



COUNTY OF ORANGE



Bike. Walk. Connect.

GAP FEASIBILITY STUDY



ACKNOWLEDGMENTS

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WHAT IS THE OC LOOP?

Project Overview

The Orange County Loop (OC Loop) will form a 66-mile continuous facility for bicycles and pedestrians throughout the west and north portion of Orange County. The OC Loop will link important existing regional facilities such as the Santa Ana River Bikeway, the Coastal Bikeway, the San Gabriel River Bikeway and the Coyote Creek Bikeway. Completion of the OC Loop will provide commuting, utility, and recreational opportunities for all users including bicyclists and pedestrians.

Implementing the OC Loop will satisfy a key project goal to provide a dedicated, off-road facility across the entire 66-mile route, where possible, to minimize exposure to vehicular traffic, and provide a facility that can be used safely and comfortably by a wide variety of users. This type of project will appeal to potential bicyclists from 8 to 80 years of age (often referred to as an 8-80 facility).

Much of the OC Loop is already built as a separate off-road facility closed to motor vehicle traffic, known as a class I bikeway. This provides for minimum exposure to motor vehicle traffic, however, portions of the route either do not exist or require users to ride or walk along or near vehicular traffic. The OC Loop, along with the segments that are the focus of this report, is shown in Figure 1.3.

This study was funded by the Southern California Association of Governments (SCAG) as a component of their 2012- 2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Project assistance was provided to the County of Orange (OC Parks) to identify ways to complete the OC Loop, propose feasible connections, and provide guidance for securing funds for the missing lengths. The Orange County Transportation Authority (OCTA) also provided assistance and conducted parallel activities to more fully engage the public, affected agencies, and prospective users.



Figure 1.1: Existing Santa Ana River Bikeway (source: OCTA)



Figure 1.2: Existing San Gabriel River Bikeway (source: OCTA)



PROJECT OVERVIEW MAP

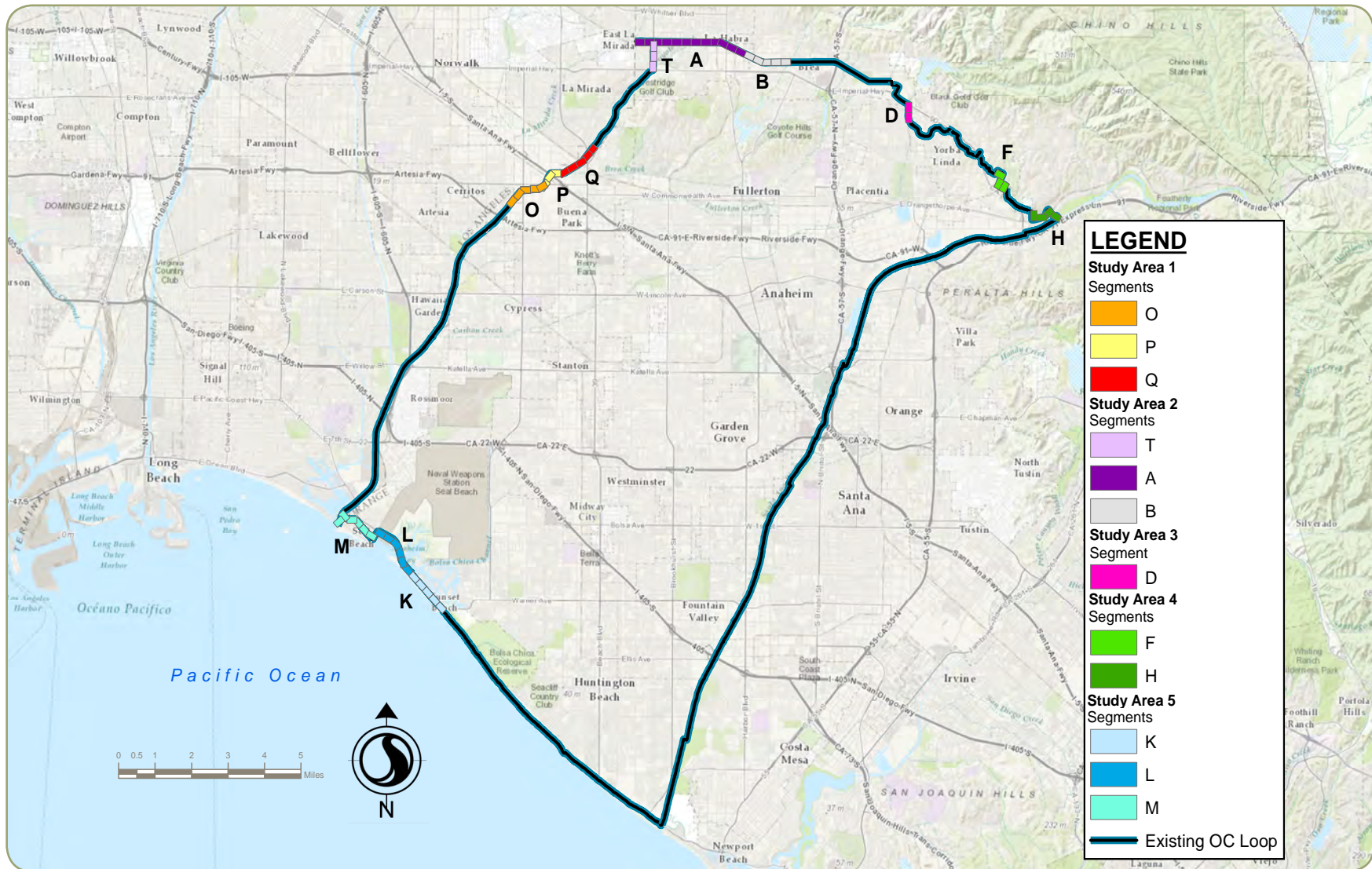


Figure 1.3: OC Loop Overview & Gap Segment Map

Project Locations and Limits

Most of the proposed OC Loop consists of existing class I bikeways and other shared use facilities. Approximately 1/3 of the OC Loop is not yet built and the necessary research to complete the gap segments has not been conducted. This study will discuss ways to complete the remaining gap segments, including an assessment of their challenges and appropriate solutions.

The OC Loop, and its component study areas and segments, have been defined in previous documents. SCAG and OC Parks have divided the OC Loop into five major segments, each connecting between existing facilities. OCTA subsequently subdivided these segments by assigning each with a letter designation. Segments that connect with each other have similar characteristics and challenges. These challenges are often shared with existing adjacent bikeway segments.

The incomplete segments are illustrated in Figure 1.3. A discussion of existing conditions, needs, challenges, and recommendations for completion are discussed on the following pages.

Strengths, Weaknesses, Opportunities and Challenges

This report includes a discussion of each segment's current conditions, and then provides a Strengths, Weaknesses, Opportunities and Challenges (SWOC) analysis for each. Strengths and weaknesses discuss internal aspects of each area that can be controlled at the site by infrastructure improvements, funding and/or investment and project improvement. Opportunities and Challenges evaluate external influences that can affect the project and project area, but are not as easily controlled by the lead agency, such as surrounding communities, economic factors, etc.

Recommendations

This section of the report includes a discussion of each Study Area's recommended gap closure and alignment for proposed gap closure. It includes the costs for the recommended alternative.

Overall Cost Estimate for Gap Closure

The estimated total cost of the OC Loop is \$87,266,000 for all Segments analyzed. Costs vary dramatically between Segments as some include major improvements such as undercrossings, signals, bridges, etc., whereas others consist of more minor improvements such as pavement striping and signage. The installation of undercrossings translates to relatively high costs for Segments A, D, O, P, and Q. Likewise, the installation of traffic signals and/or specialty signals contributes to the relatively high cost of Segments A, Q, and T. In addition, the estimates for Segment L include the cost of two new truss bridges dramatically increasing the cost. Segments F and K will cost much less to complete as improvements will consist of pavement markings (sharrows) and signage. Segment M is also comparatively inexpensive consisting primarily of bike lane striping and improvements to existing facilities.

Segment	Estimate	Segment	Estimate
O	\$7,000,000	F	\$30,000
P	\$8,500,000	H	\$3,500,000
Q	\$17,000,000	Study Area 4	\$3,530,000
Study Area 1	\$32,500,000	K	\$36,000
T	\$3,000,000	L	\$7,500,000
A	\$30,500,000	M	\$700,000
Study Area 2	\$33,500,000	Study Area 5	\$8,236,000
Study Area 3 / Segment D	\$9,500,000	OC Loop Total	\$87,266,000



BIKEWAY FACILITY TYPES

The general design for the OC Loop will follow accepted guidelines for bikeways as trails on a separate alignment from roadways, but some segments may need to be located along streets and highways. A definition of bikeway facility classes and types is offered for clarification and reference in latter portions of this study. Caltrans has established definitions for classes of bikeways which are used throughout the state for project description, design standards, and other purposes. Traditionally bikeways were divided into three classes, but a fourth class was recently created by a new State law.

Class I Bikeways

Class I Bikeways provide a paved right-of-way that is physically separated and independent from the street or highway. Bikeways provide recreational and commuter bicycling opportunities as well as a path for walkers and joggers. Class I Bikeways are commonly found along rivers, ocean fronts, canals, utility rights-of-way, and adjacent to railroad rights-of-way.

Class I facilities can also close gaps in a bicycle network caused by the construction of freeways or the existence of natural barriers (rivers, hills, and mountains). Class I Bikeways typically prohibit motorized traffic but are often shared with pedestrians and other non-motorized users.

Class II Bicycle Lanes

Class II facilities are on-street Bicycle Lanes delineated by traffic striping and marking to create separate portions of the roadway available to bicyclists and motorists, providing for more predictable movements by each. Class II Bicycle Lanes also assist bicyclists



Figure 1.4: A Typical class I bikeway (Multi-use Path)



Figure 1.5: Existing class I bikeway along the OC Loop (Adjacent to Seal Beach Boulevard)

traveling on-road where there is insufficient width for motorists and bicyclists to share. Class II facilities include a striped lane that allows for one-way bicycle travel normally on the right side of a street or highway. Class II facilities are located adjacent to the curb or they can provide for a parking lane to the right of the bicycle lane.

Recently, agencies have started providing special paving or color treatments to make bicycle lanes more visible to motorists. This can be done by using colored pigment in the asphalt mix, applying a surface coloring to the entire lane, solidly coloring part of the lane, or adding colored stripes within the lane. These surface treatments can be expensive to apply and difficult to maintain in good condition when exposed to traffic and weather.

Class III Bicycle Routes

Class III facilities are designated routes that provide for shared use with motor vehicle traffic and are identified by signage, but do not provide a designated area for bicycles and non-motorized users. These facilities can provide continuity to other bicycle facilities or to designate preferred routes through high-demand corridors. Bike routes are established by placement of Bicycle Route guide signs.

