bikeway routes and placed at key intersections. These signs should differentiate between Class I, Class II, and Class III bikeways.
- **Bikeway Begin/End Signs:** Standard bikeway signage calling out the beginning and end of any bikeway route.
- **Bikeway Railroad Crossing Signs:** Standard railroad crossing signage placed at all bikeway railroad crossings and at all connecting bikeways and sidewalks.
- **Bikeway Caution Signs:** Cautionary signage preceding any roadway intersection to warn bikeway users. These will help shorten the stopping distance for bikeway users due to the advanced warning to reduce speed at the beginning of the line-of-site.



The City of Tracy has extensive existing mileage of Class I bikeways parallel to the arterial roadway network with public right-of-way. This wide sidewalk network accommodates pedestrian and bicycle circulation through landscape setbacks with minimal driveway intersections. This chapter presents design solutions for closing gaps and providing improvements in the existing bikeway network.

A. Roadside Bikeways Project Improvement Areas

The main North-South roadside bikeway connection of Corral Hollow Road from the West Valley Mall to Linne Road, along with key east-west connections of Grant Line Road, Byron Road and Schulte Road, were identified as the primary areas for making the majority of roadside bikeway facility upgrades to better connect to the existing network. These project areas also connect schools and parks to the rest of Tracy utilizing the existing bikeway facilities. Additionally, these roadside bikeway connections are generally located within existing Landscape Maintenance Districts (LMD). A total of 13 roadside bikeway project improvement areas are identified in this Design Supplement for facility upgrades and/or gap closures. Each will serve to increase the continuity of the Tracy bikeway facility. These roadside bikeway project improvement areas are shown in Figure 3-1.

B. Roadside Bikeways Project Improvement Approach

During field reconnaissance of Tracy's existing bikeways facilities and detailed analysis of the 13 roadside bikeway project improvement areas, a pattern of similar bikeway design considerations began to emerge. These considerations generally included utilities and easement locations, expansion of existing facility types and constrained right-of-way areas.

To address these general patterns and design challenges, a series of modular trail segments have been developed to give the City a variety of design options. At least one of these can be applied to each of the roadside bikeway project improvement areas. Additionally, these segments can be utilized throughout the City and for future projects not identified in this Design Supplement.

C. Roadside Bikeways Project Improvement Typical Sections

Based on the approach described above, six roadside bikeway typical sections have been developed that can be applied to each of the roadside bikeways project improvement areas.

1. Roadside Bikeway Typical Section A

Typical Section A, Figure 3-2, illustrates a new Class I shared use path bound between utility easements and a major roadway. There is enough space to create an 8-foot wide shared use path with no lane reconfigurations, but there is not enough room for adequate separation of vehicles and bicyclists/pedestrians. The 42-inch high barrier along the roadside curb will separate vehicles and bicyclists/pedestrians, creating a safer bikeway.

2. Roadside Bikeway Typical Section B

Typical Section B illustrates a new Class I shared use path along a major road with adequate room for landscape buffering and improvements. Trees are to be staggered every 20 feet to remain clear of the bikeway envelope. This design is depicted in Figure 3-3.

3. Roadside Bikeway Typical Section C

Typical Section C, Figure 3-4, illustrates a bikeway facility upgrade from an existing 5-foot sidewalk to a Class I shared use path. Upgrading the existing facility may be completed by one of three options. These include demolishing the existing sidewalk and building a new 8-foot wide concrete shared use path; adding to the existing 5-foot sidewalk with unit-pavers; or adding to the existing 5-foot sidewalk with hardened decomposed granite. A variation of the unit-paver layout is provided in contrast to Typical Section D.

4. Roadside Bikeway Typical Section D

Typical section D, shown in Figure 3-5, also illustrates a bikeway facility upgrade from an existing 5-foot sidewalk to a Class I shared use path and addresses a grade change between the roadway and the path. This section also provides three options for the upgrade including demolishing the existing sidewalk and building a new 8-foot wide concrete shared use path, adding to the existing 5-foot wide sidewalk with unit-pavers and adding to the existing 5-foot wide sidewalk with hardened, decomposed granite. A variation of the unit-paver layout is provided in contrast to Typical Section C.

5. Roadside Bikeway Typical Section E

Typical Section E, Figure 3-6, illustrates a new 5-foot wide Class II bike lane on both sides of a two-lane road separated by a broken median. This section does not reduce any existing vehicular travel lanes or roadway capacity. All landscape elements shown are existing and would remain in the current condition.

6. Roadside Bikeway Typical Section F

Typical section F, Figure 3-7, illustrates a new 5-foot wide Class II bike lane on both sides of a four-lane road separated by a broken median. This section does not reduce any existing vehicular travel lanes or roadway capacity. All landscape elements shown are existing and would remain in the current condition.

D. Roadside Bikeways Project Improvement Descriptions

The six roadside bikeway typical sections address the 13 identified roadside bikeway project areas previously identified in Figure 3-1. Each project narrative describes the project location, surrounding land uses, project benefits, and design characteristics.

1. Roadside Project 1 – West Valley Mall Connection

a. Project Location and Description

Roadside Project 1 (RP-1) is located at the northern end of the Corral Hollow North-South bikeway corridor. This project is primarily a gap closure that will extend the existing Class I shared use path from the intersection of West Valley Mall Drive and Naglee Road to the intersection of Corral Hollow Road and Highway 205.

b. Project Benefits and Description

RP-1 creates a Class I bikeway connection from the existing Class I facility on the west side of West Valley Mall around the perimeter of the shopping mall to Corral Hollow Road. This connection will provide for a safer connection from residential areas along Corral Hollow Road to the West Valley Mall.

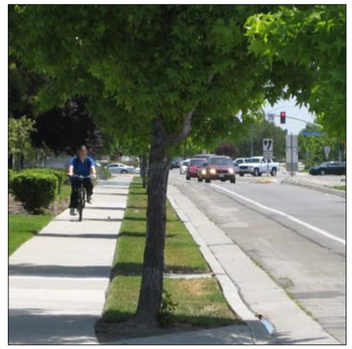
c. Design Characteristics and Description

Typical Sections A and B (Figures 3-2 and 3-3) apply to RP-1. Section A, which specifies a new roadside Class I shared use path, is necessary due to the existing utilities, light poles and juxtaposing vehicular traffic. It will create a safe environment and will remain cost effective due to minimal utility relocation. Section B specifies a new Class I shared use path buffered by landscape improvements on either side.

2. Roadside Project 2 – West Grant Line Road Connection

a. Project Location and Description

Roadside Project 2 (RP-2) extends the existing Class I shared use path along Orchard Parkway from the intersection of Highway 205 and Corral Hollow Road to the intersection of Orchard Parkway and Grant Line Road.



b. Project Benefits

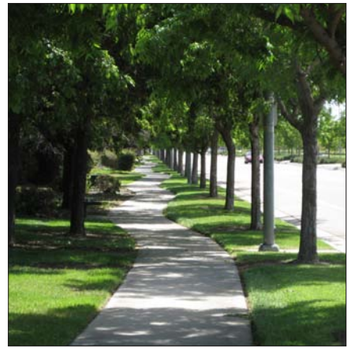
RP-2 creates a Class I bikeway connection in the primarily residential neighborhood between Kavanagh Avenue and Corral Hollow Road. This connection will provide a safe route to school for children who attend the Jacobson Elementary School and who play at Kenner Park. This project is coordinated with RP-1, providing access to the West Valley Mall and the commercial areas along Corral Hollow Road.

c. Design Characteristics

Typical Sections A, B and D (Figures 3-2, 3-3 and 3-5) apply to RP-2. Section A specifies roadside Class I shared use path with a 42-inch barrier. Section B specifies a Class I shared use path buffered by landscaping in the eastern and central portions of the project area. Section D specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk. This section also allows for a grade change between the roadway and the sidewalk.

3. Roadside Project 3 – West Lowell Avenue Connection

a. Project Location and Description



Roadside Project 3 (RP-3) provides a gap closure, connecting the point at approximately 100 yards east of the intersection of Orchard Parkway and Lowell Avenue to the intersection of Lowell Avenue and Corral Hollow Road.

b. Project Benefits

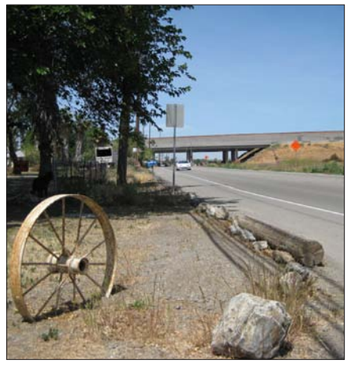
RP-3 creates a Class I bikeway connection in a primarily residential neighborhood and provides a safe route to school for children and adults that attend the Merrill F. West High School and Tracy Adult School.

c. Design Characteristics

Typical Section D (Figure 3-5) applies to the entirety of RP-3. Section D specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk. This section also allows for a grade change between the roadway and the sidewalk.

4. Roadside Project 4 – West Byron Road Connection

a. Project Location and Description



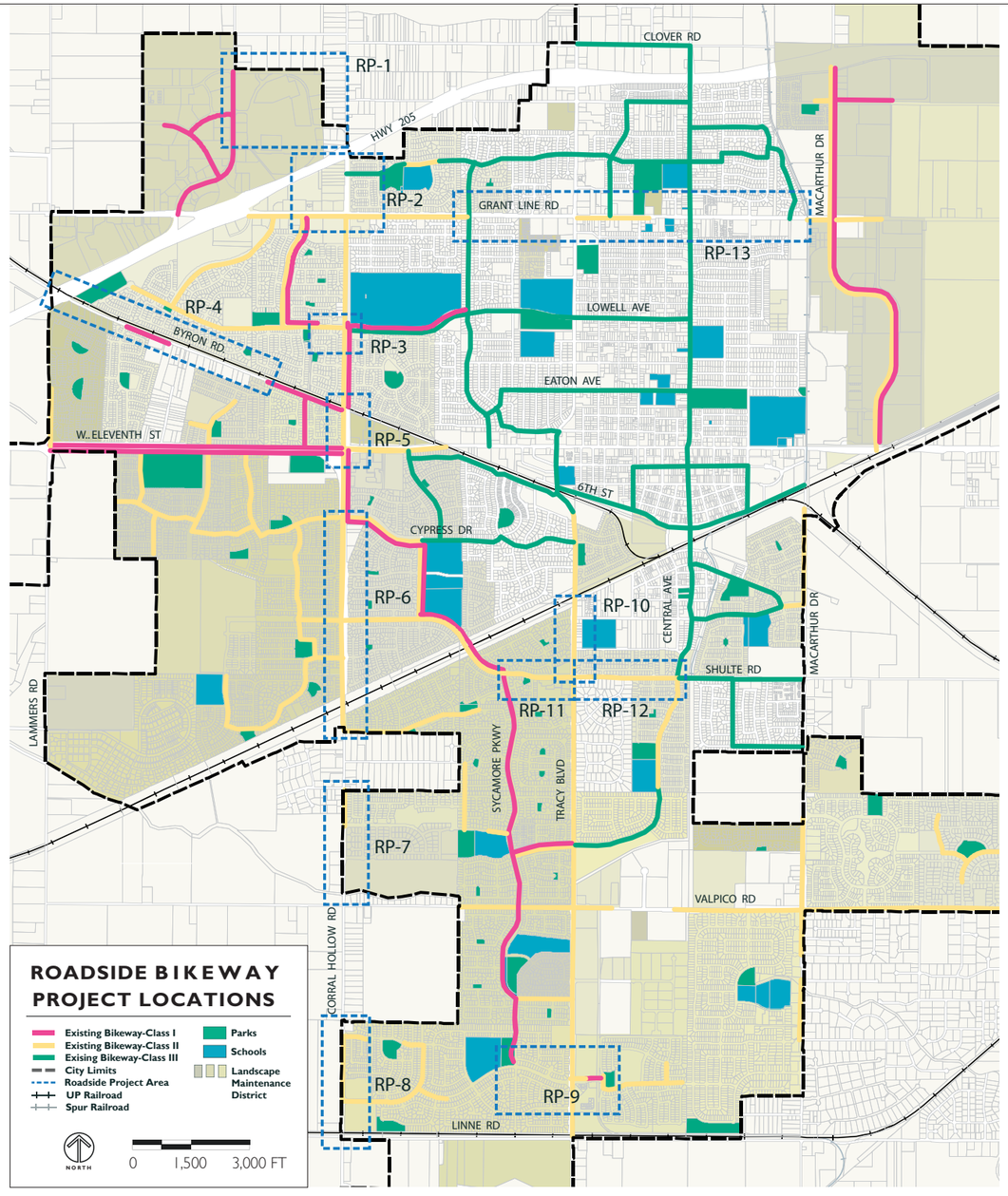
Roadside Project 4 (RP-4) is located on the Class I bikeway along Byron Road. It involves closing the gap between the intersection of Highway 205 and Byron Road to approximately 200 yards west of the intersection of Belconte Drive and Byron Road.

b. Project Benefits

RP-4 creates a continuous Class I bikeway connection along residential areas of Byron Road all the way to Corral Hollow Road. This project also provides a connection to the Northwest alignment of the Rail-with-Trails project described in Chapter 4.

c. Design Characteristics

Typical Section A (Figure 3-2) applies to the entirety of RP-4. Section A specifies a new roadside Class I shared use path and is necessary due to the existing utility poles, mail boxes and juxtaposing vehicular traffic, and will create a safe environment while remaining cost effective with minimal utility relocation. Section A also allows for a Class I shared use path that emulates the existing Class I shared use path, which RP-4 connects to either side.



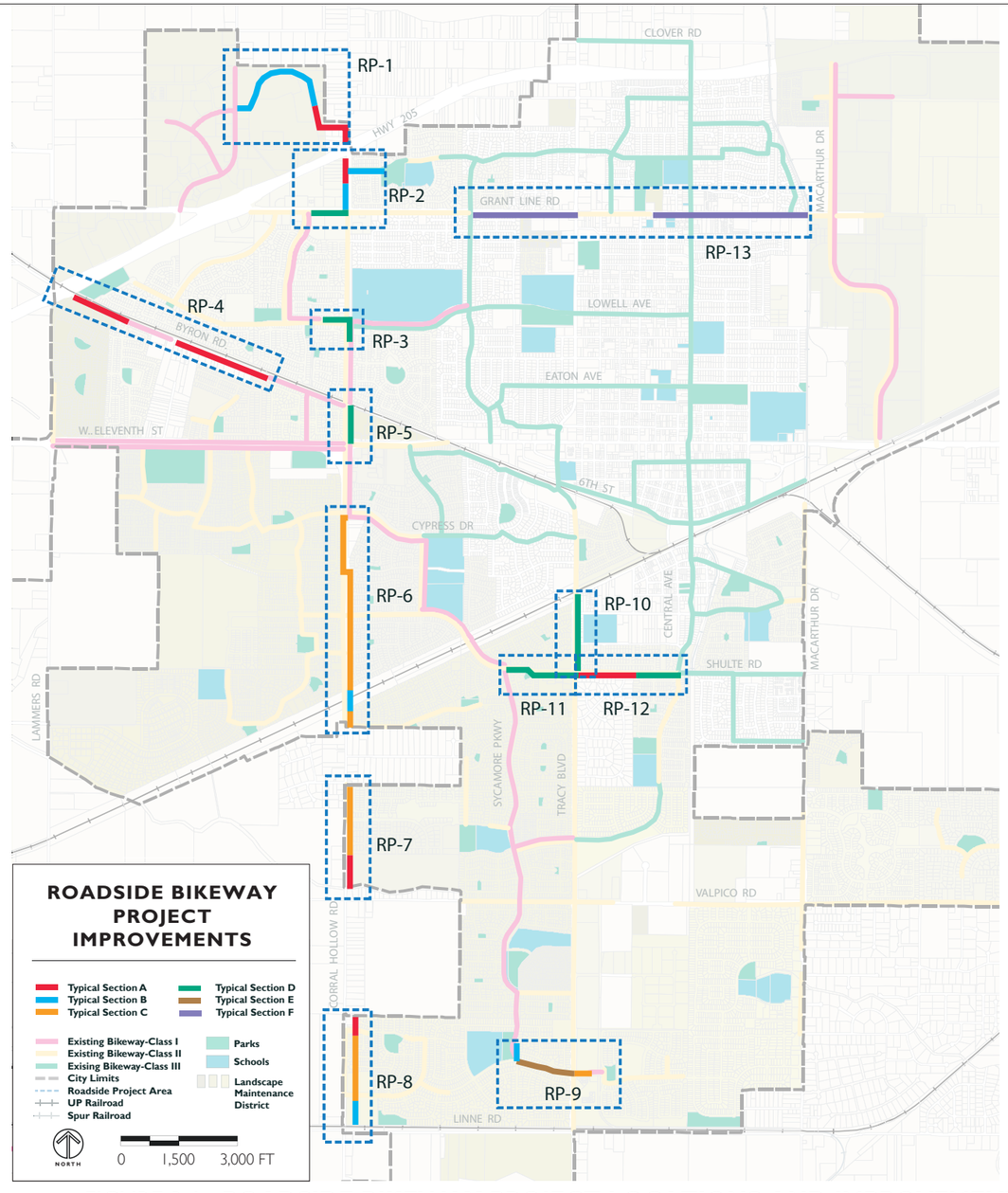


FIGURE 3-1: **ROADSIDE BIKEWAY PROJECT LOCATIONS AND IMPROVEMENTS**

5. Roadside Project 5 – West Eleventh and Corral Hollow Connection

a. Project Location and Description

Roadside Project 5 (RP-5) involves a gap closure that extends from the intersection of Byron Road and Corral Hollow Road to the intersection of Eleventh Street and Corral Hollow Road.

b. Project Benefits

RP-5 creates a continuous Class I bikeway connection along residential areas adjacent to Corral Hollow Road. This project provides safe access and connectivity to various east-west Class I bikeway connections and commercial areas located at the northern portion of Corral Hollow Road.

c. Design Characteristics

Typical Section D (Figure 3-5) applies to the entirety of RP-5. Section D specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk. This section also allows for a grade change between the roadway and the sidewalk. Railroad safety crossing improvements for this project are addressed in the proposed Rail-with-Trail Project 6 (RWT-6), in Chapter 4.

6. Roadside Project 6 – Corral Hollow Central Connection

a. Project Location and Description

Roadside Project 6 (RP-6) provides a bikeway connection between the intersection of Cypress Drive and Corral Hollow Road and the intersection of Parkside Drive and Corral Hollow Road.

b. Project Benefits

RP-6 creates a continuous Class I bikeway connection along residential areas adjacent to Corral Hollow Road. This project provides safe access and connectivity to various east-west Class I bikeway connections and commercial areas located at the northern portion of Corral Hollow Road.

c. Design Characteristics

Typical Sections B and C (Figures 3-3 and 3-4) apply to RP-6. Section C specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk. Section B specifies a new Class I shared use path facility to be constructed across the rail corridor with landscape improvements buffering both sides. Railroad safety crossing improvements for this project are addressed in the proposed Rail-with-Trail Project 12 (RWT-12), in Chapter 4.

7. Roadside Project 7 – Corral Hollow South Central Connection

a. Project Location and Description

Roadside Project 7 (RP-7) provides a bikeway connection between the intersection of Midway Drive and Corral Hollow Road and the intersection of the Westside Irrigation District canal and Corral Hollow Road.

b. Project Benefits

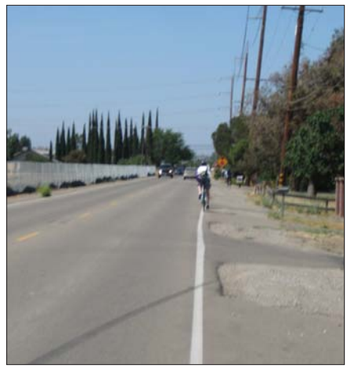
RP-7 creates a continuous Class I bikeway connection along residential areas adjacent to Corral Hollow Road. This project provides safe access and connectivity to various east-west Class I bikeway connections and commercial areas located at the northern portion of Corral Hollow Road.

c. Design Characteristics

Typical Sections A and C (Figures 3-2 and 3-4) apply to RP-7. Section A specifies a roadside Class I shared use path with a 42-inch barrier at the south end of the project. Section C specifies a Class I shared use path upgrade which promotes reuse of the newly constructed existing 5-foot sidewalk at the north end of the project.

8. Roadside Project 8 – Corral Hollow South Connection

a. Project Location and Description



Roadside Project 8 (RP-8) provides gap closure between approximately 100 feet north of the intersection of Peony Drive and Corral Hollow Road and the intersection of Linne Road and Corral Hollow Road.

b. Project Benefits

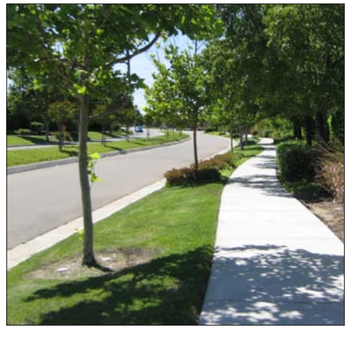
RP-8 is a continuous Class I bikeway connection that provides safe access and connectivity to various east-west Class I bikeway connections and commercial areas located at the northern portion of Corral Hollow Road.

c. Design Characteristics

Typical Sections A, B and C (Figures 3-2, 3-3 and 3-4) apply to RP-8. Section A specifies a new roadside Class I shared use path with a 42-inch barrier at the north end of the project. Section B specifies a new Class I shared use path buffered by landscaping at the south end of the project. Section C specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk at the center of the project.

9. Roadside Project 9 – South Tracy Boulevard Connection

a. Project Location and Description



Roadside Project 9 (RP-9) extends from the intersection of Cherry Blossom Lane and English Oaks Avenue to the intersection of whispering Wind Drive and Regis Drive.

b. Project Benefits

RP-9 creates Class I and Class II bikeway connections in the primarily residential neighborhood between English

Oaks Avenue and Tracy Boulevard. This connection provides a safer route to school for children who attend the Anthony Traina Elementary School and who play at the adjacent park. Additionally, this project provides a connection to the southern terminus of the Sycamore Parkway Class I bikeway.

c. Design Characteristics
Typical Sections B, C and E (Figures 3-3, 3-4 and 3-6) apply to RP-9. Section B specifies a new Class I shared use path buffered by landscaping at the west end of the project. Section C specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk at the east end of the project. Section E specifies the installation of a Class II bike lane between an existing 5-foot wide sidewalk and an existing two-lane road with a median.

10. Roadside Project 10 – Rail-With-Trail Schulte Road Connection

a. Project Location and Description
Roadside Project 10 (RP-10) provides gap closure between the intersection of the proposed rail-with-trail and Tracy Boulevard and the intersection of Schulte Road and Tracy Boulevard.

b. Project Benefits
RP-10 creates a continuous Class I bikeway connection along residential areas adjacent to Tracy Boulevard. This project, in conjunction with Roadside Project 11, provides access to the Sycamore Parkway bikeway and the Southwest alignment of the Rail-with-Trails project described in Chapter 4.

c. Design Characteristics
Typical Section D (Figure 3-5) applies to the entirety of RP-10. Section D specifies a Class I shared use path upgrade and promotes the reuse of the newly constructed existing 5-foot sidewalk. This section also allows for a grade change between the roadway and the sidewalk. Railroad safety crossing improvements for this project are addressed in the proposed Rail-with-Trail Project 8 (RWT-8), in Chapter 4.