Some class III facilities are supplemented by bicycle “sharrow” markings (see Figure 1.7) which indicate that travel lanes are intended for the shared use of both bicycles and motor vehicles. Sharrows are a visual reminder for cyclists and cars to share the road and may be used where there is insufficient width to add a bike lane. The sharrow, when implemented correctly, shows the rider where to travel to increase maximum visibility of the cyclist and move the cyclist out of the “door zone” of parked cars. Sharrow markings and signs may be applied to class III Bike Routes to inform motorists that cyclists are allowed and to share the road. They can also be supplemented by additional signs indicating Bicycles May Use Full Lane, to further indicate allowed use of the roadway.



Figure 1.6: A typical class II bikeway (bike lane)



Figure 1.7: A typical class III bicycle route with sharrows



Class IV Bikeways

In addition to the standard class I, II, and III bike facilities, an additional bicycle treatment is now being implemented in select bicycle friendly cities across the country. Class IV Bikeways, also known as cycle tracks, separated bikeways, or protected bikeways are similar to class I facilities in that they feature a dedicated bicycle right-of-way. Rather than being independent from a street or highway, class IV facilities are located inside the road right-of-way. Cyclists are typically separated from motor vehicles by a barrier such as a curb, delineator posts, parked cars, or median.

The State of California recently passed a law defining class IV bikeways and tasked Caltrans to prepare design criteria for their proper development. This law also allows for use of design criteria in the Urban Bikeway Design Guide, published by the National Association of City Transportation Officials (NACTO). Elements of class IV facilities were formerly considered to be contrary to State design standards until the passage of this law. They are now permitted and are encouraged where feasible by Caltrans.

Cycle Tracks can provide opportunities for aesthetic improvements in addition to mobility improvements. They can provide opportunities for landscaping or other decorative features in the roadway (as shown with the potted plants in Figure 1.9). Drainage should be maintained on both sides of the cycle track.

Class IV Bikeways are currently rare in California, with examples currently in Temple City, Long Beach, Carlsbad, and San Francisco. They are being implemented in major cities throughout the U.S., often following the criteria found in the NACTO guide.



Figure 1.8: A typical class IV bikeway (cycle track)

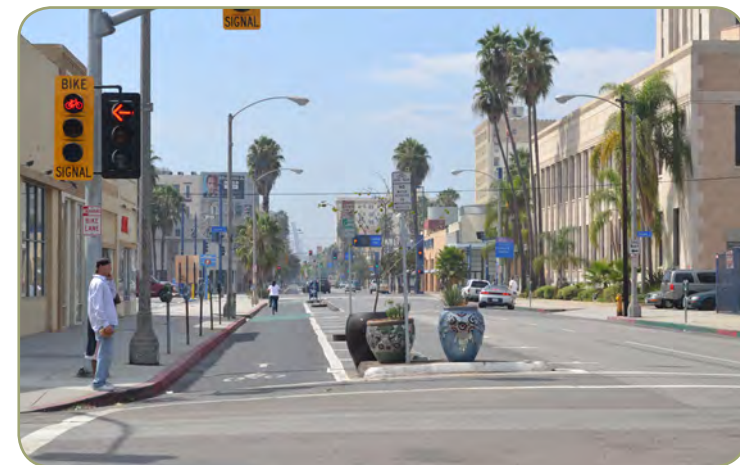


Figure 1.9: Sample class IV facility in Long Beach, California

GENERAL RECOMMENDATIONS

Introduction

The Caltrans Highway Design Manual (HDM) sets forth minimum criteria for design of bikeways. The Caltrans criteria serves as the minimum requirements for the OC Loop, but the success of the initiative will be enhanced by following an additional set of design guidelines. This section proposes design criteria to be applied to unconstructed segments of the loop. This criteria can also be applied to existing segments of the loop to determine whether upgrades may be appropriate. Given construction of the OC Loop will be managed by multiple jurisdictions, the final design is subject to change based on local preferences and standards.

Major Crossings

High quality class I bikeways limit the number of at-grade crossings of streets and intersections. For the highest quality user experience, grade separated crossings that require bridges, underpasses, or other structures are preferred. Where grade separated crossings are required, the feasibility and cost of crossing alternatives are appropriate to consider.

Many existing crossings in Orange County along the Santa Ana River and Coyote Creek Bikeways are grade separated, where each passes under the roadway bridges that span the channel. These can be very affordable to construct, if the channel is constructed as a trapezoidal channel (with sloped walls) and the bottom of the channel is more than eight feet below the bottom surface of the bridge. These crossings at trapezoidal channels are known as dip undercrossings. Unfortunately, this solution does not work well where the channel has vertical walls or where the depth is insufficient to provide vertical clearance for bicyclists and other users. A separate new structure will often be required to facilitate grade separation, which is a more expensive undercrossing.



Figure 1.10: Sample class I bicycle underpass (from Bousdreau Bridge in St. Albert, Canada)



Undercrossings are generally more desirable than overcrossings for bicycling. The bikeway needs to depress only eight feet beneath the roadway structure, while an overpass must be 20' above a roadway and 30' above a railroad. Overpasses require bicyclists to negotiate long upgrades that cause tiring or loss of momentum. Also the long constructed grades must meet Americans with Disabilities Act (ADA) requirements for maximum grade. In contrast undercrossings allow bicyclists to speed up on the downgrade and use inertia to travel minimum distances on the upgrade beyond the crossing. While more desirable for cyclists, undercrossing design requires features to avoid loitering, provide for personal security, and avoid conflict with buried utilities.

In some cases, the need for overcrossings or undercrossings may be unavoidable. Grade level crossings are prohibited across freeways and major railroads. Even minor railroad crossings may be discouraged or require automatic gates and warning systems based on train frequency and/or speeds.

It is difficult for bicycle users to cross roadways at-grade that carry more than 10,000 daily vehicles unless crossing protection is provided that requires vehicles to stop. If bicyclists must cross busy intersections that serve intersections between arterials, delays can be significant. One of the key issues to resolve for the OC Loop will be to identify the feasibility and most appropriate approach to crossing streets and intersections. The ultimate cost of completing the OC Loop will be highly reliant upon the necessary crossing treatments at streets, railroads, and freeways. Half or more of the cost will be determined by the design of crossings.

Where grade separations are not feasible but traffic conditions make crossing difficult, intersection traffic controls will be needed. These can include traffic signals, especially for locations that serve heavy traffic volumes (over 20,000 vehicles per day) and especially where traffic signal coordination along the arterial must be considered.

For lower volume crossings, a new and simpler form of traffic device, known as a pedestrian hybrid beacon, or PHB, formerly known as a Hybrid

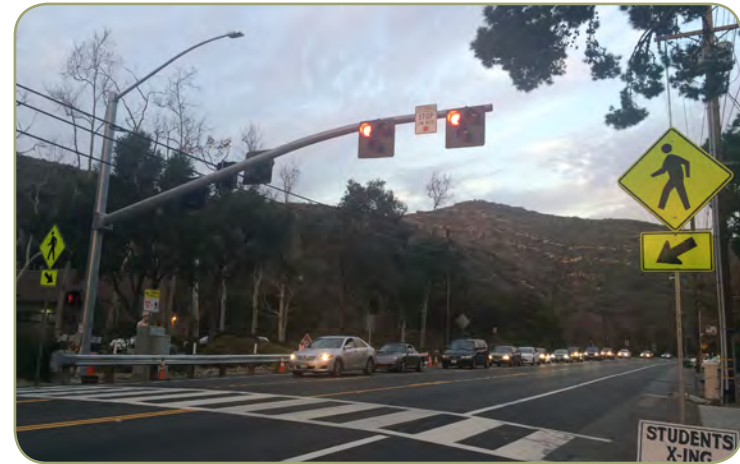


Figure 1.11: Recently completed PHB signal along Laguna Canyon Road, looking northbound

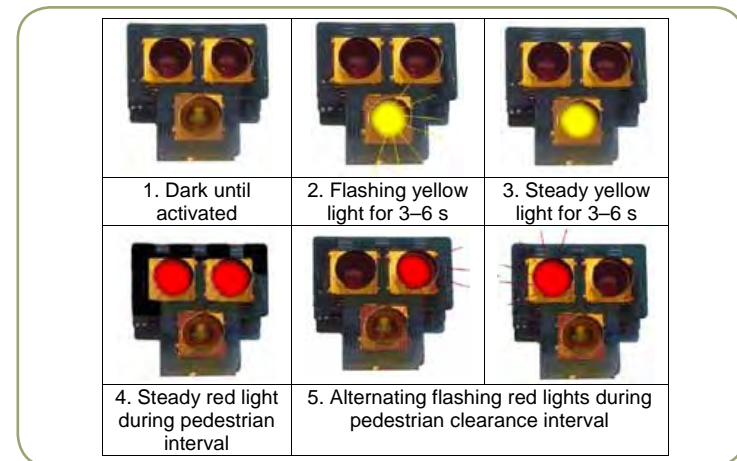


Figure 1.12: Example of PHB Phase Sequencing

actuated beacon (HAWK), is feasible. A PHB resembles a traffic signal, except that it is dark most of the time. When actuated by bikeway users, it changes to yellow followed by steady red facing motor vehicle traffic. A WALK signal is displayed when the PHB is steady red for roadway traffic. After about 7 seconds, the WALK changes to Flashing Don't Walk, and the signal facing the vehicle shifts to flashing red. This allows vehicles to proceed after stopping, if the crossing activity does not interfere with their lane of traffic. After sufficient time, the signal reverts to dark while waiting for the next actuation. As the PHB signal is a relatively new device, there are few examples in Orange County, but an installation was recently completed by Caltrans on Laguna Canyon Road (SR 133) in north Laguna Beach.

The study areas and segments are discussed in a clockwise direction around the OC Loop. While the discussion is presented in a one-way fashion to describe the routes (e.g. ... west along Mountain View Avenue to Sunmist Drive, etc.), the actual loop will provide for two-way (clockwise and counter-clockwise) travel by bicyclists and other users.

Alignment and Cross Section

The OC Loop should provide a minimum of 12' of pavement for bicycling. This allows two bicyclists to ride side-by-side in one direction while allowing cyclists in the opposing direction to pass readily, and also allows faster cyclists to pass on the left. Narrower bikeways are difficult for cyclists to use except in single file. Additional paved width should be considered where feasible in locations where congestion is expected or where cyclists must make sharp turns, such as at bridges that cross adjacent waterway channels.

Handrails should be provided where the bikeway is paved adjacent to flood control channels, especially where a cyclist forced off the bikeway may be subject to injury. An inexpensive handrail consists of 3" metal posts with cable strands. Where possible, a minimum 2' unpaved buffer

should be provided to separate the bikeway from a channel wall or slope. Some existing bikeway segments of the OC Loop may not meet this specification. Alternatively, fencing along the entirety of the edge against flood control channels could be provided to prevent drops.