11. Roadside Project 11 – Sycamore Parkway Connection

a. Project Location and Description
Roadside Project 11 (RP-11) provides gap closure between the intersection of Sycamore Parkway and Schulte Road and the intersection of Tracy Boulevard and Schulte Road.

b. Project Benefits
RP-11 creates a continuous Class I bikeway connection along residential areas adjacent to Shulte Road. This project, in conjunction with RP-10, provides access to the Sycamore
Parkway bikeway and the Southwest alignment of the Rail-with-Trails project described in Chapter 4. Additionally, connection with Roadside Project 12 provides for a continuous Class I bikeway connection to Central Avenue.

c. Design Characteristics
Typical Section D (Figure 3-5) applies to the entirety of RP-11. Section D specifies a Class I shared use path upgrade and promotes the reuse of the newly constructed existing 5-foot sidewalk. This section also allows for a grade change between the roadway and the sidewalk.

12. Roadside Project 12 – Central Avenue Connection

a. Project Location and Description
Roadside Project 12 (RP-12) provides gap closure between the intersection of Tracy Boulevard and Schulte Road and the intersection of Central Avenue and Schulte Road.

b. Project Benefits
RP-12 creates a continuous Class I bikeway connection along residential areas adjacent to Shulte Road. This project, in conjunction with RP-11 provides for a continuous Class I bikeway connection to the Sycamore Parkway bikeway.

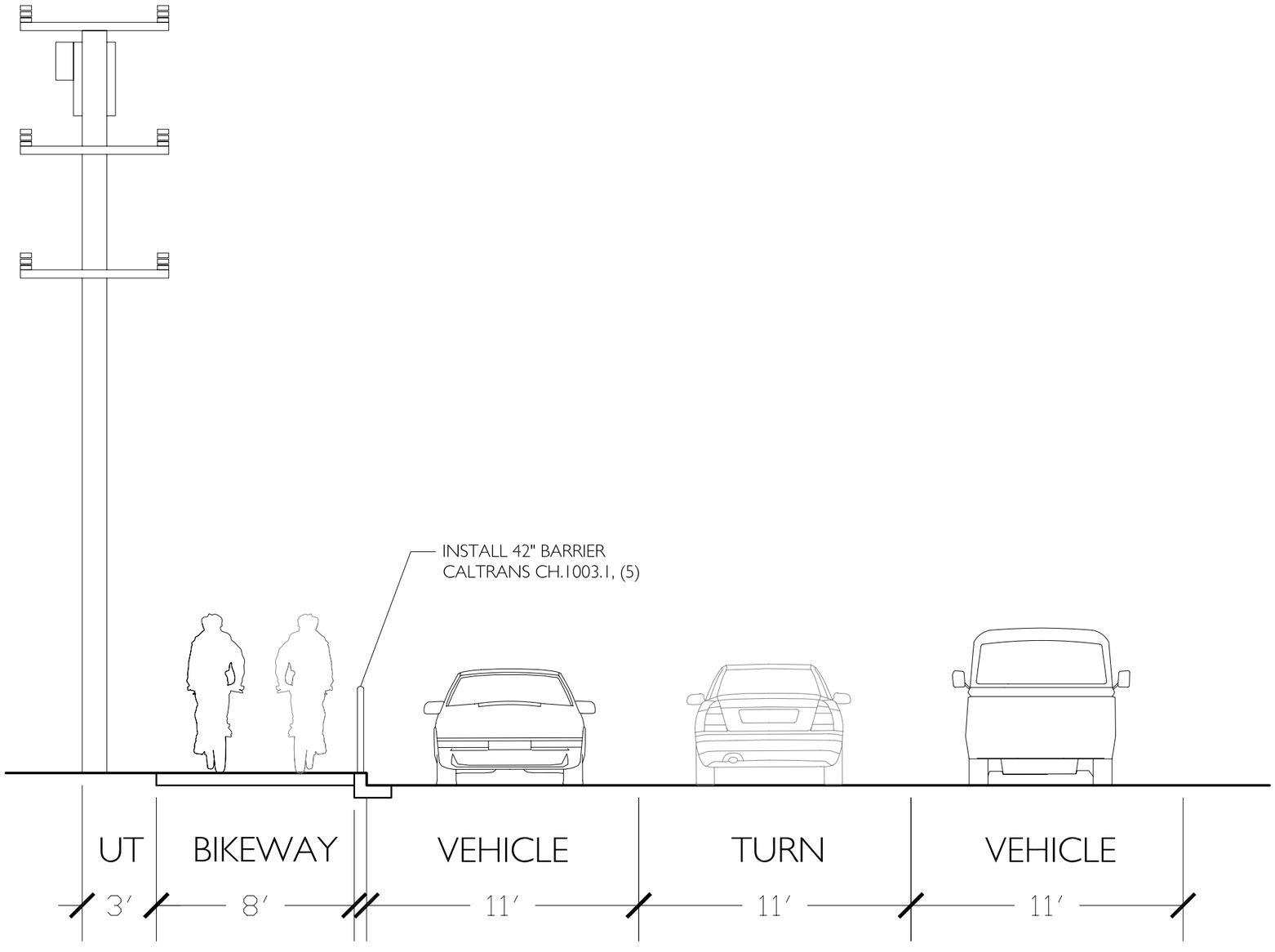
c. Design Characteristics
Typical Sections A and D (Figures 3-2 and 3-5) apply to RP-12. Section A specifies a roadside Class I shared use path with a 42-inch barrier at the west end of the project. Section D specifies a Class I shared use path upgrade and promotes reuse of the newly constructed existing 5-foot sidewalk. This section also allows for a grade change between the roadway and the sidewalk at the east end of the project.

13. Roadside Project 13 – Grant Line Road Connection

a. Project Location and Description
Roadside Project 13 (RP-13) provides for gap closure connecting from the intersection of Grant Line Road and Lincoln Boulevard to the intersection of Grant Line Road and the rail line spur approximately 100 yards west of MacArthur Drive.

b. Project Benefits
RP-13 creates a continuous Class II bikeway connection along the retail and commercial corridor of the Grant Line Road. Additional connections to residential areas are improved for the major intersections of Lincoln Boulevard and Holly Drive.

c. Design Characteristics
Typical Section F (Figure 3-7) applies to the entirety of RP-13. Section F specifies the installation of a Class II bike lane between an existing 5-foot wide sidewalk and an existing four-lane road with a median.



NOTES:

1- TYPICAL SECTION A APPLIES TO ROADSIDE PROJECTS #1, #2, #4, #7, #8, AND #12.

2- COMPLIANCE WITH FIVE-FOOT HORIZONTAL SEPARATION FROM ROADWAY SPECIFIED IN CALTRANS CHAPTER 1000 FOR CLASS 1 WOULD REQUIRE UTILITY RELOCATION OR UNDERGROUNDING.

3- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

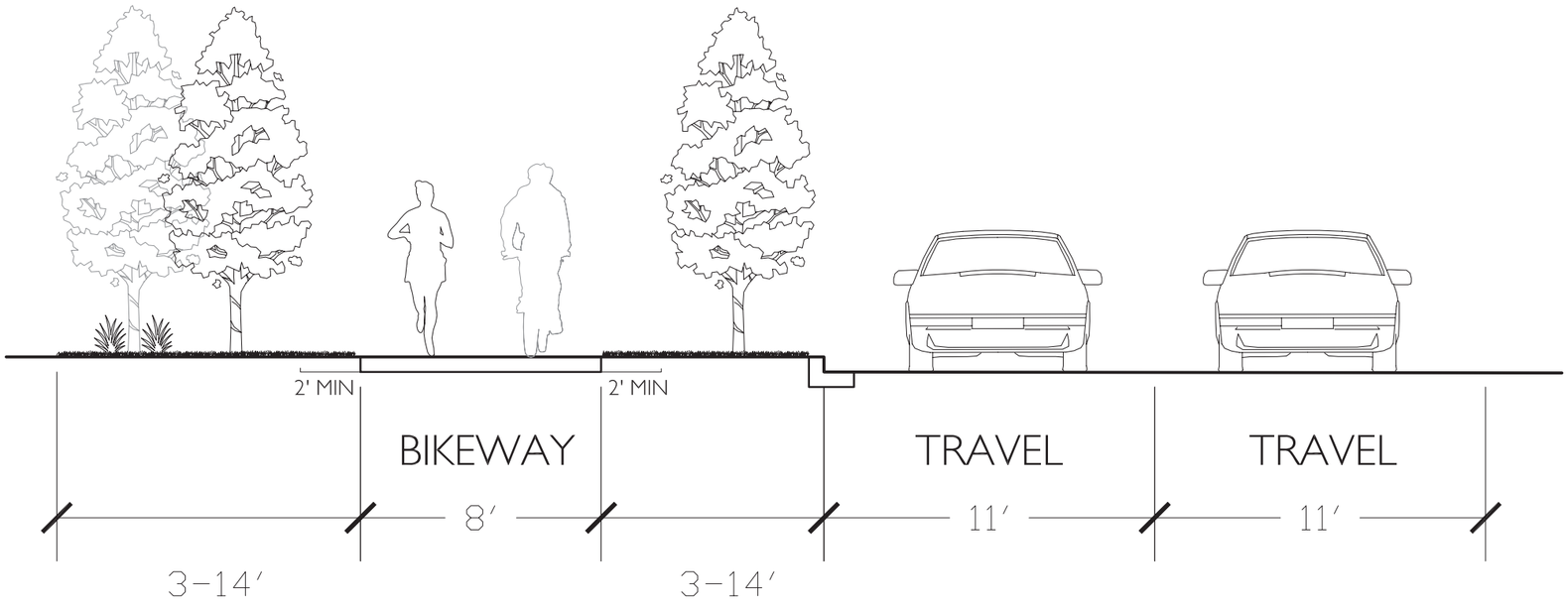
0 2.5 5 10FT.

1" = 5'-0"

FIGURE 3-2: **ROADSIDE BIKEWAY - TYPICAL SECTION A**

NOTES:
1- TYPICAL SECTION B APPLIES TO ROADSIDE PROJECTS #1, #2, #6, #8, AND #9.

2- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.



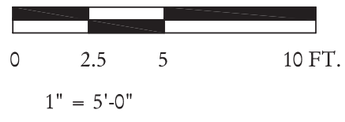
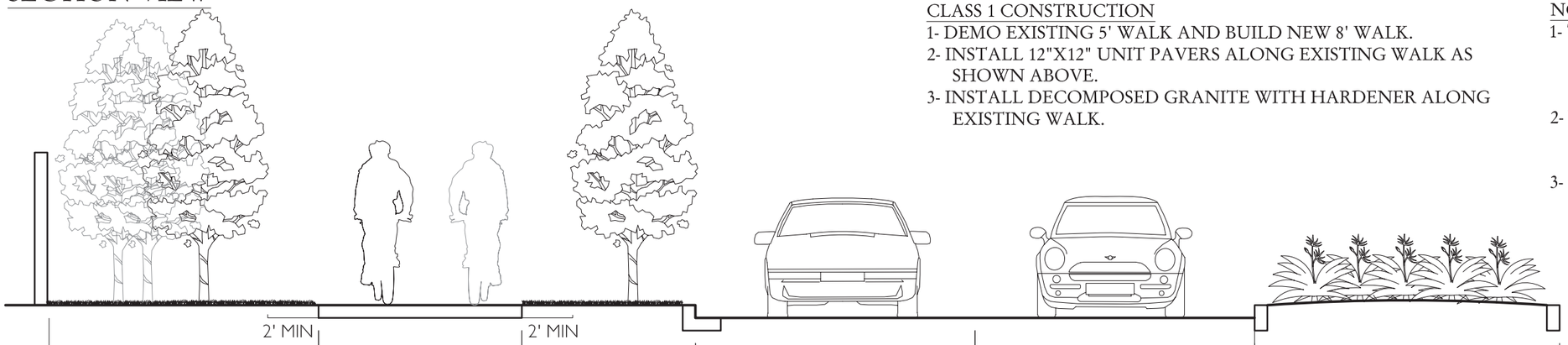


FIGURE 3-3: **ROADSIDE BIKEWAY - TYPICAL SECTION B**

SECTION VIEW



CLASS 1 CONSTRUCTION
1- DEMO EXISTING 5' WALK AND BUILD NEW 8' WALK.
2- INSTALL 12"X12" UNIT PAVERS ALONG EXISTING WALK AS SHOWN ABOVE.
3- INSTALL DECOMPOSED GRANITE WITH HARDENER ALONG EXISTING WALK.

NOTES:
1- TYPICAL SECTION C APPLIES TO ROADSIDE PROJECTS #6, #7, #8, AND #9.

2- TRAVEL LANES MIRRORED ON OPPOSITE SIDE OF STREET.

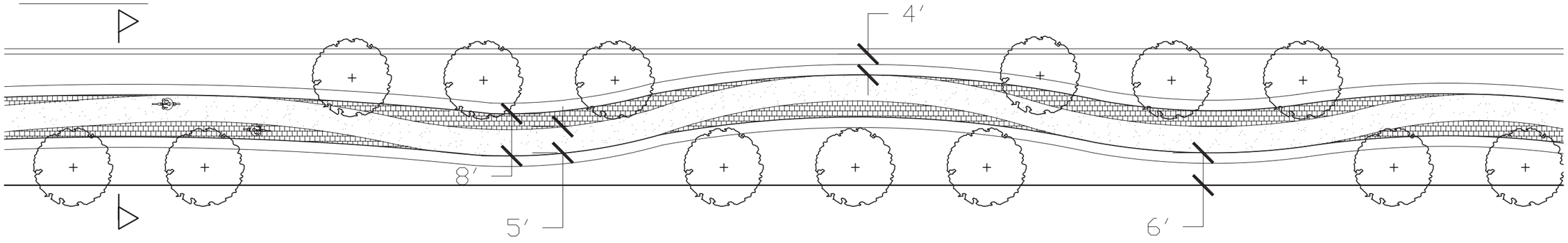
3- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

0 2.5 5 10 FT.

1" = 5'-0"

* MEDIAN OCCURS IN BROKEN AREAS ON ROAD SHOWN ABOVE.

PLAN VIEW



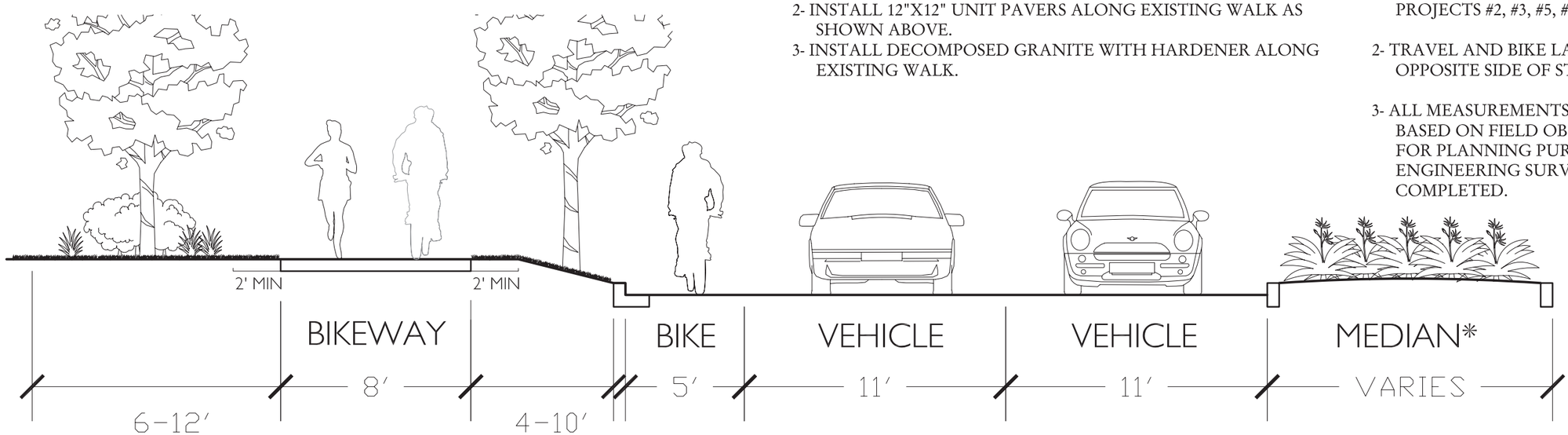
MAJOR ARTERIAL ROADWAY

0 10 20 40 FT.

1" = 20'-0"

FIGURE 3-4: **ROADSIDE BIKEWAY - TYPICAL SECTION C**

SECTION VIEW



CLASS 1 CONSTRUCTION
1- DEMO EXISTING 5' WALK AND BUILD NEW 8' WALK.
2- INSTALL 12"X12" UNIT PAVERS ALONG EXISTING WALK AS SHOWN ABOVE.
3- INSTALL DECOMPOSED GRANITE WITH HARDENER ALONG EXISTING WALK.

NOTES:
1- TYPICAL SECTION D APPLIES TO ROADSIDE PROJECTS #2, #3, #5, #10, #11, AND #12.

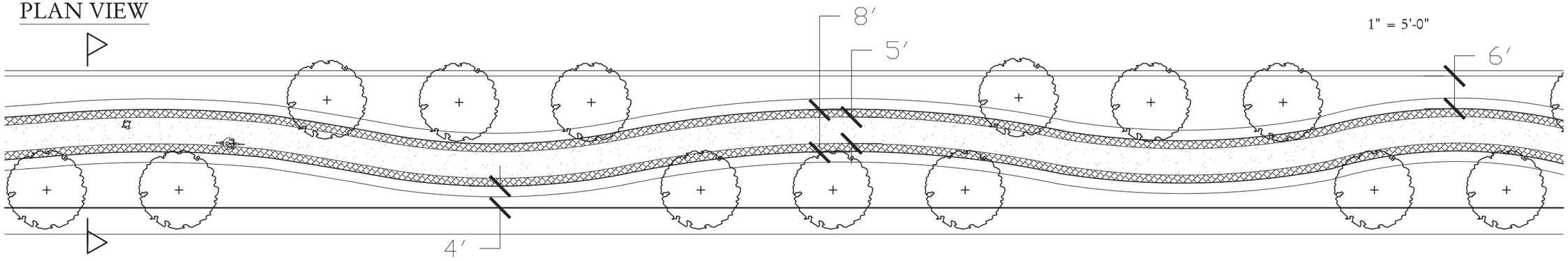
2- TRAVEL AND BIKE LANES MIRRORED ON OPPOSITE SIDE OF STREET.

3- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

* MEDIAN OCCURS IN BROKEN AREAS ON ROAD SHOWN ABOVE.

0 2.5 5 10 FT.
1" = 5'-0"

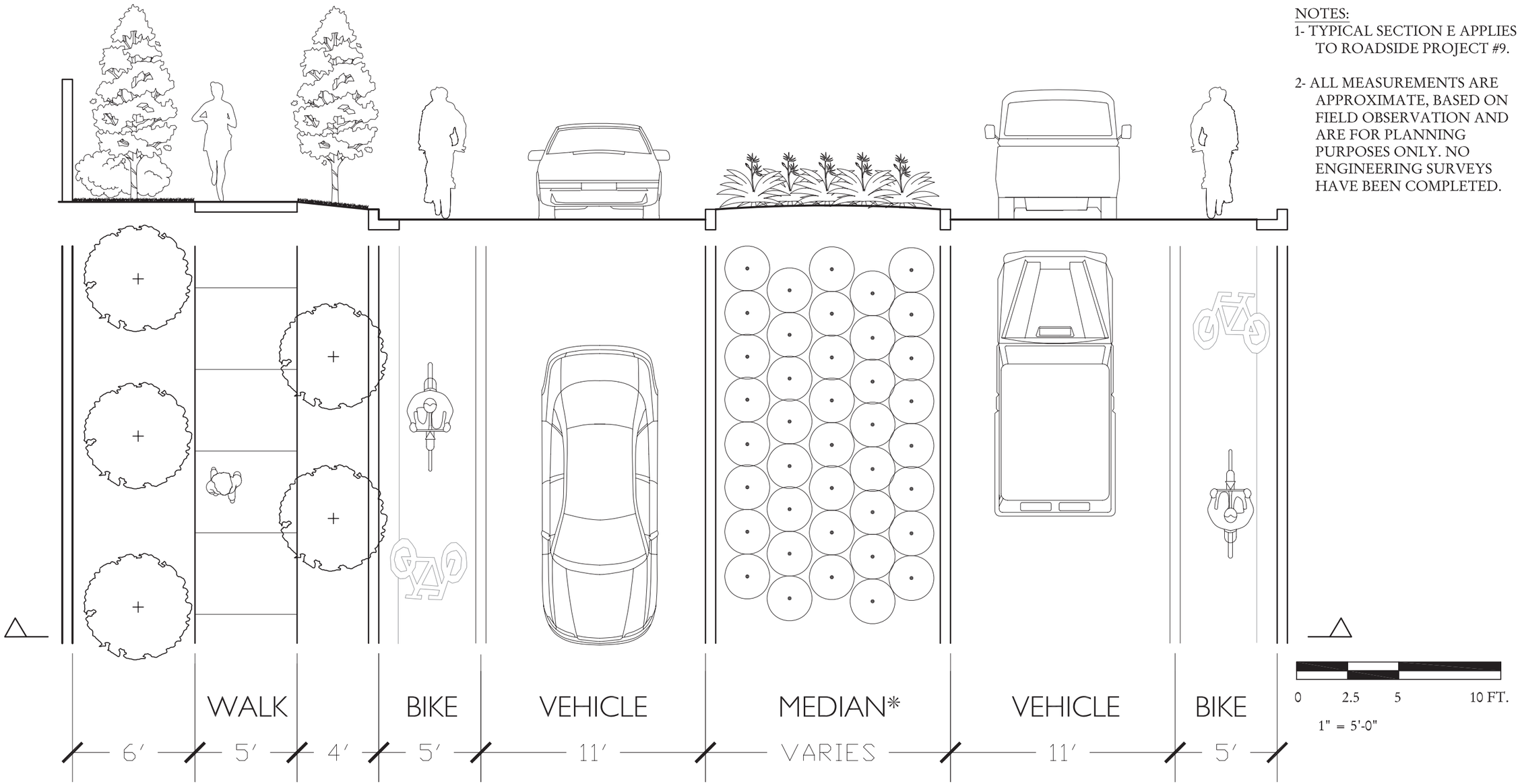
PLAN VIEW



MAJOR ARTERIAL ROADWAY

0 10 20 40 FT.
1" = 20'-0"

FIGURE 3-5: **ROADSIDE BIKEWAY - TYPICAL SECTION D**

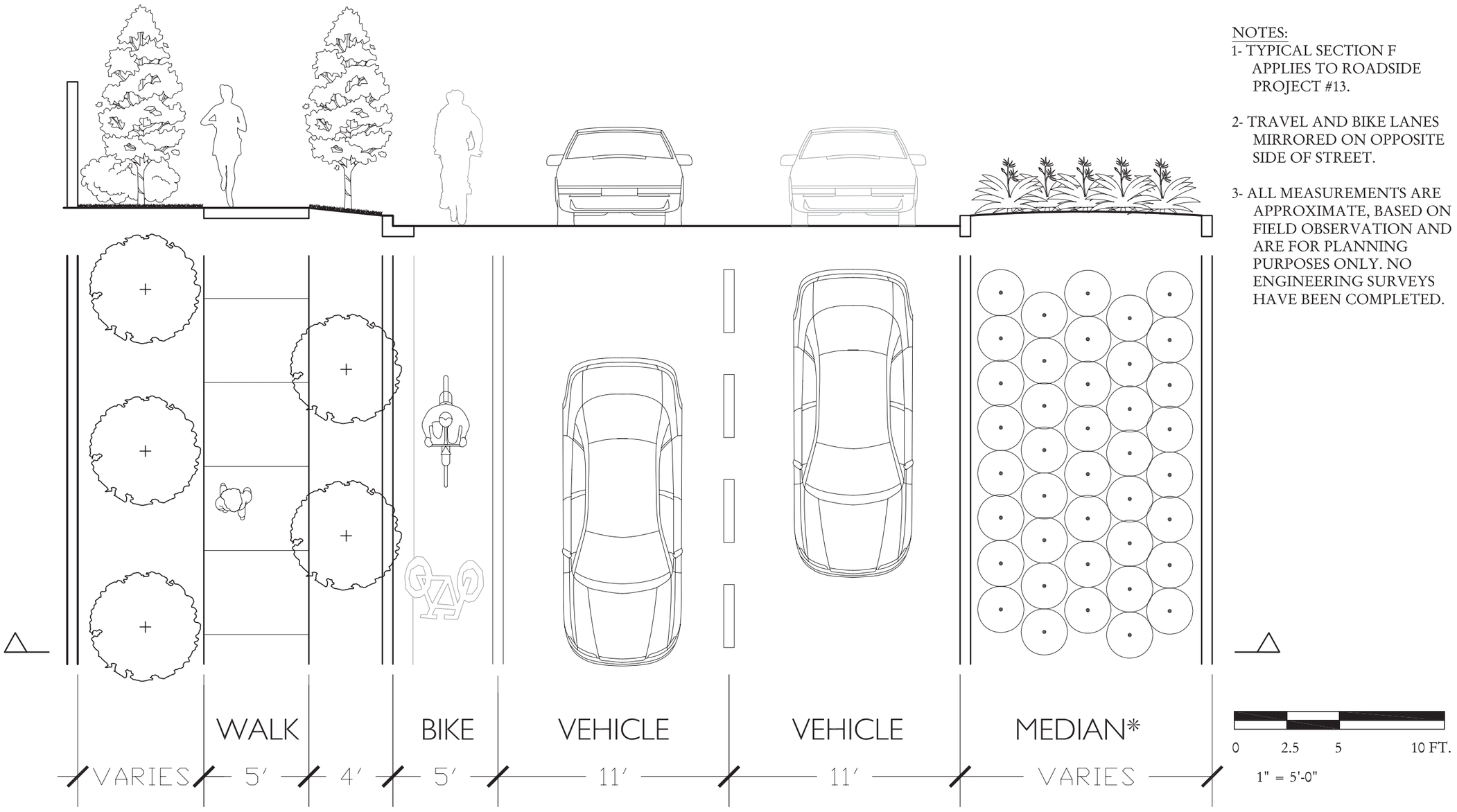


NOTES:
1- TYPICAL SECTION E APPLIES TO ROADSIDE PROJECT #9.

2- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

* MEDIAN OCCURS IN BROKEN AREAS ON ROAD SHOWN ABOVE.

FIGURE 3-6: **ROADSIDE BIKEWAY - TYPICAL SECTION E**



NOTES:
1- TYPICAL SECTION F APPLIES TO ROADSIDE PROJECT #13.

2- TRAVEL AND BIKE LANES MIRRORED ON OPPOSITE SIDE OF STREET.

3- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

* MEDIAN OCCURS IN BROKEN AREAS ON ROAD SHOWN ABOVE.

FIGURE 3-7: **ROADSIDE BIKEWAY - TYPICAL SECTION F**

4 RAIL-WITH-TRAIL BIKEWAYS

The City of Tracy has two major Union Pacific Railroad (UPRR) rail corridors, one that runs southwest/northeast and one that runs northwest/southeast. The two corridors cross near the proposed Tracy Transit Station in the downtown bowtie region. Both corridors provide excellent opportunities for east-west connectivity in the Tracy bikeway facility. Both lines are currently used for infrequent slow-speed freight, which is suitable for a juxtaposing bikeway facility. The "rail-with-trail" facilities are proposed to be Class I shared use facilities and necessary crossings. Grade separated crossings may be warranted in the future due to changes in demand. These trails will be seamlessly incorporated with the rest of the Tracy bikeway facility.

A. Rail-with-Trail Alignments

The complete extent of the rail-with-trail alignments and locations of detailed crossing areas are illustrated in Figure 4-1. The central hub of the rail-with-trail facility is the proposed Tracy Transit Station (TTS) at Central Avenue and Sixth Street. From the TTS the rail-with-trail facility goes in three different directions: Northwest, Southwest and Northeast. Along these three alignments there are eight specific crossings, including the TTS crossing.

- The Northwest trail alignment is approximately 1.5 miles long and is proposed to cross three (3) streets: Tracy Boulevard, Eleventh Street and Corral Hollow Road.
- The Southwest trail alignment is approximately 1.7 miles long and crosses three (3) streets: Tracy Boulevard, Schulte Road and Corral Hollow Road.
- The Northeast trail alignment is approximately 0.9 miles long and crosses only MacArthur Drive.

B. Rail-with-Trail Typical Section

The rail-with-trail typical section, shown in Figure 4-2, applies to all of the proposed rail-with-trail segments between the trail crossings described below. The rail-with-trail segments are identified in Figure 4-1 as: RWT-2, RWT-4, RWT-7, RWT-9, RWT-11, RWT-13 and RWT-15. This typical section illustrates a Class I shared use path bikeway facility running parallel within the UPRR rail line corridor. It depicts the range of trail setbacks, depending upon location, which occur along the three proposed rail-with-trail alignments. Additionally, this section depicts the 5-foot high barrier necessary to safely separate the trail users from the rail line. The barrier must be at least two feet from the edge of the trail and should provide visual screening from the rail line.

C. Rail-with-Trail Detailed Crossings

The rail-with-trail alignments contain the following eight specific detailed crossing areas identified in Figure 4-1:

1. RWT-1: Tracy Transit Station (TTS) Crossing

The Northwest, Southwest and Northeast trail alignments come together at the proposed Tracy Transit Station, as illustrated in Figure 4-3. The Northwest trail alignment approaches the proposed TTS on the south side of Sixth Street, (north side of the rail line) crossing Central Avenue to the proposed TTS. The trail alignment then goes clockwise around the perimeter of the proposed TTS, crosses the east end of the bus terminal median and connects to the Northeast alignment along the north side of the rail line while maintaining an approximate 35-foot setback from the rail line. The Southwest trail alignment approaches the proposed TTS along the north side of Fourth Street (south side of the rail line) with a minimum setback of approximately 40 feet. The trail then continues north along the west side of Central Avenue, crossing the railroad tracks and connecting to the Northwest trail alignment along the south side of Sixth Street.

2. RWT-3: Trail Crossing 1NW

The Northwest trail alignment approaches Tracy Boulevard along the south side of Sixth Street (north side of the rail line) with an approximate 45-foot setback from the rail line and a 5-foot setback from Sixth Street for landscape improvements. The trail turns south to cross the railroad and then turns west to cross Tracy Boulevard to the southwest corner of Tracy Boulevard and Beechnut Avenue. At that point the trail turns north, crossing Beechnut Avenue. It then continues northwest along Beechnut Avenue with an approximate 32-foot setback from the rail line and a 9-foot setback from Beechnut Avenue for landscape improvements. Figure 4-4 illustrates this crossing.

3. RWT-5: Trail Crossing 2NW(A) and 2NW(B)

The Northwest trail alignment approaches from crossing 1NW along the south side of the rail line with an approximate 30-foot setback. Trail crossing 2NW(A) and 2NW(B) on Figure 4-5 depict four possible options for trail configuration at this crossing. 2NW(A) depicts options 1 and 2, in which the rail-with-trail exits the rail corridor and becomes a street-side Class I shared use path facility along the west

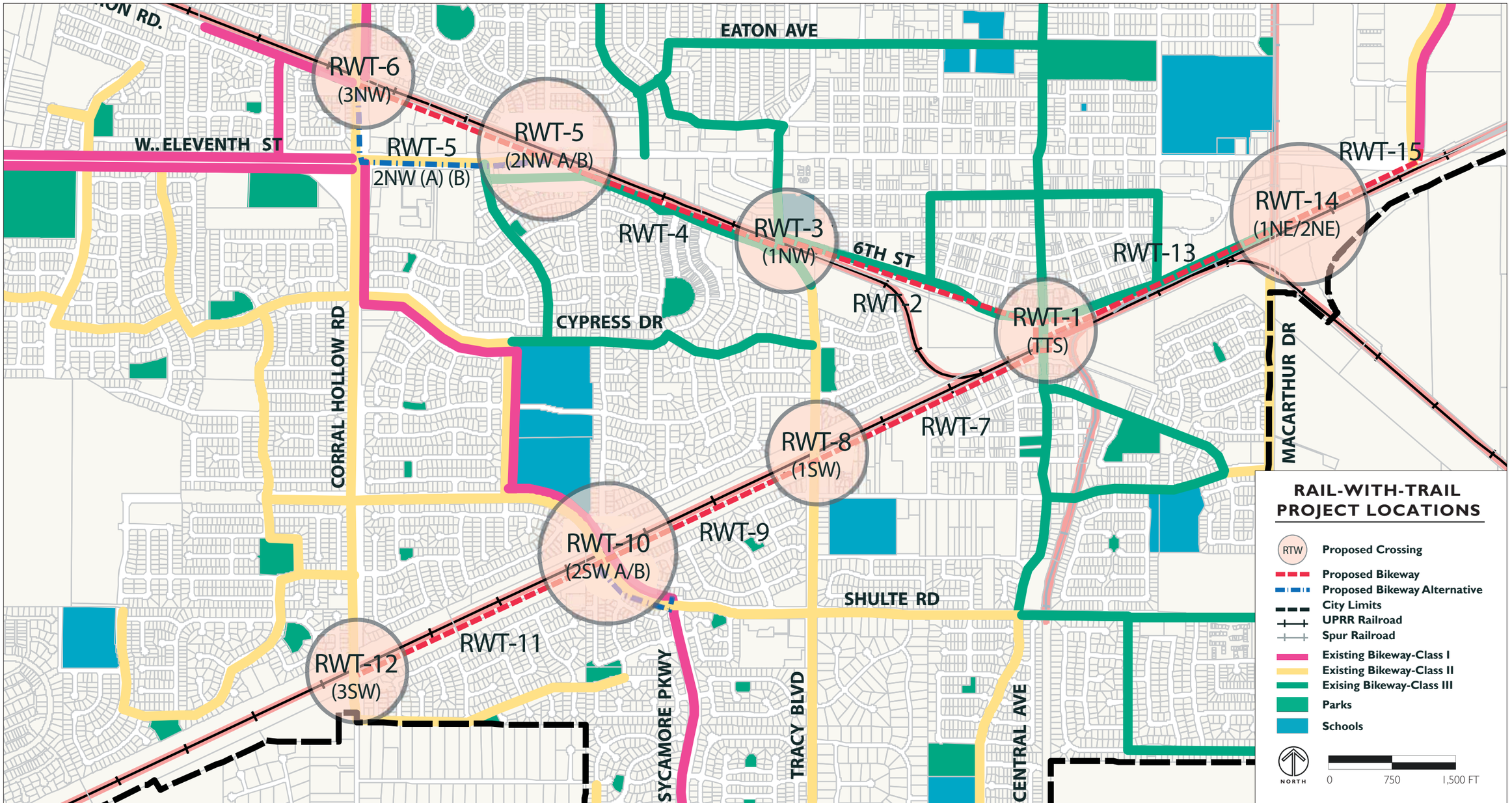


FIGURE 4-1: **RAIL-WITH-TRAIL ALIGNMENTS AND CROSSING LOCATIONS**

side of Corral Hollow Road. Option 1 runs along the west side of Corral Hollow Road while option 2 runs long the east side. Both option 1 and 2 cross Eleventh Street and Corral Hollow Road at existing crosswalks. The trail then continues on the south side of Eleventh Street crossing Alden Glen Drive and reconnecting with the rail-with-trail heading southeast just before the railroad crossing.

Trail crossing 2NW(B) depicts options 3 and 4 on Figure 4-6 for trail alignment across Eleventh Street. In option 3 the Northwest alignment approaches from 1NW and continues west along the south side of Eleventh Street, crossing Eleventh Street on the east side of Alden Glen Drive. Option 3 then turns east along the north side of Eleventh Street and then turns north along the west side of the Tracy Fire Station, reconnecting with the rail-with-trail heading northwest along the south side of the rail line with an approximate 30-foot setback.

Option 4 of trail crossing 2NW(B) promotes the most continuity for the rail-with-trail facility. In option 4 the Northwest trail alignment approaches from crossing 1NW along the south side of the railroad and then crosses Eleventh Street. This crossing features a staggered crosswalk and a pedestrian refuge in the median for safety and a timed signal for minimization of traffic impacts. The trail alignment in option 4 then continues northwest with an approximate 30-foot setback along the south side of the rail line to crossing 3NW.

4. RWT-6: Trail Crossing 3NW

The Northwest trail alignment continues from crossing options 1-4, depicted in 2NW(A) and 2NW(B), and then continues along the south side of Byron Road. Option 1 from 2NW(A) show the trail connection from the east side of Corral Hollow Road. Options 2, 3 and 4, depicted in 2NW(A) and 2NW(B), shows the trail crossing at the intersection of Corral Hollow Road and Byron Road. All options connect to the existing Class I shared use path along the South side of Byron Road. Figure 4-7 illustrates this crossing.

5. RWT-8: Trail Crossing 1SW

The Southwest trail alignment approaches the north side of Fourth Street (south side of the rail line) from the proposed TTS at Central Avenue. It has an approximate 35-foot setback from the rail line and a 5-foot setback from Fourth Street for landscape improvements. When the trail intersects Tracy Boulevard, it crosses Fourth Street to the south and then crosses Tracy Boulevard to the west. The trail also continues southwest along the south side of the rail line with an approximate 75-foot setback to crossing L2SW(A) and L2SW(B) at Schulte Road. Figure 4-8 illustrates this crossing.

6. RWT-10: Trail Crossing 2SW(A) and 2SW(B)

The Southwest trail alignment approaches from crossing 1SW along the south side of the rail line with an approximate 75-foot setback and turns over a proposed pre-fabricated bridge before hitting the existing Class I shared use path facility along the north side of Schulte Road. Trail crossing 2SW(A) and 2SW(B) depict two possible options for crossings at this location.

2SW(A) depicts option 1 on Figure 4-9 showing the rail-with-trail exiting the rail corridor and becoming an existing street side Class I shared-use path facility along the north side of Schulte Road. The trail then heads southeast and utilizes the existing crossing across Schulte Road at Sycamore Parkway, and then crosses Sycamore Parkway and continues northwest backtracking along the south side of Schulte road. The upgrade along the south side of Schulte Road from a 5-foot sidewalk to a Class I shared use path is not included in the Roadside Project improvements proposed in Chapter 3.

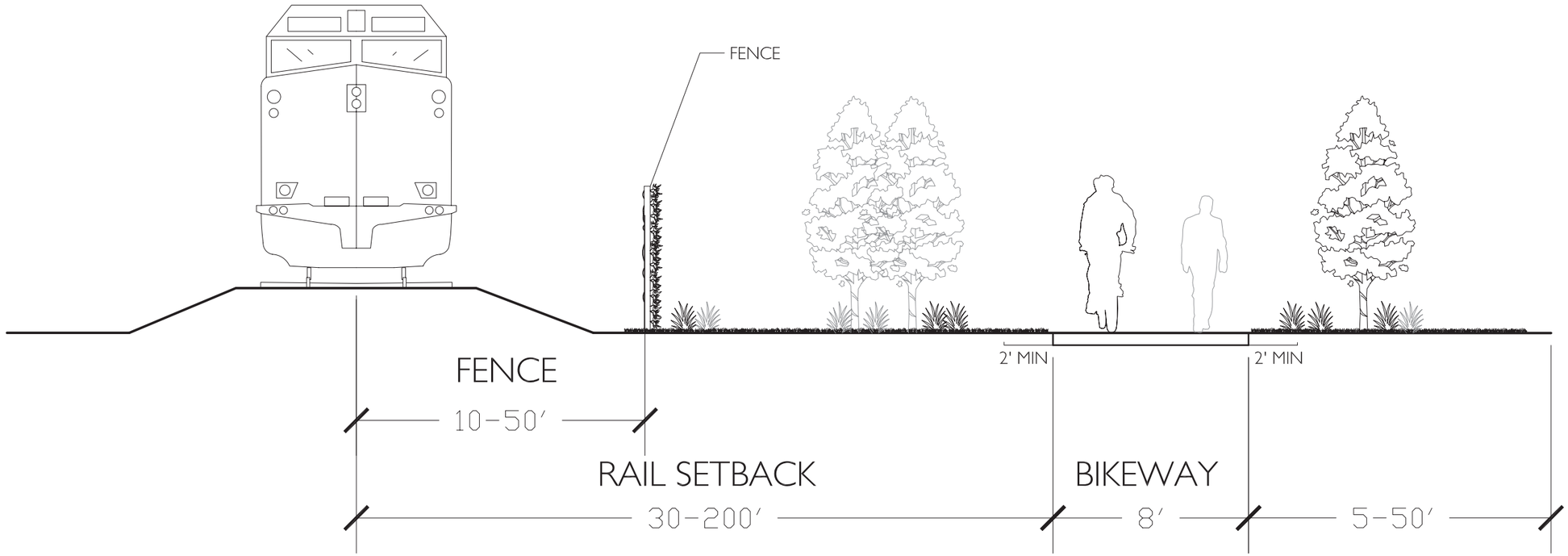
2SW(B) depicts option 2 on Figure 4-10 for the rail-with-trail crossing Schulte Road. When the trail intersects Schulte Road from the northeast after the proposed bridge, it is closer to the rail line so approaching northbound vehicles on Schulte Road will have a better line of site and safer stopping distance for crossing pedestrians. The trail turns and continues southwest with an approximate 150-foot setback from the rail line to crossing 3SW at Corral Hollow Road.

7. RWT-12: Trail Crossing 3SW

The Southwest trail alignment approaches from crossing 2SW(A) and 2SW(B) at Schulte Road with an approximate 150-foot setback from the rail line. The trail connects with the proposed Roadside Project 6 along the east side of Corral Hollow Road and ends the proposed rail-with-trail along the Southwest trail alignment. Figure 4-11 illustrates this crossing.

8. RWT-14: Trail Crossing 1NE and 2NE

The Northeast trail alignment approaches from the proposed TTS at Central Avenue along the south side of Sixth Street (north side of the rail line) with an approximate 30-foot setback from the rail line. The trail crosses the MacArthur Drive rail spur at an approximate 45-degree angle to maximize setbacks from the rail line and then crosses MacArthur Drive and continues northeast along the north side of the rail line through Union Pacific property with an approximate 175-foot setback from the rail line and a buffer zone of ten feet between the Union Pacific facilities. Crossing 2NE shows a zoom-out of the Northeast trail alignment and its final connection to the existing Class I shared use path underneath Eleventh Street. These are illustrated in Figure 4-12 and Figure 4-13.



NOTE:
1- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

FIGURE 4-2: **RAIL-WITH-TRAIL TYPICAL CROSS SECTION**

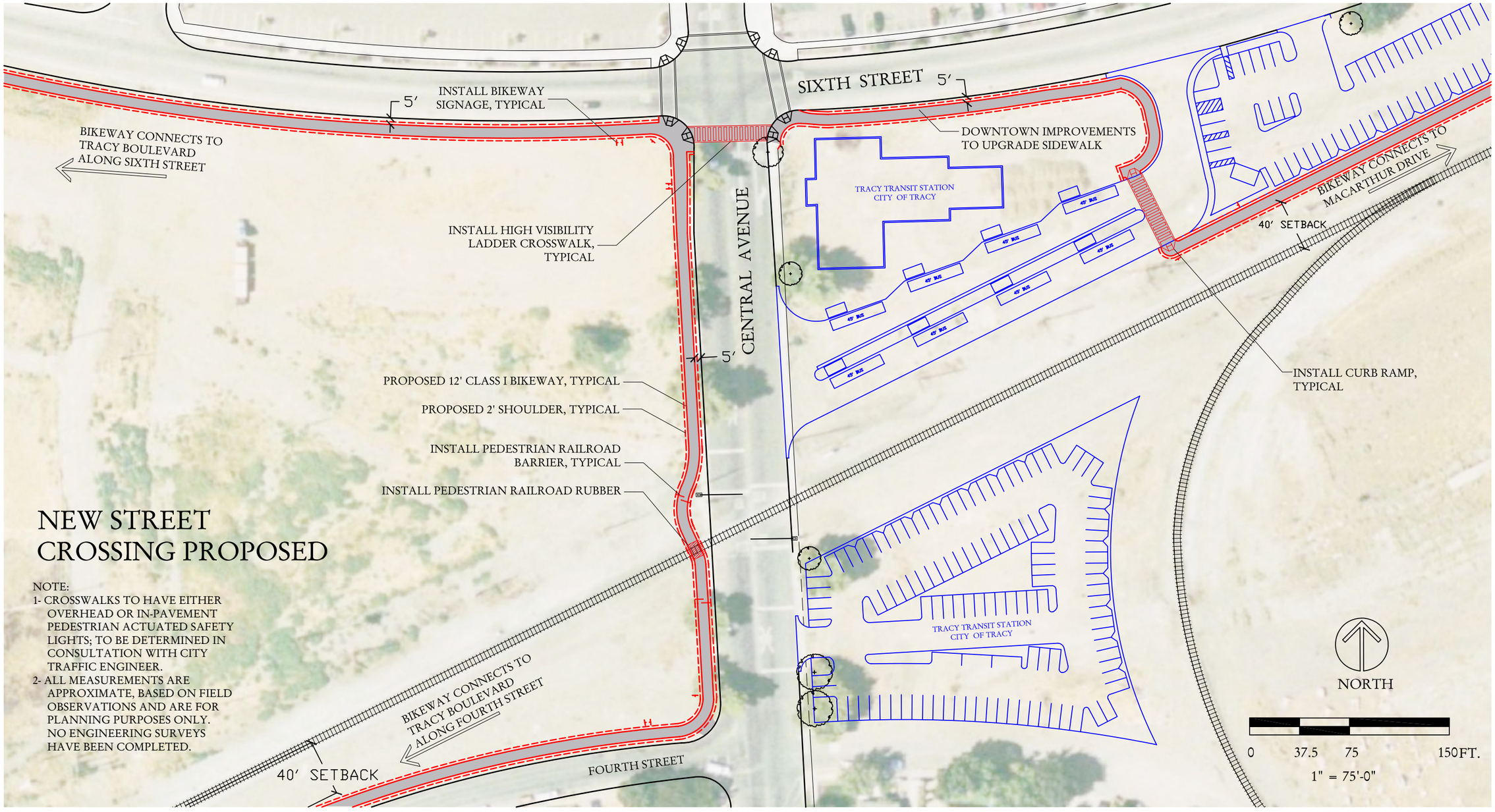


FIGURE 4-3: **RWT-1: TTS DETAILED CROSSING**

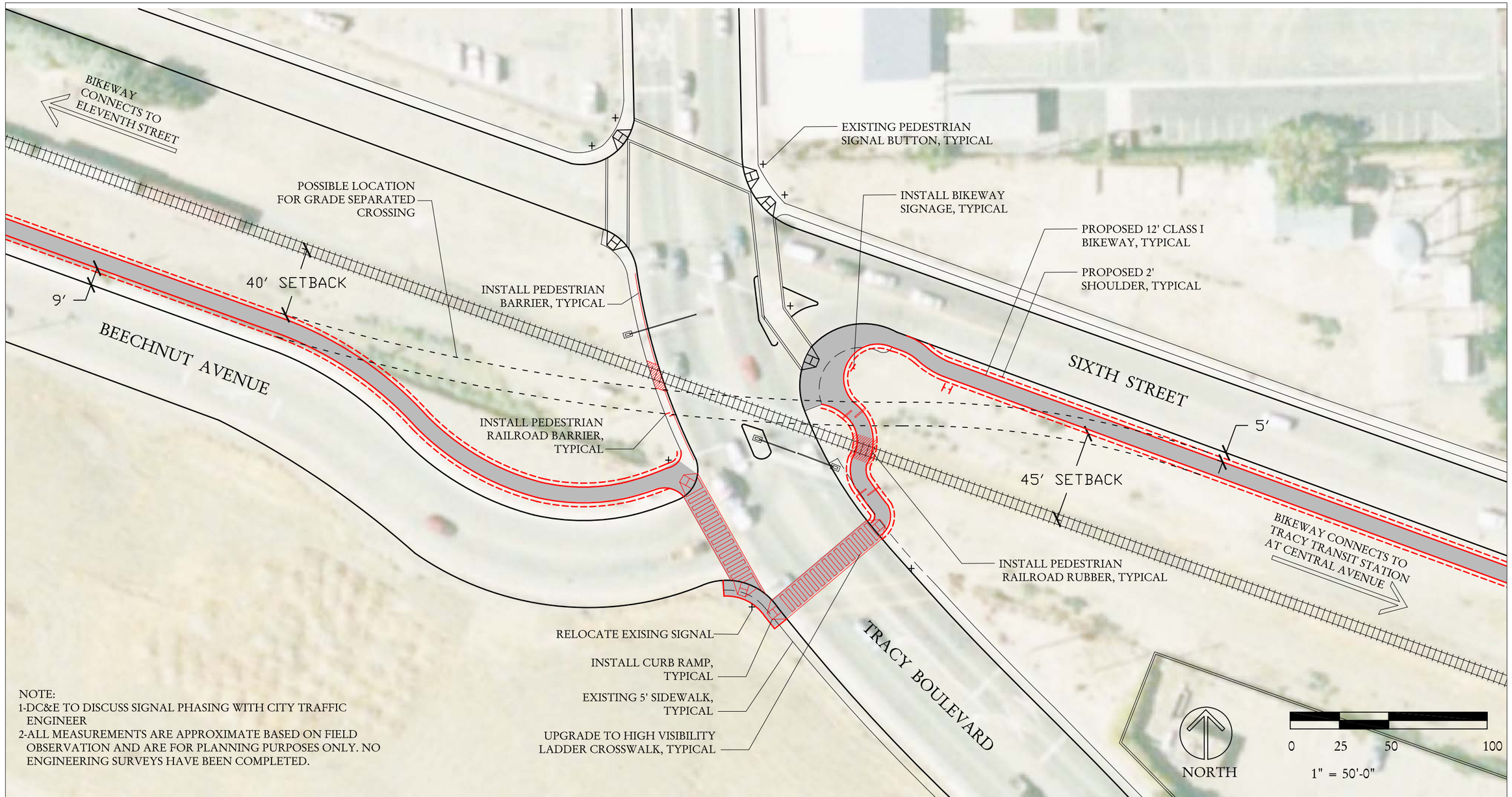


FIGURE 4-4: **RWT-3: 1NW DETAILED CROSSING**

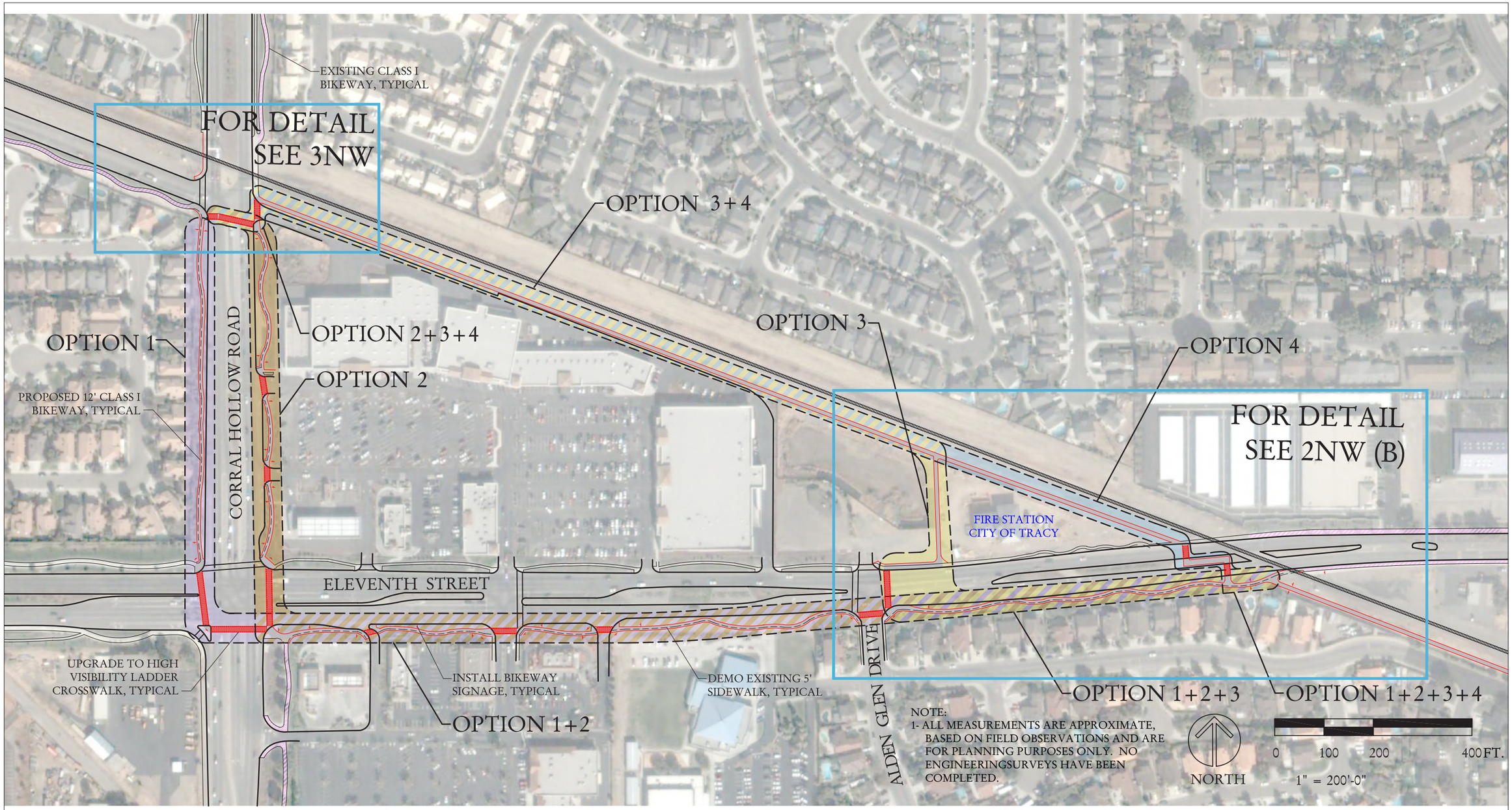


FIGURE 4-5: **RWT-5: 2NW (A) DETAILED CROSSING**

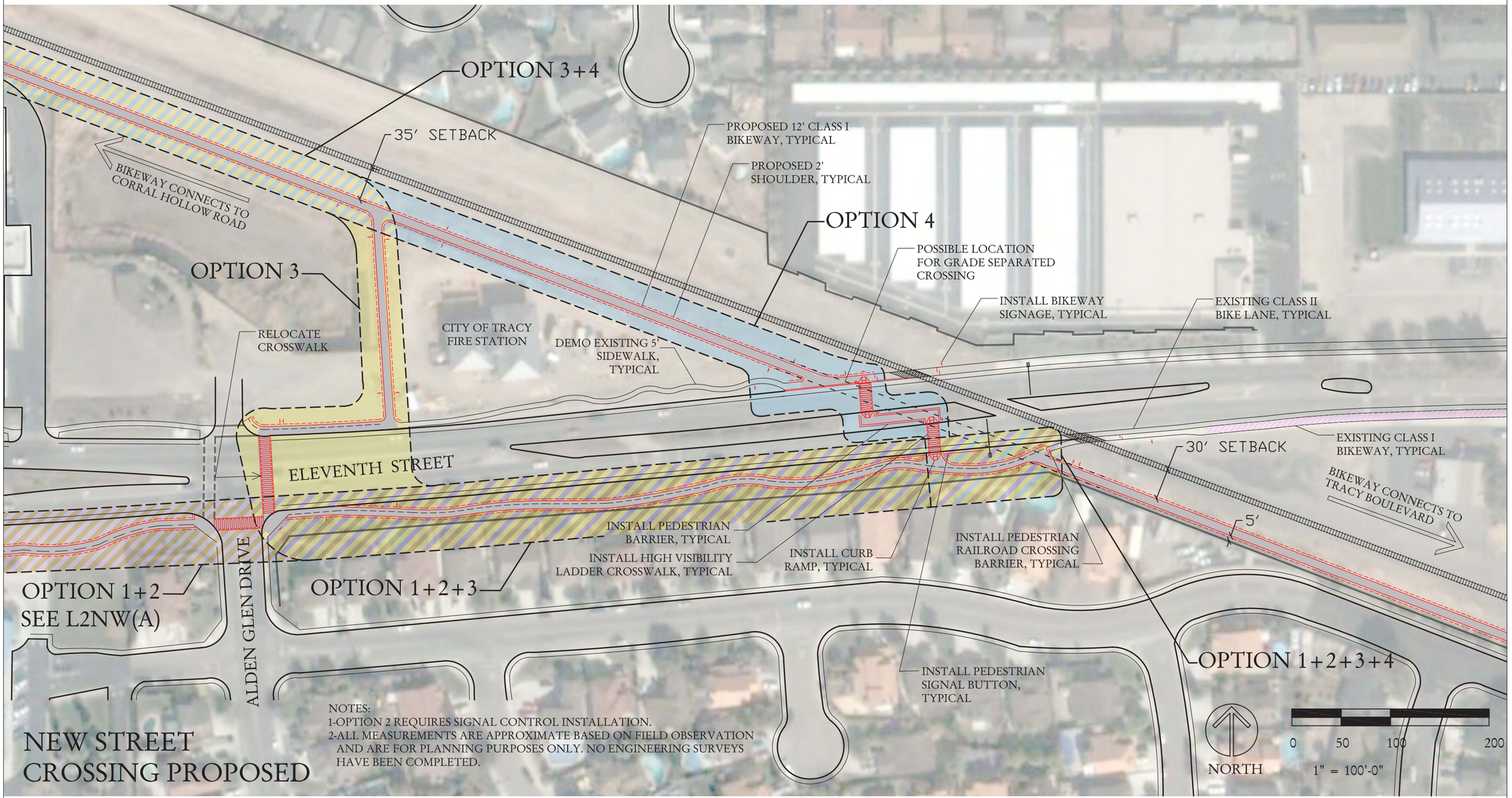


FIGURE 4-6: **RWT-5: 2NW (B) DETAILED CROSSING**

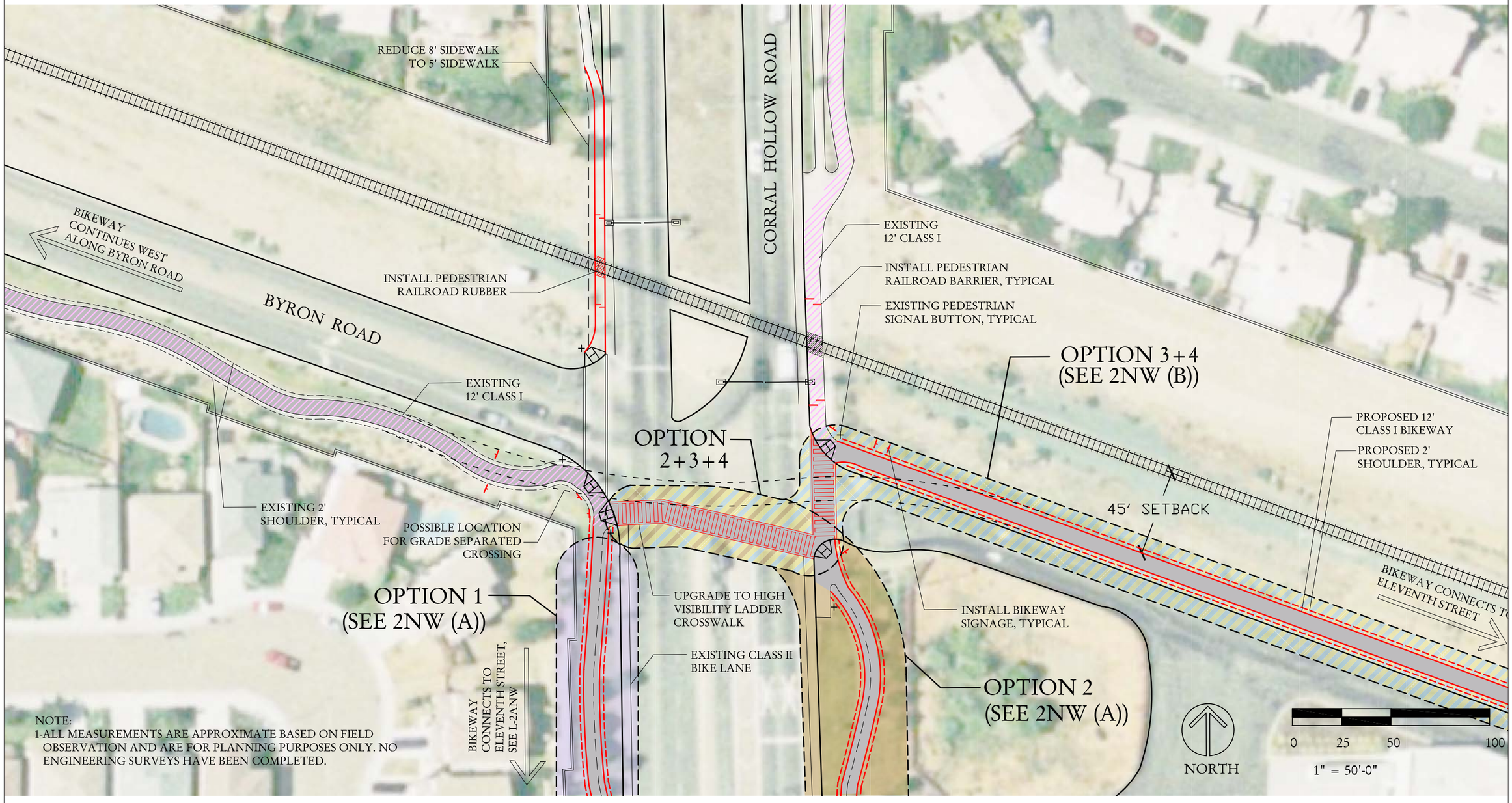


FIGURE 4-7: **RWT-6: 3NW DETAILED CROSSING**

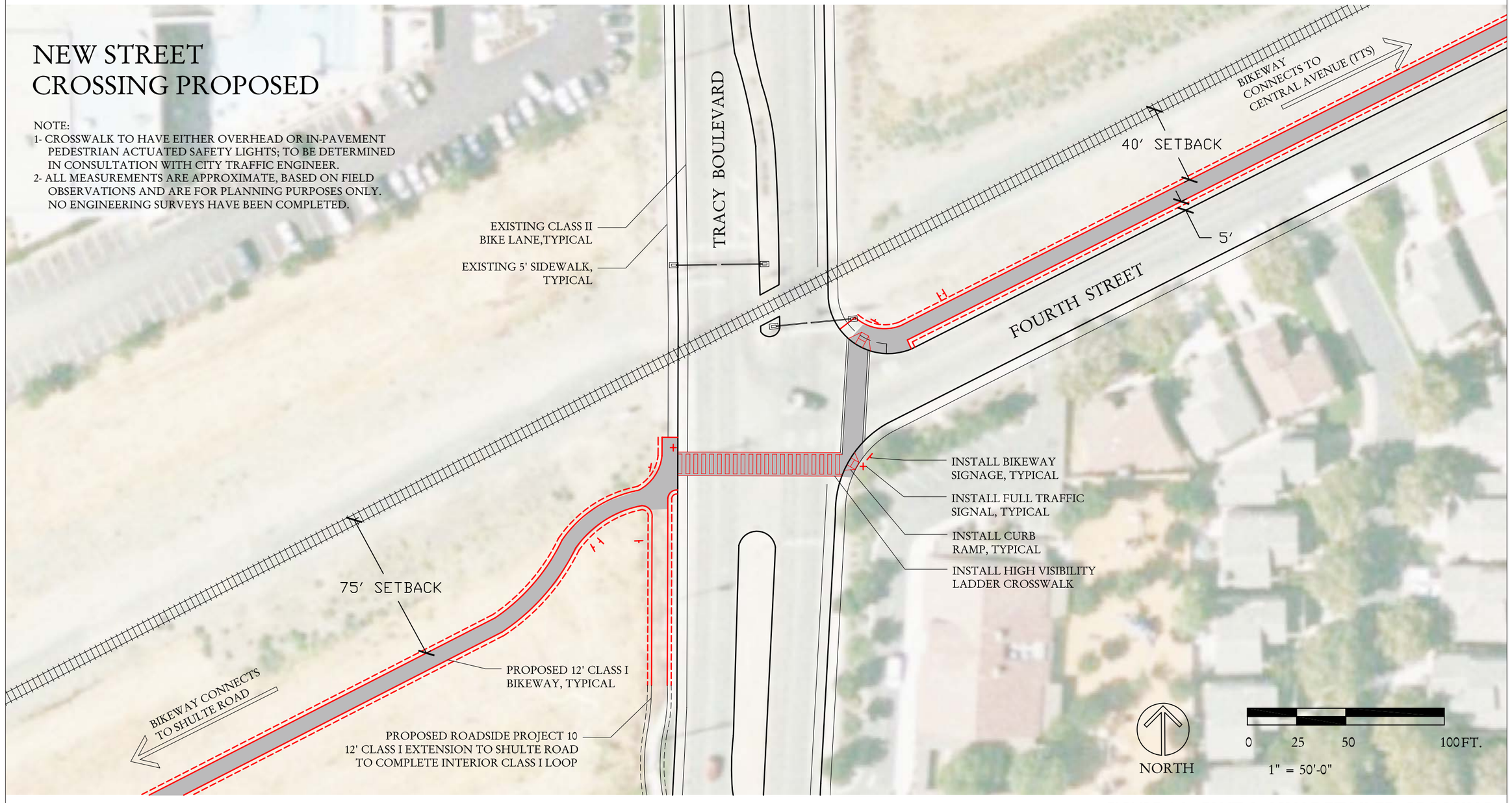


FIGURE 4-8: **RWT-8: 1SW DETAILED CROSSING**

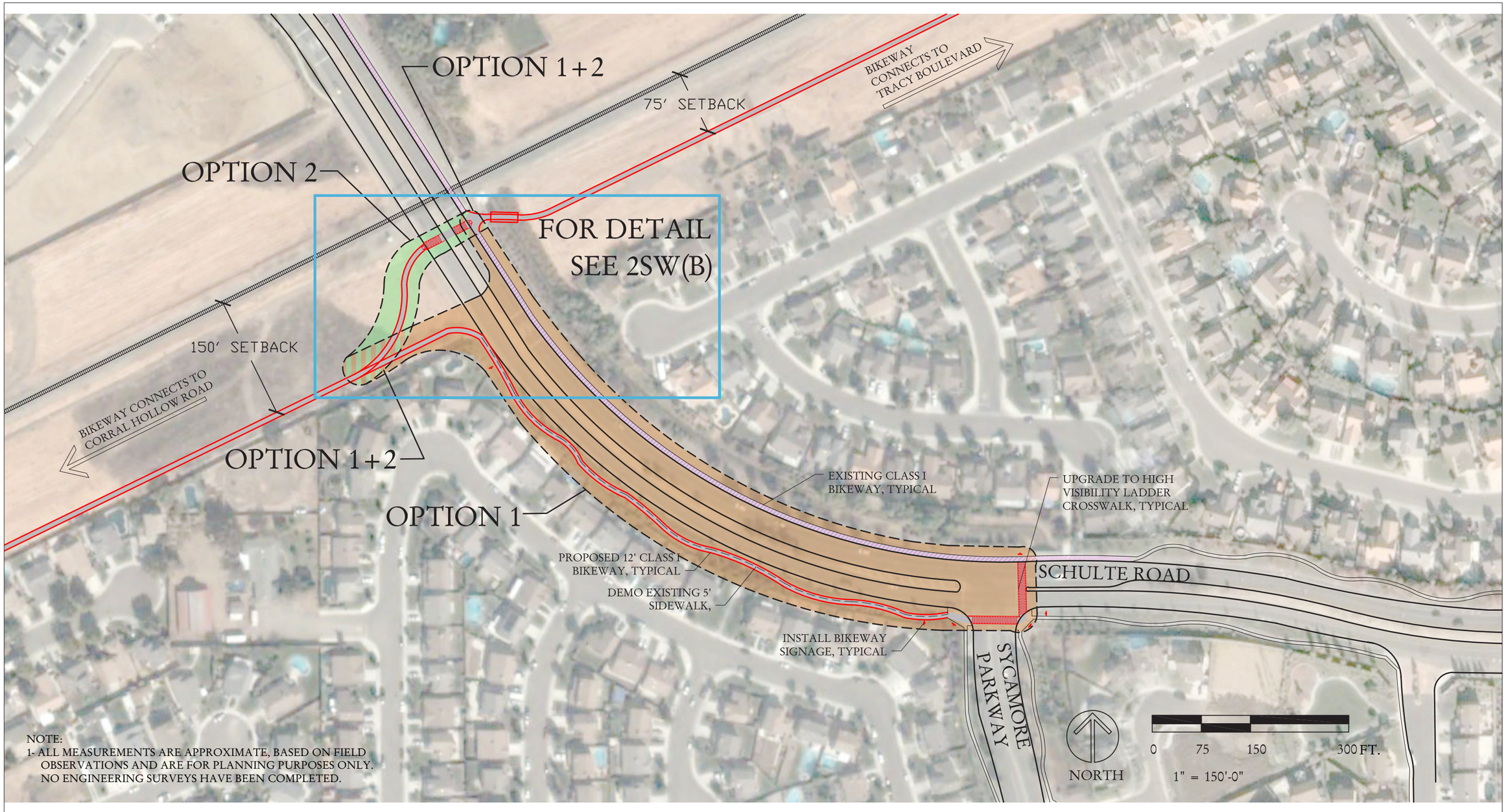


FIGURE 4-9: **RWT-10: 2SW (A) DETAILED CROSSING**

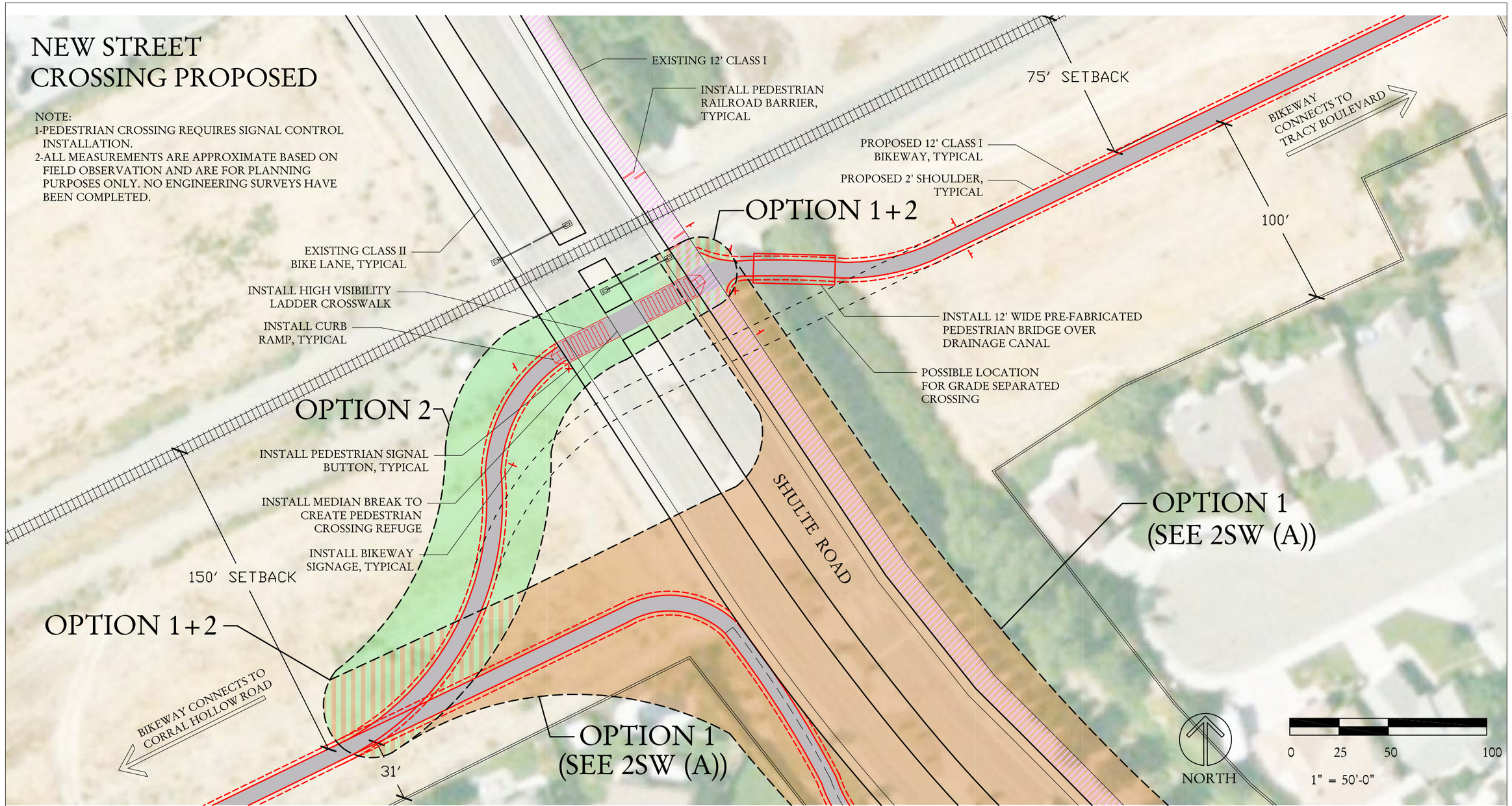


FIGURE 4-10: **RWT-10: 2SW (B) DETAILED CROSSING**

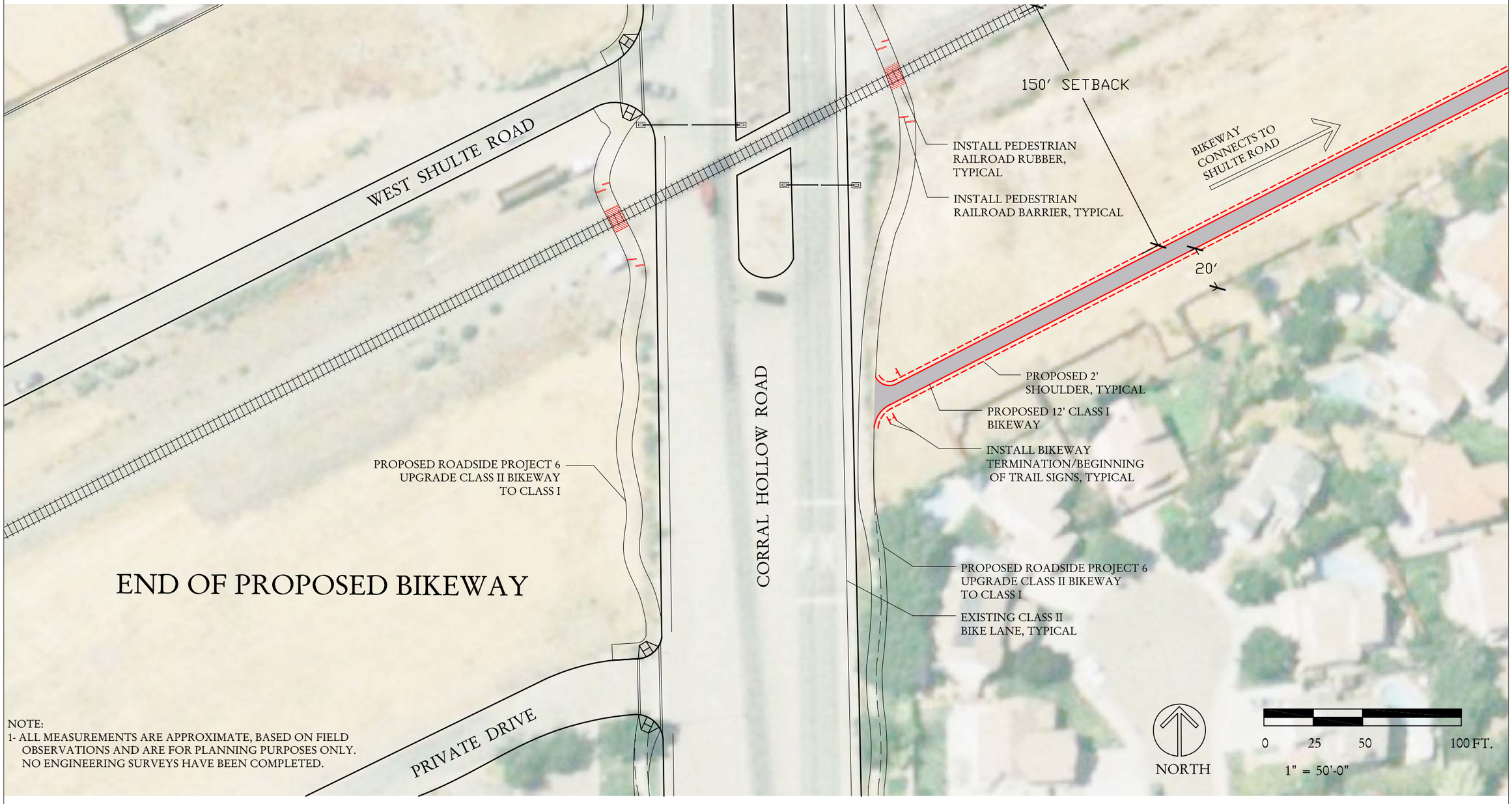


FIGURE 4-11: **RWT-12: 3SW DETAILED CROSSING**

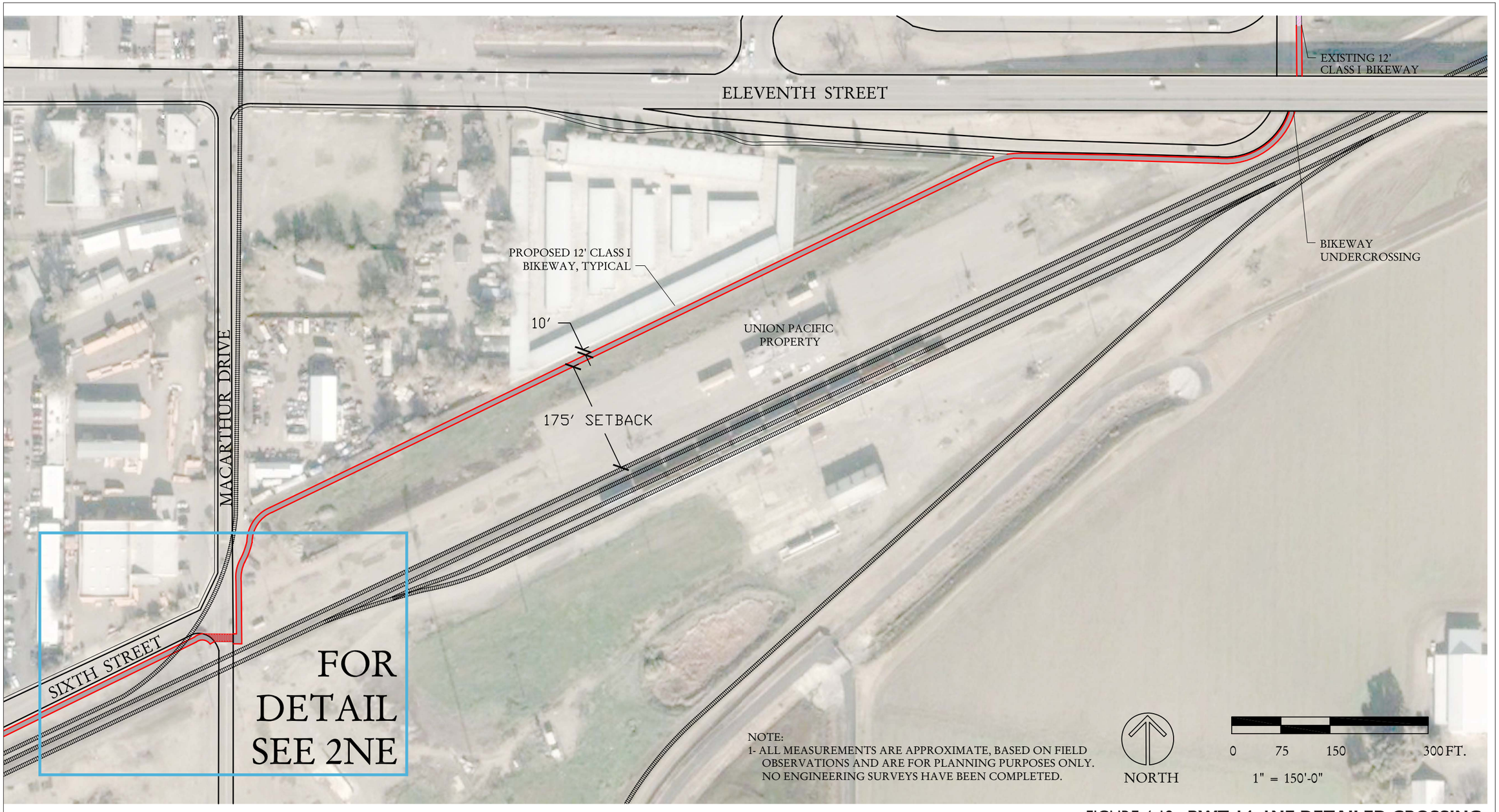


FIGURE 4-12: **RWT-14: 1NE DETAILED CROSSING**

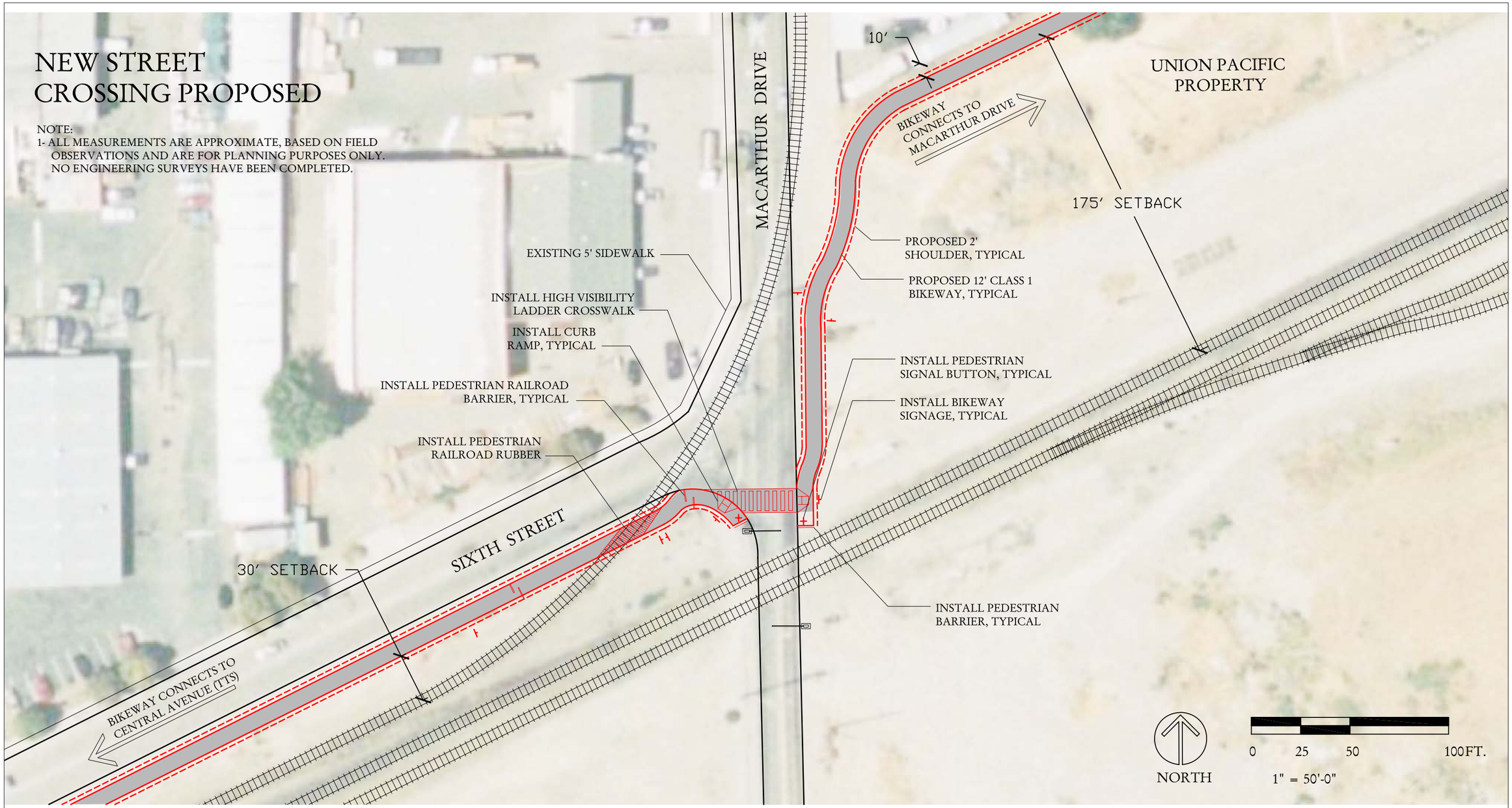


FIGURE 4-13: **RWT-14: 2NE DETAILED CROSSING**

As noted earlier in this Design Supplement, the Westside Irrigation District (WID) land holdings in the City of Tracy should be retained for future corridor use. As these areas are improved or developed, the City of Tracy should work with WID to retain these land holdings for future bikeway trail development.

A. Irrigation Right-of-Way Project Locations

Figure 5-1 illustrates the key bikeway facility opportunities that have been identified within WID property for the Tracy Bikeways Master Plan Design Supplement. As development encroaches on these holdings, the City of Tracy could require or broker an exchange of the easement location with no loss of area within any given development to preserve a corridor for future use.

B. Irrigation Right-of-Way Typical Sections

Two irrigation right-of-ways typical sections were designed based on field visits. Both can be applied to development of bikeway project improvements within these areas.

1. Typical Section – Culvert

All proposed trail alignments in the irrigation right-of-ways should minimize placement above the alignment of the culvert as to minimize the area of the trail that could be deconstructed for maintenance or emergency access to the pipeline. This alignment is illustrated in Figure 5-2. The WID will need to retain full enjoyment and access to the entirety of their easement. Any reconstruction costs resulting from deconstruction or demolition of the bikeway facility due to WID culvert access will be paid for by the City of Tracy.

2. Typical Section – Open Canal