Pavement Surface Design

Asphalt concrete (AC) is the preferred surface for paving. While concrete can potentially provide a more durable surface, AC is more appropriate for premiere bicycle facilities. Concrete can be more slippery when wet, and its required expansion joints and score lines produce unnecessary bumps and vibrations for cyclists. Concrete facilities often can be left unmaintained for decades when used by automobiles, but cracking and buckling of the concrete surface can produce deterioration to the extent that cyclists become discouraged. AC pathways may require resurfacing every 10 to 15 years in order to remain smooth and level, but scheduled repaving will insure that the riding surface is smooth, pleasant, and free of surface irregularities for decades.

Pavement life can be extended if the bikeway surface is designed to a traffic index of at least 4.5. The traffic index is a function of the amount of traffic expected over a multi-year period. Use of concrete headers along each edge reduces damage along the edges of the paved surface. They also simplify the process of pavement maintenance.

Hills and Grades

Uphill grades should be kept to 5% or less where possible. Also, it is preferable to place an upgrade beyond a downgrade, so that cyclists can gain speed and inertia. This design naturally occurs when bikeways are depressed to pass beneath roadways and rise to ground level on the other side. Grades must also meet ADA requirements.



Landscaping and Amenities

Varying levels of landscaping can currently be found along segments of the Santa Ana River and Lower San Gabriel River Bikeways that are included in the OC Loop. Added landscape requirements are not required where adjoining lands provide scenery or appropriate visual relief. City or Regional Parklands, ocean vistas, open space, or adjacent manicured landscapes reduce the need for landscaping of the bikeway.

Many existing and proposed OC Loop segments are bordered on one side by a concrete lined flood control channel and on the other side by residential backyard fences or industrial property walls, fences, parking lots, and storage areas. The effect is functional for frequent cyclists focusing on speed and mileage who are not discouraged by the visual environment, but the lack of visual appeal does not encourage or support casual users. Segments of the Santa Ana River Bikeway have received enhanced landscaping recently. It is recommended that construction cost estimates include a 10% contingency, consistent with ATP funding guidelines, for landscaping in areas where the existing visual environment requires enhancement.

While landscaping is appropriate for “greening”, care should be used in plant selection. Trees, shrubs, and groundcovers that may grow and encroach upon the width of the bikeway should be discouraged. This is a problem in some areas of the Santa Ana River Bikeway where trail users cut away encroaching vegetation to maintain the full bikeway width. Also, trees and plants with invasive roots that tend to lift the paved areas should be avoided or properly shielded.

Heavily used commuter and recreational bikeways often feature rest stops with benches, drinking fountains, and shade. Appropriate rest areas could be provided at 5 to 10 mile intervals. The bikeway often passes within or near to City or regional parks that can meet these needs. In other cases a suitable site may be located within $\frac{1}{4}$ mile of the bikeway route and be signed as a rest area.



Figure 1.13: San Gabriel River Bikeway, scenic area which may not require landscaping (image from Wikipedia)



Figure 1.14: San Gabriel River Bikeway, less scenic area where landscape amenities may be desirable

WAYFINDING PRINCIPLES & GUIDANCE

A wayfinding system consists of maps, markers, and signs. Successful wayfinding creates awareness for a bikeway system, helps users get to and navigate that bikeway, and directs users to nearby points of interest. Uniformity of basic elements of wayfinding supports recognition and consistency of facility. The following is the comprehensive wayfinding guide system recommended for the OC Loop.

The benefits of this wayfinding system include:

- A consistent identity for the OC Loop
- Improved awareness of the bikeway, leading to increased use
- Greater ease of use: helping the public follow the bikeway and use it to arrive at destinations
- Consistent aesthetics and perceived upkeep, improving bikeway security and user comfort
- Increased numbers of bicycle and walking trips
- Standardized location markings to help coordinate emergency and maintenance access

The 66 mile OC Loop is a multi-jurisdictional bikeway system that runs through 17 cities. As the individual cities have unique characteristics and provide the operational oversight of the bikeway through their jurisdiction, this wayfinding plan provides guidance for implementing a cohesive sign system while providing flexibility for local jurisdictions to choose wayfinding elements that fit within the local community context. It is recognized that wayfinding elements relevant to a popular Coastal Trailhead are different from the needs of a neighborhood access point on the El Cajon Bikeway.

To accommodate the changes in context, a family of wayfinding elements have been identified including a range of sign types and materials. The wayfinding system also provides opportunities to incorporate City names and logos (refer to Appendix 0 for a list of agency

names and logos). This plan provides guidance for local agencies to select and install OC Loop wayfinding elements unique to each community.

The OC Loop connects existing bikeways with existing names and branding familiar to, and widely used by the community. The Coastal Bikeway, San Gabriel River Bikeway, Coyote Creek Bikeway, Union Pacific Railroad ROW Bikeway, El Cajon Bikeway, and Santa Ana River Bikeway are regional landmarks that create a mental map for Orange County and Los Angeles County residents. The wayfinding plan builds upon these landmark bikeways to help reinforce local understanding and placement in the regional Loop. Each bikeway has been color coded. The consistent use of color and bikeway name throughout the wayfinding elements (on maps and signs) aids in user navigation.



Figure 2.1: Consistent use of bikeway names and colors reinforces bikeway users' sense of place within the OC Loop



It is noted that some portions of the OC Loop run through Los Angeles County. Their signage is provided by their watershed department. OC Loop signage will be non-standard, and will need to be coordinated through the County.

Branding

OC Loop partners have produced an OC Loop logo that serves as the basis of the wayfinding design. Consistent use of the logo is important in maintaining the OC Loop brand through individual communities. The rectangular proportions and approved colors of the logo should not be altered. The following logos are approved for use on the wayfinding elements.

Sign Standards

The OC Loop wayfinding sign colors and font are established by the OC Parks Signage & Graphics Master Plan, August 2014. See color palette on the following page for color specifications. All fonts included on the off-street signs should use the Univers font family, see Section 2 for dimensions, specific to each sign type.

On-street bikeway sign guidance is provided by the latest California Manual on Uniform Traffic Control Devices (CA MUTCD). The Caltrans Highway Design Manual (HDM) establishes standards for sign placement from the edge of the bikeway.

QR Codes

Quick response codes, called QR codes, are a smartphone technology that dynamically connects mobile users with digital content by taking a picture of a two dimensional square bar code. Incorporating QR codes into wayfinding signs allow people to access digital information for the bikeway such as bikeway maps, park information or interpretive information. The wayfinding elements allow for the opportunity to add QR codes.

Software to deliver information from a QR code can be set up in two ways. The first alternative is to develop a custom OC Loop application which would enable use without an internet connection. The second alternative is to link users to the OC Loop website, or existing OC Parks website, by launching an internet browser. Before launching a QR code program it is important that it be designed to be easy to use and add value to the bikeway user's experience.



Figure 2.2: Gradient colored logo (for printed materials)



Figure 2.3: Solid color logo (used on wayfinding signs)



Figure 2.4: QR Code examples

Wayfinding Sign Family

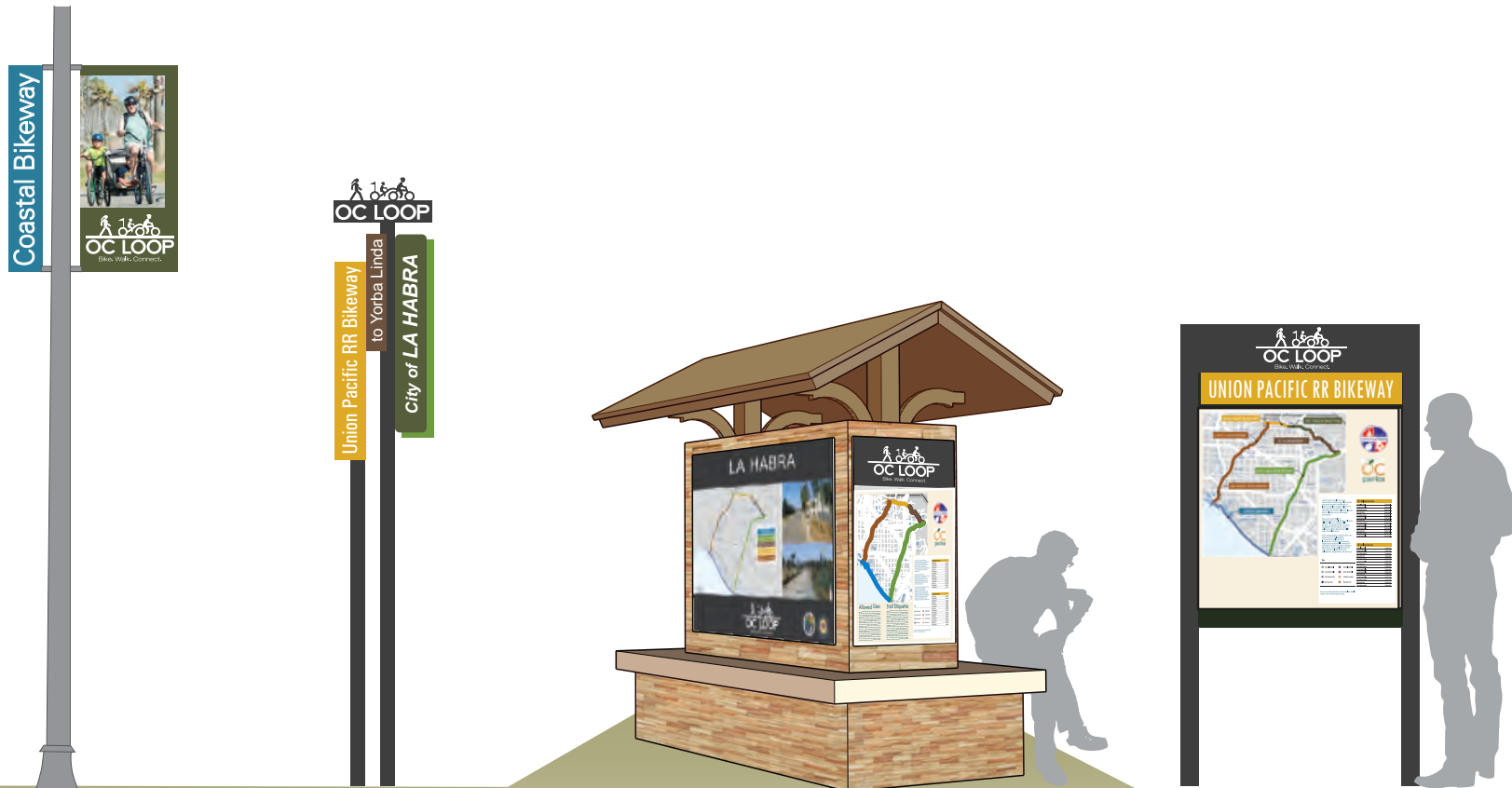
This section provides an overview of the OC Loop wayfinding family and planning level design guidance for sign production. The wayfinding program includes the following elements:

- Street Banners
- Arrival Identity Sign
- Trailhead Kiosk
- Mapboard
- Direction Sign/Marker
- Supplemental Guidance Sign
- Confirmation Sign
- Undercrossing Street Sign
- On-Street Bike Guide Sign
- Pavement Markings
- OC Loop Logo on Existing Signs
- User Maps



Figure 2.5: OC Parks Signage & Graphics Master Plan Palette)





Street Banners

Vehicular scale banners bring attention to the bikeway. Locate along roads and parking lots adjacent to the OC Loop and at major intersections.