Most of the WID property contains drainage canals, which are not in underground culverts. Any bikeway facility, proposed adjacent to an irrigation canal must include a fence and/or barrier planting separating the bikeway from the canal. Setbacks must also be considered for fencing and/or barrier plantings; these will minimize the possibility of erosion and debris falling into the canal, particularly during routine landscape maintenance. This section is illustrated in Figure 5-3.

C. Irrigation Right-of-Way Project Improvement Areas

Based on field visits and property ownership analysis, three bikeway facility opportunity areas have been identified within the irrigation right-of-ways. These areas provide the best opportunity within the WID land holdings for connectivity between schools, parks and residential neighborhoods. These are also illustrated in Figure 5-1.

1. Irrigation Right-of-Way Project Area 1

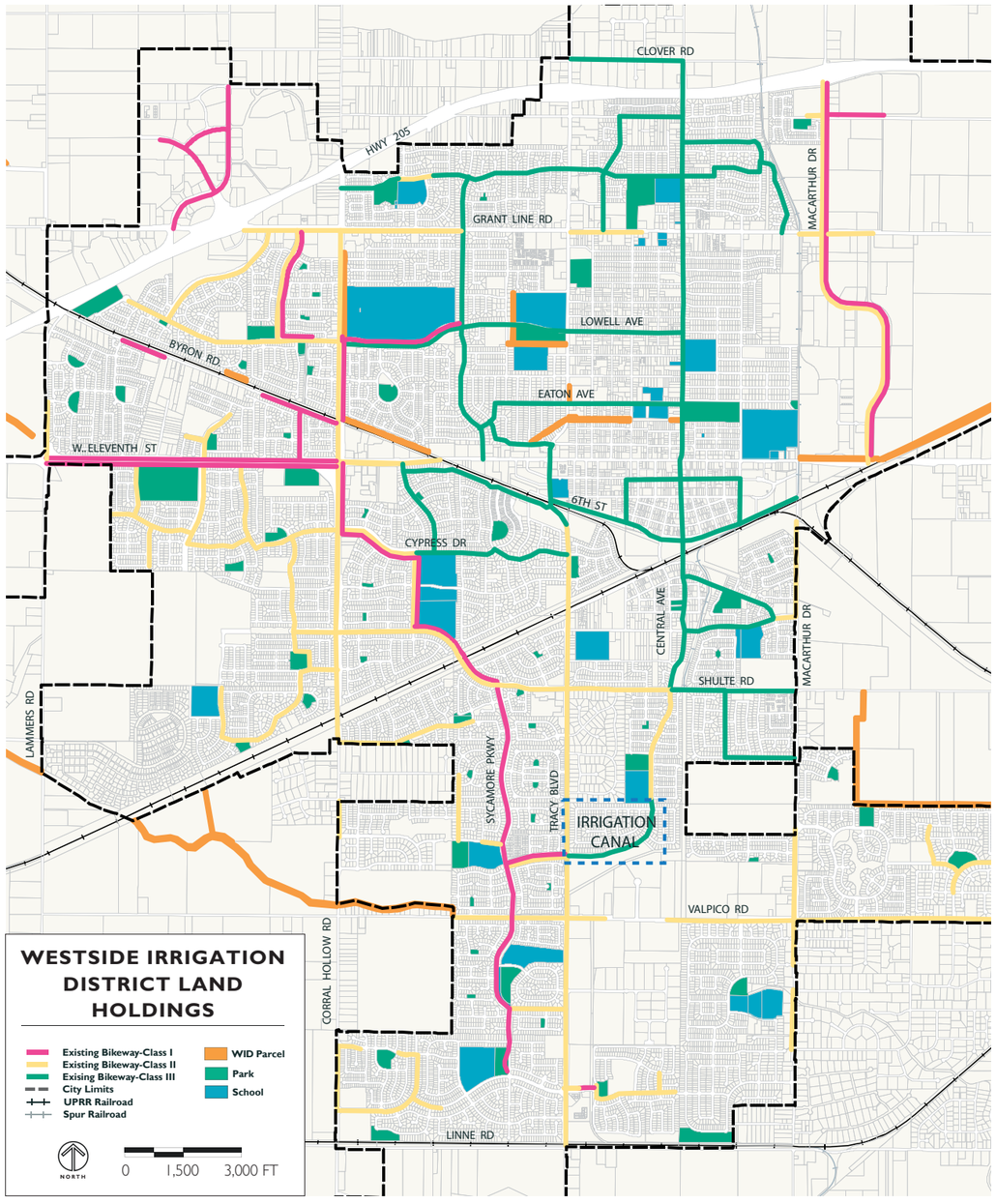
Irrigation Right-of-Way Project Area 1 (IROW-1) has been identified as a potential location for trail alignments that provide both north-south and east-west connectivity along Eleventh Street and East Highland Avenue, from Tracy Boulevard to MacArthur Drive. In this area, the irrigation right-of-way canals are within culverts. In certain areas some existing structures impede the at-grade right-of-way. The IROW-1 area contains a high concentration of schools and parks, which would benefit from a Class I bikeway facility designed consistent with Figure 5-2.

2. Irrigation Right-of-Way Project Area 2

Irrigation Right-of-Way Project Area 2 (IROW-2) has been identified as a potential location for a trail alignment that provides bikeway connectivity along the southern portion of Central Avenue between the roadway and the existing open canal. IROW-2 would provide a connection between the residential areas of Central Avenue and Sycamore Parkway, as illustrated in Figure 5-1. The existing canal footprint is considerably wider than most WID canals and would be difficult to culvert and would result in significant ground disturbance and tree removal. Based on these conditions, it is recommended that the existing adjacent open canal path be upgraded to Class I bikeway facility consistent with Figure 5-3.

3. Irrigation Right-of-Way Project Area 3

A bikeway facility in Irrigation Right-of-Way Project Area 3 (IROW-3) would provide east-west connectivity along the existing WID open canal north of Valpico Road. IROW-3 would connect the existing Class I bikeway along Sycamore Parkway and residences to the west. This open canal is in an area that is likely to grow in the future and could be developed with either of the irrigation right-of-ways typical sections described above.



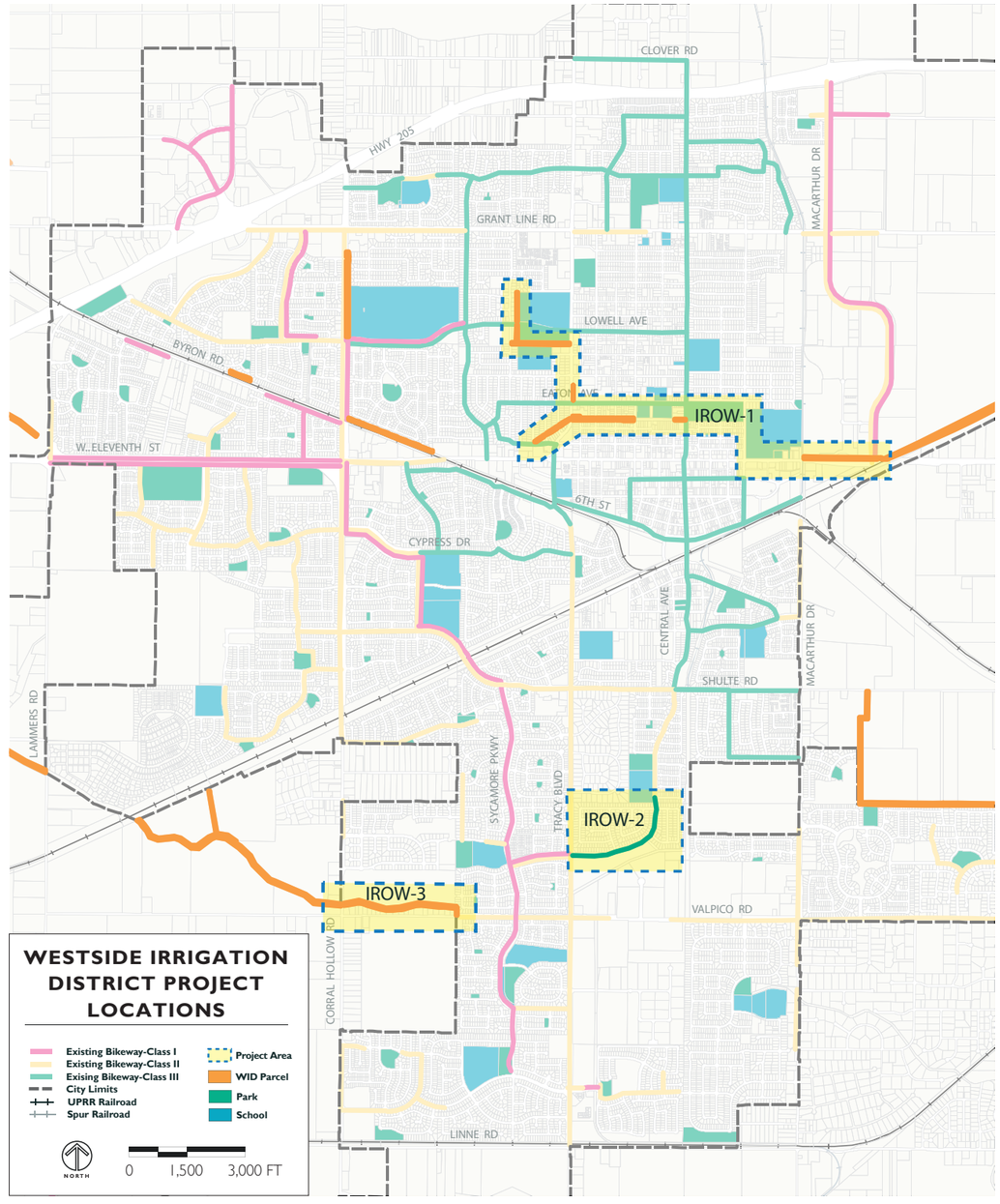
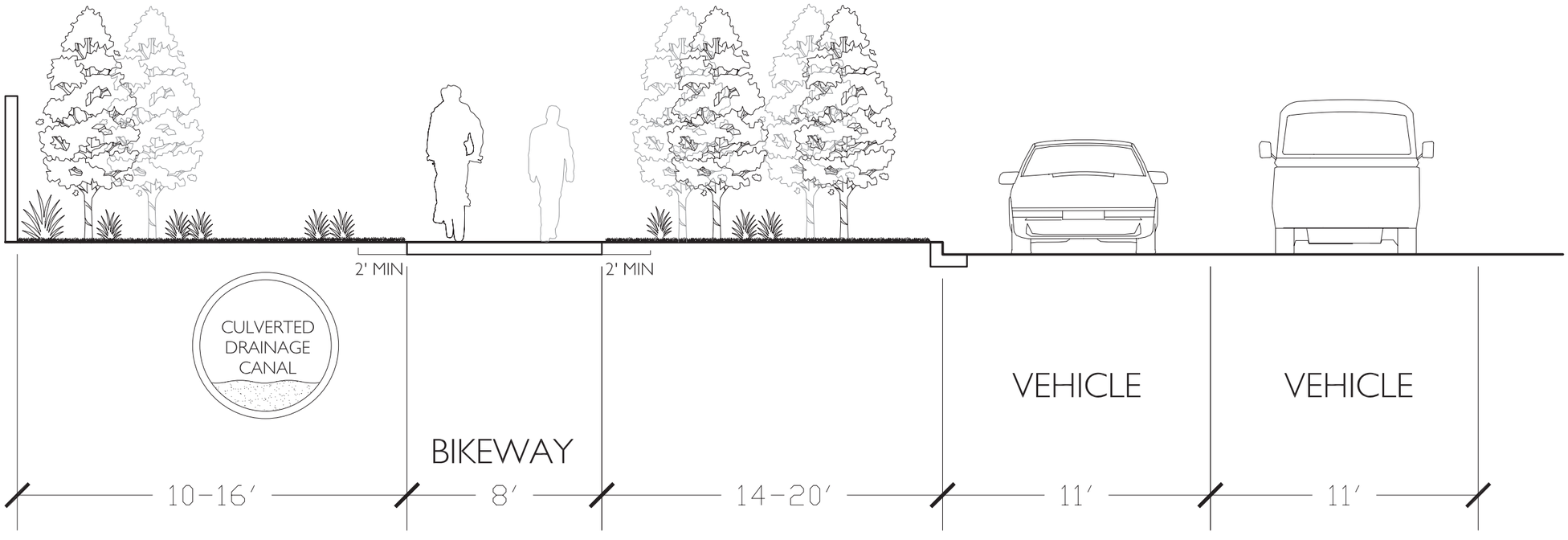


FIGURE 5-1: **IRRIGATION RIGHT-OF-WAY LAND HOLDING AND PROJECT LOCATIONS**



NOTE:
1- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

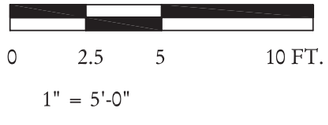
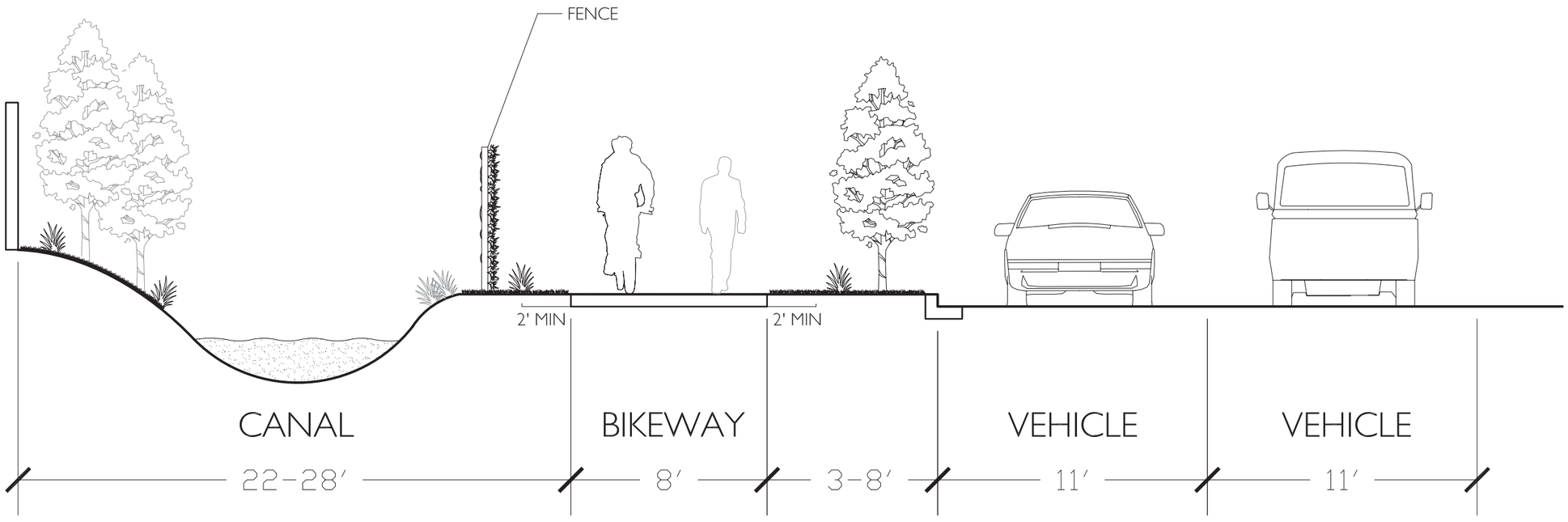


FIGURE 5-2: **IRRIGATION RIGHT-OF-WAY - TYPICAL SECTION CULVERT**



NOTE:
1- ALL MEASUREMENTS ARE APPROXIMATE, BASED ON FIELD OBSERVATION AND ARE FOR PLANNING PURPOSES ONLY. NO ENGINEERING SURVEYS HAVE BEEN COMPLETED.

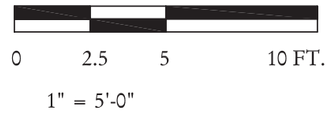


FIGURE 5-3: **IRRIGATION RIGHT-OF-WAY - TYPICAL SECTION OPEN CANAL**

This chapter describes project costs, an implementation plan, right-of-way strategies and funding strategies for the proposed improvements identified in this Design Supplement. The implementation plan includes a timeframe for the proposed projects and potential phasing opportunities. Right-of-way strategies discuss possible negotiation approaches for working with Union Pacific Railroad and the Westside Irrigation District.

I. Project Cost Estimates

This section presents cost estimates for the roadside, rail-with-trail and irrigation right-of-way bikeways projects, including annual operations and maintenance estimates. The total cost for the projects identified in this Design Supplement is estimated at approximately $23.4 to $34.8 million, depending upon the project selected. Cost estimates were developed using 2008 dollars, and are based on unit costs from recent 2008 bikeway construction projects in the San Francisco Bay Area and Central Valley.

A. Unit Cost Assumptions

This section presents a summary of the unit cost assumptions used to estimate the cost of each of the primary trail types presented in this Design Supplement and is described in more detail in Appendix A: Detailed Project Cost Estimates. Estimated costs are derived from the unit cost, then applied on a linear basis. The detailed project cost estimates are divided into two categories: bikeway infrastructure and bikeway amenities. The bikeway infrastructure includes the core facilities needed to build the minimum bikeway facilities. Items include all proposed hardscape, curb and gutter installation, wheelchair ramps, Class II striping and any necessary barriers or fencing. The bikeways amenities section includes all items necessary to create a user-friendly bikeway facility, including landscape improvements, gateway features, signage, information kiosks, benches and trash cans.

1. Unit and Quantity

Estimated costs for both the bikeway infrastructure and bikeway amenities categories are calculated per linear foot (LF). It is assumed that amenities such as benches and information kiosks will be located every 1300 (~1/4 mile) to 2600 (~1/2 mile) feet to create a usable bikeway environment. Any variations to these assumed distances would be adjusted in the detailed project design and final cost estimate.

2. Low and High Unit Costs

The project cost estimates provide low and high unit cost estimates for the bikeway infrastructure. This range allows for variation in the materials and design of each item.

3. Low and High Unit Cost Subtotals

Subtotal costs include the bikeway infrastructure cost and bikeway amenities. Together, this provides a subtotal cost estimate for each project.

4. Total Costs

Two separate cost totals are provided: total construction cost per linear foot, and total anticipated cost per linear foot. The total construction cost per linear foot is an estimate of all built features, including any necessary demolition and all installation costs. The anticipated total cost estimate per linear foot includes general assumptions regarding "soft costs" such as, construction contingency fees, and a project-specific design cost. Additional project mobilization costs are included in the total anticipated cost estimate.

B. Cost Estimates by Project Type

Preliminary cost estimates are presented here for the roadside, rail-with-trail and irrigation right-of-way trail segments and include necessary crossing improvements. Table 6-1 provides sub-total cost estimates for roadside bikeway facilities, Table 6-2 provides sub-total cost estimates for rail-with-trail bikeway facilities and Table 6-3 provides sub-total cost estimates for irrigation right-of-way bikeway facilities. Table 6-4 includes all three project type sub-total costs and calculates the anticipated total cost.

1. Roadside Bikeways Cost Breakdown

The total distance of the roadside bikeway improvements are 37,800 linear feet or approximately 7.2 miles. The average width of the roadside bikeways typical sections is approximately 20 feet. 37,800 linear feet multiplied by 20 feet results in an improvement area of approximately 756,000 square feet. The low subtotal of $4,740,360 and high subtotal of $7,644,640 divided by 756,000 square feet equals an average construction cost ranging from approximately $6.27 to $10.11 per square foot.

2. Rail-With-Trail Cost Breakdown

The total linear feet and the crossing improvements for the rail-with-trail projects vary depending on the option selected. Therefore, an average cost per square foot for the rail-with-trail projects cannot accurately reflect the average improvement cost per square foot due to trail segment options and the specific lump sum cost for crossing improvements.

The UPRR has indicated that it is currently not interested in selling property due to projected increased freight traffic and associated need to preserve right-of-way.[1] Based on UPRR's intent to retain ownership of the existing right-of-way, the cost estimate does not include right-of-way acquisition costs for the rail-with-trail Class I bikeways.

3. Irrigation Right-Of-Way Bikeways Cost Breakdown

The total distance of the irrigation right-of-way bikeway improvements is 19,200 linear feet, or approximately 3.6 miles. The average width of the irrigation right-of-way bikeways typical sections is approximately 30 feet. 19,200 linear feet multiplied by 30 feet results in an improvement area of

[1] Jerry Wilmoth, General Manager Network Infrastructure, Union Pacific Railroad. Personal communication with Chad Markell, Associate, DC&E. November 14, 2008.

approximately 576,000 square feet. The low subtotal of $6,254,640 and high subtotal of $8,198,760 divided by 576,000 square feet equals an average construction cost ranging from approximately $10.85 to $14.23 per square foot.

C. Annual Operations and Maintenance

The cost estimates for annual operations and maintenance per project type range from $6.00 to $10.80 per linear foot per year due to the variation in typical width of each section and vary based on project type. These cost estimates are generalized and do not include water cost for irrigation. The operations and maintenance cost estimates are detailed in Table 6-5.

1. Roadside Bikeways

This estimate assumes a $0.04 per square foot per month or $0.48 per square foot per year generalized cost. This figure assumes hardscape cleaning and repairs, irrigation repairs, plant pruning, mulching, and turf mowing for a more intensely planted landscape.

2. Rail-with-Trail

This estimate assumes a $0.02 per square foot per month or $0.24 per square foot per year generalized cost. This figure assumes minor hardscape cleaning and repairs, limited irrigation repairs, mulching and minimal plant maintenance for more sparsely planted landscape.

3. Irrigation Right-Of-Way Bikeways

This estimate assumes a $0.03 per square foot per month or $0.36 per square foot per year generalized cost. This figure assumes hardscape cleaning and repairs, minor irrigation repairs, plant pruning, and turf mowing for more a moderately planted landscape.

II. Implementation Plan

The implementation plan for this Design Supplement addresses the timeframe for bikeway improvements, possible phasing options and right-of-way strategies.

A. Bikeway Improvement Timeframe

The bikeway projects identified in this Design Supplement have been categorized into short-term (1-5 years), medium-term (6-10 years) and long-term (11+ years) improvements. These timeframes are identified in Tables 6-2, 6-3, and 6-4 of the project cost estimates.

Short-term improvement projects primarily focus on critical gap closures in the existing Class I bikeway network and areas where regular use is anticipated. Additionally, projects that will increase bicyclist and pedestrian safety at key crossings were also identified as short-term. These improvements coincide primarily with the Rails-with-Trails crossing that will serve as an access location for the future Rails-with-Trails bikeways corridor. The total cost for short-term projects is estimated at approximately $4.9 to $6.3 million, depending upon the project selected.

Medium-term improvement projects focus on upgrades to existing bikeways and new facility construction to enhance the existing Class I bikeway network. Many of the existing Class II and III bikeways can be utilized to serve as connections to the Class I bikeway network until funding is made available for segment improvements. Additionally, some of these medium-term projects involve longer segments that could be phased over time. The total cost for medium-term projects is estimated at approximately $11 to $15.1 million, depending upon the project selected.

Similar to the medium-term projects, the long-term projects also focus on upgrades to existing bikeways as well as new facility construction that will enhance the existing Class I bikeway network. Many of the existing Class II or III bikeways can be utilized to serve as connections to the Class I bikeway network until funding is made available for segment improvements. Also, some of these projects would occur concurrently with new development and are therefore dependant on the timing of future development. The total cost for long-term projects is estimated at approximately $8 to $11.7 million, depending upon the project selected.

B. Bikeway Improvement Phasing Options

Most of the bikeway improvement projects identified in this Design Supplement can be completed as single projects. However, some of the longer segments may need to be phased commensurate with funding limitations. Phasing should occur only where projects can be divided into discrete sections where each section can be fully completed. The best locations for phasing occur where there are intersections or seamless transitions to existing Class II or III bikeways. Phased projects should never leave the trail user at a dead-end or without a safe connection to an alternative bicycle route. Projects identified in this Design Supplement with the potential for phasing include:

- RP-4: West Byron Road Connection
- RP-6: Corral Hollow Central Connection
- RP-8: Corral Hollow South Connection
- RP-12: Central Avenue Connection
- RWT-2: Trail Segment TTS to 1NW
- RWT-4: Trail Segment 1NW to 2NW
- RWT-5: Trail Crossing 2NW A/B (Options 1 or 2)
- RWT-7: Trail Segment TTS to 1SW
- RWT-13: Trail Segment TTS to 1NE
- IROW-1

Phasing is not feasible for the following Rail-with-Trail segments as there is no means to transition to alternative bicycle routes.

- RWT-5: Trail Crossing 2NW A/B (options 3 or 4)
- RWT-9: Trail Segment 1SW to 2SW
- RWT-11: Trail Segment 2SW to 3SW
- RWT-15: Trail Segment 1NE to Existing Class I facility

Table 6-1: **COST ESTIMATES FOR ROADSIDE BIKEWAYS**

Item	Description	Approximate Linear Feet (LF)	Low Unit $/LF	High Unit $/LF	Low Subtotal	High Subtotal	Timeframe
Roadside Project 1 – West Valley Mall Connection							
RP-1	Section A	1,600	$124	$153	$198,720	$245,280	1-5 years
	Section B	2,700	$208	$288	$561,465	$777,060	
Roadside Project 2 – West Grant Line Road Connection							
RP-2	Section A	800	$124	$153	$99,360	$122,640	1-5 years
	Section B	1,300	$208	$288	$270,335	$374,140	
	Section D Option 1	1,000	$218	$298	$217,950	$297,800	
	Section D Option 2	1,000	$181	$252	$180,950	$251,800	
	Section D Option 3	1,000	$156	$212	$155,950	$211,800	
Roadside Project 3 – West Lowell Avenue Connection							
RP-3	Section D Option 1	1,200	$218	$298	$261,540	$357,360	1-5 years
	Section D Option 2	1,200	$181	$252	$217,140	$302,160	
	Section D Option 3	1,200	$156	$212	$187,140	$254,160	
Roadside Project 4 – West Byron Road Connection							
RP-4	Section A	3,800	$124	$153	$471,960	$582,540	6-10 years
Roadside Project 5 – West Eleventh and Corral Hollow Road Connection							
RP-5	Section D Option 1	800	$218	$298	$174,360	$238,240	1-5 years
	Section D Option 2	800	$181	$252	$144,760	$201,440	
	Section D Option 3	800	$156	$212	$124,760	$169,440	
Roadside Project 6 – Corral Hollow Road Central Connection							
RP-6	Section B	450	$208	$288	$93,578	$129,510	11+ years
	Section C Option 1	4,500	$218	$298	$980,775	$1,340,100	
	Section C Option 2	4,500	$181	$252	$814,275	$1,133,100	
	Section C Option 3	4,500	$156	$212	$701,775	$953,100	
Roadside Project 7 – Corral Hollow Road South Central Connection							
RP-7	Section A	1,000	$124	$153	$124,200	$153,300	11+ years
	Section C Option 1	1,600	$218	$298	$348,720	$476,480	
	Section C Option 2	1,600	$181	$252	$289,520	$402,880	
	Section C Option 3	1,600	$156	$212	$249,520	$338,880	
Roadside Project 8 – Corral Hollow Road South Connection							
RP-8	Section A	400	$124	$153	$49,680	$61,320	11+ years
	Section B	700	$208	$288	$145,565	$201,460	
	Section C Option 1	1,500	$218	$298	$326,925	$446,700	
	Section C Option 2	1,500	$181	$252	$271,425	$377,700	
	Section C Option 3	1,500	$156	$212	$233,925	$317,700	

Table 6-1: **COST ESTIMATES FOR ROADSIDE BIKEWAYS (Continued)**

Item	Description	Approximate Linear Feet (LF)	Low Unit $/LF	High Unit $/LF	Low Cost Trail	High Cost Trail	Timeframe
Roadside Project 9 – South Tracy Boulevard Connection							
RP-9	Section B	700	$208	$288	$145,565	$201,460	1-5 years
	Section C Option 1	350	$218	$298	$76,283	$104,230	
	Section C Option 2	350	$181	$252	$63,333	$88,130	
	Section C Option 3	350	$156	$212	$54,583	$74,130	
	Section E	1,300	$3.20	$3.30	$4,160	$4,290	
Roadside Project 10 – Rail-with-Trail Schulte Road Connection							
RP-10	Section C Option 1	1,800	$218	$298	$392,310	$536,040	6-10 years
	Section C Option 2	1,800	$181	$252	$325,710	$453,240	
	Section C Option 3	1,800	$156	$212	$280,710	$381,240	
Roadside Project 11 – Sycamore Parkway Connection							
RP-11	Section D Option 1	1,600	$218	$298	$348,720	$476,480	6-10 years
	Section D Option 2	1,600	$181	$252	$289,520	$402,880	
	Section D Option 3	1,600	$156	$212	$249,520	$338,880	
Roadside Project 12 – Central Avenue Connection							
RP-12	Section A	1,300	$124	$153	$161,460	$199,290	11+ years
	Section D Option 1	1,000	$218	$298	$217,950	$297,800	
	Section D Option 2	1,000	$181	$252	$180,950	$251,800	
	Section D Option 3	1,000	$156	$212	$155,950	$211,800	
Roadside Project 13 – Grant Line Road Connection							
RP-13	Section F	6,400	$3.20	$3.30	$20,480	$21,120	1-5 years
	Total Linear Feet	**37,800**		**Low Cost Sub-Total**	**$4,740,360**	**$6,324,540**	
				High Cost Sub-Total	**$5,692,060**	**$7,644,640**	

Table 6-2: **COST ESTIMATES FOR RAIL-WITH-TRAIL BIKEWAYS**

Item	Description	Approximate Linear Feet (LF)	Low Unit $/LF	High Unit $/LF	Low Cost Trail	High Cost Trail	Crossing Improvement	Low Subtotal	High Subtotal	Timeframe
Tracy Transit Station (TTS)										
RWT-1	Tracy Transit Station (TTS) Crossing	900	$219	$302	$197,055	$271,620	$21,000	$218,055	$292,620	1-5 years
Northwest Alignment										
RWT-2	TTS to 1NW Trail Segment	3,000	$219	$302	$656,850	$905,400	$0	$656,850	$905,400	6-10 years
RWT-3	1NW Crossing		$219	$302	$0	$0	$18,000	$18,000	$18,000	1-5 years
RWT-4	1NW to 2NW Trail Segment	2,700	$219	$302	$591,165	$814,860	$0	$591,165	$814,860	11+ years
RWT-5	2NW to 3NW Option 1 Trail Segment & Crossing	3,400	$219	$302	$744,430	$1,026,120	$4,000	$748,430	$1,030,120	6-10 years
	2NW to 3NW Option 2 Trail Segment & Crossing	3,300	$219	$302	$722,535	$995,940	$10,000	$732,535	$1,005,940	
	2NW to 3NW Option 3 Trail Segment & Crossing	1,400	$219	$302	$306,530	$422,520	$2,000	$308,530	$424,520	
	2NW to 3NW Option 4 Trail Segment & Crossing	700	$219	$302	$153,265	$211,260	$55,000	$208,265	$266,260	
RWT-6	3NW Crossing (Option 1)		$219	$302	$0	$0	$12,000	$12,000	$12,000	1-5 years
	3NW Crossing (Option 2,3,4)		$219	$302	$0	$0	$15,000	$15,000	$15,000	
Southwest Alignment										
RWT-7	TTS to 1SW Trail Segment	2,800	$219	$302	$613,060	$845,040	$0	$613,060	$845,040	6-10 years
RWT-8	1SW Crossing		$219	$302	$0	$0	$255,000	$255,000	$255,000	1-5 years
RWT-9	1SW to 2SW Trail Segment	2,600	$219	$302	$569,270	$784,680	$100,000	$669,270	$884,680	11+ years
RWT-10	2SW Option 1 Crossing	2,200	$219	$302	$481,690	$663,960	$2,000	$483,690	$665,960	11+ years
	2SW Option 2 Crossing	300	$219	$302	$65,685	$90,540	$37,000	$102,685	$127,540	
RWT-11	2SW to 3SW Trail Segment	3,000	$219	$302	$656,850	$905,400	$0	$656,850	$905,400	11+ years
RWT-12	3SW Crossing		$219	$302	$0	$0	$10,000	$10,000	$10,000	1-5 years
Northeast Alignment										
RWT-13	TTS to 1NE Trail Segment	2,500	$219	$302	$547,375	$754,500	$0	$547,375	$754,500	6-10 years
RWT-14	1NE Trail Crossing		$219	$302	$0	$0	$40,000	$40,000	$40,000	6-10 years
RWT-15	1NE to Existing Class I	2,200	$219	$302	$481,690	$663,960	$0	$481,690	$663,960	11+ years
							Low Cost Sub-Total	**$5,080,265**	**$6,795,260**	
							High Cost Sub-Total	**$6,004,435**	**$8,100,540**	

Notes: Item RWT-8 includes a full signal crossing improvement.
Item RWT-9 includes a pre-fabricted pedestrian bridge for the canal crossing in this segment.