Arrival Identity

Vehicular scale identity sign provides the initial welcome and identifies primary trail access points.

Trailhead Kiosk

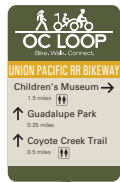
This kiosk serves as a gateway and "meet-up" spot and provides for trail maps and interpretive panels. Suggested for trailheads and to be used in conjunction with bike racks and landscaping.

Mapboard

Large display to orient users through maps, educational, guidance and regulatory information.



Supplemental Guidance Sign



Direction Sign
Provides directional information to local destinations. Allows for icons for services, i.e. restrooms, drinking water, etc.



Confirmation Marker
Guides users along the loop. Can be placed at bikeway entrances, junctures and/or used as mile markers.



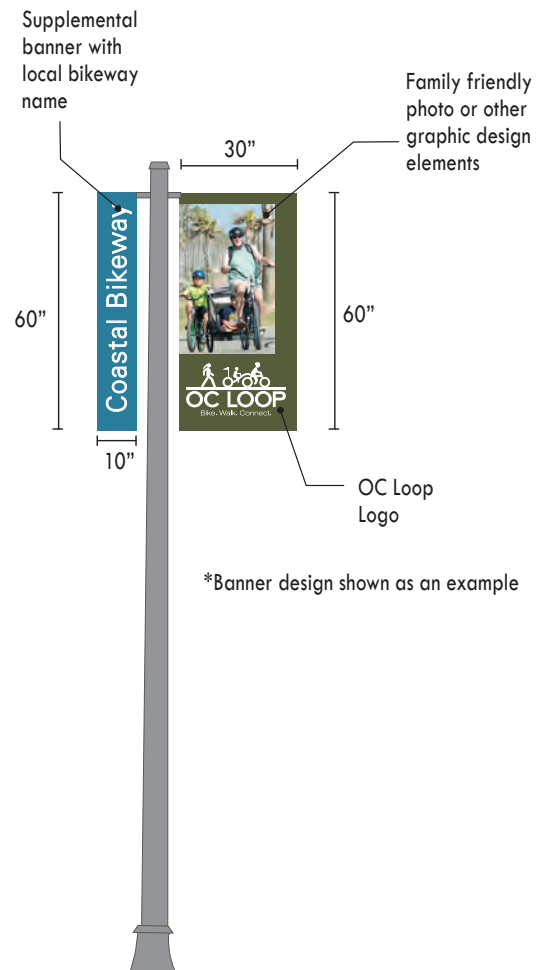
Undercrossing Street Sign
Identifies major road names on bridges.

On-Street Bike Guide Sign
MUTCD bicycle guide sign with OC LOOP supplemental plaque.

Pavement Markings
Reinforce users are on the OC Loop. Locate on paved trails and sidewalks.



Street Banners



Description

Street banners can be used to promote the OC Loop or advertise a community event using the OC Loop. These types of banners are generally hung for one to two months and are oriented toward intriguing interest in all citizens not just current bikeway users. Street banners along the OC Loop could also be used as a decorative element to enhance the ambiance of the bikeway or streetscape.

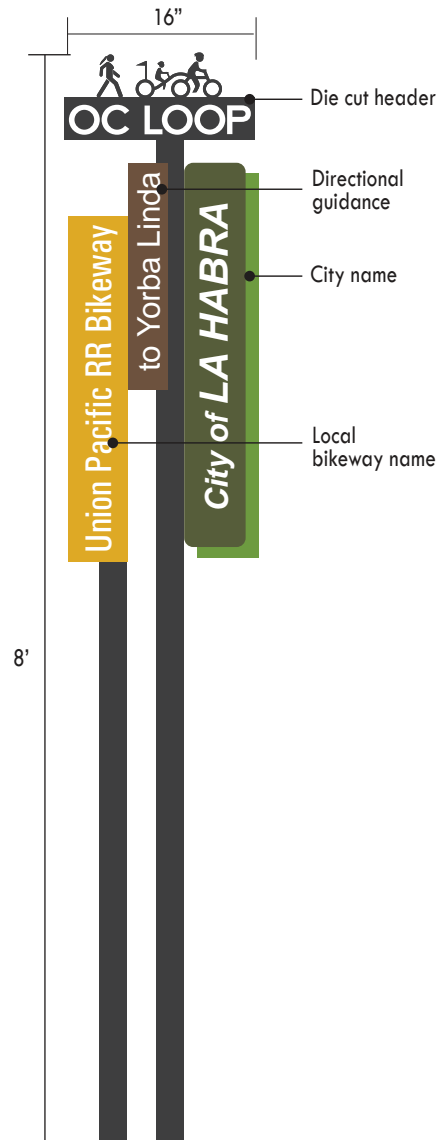
Placement

There are many potential uses for the OC Loop street banners. Promotional types of banners could be hung on street lights along segments of the bikeway that parallel roadways or at major intersection crossings. They could also be hung in parking lots along major segments such as the Coastal Bikeway or on utility poles along river channels

Materials

- The banners can be vinyl, nylon or cloth. Vinyl tends to be less expensive and has a shorter life span due to fading and wear (applicable for one month). Cloth banners are more durable and provide a longer term life span.
- Most jurisdictions require a permit to install street banners. Follow local jurisdiction requirements for banner size, mounting, placement and vertical clearance requirements.

Arrival Identity



Description & Location

Arrival identity signs serve as the initial identification of primary access points. They provide at-a-glance branding and reassurance for vehicle drivers and passing cyclists that the OC Loop can be accessed at that location.

Placement

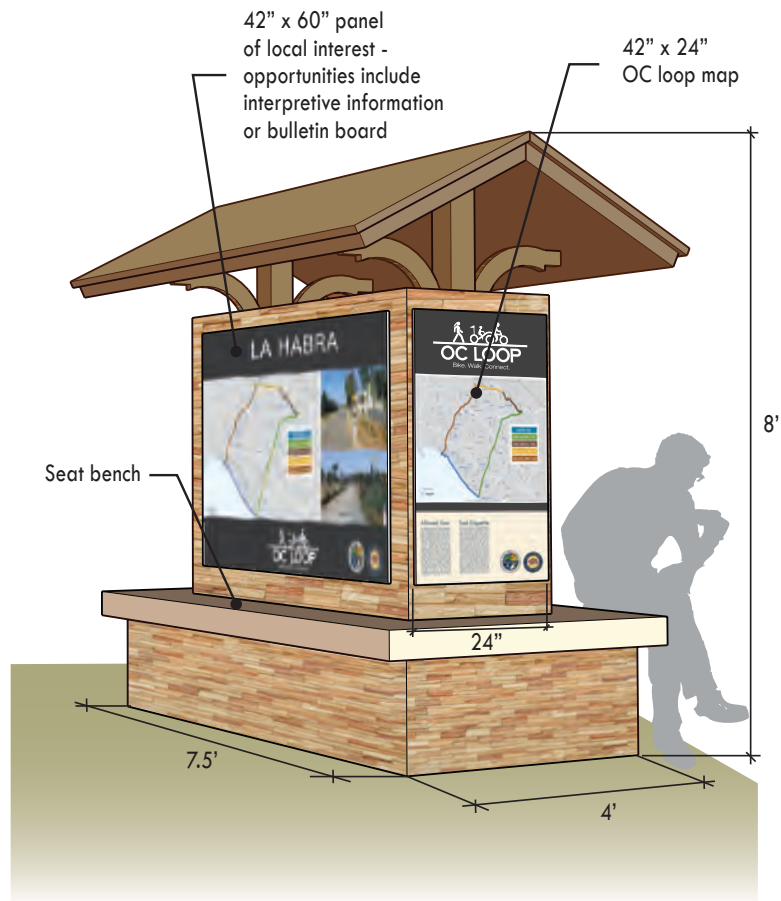
Vehicle oriented and scaled identity signs should be located at trailheads, such as at a parking lot driveway along Pacific Coast Highway, or regional OC Loop access points, such as an intersection with a regional bike connection. When placing arrival identity signs, maintain sight triangles so as to not obstruct sight lines between roadways and entries at trailhead locations.

Materials

- Powder coated steel or painted aluminum sign plaques
- Powder coated steel frame with 3" x 3" posts



Trailhead Kiosk



Description

Trailhead kiosks serve as bikeway landmarks. Placed at trailheads or major access points, they act as a meet-up spot for group or family rides, walks or strolls. The large scale provides space for a bikeway map, interpretive opportunities and/or bulletin board and the built-in seat bench provides a resting place for users. A similar kiosk is provided today in Seal Beach at the River's End Trailhead at the terminus of the San Gabriel River Bikeway.

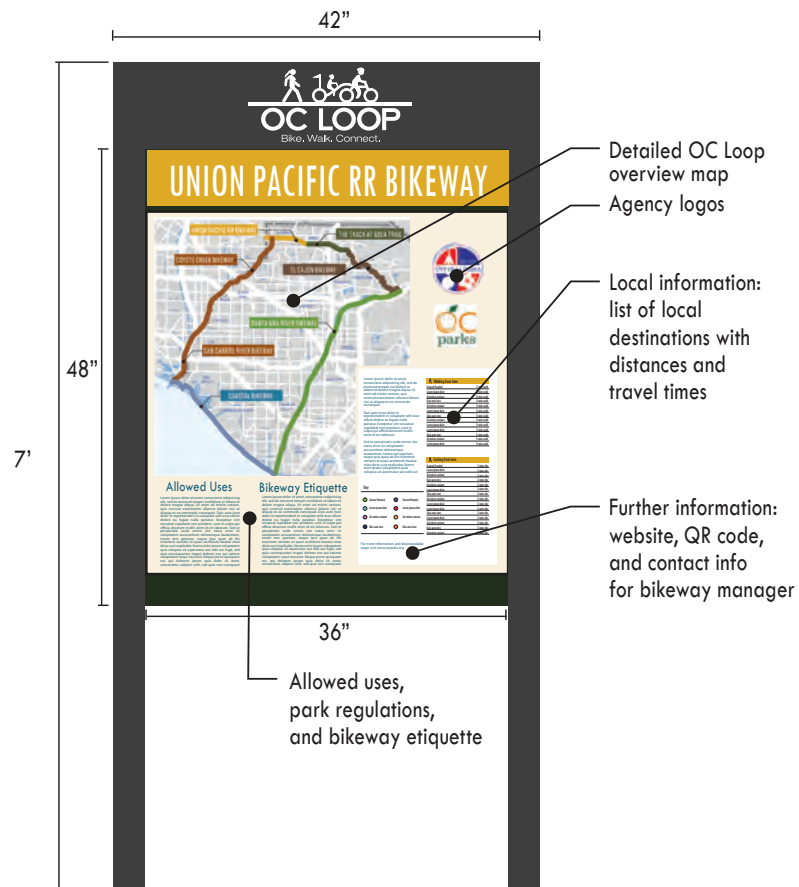
Placement

Consider placing at major trailheads. They are recommended to be used in conjunction with additional bikeway amenities such as bicycle racks, drinking fountains, landscaping and/or restrooms.