Table 6-3: **COST ESTIMATES FOR IRRIGATION RIGHT-OF-WAY BIKEWAYS**

Item	Description	Approximate Linear Feet (LF)	Low Unit $/LF	High Unit $/LF	Low Cost Trail	High Cost Trail	Timeframe
Irrigation Right-of-Way Project Area 1							
IROW-1	Section Type Culvert	13,500	$323	$423	$4,359,825	$5,707,800	6-10 years
Irrigation Right-of-Way Project Area 2							
IROW-2	Section Type Open Canal	2,700	$343	$453	$925,965	$1,222,560	1-5 years
Irrigation Right-of-Way Project Area 3							
IROW-3	Section Type Culvert	3,000	$323	$423	$968,850	$1,268,400	11+ years
	Total Linear Feet	**19,200**		**Sub-Total Cost**	**$6,254,640**	**$8,198,760**	

Table 6-4: **COST ESTIMATES GRAND TOTAL**

Project Improvement	Low Subtotal	High Subtotal
Roadside Bikeway	$4,740,360	$7,644,640
10% Mobilization cost:	$474,036	$764,464
20% Contingency:	$948,072	$1,528,928
15% Design Fee:	$711,054	$1,146,696
Grand Sub-Total Cost	**$6,873,522**	**$11,084,728**
Rail-With-Trial Bikeways	$5,080,265	$8,100,540
10% Mobilization cost:	$508,027	$810,054
20% Contingency:	$1,016,053	$1,620,108
15% Design Fee:	$762,040	$1,215,081
Grand Sub-Total Cost	**$7,366,384**	**$11,745,783**
Irrigation Right-of-Way Bikew	$6,254,640	$8,198,760
10% Mobilization cost:	$625,464	$819,876
20% Contingency:	$1,250,928	$1,639,752
15% Design Fee:	$938,196	$1,229,814
Grand Sub-Total Cost	**$9,069,228**	**$11,888,202**
Grand Total Cost	$23,309,134	$34,718,713

Table 6-5: **COST ESTIMATES FOR ANNUAL OPERATIONS AND MAINTENANCE**

Project Improvement	Approximate Linear Feet (LF)	Cost/LF	Subtotal
Roadside Bikeway			
Roadside Project 1	4,300	$9.60	$41,280
Roadside Project 2	3,100	$9.60	$29,760
Roadside Project 3	1,200	$9.60	$11,520
Roadside Project 4	3,800	$9.60	$36,480
Roadside Project 5	800	$9.60	$7,680
Roadside Project 6	4,950	$9.60	$47,520
Roadside Project 7	2,600	$9.60	$24,960
Roadside Project 8	2,600	$9.60	$24,960
Roadside Project 9	2,350	$9.60	$22,560
Roadside Project 10	1,800	$9.60	$17,280
Roadside Project 11	1,600	$9.60	$15,360
Roadside Project 12	2,300	$9.60	$22,080
Roadside Project 13	6,400	$9.60	$61,440
		Sub-Total Cost	**$362,880**
Rail-With-Trail Bikeways			
Tracy Transit Station	900	$6.00	$5,400
Northwest Alignment			
with Option 1	9,100	$6.00	$54,600
with Option 2	9,000	$6.00	$54,000
with Option 3	7,100	$6.00	$42,600
with Option 4	6,400	$6.00	$38,400
Southwest Alignment			
with Option 1	10,600	$6.00	$63,600
with Option 2	8,700	$6.00	$52,200
Northeast Alignment	4,700	$6.00	$28,200
		Low Sub-Total Cost	**$124,200**
		High Sub-Total Cost	**$151,800**
Irrigation Right-of-Way Bikeways			
Project Area 1	13,500	$10.80	$145,800
Project Area 2	2,700	$10.80	$29,160
Project Area 3	3,000	$10.80	$32,400
		Sub-Total Cost	**$207,360**
		Low Cost Grand-Total	$694,440
		High Cost Grand-Total	$722,040

III. Right-of-Way Strategies

This section describes the options available to the City of Tracy for securing rights-of-way for bikeway improvement projects expected to occur on lands owned by Union Pacific Railroad and the Westside Irrigation District.

A. Union Pacific Railroad

The UPRR has indicated that it is currently not interested in selling property due to projected increased freight traffic and the associated need to preserve rights-of-way.[2] As an alternative to right-of-way acquisition, the City of Tracy should negotiate lease agreements with UPRR. Lease agreements have been successfully negotiated by other jurisdictions in the past and could potentially be similar to the example agreement between the Town of Truckee and UPRR provided in Appendix B: Implementation and Funding Support.

As a first step in negotiations, the City of Tracy or its representative should initiate direct communication with UPRR by calling and writing to the Land Leases/Property Management department in Omaha, Nebraska. The initial communication should convey a willingness to work with UPRR to ensure that a rail-with-trail program will not result in a negative impact on current or future rail line operations and that a rail-with-trail program will provide a benefit to the UPRR. Within the existing UPRR right-of-way in Tracy, occurrences of trespassing, vandalism and illegal dumping can readily be found. In addition, several of the rail line crossings are dangerous and do not meet current safety standards. By working together to develop a rail-with-trail program, the City can point out that UPRR will benefit from safety upgrades at dangerous rail line locations and from a reduction in illegal use.

Negotiations with UPRR should focus on issues related to trespassing, vandalism and illegal dumping and how a rail-with-trail program can limit these occurrences. To achieve this, the City of Tracy should present the information presented in Chapters 2 and 4 of this Design Supplement, focusing on specific design details, such as a 50-foot setback from the rail line (where possible) and the installation of the fencing and signage along the rail-with-trail to discourage trespassing. In addition, the City should point out that the final design will comply with the *Rails-with-Trails: Lessons Learned. Literature Review, Current Practices and Conclusions* prepared by the U. S. Department of Transportation in 2002.

Prior to signing any lease agreement, the City of Tracy might work with UPRR, and if necessary the California Public Utilities Commission (PUC), to first create a Memorandum of Understanding (MOU) that will indicate the parties' willingness to work together in the development of a rails-with-trials program that improves overall safety along the railway corridor and provides a general description of how the lease would be executed.

Once the MOU has been signed, the City can seek grant funding opportunities. After acquiring adequate funding for design and construction of a specific project, the City of Tracy would then work with UPRR to establish a formal lease agreement and complete the PUC application process.

The PUC must approve projects involving the construction of new, or alterations of existing, public or publicly-used railroad right-of-ways and crossings.[3] It should be noted that the PUC's primary concern will be related to railway safety, and any project musto include improved safety for both railway operations and the general public.

After approval of a project by the PUC, the UPRR could formally grant the City of Tracy an easement for the construction and maintenance of a bikeway along the UPRR right-of-way.

B. Westside Irrigation District

The City of Tracy has already initiated discussions with the Westside Irrigation District (WID) on future right-of-way strategies. On August 13, 2008, City representatives attended a WID Board Meeting to present preliminary design schematics and discuss the possible future development of bikeway facilities. The primary outcome of the meeting was the Board's stated willingness to work with the City of Tracy in developing a right-of-way strategy.

To achieve a successful right-of-way strategy in the future, the City of Tracy needs to create an approach that addresses culverted and open canal areas.

1. Culverted Holdings

To initiate the right-of-way negotiation process for culverted WID holdings, the City of Tracy should work with WID to first create a MOU to formalize the willingness of both parties to work together to develop bikeway facilities through land purchase, lease agreement or easement.

With an MOU in place, the City of Tracy can identify funding sources, including grant funding opportunities for design and construction. The City of Tracy would then work with WID to establish formal legal agreements for each specific segment. In these agreements, WID would formally grant the City of Tracy the approval for the construction and maintenance of a bikeway.

2. Open Canal Holdings

Currently, most of the WID open canal land holdings remain in undeveloped areas of the City. As these areas develop in the future, WID would like to have any remaining canals culverted as part of the development process.[4] As future development proposals are brought to the City of Tracy and WID, the City should work with WID to ensure that all development agreements or project approvals include provisions for culverting of open canals and construction of bikeway facilities, as specified in Chapter 5 of this Design Supplement.

The City of Tracy and WID should work together to create an MOU to formalize their commitment to requiring that future development includes both culverting of open canals and construction of the bikeway facilities shown in this Design Supplement.

IV. Funding Program Strategies

This section presents likely local, State and federal sources for recreational trails and non-motorized transportation facilities. Many of these programs are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs and benefits.

This section presents the most directly applicable and strategic programs for the projects in this Design Supplement where the City of Tracy will be

[2] Jerry Wilmoth, General Manager Network Infrastructure, Union Pacific Railroad. Personal communication with Chad Markell, Associate, DC&E. November 14, 2008.

[3] http://www.cpuc.ca.gov/PUC/Transportation/crossings/Filing+Procedures, accessed November 17, 2008.

[4] Discussion during the Westside Irrigation District Board Meeting. August 13, 2008.

competitive. Not all potential programs are presented in this section. Bikeway and trail funding resources, in addition to those presented here, are also listed in the California Bicycle Coalition's *California Guide to Bicycle Funding* and the Rails-to-Trails Conservancy's *California Trail Funding Matrix*.

A. Local Funding Sources

1. Developer Impact Fees

Developer impact fees are used to offset public infrastructure costs required to accommodate new development. These fees are determined based on the direct relationship between the need for the facilities and the growth from new development and are included in the City's nexus study.

Developer fees generally are used to cover local, rather than regional improvements for projects that are adjacent to planned corridor improvements. Developer fees could include bikeway improvements for projects identified in this Design Supplement. Fees to fund these projects should be included during the next update of the City's nexus study.

2. San Joaquin County Measure K

Measure K is the half-cent sales tax dedicated to multi-modal transportation projects in San Joaquin County. The Measure K program is administered by the San Joaquin Council of Governments (SJCOG), which acts as the Local Transportation Authority for San Joaquin County. The Measure K program allocates 1.3 percent of its total revenues over 20 years for bicycle facility projects within San Joaquin County. These projects may include improving existing bicycle facilities and/or planning, developing and constructing new facilities.

The Measure K Expenditure Plan requires that these funds be allocated according to a bicycle program and a periodic application process.[5] Funding for bicycle projects is allocated to two categories: competitive and non-competitive.

a. Non-Competitive Share

The Measure K Non-Competitive Bicycle Program is intended to fund bicycle projects that may not be competitive but are still important to a community. Funds for this program are allocated on a per capita basis, based on a county's total population.

i. Program Description

The 2008-2010 cycle is the eighth and final cycle in the 20-year Measure K program. Sixty percent of Measure K Bicycle Program revenues are allocated to the non-competitive category. The total amount for Cycle 8: 2008-2010 is estimated to be $674,996. Eligible applicants include the Cities and County of San Joaquin. The City of Tracy's population in 2008 is 80,505 residents or approximately 12 percent of the County population. As a result, $79,950 is available for the City to pursue.

ii. Eligible Projects

The Non-Competitive Bicycle Program supports the following types of projects:

- Class I Bikeway (Bicycle Path or Trail) with exclusive right-of-way for the bicycle.
- Class II Bikeways (Bicycle Lanes) within the paved area of highways.
- Class III Bikeways (Bicycle Routes) established along through routes not served by existing facilities.
- Class I or II bikeways, or connecting segments of bikeway.
- New planning, implementation studies or educational programs.
- Auxiliary facilities including, but not limited to: bicycle lockers or other storage facilities, bicycle-actuated traffic signals, traffic calming devices, landscaping, signage, lighting, bicycle-related roadway widening, restriping, parking removal and bridges.

iii. Application Process

SJCOG application forms are included in Appendix B: Implementation and Funding Support. City of Tracy must apply for and claim these funds by June 30, 2011.

b. Competitive Share

The Measure K program allocates 1.3 percent of its total revenue over 20 years for bicycle facility projects within San Joaquin County.

i. Program Description

These projects may include improving existing bicycle facilities and/or planning, developing, and constructing new facilities. For the 2007/2008 through 2010/2011 period, Measure K's competitive allocations will equal 40 percent of the bicycle revenues and is estimated to be $1,200,000.

All local agencies, including Caltrans and San Joaquin Regional Transit District (SJRTD), are eligible to apply for competitive funds. Jurisdictions using TDA pedestrian/bicycle money for other than pedestrian/bicycle projects are not eligible to apply for or receive Measure K bicycle funds. If pedestrian/bicycle monies are spent on road and street projects in any year after funds have been awarded, reimbursement for project costs will be discontinued at that time.

ii. Eligible Projects

The Competitive Bicycle Program will fund the following project types:

- Class I Bikeway (Bicycle Path or Trail) with exclusive right-of-way for the bicycle.
- Class II Bikeways (Bicycle Lanes) within the paved area of highways.
- Class III Bikeways (Bicycle Routes) established along through routes not served by existing facilities.
- Class I or II bikeways, or connecting segments of bikeway.
- New planning, implementation studies, or educational programs.
- Auxiliary facilities including but not limited to: bicycle lockers or other storage facilities, bicycle-actuated traffic signals, traffic calming devices, landscaping, signage, lighting, bicycle-related roadway widening, restriping, parking removal, bridges.

iii. Application Process

The current application funding cycle was completed in 2007 through FY 2010/2011. SJCOG application materials are included in Appendix B:

[5] Measure K Bicycle Program Guidelines attached in Appendix B and available online at http://www.sjcog.org/Programs"%20&%20Projects/Measure%20K_files/bicycle_program.htm, accessed September 30, 2008.

Implementation and Funding Support. Future cycles are not currently planned at this time.

3. San Joaquin Valley Air Pollution Control District

a. Program Description

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is a participant in the California vehicle registration fee surcharge program, in support of the California Clean Air Act. Funds from this program can be used to support programs and projects that reduce air pollution from motor vehicles and to implement Transportation Control Measures (TCMs) contained in local Air Quality Attainment Plans.

The SJVAPCD administers the Bicycle Infrastructure Incentive Remove II Program.[6] Funding for the Remove II program varies from year to year depending on the funding sources and project specific requirements. According to SJVAPCD staff, the District has always had money for the Remove II project applications received in the past, and one of the District's goals is to promote the Remove II program in an effort to receive more applications in the future.[7]

b. Eligible Projects

This program provides funds for construction of Class II bicycle lane projects and Class I multi-use trail projects. To be eligible, bicycle infrastructure projects must:

- Augment the existing commuter bicycle travel routes.
- Reduce the Vehicle Miles Traveled (VMT) and traffic congestion (idling) at the project site.
- Eliminate barriers or gaps within the general bicycle transportation network of the community.
- Contribute to the reduction of motor vehicle emissions and promotion of clean air.
- Contribute to the development of a widespread alternative transportation network of paths, lanes or routes for the benefit of commuter bicycling.
- Improve accessibility for commuter bicyclists to utilize the public transit system or contribute to intermodal transportation measures.
- Improve the general safety conditions for commuter bicyclists and increase their visibility or awareness to motorists.
- Contribute to the reduction of single occupancy vehicle (SOV) travel.
- Maps and description of the bicycle project design layout are included in this application submittal.
- For bicycle paths and lanes, the infrastructure project will comply with Caltrans design standards.

Proposed bikeway projects are not required to comply with all the above criteria. However it must demonstrate a quantitative contribution to air quality improvements.

c. Application Process

The most recent program solicitation and guidelines are included in Appendix B: Implementation and Funding Support. As of April SJAPCD is accepting applications for 2008.

B. State Program Sources

1. Bicycle Transportation Account

a. Program Description

The Bicycle Transportation Account (BTA) provides State funds for city and county projects that improve the safety and convenience of bicycle commuters. Between the FY 2001/2002 and 2008/2009, BTA has distributed approximately $7.2 million per year in funds for bikeway projects throughout the State.

b. Eligible Projects

Eligible projects include new bikeways that serve major transportation corridors, secure bicycle parking, bicycle-carrying facilities on transit vehicles, installation of traffic control devices, planning, bikeway improvements, maintenance and hazard eliminations. To be eligible for BTA funds, a city or county must prepare and adopt a Bicycle Transportation Plan (BTP) that complies with Streets and Highways Code Section 891.2. The City of Tracy complied with this requirement with the adoption of the *2005 Bikeways Master Plan*.

c. Application Process

BTA application materials along with a list of approved projects are included in Appendix B: Implementation and Funding Support.

San Joaquin County and member cities have not received BTA funding in recent grant cycles and should be competitive in the current and future cycles given increases in population, traffic congestion and air quality concerns. BTA project applications, coordinated by SJCOG, are due December 1, 2008.

2. Transportation Development Act (Article 3)

a. Program Description

The Transportation Development Act (TDA) of 1971 states that one quarter of every cent of retail sales tax must be returned to the county of origin for the purpose of funding transportation improvements in that county. Article 3 of the TDA law allows Regional Transportation Planning Agencies (RTPAs) to earmark two percent of the Local Transportation Fund (LTF) towards bicycle and pedestrian facilities. In these counties, TDA is one of the most important funding sources for bicycle and pedestrian facilities. In San Joaquin County SJCOG allocated a percentage of the LTF funds to cities based on population. The apportionment to the City of Tracy the past two cycles has been approximately $60,000 annually.

b. Eligible Projects

Typical projects funded by TDA funds in San Joaquin County have included in recent years sidewalk repairs, school signage, street reconstruction for pedestrian improvements, sidewalk maintenance, bicycle route improvements, and other related projects.

c. Application Process

SJCOG staff administer the TDA/LTF funds and can provide guidance to City of Tracy staff in addition to the information provided in Appendix B: Implementation and Funding Support. In February of each fiscal year, TPA/LTF money is estimated and approved by the COG Board. Estimates are then sent to claimants, including the City of Tracy, in March.

6 http://www.valleyair.org/transportation/removeII/BI.htm, accessed on September 30, 2008.
7 Ashley Clarke, Air Quality Specialist. San Joaquin Valley Air Pollution Control District. Personal communication with Chad Markell, Associate, DC&E. December 2, 2008.

3. State Legislated Safe Routes to School

Caltrans administers funding for Safe Routes to School (SRTS) projects through two separate and distinct programs: the federally legislated Program – SRTS, and State legislated Program – SR2S. Both are competitive reimbursement programs with the goal of increasing the number of children who walk or bicycle to school. The State legislated Program SR2S is discussed below.

a. Program Description

Established in 1999, the State legislated Safe Routes to School (SR2S) program came into effect with the passage of AB 1475. In 2001, SB 10 was enacted to extend the program for three additional years. In 2004, SB 1087 was enacted to extend the program three more years. And in 2007, AB 57 was enacted to extend the program indefinitely. Seven (7) cycles of the SR2S program have been completed. The seventh cycle (for FY 2006/2007 and FY 2007/2008) awarded $52,048,300 statewide.

b. Eligible Projects

Caltrans Local Assistance recommends the following process to develop projects that can effectively compete for funding.

- Identify community stakeholders and form a multidisciplinary team of partners committed to working together in developing a community vision, developing project applications, and implementing those projects if selected for funding.
- Inventory and identify safety needs or hazards around schools; get information and seek out resources; and propose alternatives that would correct those needs or hazards.
- Prioritize alternatives and adopt the best alternative that proposes short-term and long-term safety solutions in the form of projects.
- Develop a plan.
- Submit an application to secure funding for project within that plan.

When these criteria have been met and can be compellingly documented in a funded application, the project has a likelihood of funding success.

Specific eligible infrastructure project types include:

- New bicycle trails and paths, bicycle racks, bicycle lane striping and widening, new sidewalks, widening of sidewalks, sidewalk gap closures, curbs, gutters, and curb ramps.
- New pedestrian trails, paths, and pedestrian over and under crossings, roundabouts, bulb-outs, speed bumps, raised intersections, median refuges, narrowed traffic lanes, lane reductions, full or half-street closures, and other speed reduction techniques.
- Traffic control devices including new or upgraded traffic signals, crosswalks, pavement markings, traffic signs, traffic stripes, in-roadway crosswalk lights, flashing beacons, bicycle-sensitive signal actuation devices, pedestrian countdown signals, vehicle speed feedback signs, pedestrian activated upgrades, and all other pedestrian and bicycle-related traffic control devices.

In addition to the above listed infrastructure projects, the following non-infrastructure projects are eligible:

- Program Manager to coordinate SRTS efforts and volunteers at several schools.
- Create Walkable Community Workshop which includes a walk and bicycle audit.
- Provide a community with walkability checklist.
- Provide modest incentives for SRTS contests, and incentives that encourage more walking and bicycling over time.
- Pay for a substitute teacher, if needed, to cover for faculty attending SRTS functions during school hours.
- Procure equipment and training needed for establishing crossing guard programs.
- Conduct outreach to local press and community leaders.
- Pay for the cost of additional traffic enforcement or equipment needed for enforcement activities.

c. Application Process

Applications for the current funding cycle were reviewed and awarded in 2008 for FY 2006/2007 and 2007/2008. The application materials for Cycle 8 (FY 2008/2009 and 2009/2010) will be available in 2010 giving the City of Tracy ample time to identify and develop an appropriate project. Application guidance and materials will be available via Caltrans Local Assistance and is available in Appendix B: Implementation and Funding Support.[8]

C. Federal Program Sources

The Transportation Equity Act of the 21st Century (TEA-21) was authorized in 1997 and 2003 in continuation of the Intermodal Surface Transportation Efficiency Act (ISTEA). TEA-21 requires that local jurisdictions consider bicycling and walking in transportation plans and projects.

Bicycle projects can be funded directly or indirectly through all of the TEA-21 programs. The Congestion Mitigation and Air Quality (CMAQ) Improvement Program, the Recreational Trails Program, the Regional Surface Transportation Program (RSTP) and the Transportation Enhancement Activities (TEA) programs relate most directly to bicycle facilities and programs. In general, the federal government has designated the metropolitan planning organizations (MPOs) as the lead agency in developing long-range regional transportation plans (RTPs) and short-range programming documents called transportation improvement programs (TIP).

1. Congestion Management Air Quality Improvement Program

a. Program Description

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) was established by the 1991 Federal Intermodal Surface Transportation Efficiency Act (ISTEA) and was re-authorized with the passage of SAFETEA-LU. Funds are directed to transportation projects and programs which contribute to the attainment or maintenance of National Ambient Air Quality Standards in non-attainment or air quality maintenance areas for ozone, carbon monoxide, or particulate matter under provisions in the Federal Clean Air Act. CMAQ grant application information is available in Appendix B: Implementation and Funding Support.