Materials

- Kiosk materials can match local jurisdiction styling and branding and could include stone, wood, metal and concrete. OC Loop Map should utilize a consistent regional map.

Mapboard



Description & Location

Mapboards are freestanding one or two-sided information displays that orient users to the OC Loop, its destinations, rules of use, and safety information. Mapboards should provide a detailed map showing the OC Loop, indicating "you are here", highlight access points, landmarks, restrooms and services, and other bikeway and on-street bikeway networks. The mapboard could provide detailed information on local destinations within a 5 minute ride or 10 minute walk (1/2 mile to 3 miles) to the current location. The mapboard is also an opportunity to detail bikeway etiquette and could illustrate ecological or cultural interpretive information on the back side of the map.

Placement

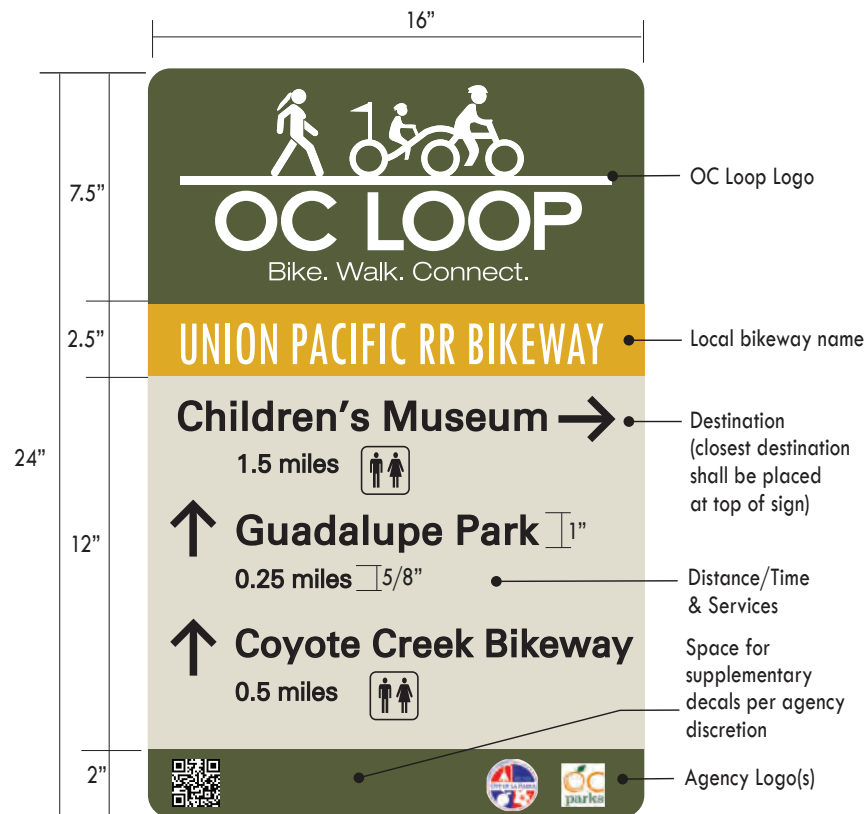
Mapboards can be located at trailheads, bikeway access points and selected public gathering spaces. The mapboard should be setback from the path a minimum of 3' to provide space for people to read and consider the information without blocking the bikeway. A minimum of 3' should also be provided for each side of the mapboard per accessibility guidelines.

Materials

- Phenolic Resin Panel (high pressure laminate)
- Mount to powder coated steel frame with 3" x 3" posts and custom header.



Direction Sign



Description & Location

Direction signs provide directional and distance information to major destinations and bikeway amenities. Supplementary decals indicating services (such as restroom, drinking fountain, etc.) can be added to destinations at the discretion of individual agencies. Direction signs should contain the local bikeway name in the header plaque and list up to three destinations. See following page for additional information in selecting destinations.

Color bands with bikeway names



Placement

Install direction signs along the bikeway prior to decision making points and at major bikeway intersections. Allow for sufficient distance prior to the intersection to provide safe recognition and response to information provided.

Materials

- 0.080 inch aluminum sign panel, 1/4" corner radius, typical.
- Front of sign to be screened, all exposed surfaces to be painted
- Mount to 4" wood or recycled plastic wood post or galvanized steel post.

Destination Hierarchy & Symbols

A consistent approach for selecting destinations to be included on direction signs, is necessary to keep the regional wayfinding system clear and predictable. The following table provides guidance for selecting and prioritizing potential destinations to which OC Loop users may want to travel.

Destinations are organized into three Tiers. Tier 1 destinations provide the broadest navigational guidance such as city names and regional bikeway connections and should be prioritized on signs up to 5 miles away. Tier 2 destinations include regional landmarks and attractions and can be signed up to 2 miles away. Tier 3 destinations are places of local interest and can be signed up to one mile away. In situations where two destinations of equal significance and distance may be properly designated and the two destinations cannot appear on the same sign, the two names may be alternated on successive signs. Furthermore, destinations should only be included on signs if they are accessible by a marked bikeway or sidewalk.

When destinations provide services or amenities, symbols can be used in conjunction with the destination name. The following symbols were selected from the *2014 OC Parks Signage Master Plan* as the most relevant to the OC Loop. Additional symbols should match the symbols in that plan.



Restrooms



Drinking Water

Restaurant/
Food

Picnic Site



Parking



Information



First Aid



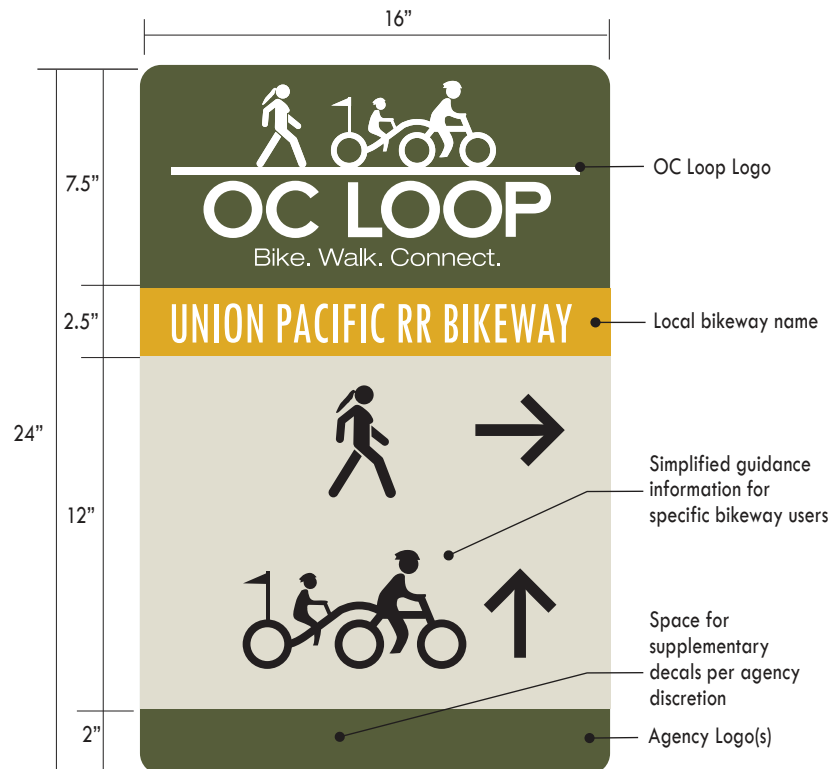
Campground

Table 2.1: Destination Hierarchy

Tier 1	Regional Destinations and Landmarks Signed up to 5 miles away, measured from entrance <ul style="list-style-type: none"> • Cities (Anaheim, Brea, Buena Park, Costa Mesa, Cypress, Fountain Valley, Fullerton, Huntington Beach, La Habra, La Palma, Los Alamitos, Newport Beach, Orange, Placentia, Santa Ana, Seal Beach, Yorba Linda) • Regional OC Loop Bikeways (Coastal Bikeway, San Gabriel River Bikeway, Coyote Creek Bikeway, Union Pacific ROW Bikeway, El Cajon Bikeway, Santa Ana River Bikeway)
	Regional Attractions (Signed up to 2 miles) Signed up to 2 miles away, measured from entrance <ul style="list-style-type: none"> • Metrolink Stations • Stadiums (Angel Stadium, Honda Center) • Beaches (Huntington Beach Pier) • Regional Parks • Major Civic / Retail Centers
Tier 3	Local Destinations Signed up to 1 miles away, measured from entrance <ul style="list-style-type: none"> • Transit Center • Businesses and Services (medical facility, shopping center, visitor centers) • Education (college, university or public school) • Entertainment and Culture (historic site, museum, movie theater) • Public Facility (Civic building, local park, post office) • Community or Sports Facility (fairgrounds, sports field)



Supplemental Guidance



Description

Supplemental guidance signs provide information to direct specific bikeway users to appropriate routes based upon mode of travel. Circumstances arise which limit usable modes on a route, such as bicycles being prohibited on sidewalks, or pedestrians must follow sidewalks. These signs contain simplified, mode-specific direction information, and are used to clarify how users are to stay on the OC Loop.

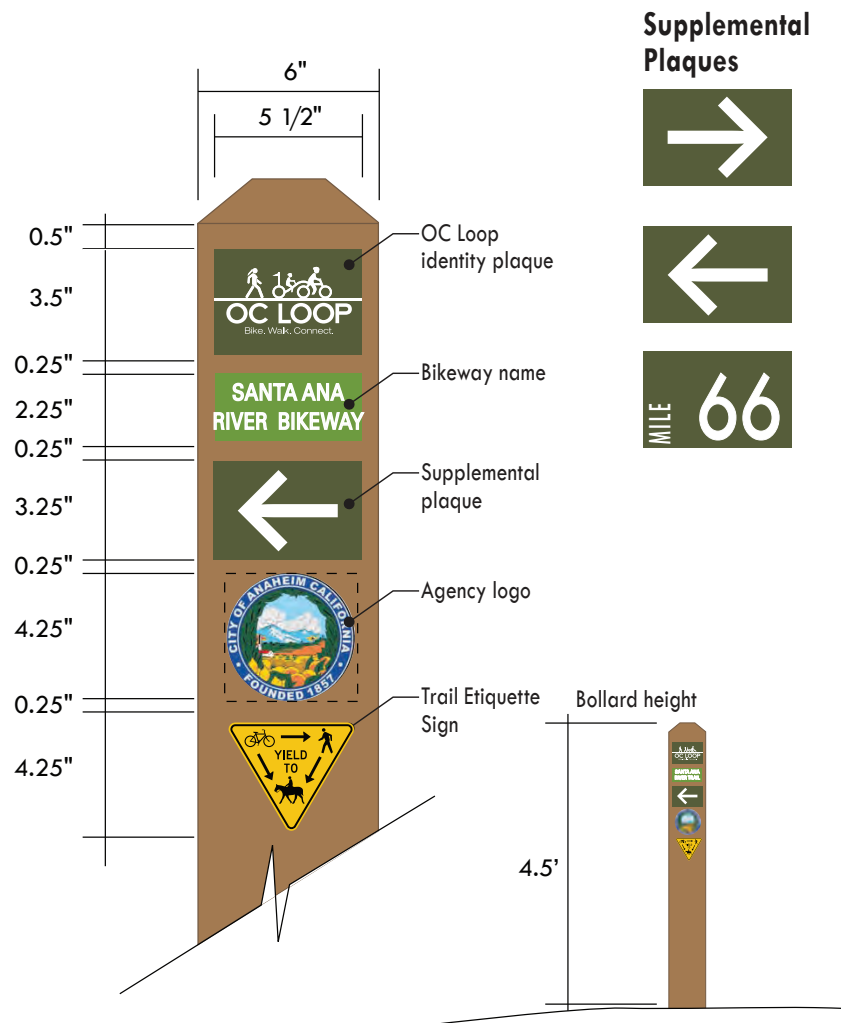
Placement

Install supplemental guidance signs at intersections where different bikeway users are to follow different routes. For example, bicycles may take an on-street route while pedestrians will use a sidewalk. Confirmation markers could be used in place of a supplemental guidance sign.

Materials

- 0.080 inch aluminum sign panel, 1/4" corner radius, typical.
- Front of sign to be screened, all exposed surfaces to be painted
- Mount to 4" wood or recycled plastic wood post or galvanized steel post.

Confirmation Marker



Description

Confirmation signs provide en route reassurance of bikeway identity and inform users they are on the designated OC Loop. They display the OC Loop brand and bikeway name. The confirmation posts also provide space for supplemental directional arrows to help users stay on the OC Loop.

Confirmation posts can also serve as mile markers. Mile markers are a small feature with large significance and are an important element of wayfinding along pathways. They allow users to track how far they have traveled and help people put their location in context by matching the marker to a map. Most bikeway users identify strongly with distance from home, distance from their favorite place, or simply with knowing a certain location based on its relationship to a mile point. Knowing one's location on the OC Loop is critical to assisting emergency responders trying to locate a person in distress. Mile markers should be located at one mile intervals along the corridor in a clockwise direction, starting mile 0 at the intersection of the Coastal Bikeway and the Santa Ana River Bikeway. Mile markers could also be provided as a pavement marking, see the Pavement Marking section.

Placement

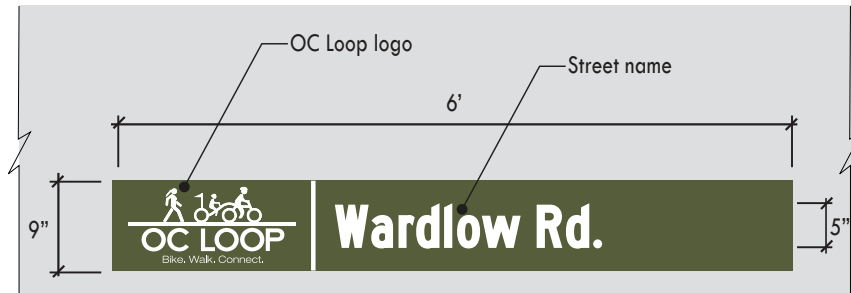
Place confirmation posts at minor pathway access points, intersections with other bikeways or when a direction sign is not used, at locations where the route is not explicit and at mile post locations.

Materials

- 0.080" aluminum plaques
- Mount to 6" wood or recycled plastic wood post or galvanized steel post



Undercrossing Street Signs



Description & Location

Street signs identify major road crossings and serve as a point of reference for users along the OC Loop.

Placement

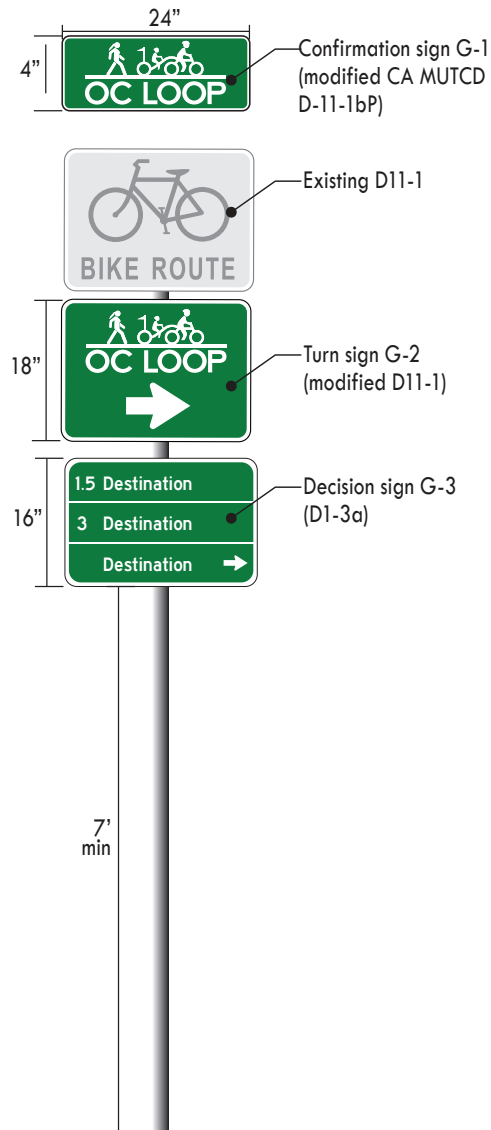
Street signs can be placed on bridge structures over bikeway undercrossings and should be located on both sides of the structure.

Note: Some facilities likely already have street name signs, and they can either be replaced or have additional OC Loop signage added. Replacement is recommended.

Materials

- 0.080" aluminum sign panel, 1/4" corner radius, typical.
- Front of sign to be screened, all exposed surfaces to be painted.
- Mount to bridge overpass structures, centered above the path.

On-Street Guide Sign



Description & Location

On-street bicycle signs guide bicyclists to their destinations along the on-street portions of the OC Loop route. The following plaques can be used individually or in conjunction with one another. OC Loop confirmation plaques indicate to bicyclists that they are on the designated OC Loop bikeway and makes motorists aware of the bicycle route. Turn signs indicate where the OC Loop turns from one street onto another street and can be used with pavement markings. Decision signs mark the junction of two or more bikeways and inform bicyclists of a designated bike route to access key destinations.

Placement

OC Loop plaques can be placed on existing bike route signs to identify the route. The plaques serve as confirmation signs and should be placed soon after turns to confirm the OC Loop route. Turn signs are placed at the near-side of intersections where the OC Loop route turns. Decision signs are placed at the near-side of intersections in advance of a junction to indicate a nearby destination.

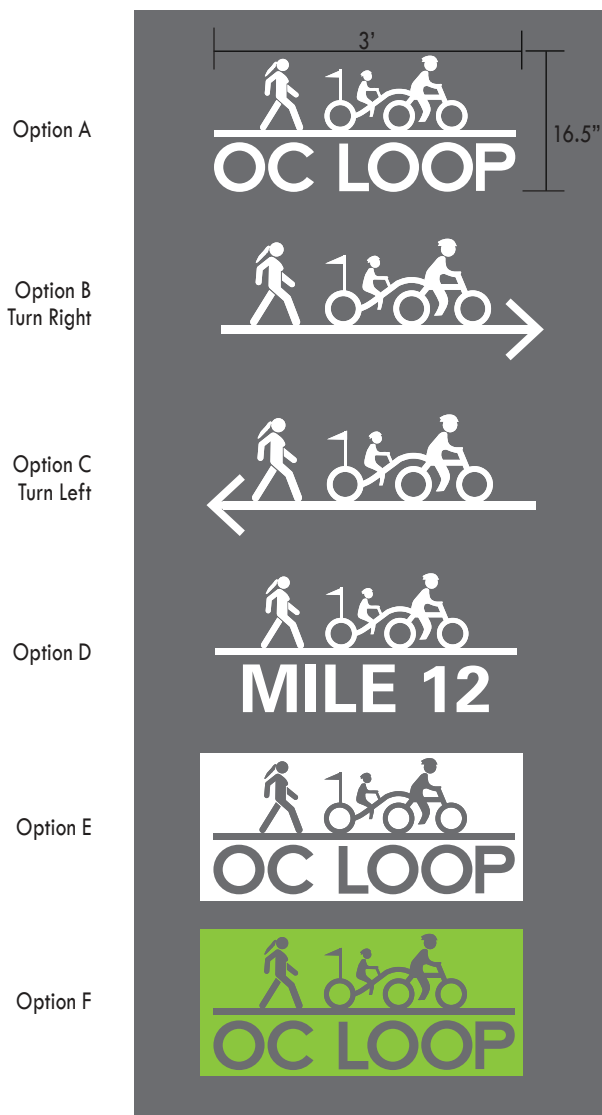
Follow CA MUTCD standards (Section 9B.01 – Application and Placement of Signs), including mounting height and lateral placement from edge of path or roadway. Additional standards and guidance are found in Section 9B.20 – Bicycle Guide Signs. Note: G-1 and G-2 should not be used in the same locations. See appendix B for additional information.

Materials

- 0.080" aluminum sign panel, 1/4" corner radius, typical.
- Front of sign to be screened, all exposed surfaces to be painted.
- Mount to 2" square perforated unistrut post or existing post adjacent to road where available. Follow local standards.



Pavement Markings



Description

Pavement markings reinforce that users are on the OC Loop. They serve as a wayfinding tool as well as a subtle marketing tool for the regional Loop system. Mile markers can be incorporated into the pavement markings.

Each agency will be responsible for maintaining the bikeway in their respective jurisdictions.

Placement

Pavement markings can be used on paved pathways, city sidewalks, or on-street bikeways that connect segments of the OC Loop.