[8] http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm, accessed September 30, 2008.

b. Eligible Projects

Eligible bicycle-related projects include bicycle transportation facilities (e.g., preliminary engineering, project planning studies and construction), bicycle route maps, bicycle activated traffic lights, bicycle safety and education programs and bicycle promotional programs. For example, San Joaquin County obtained $250,000 CMAQ in FY 1999/2000 for the Stanislaus River Bicycle and Pedestrian Bridge project.

c. Application Process

SJCOG conducted a three-year cycle call for projects in 2006. SJCOG received a total of thirty-five (35) applications totaling $47 million. There is a total of $20.4 million available for the three-year CMAQ cycle through FY 2009. The 2006 CMAQ cycle awarded federal funds for FY 2008/2009 through 2010/2011.

Several San Joaquin County projects awarded include pedestrian and/or bicycle facilities. These projects include intersection improvements, pedestrian crossings, construction of paved shoulders and sidewalks, and installation of bicycle lanes.

SJCOG anticipates that the next CMAQ call for projects will be conducted after the next federal transportation bill is authorized. This could be during FY 2009/2010 or 2010/2011, depending on when the bill is approved. This schedule will provide SJCOG with a better understanding of what apportionments to expect past 2010/2011.

The application process will be restructured prior to the next call for projects. SJCOG will generally provide local municipalities with a one- to two-month timeframe to submit applications. The project application must be accompanied with Emission Reduction Calculations using ARB's Air Quality Cost-Effectiveness methodology. This is a large component of the overall score of the project. The grant application package also includes the scoring criteria for each type of project, therefore the project sponsor should be aware of how their potential project could score and rank.

2. Federally Legislated Safe Routes to School

As mentioned previously, Caltrans administers funding for SRTS projects through two separate and distinct programs: the federally legislated Program – SRTS, and State legislated Program – SR2S. The federally legislated program is discussed below.

a. Program Description

Authorized by Section 1404 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the SRTS Program came into effect in August of 2005, and is funded at $612 million over five federal fiscal years (FY 2005-2009). During this period it is anticipated that California will receive approximately $67,533,954 in project funding.[9] It is expected that this will remain an on-going funding source that will be included in the next cycle of the Federal Highway Bill, anticipated in 2010.

This federal funding program emphasizes community collaboration in the development of projects, and projects that incorporate elements of the five E's – education, encouragement, engineering, enforcement and evaluation.

b. Eligible Projects

Caltrans Local Assistance recommends the following process to develop projects that can effectively compete for funding.

- Identify community stakeholders and form a multidisciplinary team of partners committed to working together in developing a community vision, developing project applications, and implementing those projects if selected for funding.
- Inventory and identify safety needs or hazards around schools; get information and seek out resources; and propose alternatives that would correct those needs or hazards.
- Prioritize alternatives and adopt the best alternative that proposes short-term and long-term safety solutions in the form of projects.
- Develop a plan.
- Submit an application to secure funding for project within that plan.

When these criteria have been met and can be compellingly documented in a funded application, the project has a likelihood of funding success.

Specific eligible infrastructure project types include:

- New bicycle trails and paths, bicycle racks, bicycle lane striping and widening, new sidewalks, widening of sidewalks, sidewalk gap closures, curbs, gutters, and curb ramps.
- New pedestrian trails, paths, and pedestrian over and under crossings, roundabouts, bulb-outs, speed bumps, raised intersections, median refuges, narrowed traffic lanes, lane reductions, full or half-street closures, and other speed reduction techniques.
- Traffic control devices including new or upgraded traffic signals, crosswalks, pavement markings, traffic signs, traffic stripes, in-roadway crosswalk lights, flashing beacons, bicycle-sensitive signal actuation devices, pedestrian countdown signals, vehicle speed feedback signs, pedestrian activated upgrades, and all other pedestrian and bicycle-related traffic control devices.

In addition to the above listed infrastructure projects, the following non-infrastructure projects are eligible:

- Program Manager to coordinate SRTS efforts and volunteers at several schools.
- Create Walkable Community Workshop which includes a walk and bicycle audit.
- Provide a community with walkability checklist.
- Provide modest incentives for SRTS contests, and incentives that encourage more walking and bicycling over time.
- Pay for a substitute teacher, if needed, to cover for faculty attending SRTS functions during school hours.
- Procure equipment and training needed for establishing crossing guard programs.
- Conduct outreach to local press and community leaders.
- Pay for the cost of additional traffic enforcement or equipment needed for enforcement activities.

[9] http://www.saferoutesinfo.org/legislation_funding/federal.cfm, accessed December 1, 2008.

c. Application Process
The SRTS Program requires a detailed six-part application procedure provided by FHWA and Caltrans Local Assistance. Application materials are available through Caltrans Local Assistance and are provided in Appendix B: Implementation and Funding Support.

3. Recreational Trails Program

a. Program Description
The Recreational Trails Program (RTP) provides funds annually for recreational trails and trails-related projects. The RTP is administered at the federal level by the Federal Highway Administration (FHWA). It is administered at the State level by the California Department of Parks and Recreation (DPR). Non-motorized projects are administered by the Department's Office of Grants and Local Services and motorized projects are administered by the Department's Off-Highway Motor Vehicle Recreation Division.

b. Eligible Projects
The maximum amount of RTP funds allowed for each project is 88 percent of the total project cost. The applicant is responsible for obtaining a match amount that is at least 12 percent of the total project cost.

Eligible non-motorized projects under the RTP include:

- Acquisition of easements and fee simple title to property for Recreational Trails or Recreational Trail corridors. (This must involve a willing seller.)
- Development and Rehabilitation of trails, Trailside and Trailhead Facilities.
- Construction of new trails.

Projects must comply with the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), the National Historic Preservation Act, the Endangered Species Act and the Americans with Disabilities Act (ADA).

RTP funded projects in California are geographically dispersed throughout the State and include major trail and greenway projects in cities such as Folsom, Santa Ana, San Diego and many others. Projects in California received $5,357,326 in the FY 2008/2009 grant cycle.

c. Application Process
The California RTP program is administered by California State Parks, Office of Grants and Local Services. The RTP guide and application materials are included in Appendix B: Implementation and Funding Support.

4. Transportation Enhancements

a. Program Description
Transportation Enhancements (TE) activities are federally funded community-based projects that expand travel choices and enhance the transportation experience by improving the cultural, historic, aesthetic and environmental aspects of our transportation infrastructure. California receives about $70 million per year in TE funding. The TE Program is a reimbursable capital-improvement program requiring a local or State matching share for each phase of work. Projects must comply with federal environmental requirements and other federal regulations, including those for considering disadvantaged business enterprises in consultant selection and for paying prevailing wages during construction.[10] TE grant application information is available in Appendix B: Implementation and Funding Support

b. Eligible Projects
Federal TE funds are to be used for transportation-related capital improvement projects that enhance quality-of-life, in or around transportation facilities. Projects must be over and above normal transportation projects and required mitigation, and the project must be directly related to the surface transportation system. For example, a reasonable nexus for the City of Tracy is to identify necessary pedestrian and bicycle infrastructure improvements resulting from the State Route 205 widening projects.

Relevant TE project categories for implementation of pedestrian and bicycle facilities identified in this Design Supplement include:

- Provision of facilities for pedestrians and bicycles.
- Provision of safety and educational activities for pedestrians and bicyclists.
- Acquisition of scenic easements and scenic/historic sites.
- Landscaping and other scenic beautification.
- Preservation of abandoned railway corridor (including the conversion and use thereof for pedestrian or bicycle trails).

The federal criteria have been used exclusively since the California Transportation Commission (CTC) abolished the State Transportation Enhancement Activities (TEA) Program in 2002. For the State's share, districts are encouraged to add enhancements to regular transportation projects rather than create stand-alone transportation enhancement projects.

c. Application Process
Caltrans Local Assistance Office provides guidance on current TE cycles and project competitiveness. SJCOG staff is involved in setting local priorities for use of TE funds. City of Tracy staff should consult with Local Assistance and SJCOG on development of linkage between future federally funded roadway projects and locally planned pedestrian and bicycle improvements.

V. Project Funding Matrix

This section links proposed projects to the potential funding sources described above. Table 6-6 presents each project with estimated project costs, implementing agency, grant sources, maximum amounts available through specific grant programs, and relevant grant cycle information where it is available. Some grant programs cycle information is not available until transportation agencies publish dates closer to the actual availability of funds.

In the case of all competitive grant programs, it is critical for the locally responsible party to maintain a close working relationship with the grant manager in order to best understand grant program criteria, special program considerations and timelines.

[10] http://www.dot.ca.gov/hq/transprog/ocip/stip2008_te.html, accessed December 1, 2008.

TABLE 6-6 **PROJECT FUNDING SOURCES**

Project Name/Reference	Implementing Department or Agency	Project Linkages	Project Cost Estimate	Grant Sources	Grant Maximum(s)	Local Match Requirements	Grant Cycle Information
Roadside Bikeways	City of Tracy ♦ Public Works ♦ Recreation and Parks	Landscape Maintenance Districts improvements Arterial resurfacing, signal upgrades, pedestrian safety projects	$6,873,522 to $11,084,728	Measure K – Non-competitive	$79,950	Not Identified	Apply for and claim funds by June 30, 2011.
				Measure K - Competitive	$1,200,000	Not Identified	Future cycles not currently planned.
				SJVAPCD	Up to $150,000 per Class I project Up to $100,000 per Class II project	Not Identified	On-going.
				BTA	$1,800,000	10% of project cost	Grant applications for FY 2009/10 must have a BTP adopted by December 31, 2008.
				TDA	Based on % of available funds form sales tax.	Not Identified	Yearly estimates are sent to Tracy by the COG Board every March.
				SRTS	$1,000,000 per infrastructure project $500,000 per non-infrastructure project	Not Required	On-going funding source pending Federal Highway Bill, next cycle anticipated in 2010.
				SR2S	$900,000	10% of project cost	Application material for Cycle 8 call for projects expected to be announced before the end of 2008.
				CMAQ	Must identify projects over $2,000,000	0%-20% (Depending on project type)	Next call for projects anticipated in FY 2009/2010 or 2010/2011, when next federal transportation bill is passed.
Rail-with-Trail Bikeways	City of Tracy ♦ Public Works ♦ Recreation and Parks	At-grade railroad crossing safety upgrades Mitigation for in-creased rail traffic	$7,366,384 to $11,745,783	Measure K – Non-competitive	$79,950	Not Identified	Apply for and claim funds by June 30, 2011.
				Measure K - Competitive	$1,200,000	Not Identified	Funding cycle for FY 2010/2011 was completed in 2007. Future cycles not currently planned.
				SJVAPCD	Up to $150,000 per Class I project	Not Identified	On-going
				BTA	$1,800,000	10% of project cost	Grant applications for FY 2009/10 must have a BTP adopted by December 31, 2008.
				RTP	The maximum amount of RTP funds allowed for each project is 88%	12% of the project	Applicants are expected to submit completed Applications by the first work day in October. California projects received $5,375,326 in the FY 2008/2009 cycle.
				TE	Not identified	Not Identified	Consult with Caltrans Local Assistance Office and SJCOG on developing linkages federally funded roadway projects and locally planned pedestrian and bicycle improvements.
Irrigation Right-of-Way Bikeways	City of Tracy ♦ Public Works ♦ Recreation and Parks ♦ Community Development Westside Irrigation District	Residential Subdivision Land Use Applications and Entitlements WID Culverting	$9,069,228 to $11,888,202	Measure K – Non-competitive	$79,950	Not Required	Apply for and claim funds by June 30, 2011.
				Measure K - Competitive	$1,200,000	Not Required	Funding cycle for FY 2010/2011 was completed in 2007. Future cycles not currently planned.
				SJVAPCD	Up to $150,000 per Class I project	Not Identified	On-going.
				SRTS	$1,000,000 per infrastructure project $500,00 per non-infrastructure project	Not Required	On-going funding source pending Federal Highway Bill, next cycle anticipated in 2010.
				RTP	The maximum amount of RTP funds allowed for each project is 88%	12% of the project	Applicants are expected to submit completed Applications by the first work day in October.
				TE	Not identified	Not Identified	Consult with Caltrans Local Assistance Office and SJCOG on developing linkages to federally funded roadway projects and locally planned pedestrian and bicycle improvements.

This section presents detailed cost estimates for each project presented above in this Design Supplement which were used in creating the project cost estimates in Table 6-1, 6-2 and 6-3 in Chapter 6 of this Design Supplement. Cost estimates were developed based on unit costs from recent bikeways construction projects in the San Francisco Bay Area and Central Valley communities.

1. Detailed Project Cost Estimates

The detailed project cost estimates are divided into two categories:

a. Bikeway Infrastructure

The bikeway infrastructure includes the core facilities necessary to build the minimum bikeway requirements. Items in the infrastructure section include all proposed hardscape, curb and gutter installation, wheelchair ramps, Class II striping and any necessary barriers or fencing.

b. Bikeway Amenities

Facilities in the amenities section include items necessary to create a user-friendly bikeway facility including landscape improvements, gateway features, signage, information kiosks, benches and trash cans.

2. Linear Feet (LF) Unit

All detailed project cost estimates were created based on a linear foot estimate.

3. Low and High Unit Costs

These columns provide low and high unit costs for each item. This range allows for variation in the materials and design of each item.

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION A

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$124**	**$153**	
1.0	Concrete Paving Sidewalk-scored (8 SF per LF)	LF	$72	$96			
1.1	Concrete Curb and gutter Installation	LF	$40	$40			
1.2	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
1.3	42" Roadside Barrier	LF	$10	$15			
Bikeway Amenities					**$0.20**	**$0.30**	
2.0	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$124**	**$153**	
				10% Mobilization Cost:	**$12**	**$15**	
				20% Contingency:	**$25**	**$31**	
				15% Design Fee:	**$19**	**$23**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$180**	**$222**	

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION B

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$74**	**$98**	
1.0	Concrete Paving Sidewalk-scored (8 SF per LF)	LF	$72	$96			Square foot cost of concrete for interior of sidewalk only.
1.1	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$208**	**$288**	
				10% Mobilization Cost:	**$21**	**$29**	
				20% Contingency:	**$42**	**$58**	
				15% Design Fee:	**$31**	**$43**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$302**	**$417**	

***Cost Estimates based on 2008 prices

All items listed include installation costs.

LF Linear Foot

SF Square Foot

4. Low and High Unit Cost Subtotals

These columns provide separate subtotals for the bikeway infrastructure costs and the bikeway amenities costs based on the low and high unit costs.

5. Total Costs

Two separate cost totals are provided:

a. Total Construction Cost Per Linear Foot

The total construction cost per linear foot is an estimate of all built features, including any necessary demolition and all installation costs.

b. Total Anticipated Cost Per Linear Foot

The anticipated total cost estimate per linear foot includes general assumptions regarding "soft costs" such as, construction contingency fees, and a project specific design cost. Additional project mobilization costs are included in the total anticipated cost estimate.

6. Notes and Assumptions

The notes and assumptions column provide any additional specific information relevant to a specific line item.

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION C - Option1

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$84**	**$108**	
1.0	Demo Existing Concrete Sidewalk (5 SF per LF)	LF	$10	$10			
1.1	Concrete Paving Sidewalk-scored (8 SF per LF)	LF	$72	$96			
1.2	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$218**	**$298**	
				10% Mobilization Cost:	**$22**	**$30**	
				20% Contingency:	**$44**	**$60**	
				15% Design Fee:	**$33**	**$45**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$316**	**$432**	

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION C - Option 2

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$47**	**$62**	
1.0	Unit Pavers to Widen Existing Sidewalk (3 SF per LF)	LF	$45	$60			
1.1	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$181**	**$252**	
				10% Mobilization Cost:	**$18**	**$25**	
				20% Contingency:	**$36**	**$50**	
				15% Design Fee:	**$27**	**$38**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$262**	**$365**	

***Cost Estimates based on 2008 prices

All items listed include installation costs.

LF Linear Foot

SF Square Foot

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION C - Option 3

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$22**	**$22**	
1.0	Decomposed Granite with Stabilizer to Widen Existing Sidewalk (3 SF per LF)	LF	$20	$20			
1.1	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$156**	**$212**	
				10% Mobilization Cost:	**$16**	**$21**	
				20% Contingency:	**$31**	**$42**	
				15% Design Fee:	**$23**	**$32**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$226**	**$307**	

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION D - Option1

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$84**	**$108**	
1.0	Demo Existing Concrete Sidewalk (5 SF per LF)	LF	$10	$10			
1.1	Concrete Paving Sidewalk-scored (8 SF per LF)	LF	$72	$96			
1.2	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$218**	**$298**	
				10% Mobilization Cost:	**$22**	**$30**	
				20% Contingency:	**$44**	**$60**	
				15% Design Fee:	**$33**	**$45**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$316**	**$432**	

***Cost Estimates based on 2008 prices

All items listed include installation costs.

LF Linear Foot

SF Square Foot

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION D - Option 2

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$47**	**$62**	
1.0	Unit Pavers to Widen Existing Sidewalk (3 SF per LF)	LF	$45	$60			
1.1	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$181**	**$252**	
				10% Mobilization Cost:	**$18**	**$25**	
				20% Contingency:	**$36**	**$50**	
				15% Design Fee:	**$27**	**$38**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$262**	**$365**	

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION D - Option 3

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$22**	**$22**	
1.0	Decomposed Granite with Stabilizer (3 SF per LF)	LF	$20	$20			
1.1	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$134**	**$190**	
2.0	Landscape Buffer Planting (17 SF per LF)	LF	$125	$175			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$156**	**$212**	
				10% Mobilization Cost:	**$16**	**$21**	
				20% Contingency:	**$31**	**$42**	
				15% Design Fee:	**$23**	**$32**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$226**	**$307**	

***Cost Estimates based on 2008 prices

All items listed include installation costs.

LF Linear Foot

SF Square Foot

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION E

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$3.20**	**$3.30**	
1.0	Class II Bikeway Striping	LF	$3	$3			Includes striping on both sides of street.
1.1	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$3.20**	**$3.30**	
				10% Mobilization Cost:	**$0.32**	**$0.33**	
				20% Contingency:	**$0.64**	**$0.66**	
				15% Design Fee:	**$0.48**	**$0.50**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$4.64**	**$4.79**	

DETAILED COST ESTIMATE - ROADSIDE BIKEWAY TYPICAL SECTION F

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$3.20**	**$3.30**	
1.0	Class II Bikeway Striping	LF	$3	$3			Includes striping on both sides of street.
1.1	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$3.20**	**$3.30**	
				10% Mobilization Cost:	**$0.32**	**$0.33**	
				20% Contingency:	**$0.64**	**$0.66**	
				15% Design Fee:	**$0.48**	**$0.50**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$4.64**	**$4.79**	

DETAILED COST ESTIMATE - RAIL-WITH-TRAIL BIKEWAY TYPICAL SECTION

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Pedestrian Infrastructure					**$72**	**$96**	
1.0	Asphaltic Concrete/Scored Concrete (8 SF per LF)	LF	$72	$96			Class I Bikeway Trail - Includes grading, base and concrete.
Pedestrian Amenities					**$147**	**$206**	
2.0	Landscape Buffer Planting (10 SF per LF)	LF	$80	$120			Includes planting, irrigation, and mulch.
2.1	Gateway Features (16 Gateways at $10000-$12000 EA/1 per 2600 LF)	LF	$60	$75			Includes 1,500 SF landscape, split-rail fence, boulders, and (2) 24"trees (and (2) benches and (1) trash can for high unit.)
2.2	15 Gal Trees ($100-$160 per tree/1 per 40 LF)	LF	$3	$4			
2.3	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$219**	**$302**	
				10% Mobilization Cost:	**$22**	**$30**	
				20% Contingency:	**$44**	**$60**	
				15% Design Fee:	**$33**	**$45**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$317**	**$438**	

***Cost Estimates based on 2008 prices
All items listed include installation costs.

LF Linear Foot EA Each
SF Square Foot

DETAILED COST ESTIMATE - IRRIGATION RIGHT-OF-WAY BIKEWAY TYPICAL SECTION OPEN CANAL

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$94**	**$128**	
1.0	Concrete Paving Sidewalk-scored (8 SF per LF)	LF	$72	$96			Square foot cost of concrete for interior of sidewalk only
1.1	Barrier View Fence	LF	$20	$30			
1.2	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$249**	**$325**	
2.0	Landscape Buffer Planting (30 SF per LF)	LF	$240	$310			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$343**	**$453**	
				10% Mobilization Cost:	**$34**	**$45**	
				20% Contingency:	**$69**	**$91**	
				15% Design Fee:	**$51**	**$68**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$497**	**$657**	

DETAILED COST ESTIMATE - IRRIGATION RIGHT-OF-WAY BIKEWAY TYPICAL SECTION CULVERT

Item	Description	Unit	Low Unit $	High Unit $	Low Subtotal	High Subtotal	Notes & Assumptions
Bikeway Infrastructure					**$74**	**$98**	
1.0	Concrete Paving Sidewalk-scored (8 SF per LF)	LF	$72	$96			Square foot cost of concrete for interior of sidewalk only
1.1	Wheelchair Ramps ($2000 per ramp/1 per 1000 LF)	LF	$2	$2			Includes warning surface pavers, demolition costs and repaving asphalt at cuts.
Bikeway Amenities					**$249**	**$325**	
2.0	Landscape Buffer Planting (30 SF per LF)	LF	$240	$310			Includes planting, irrigation, and mulch.
2.1	15 Gal Trees ($100-$160 per tree/1 per 20 LF)	LF	$5	$8			
2.2	60 Day Maintenance (25 SF per LF)	LF	$2	$3			
2.3	Bench ($1200-$2400 per bench/1 every 1300 LF)	LF	$1	$2			
2.4	Information kiosks ($1300-$2600 per kiosk/1 per 2600	LF	$0.50	$1			
2.5	Bikeway Signage ($260-$390 per sign/1 per 1300 LF)	LF	$0.20	$0.30			
2.6	Trash Cans ($650-$1300 per trash can/1 every 2600	LF	$0.25	$0.50			
TOTAL CONSTRUCTION COST PER LINEAR FOOT					**$323**	**$423**	
				10% Mobilization Cost:	**$32**	**$42**	
				20% Contingency:	**$65**	**$85**	
				15% Design Fee:	**$48**	**$63**	
TOTAL ANTICIPATED COST PER LINEAR FOOT					**$468**	**$613**	

***Cost Estimates based on 2008 prices

All items listed include installation costs.

LF Linear Foot

SF Square Foot

The following provides a list of the example lease agreement and potential grant sources identified in Chapter 6 of this Design Supplement. These documents are included in the CD attached to the back of this document. The grant sources information includes relevant grant source paperwork and corresponding application information.

A. Example Lease Agreement

This is a copy of the Lease Agreement, provided as an example for reference purposes, between the Town of Truckee and Union Pacific Railroad Company.

B. Local Funding Sources

1. San Joaquin County Measure K

- Competitive Bicycle Program Guidelines
- Non-Competitive Bicycle Program Guidelines

2. San Joaquin Valley Air Pollution Control District

- Background Documentation
- Grant Application Form

C. State Program Sources

1. Bicycle Transportation Account

- Call for Projects Documentation
- Call for Projects Evaluation Form
- Grant Application Form

2. Transportation Development Act

- Program Guidelines
- Grant Application Form

3. Safe Routes to School

- Cycle Two Application Form

D. Federal Program Sources

1. Congestion Management Air Quality Improvement Program

- Federal Project Application Form

2. Safe Routes to School

- Cycle Two Application Form

3. Recreational Trails Program

- Program Guidelines
- Grant Application Form

4. Transportation Enhancemants

- Contact Information
- Program Guidelines
- Application Forms