Mile marker pavement markings should be placed perpendicular to the edge of path on both sides. OCTA, OC Parks, or another regional agency will need to determine the point of origin or mile 0 for mile marker purposes, although starting mile 0 at the intersection of the Coastal Bikeway and the Santa Ana River Bikeway is recommended.

Materials

- Paint or thermoplastic stencils - surface material and level of use should be considered when selecting an appropriate pavement marking material. Thermoplastic stencils have a higher up front cost but require less maintenance and are preferred for areas with high use and or tire abrasion.

OC Loop Logo on Existing Signs

Description

There are opportunities to add the OC Loop logo to existing signs and features to expand visibility of the OC Loop. There are a number of variations of incorporating the OC Loop branding. Examples include mounting a supplemental OC Loop logo plaque to existing posts, placing vinyl stickers (adhesive graphics) to existing signs, posts, and racks or incorporated into park entrance signs to denote access to the OC Loop.

Placement

Placement should be at each jurisdiction's discretion based on the need for OC Loop system visibility. All OC Loop branding should maintain the set rectangular proportions and approved colors but can be scaled to fit existing signs and features.

Materials

- Porcelain enamel
- .080 inch aluminum sign with graffiti coating
- Adhesive vinyl stickers

User Maps

Description

Clear, legible user maps are essential for planning a journey along the OC Loop. Web resources, mobile apps and printed user maps provide visitors with information and reassurance to make different choices about how they travel and destinations they can reach via the OC Loop. QR tags can provide instant access to mobile and online information on the OC Loop.

It is also recommended that the OC Loop be branded with the logo on other City, park and bikeway maps.

Content

The OC Loop map should include landmarks, services, amenities, mile marker locations, transit stops and existing bike lanes and routes. Published information on web sites and printed maps and brochures should be carefully coordinated with on-site maps and signs.

Materials

- Online interactive or pdf download map
- Mobile Apps
- Printed map (folded pocket size map)

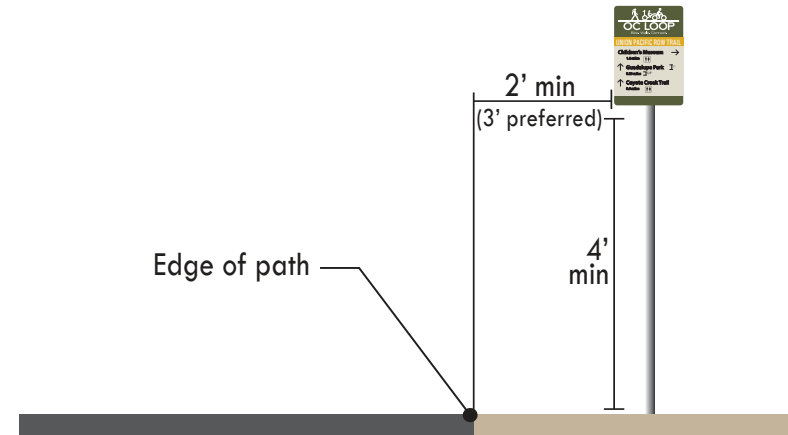


Sign Placement

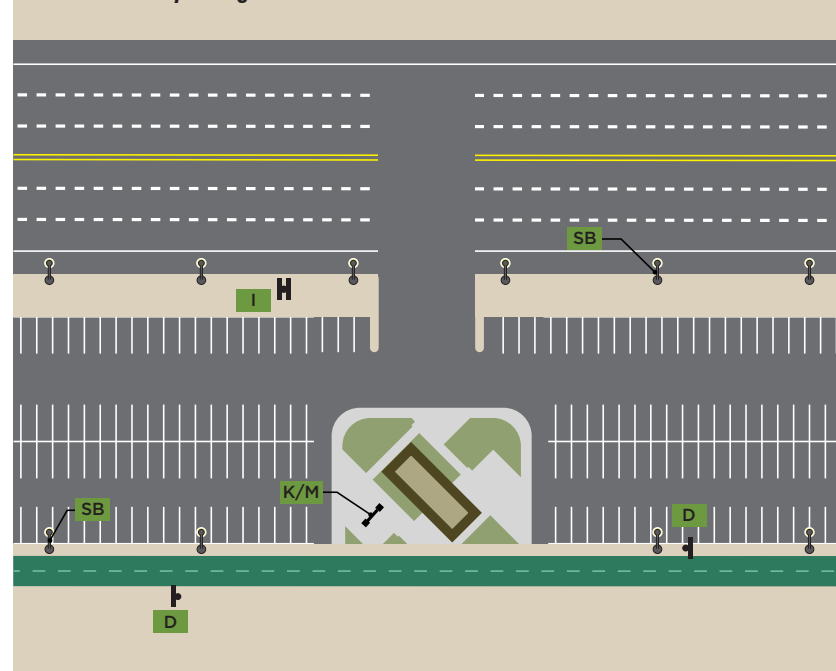
The OC Loop wayfinding elements should be located in a consistent manner across all jurisdictions. The following diagrams represent typical sign placement scenarios seen throughout the OC Loop.

- Coastal Bikeway / Regional Trailhead
- Undercrossing
- At-grade Crossing
- Bikeway Intersection
- Intersection Crossing
- On-Street Connection
- Separated Bike and Pedestrian Paths

Per both the CA MUTCD and HDM, the nearest edge of any sign should be a minimum of two feet from the edge of the pathway. The lowest edge of post mounted signs should be no less than four feet above finish grade. The lowest sign edge of on-street bicycle signs should be seven feet. Follow local agency design standards for on-street signs. See Appendix B for guidance for placement of on-street bicycle guide signs.



Coastal Bikeway / Regional Trailhead



SB- Street Banners

Could be placed on street lights along Pacific Coast Highway and/or along bikeway parking lot light posts adjacent to the Coastal Bikeway.

I- Arrival Identity Sign

An identity sign could be used to indicate a primary access point for vehicle drivers.

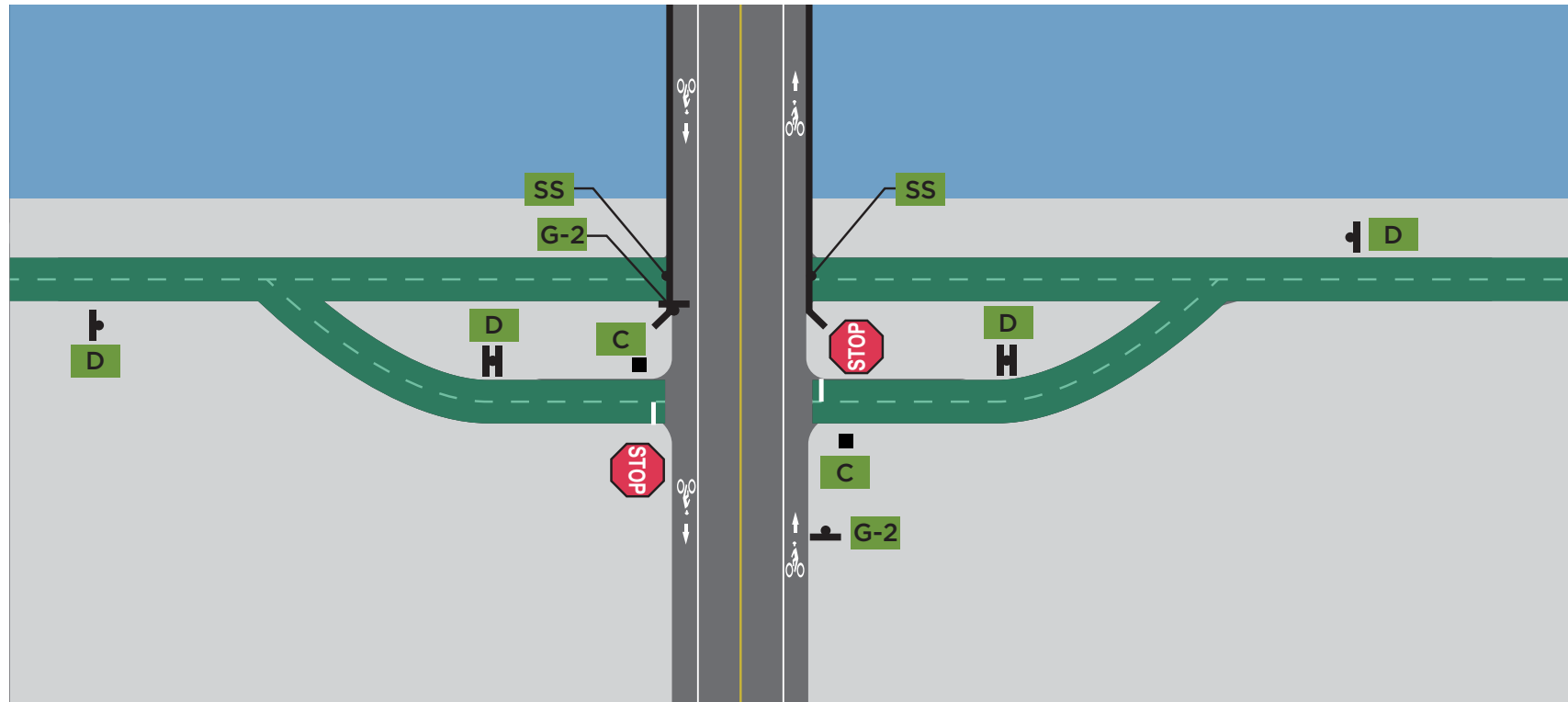
K/M- Trailhead Kiosk/Mapboard

An OC Loop map should be located at major access points where restrooms and bike parking are available. The map could be displayed on a trailhead kiosk or a mapboard.

D- Direction Sign

Direction signs should be placed in advance of turns to local destinations and services.

Undercrossing



D- Direction Sign

Direction signs should be placed in advance of turns to local destinations and services.

C- Confirmation Signs

Confirmation signs reinforce the identity and direction of the OC Loop.

SS- Street Sign

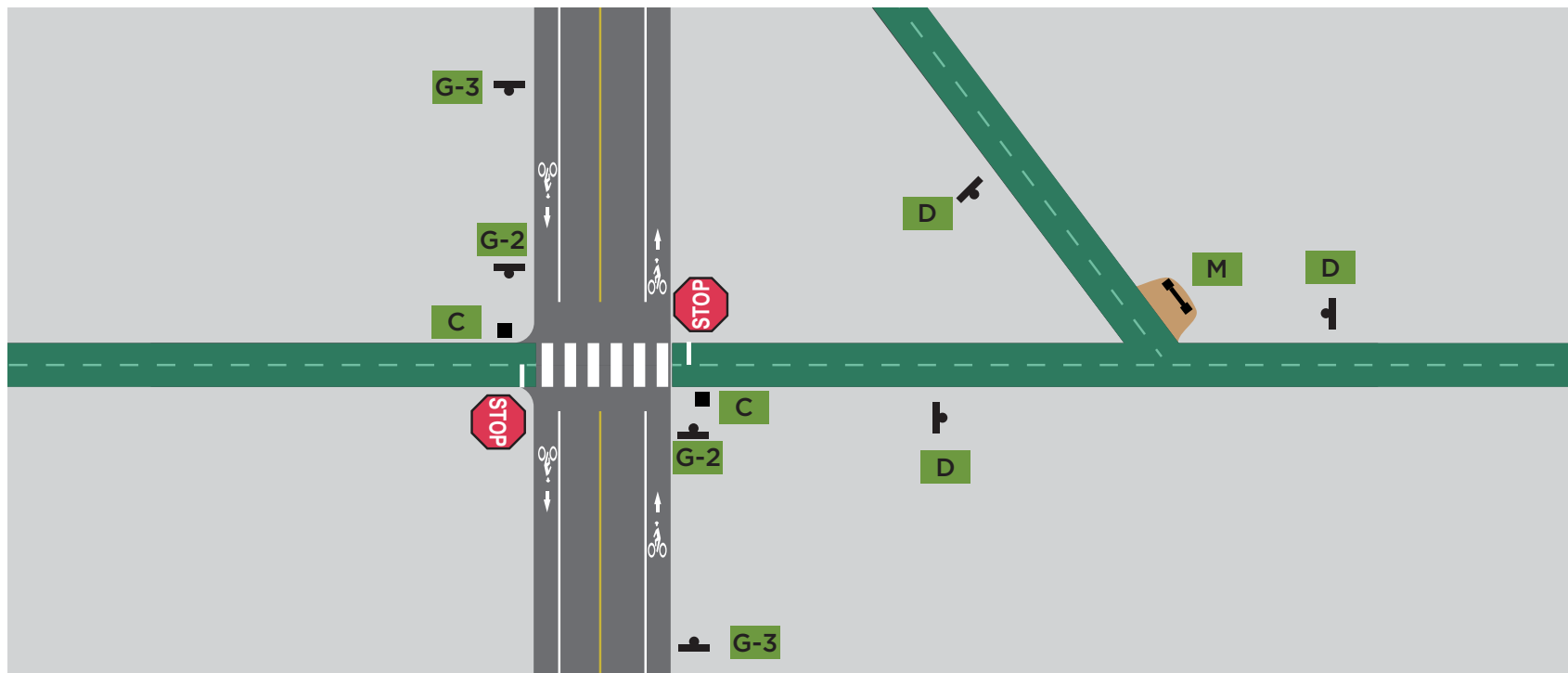
Place street signs on bridge structure where the OC Loop path crosses under major roads.

G-2- On-Street Turn Sign

A turn sign shows bicycles where to access the Loop from adjacent bikeways.



At-Grade Crossing



M- Mapboard

Consider placing a mapboard at the intersection of connecting bikeways.

D- Direction Signs

Direction signs should be placed in advance of turns to local destinations and services.

C- Confirmation Signs

Confirmation signs reinforce the identity and direction of the OC Loop.

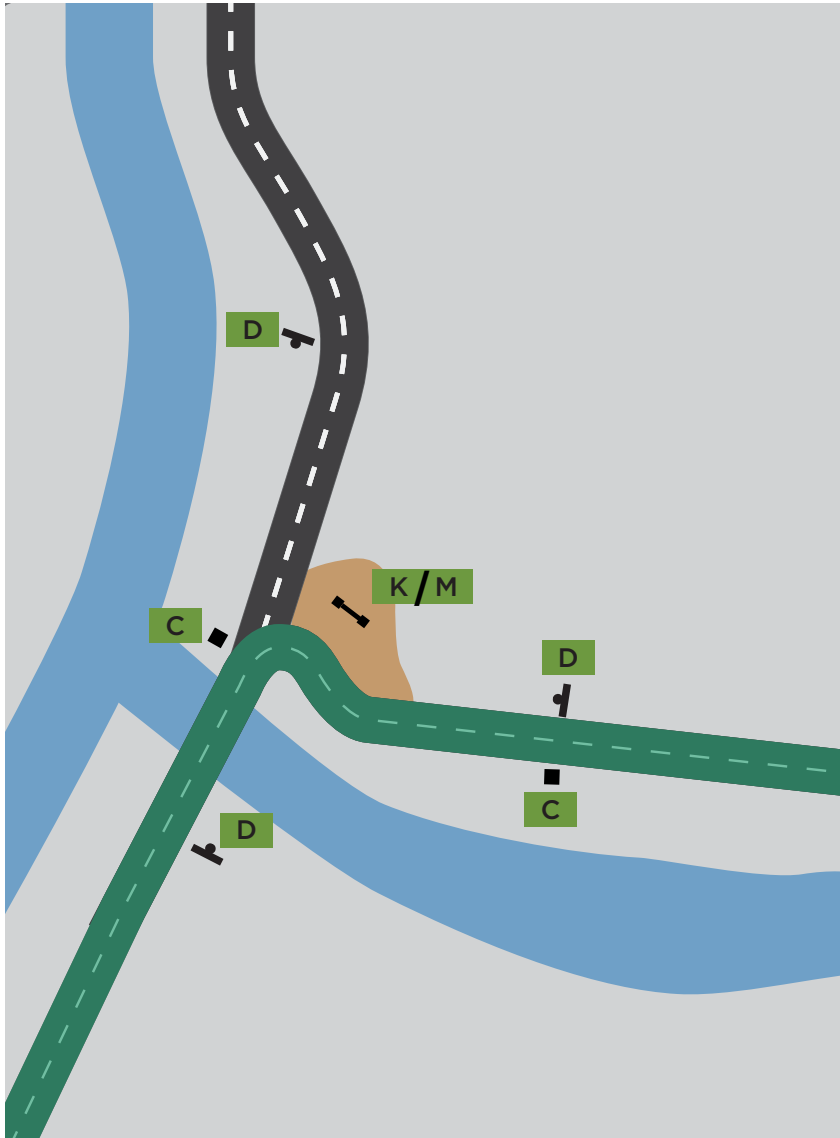
G-2- On-Street Turn Signs

Turn signs shows bicyclists where to access the Loop from adjacent bikeways.

G-3- On-Street Decision Signs

Decision signs placed prior to an intersection of the pathway indicate destinations reached via the OC Loop intersection

Bikeway Intersection



K/M- Trailhead Kiosk / Mapboard

Consider placing a kiosk or mapboard at the intersection of connecting bikeways. It is an opportunity to display the OC Loop map and interpretive information.

D- Direction Signs

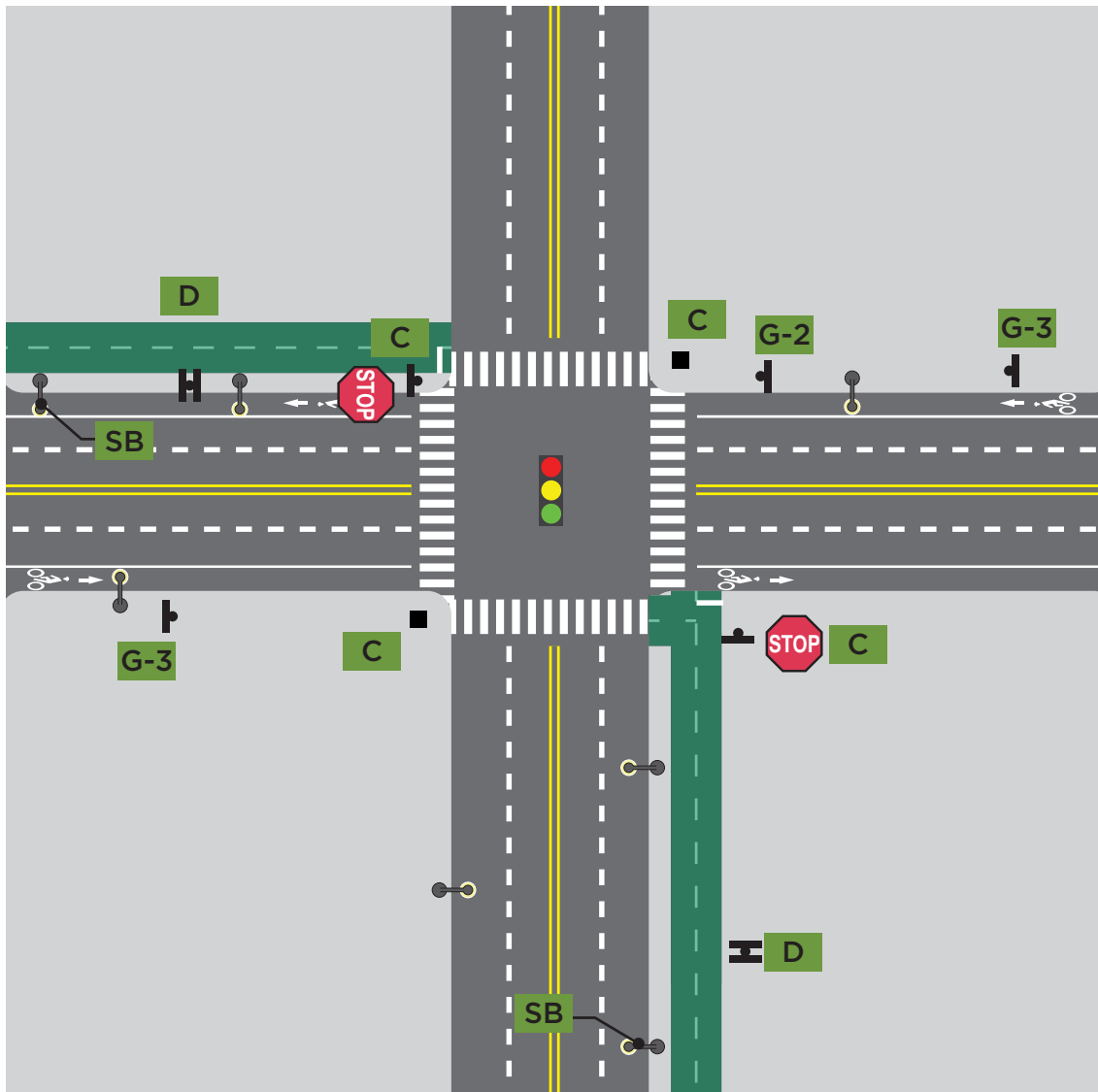
Direction signs should be placed advance of turns to local destinations and services. The OC Loop logo and/or confirmation plaque (G-1) could be added to existing bikeway signs in advance of the OC Loop.

C- Confirmation Signs

Confirmation signs reinforce the identity and direction of the OC Loop.



Intersection Crossing



SB- Street Banners

Consider placing street banners where the OC Loop runs parallel to a major road. Street banners could also be used at the crossings of major roadway intersections.

D- Direction Signs

Direction signs should be placed in advance of turns to local destinations and services.

C- Confirmation Signs

Confirmation signs reinforce the identity and direction of the OC Loop.

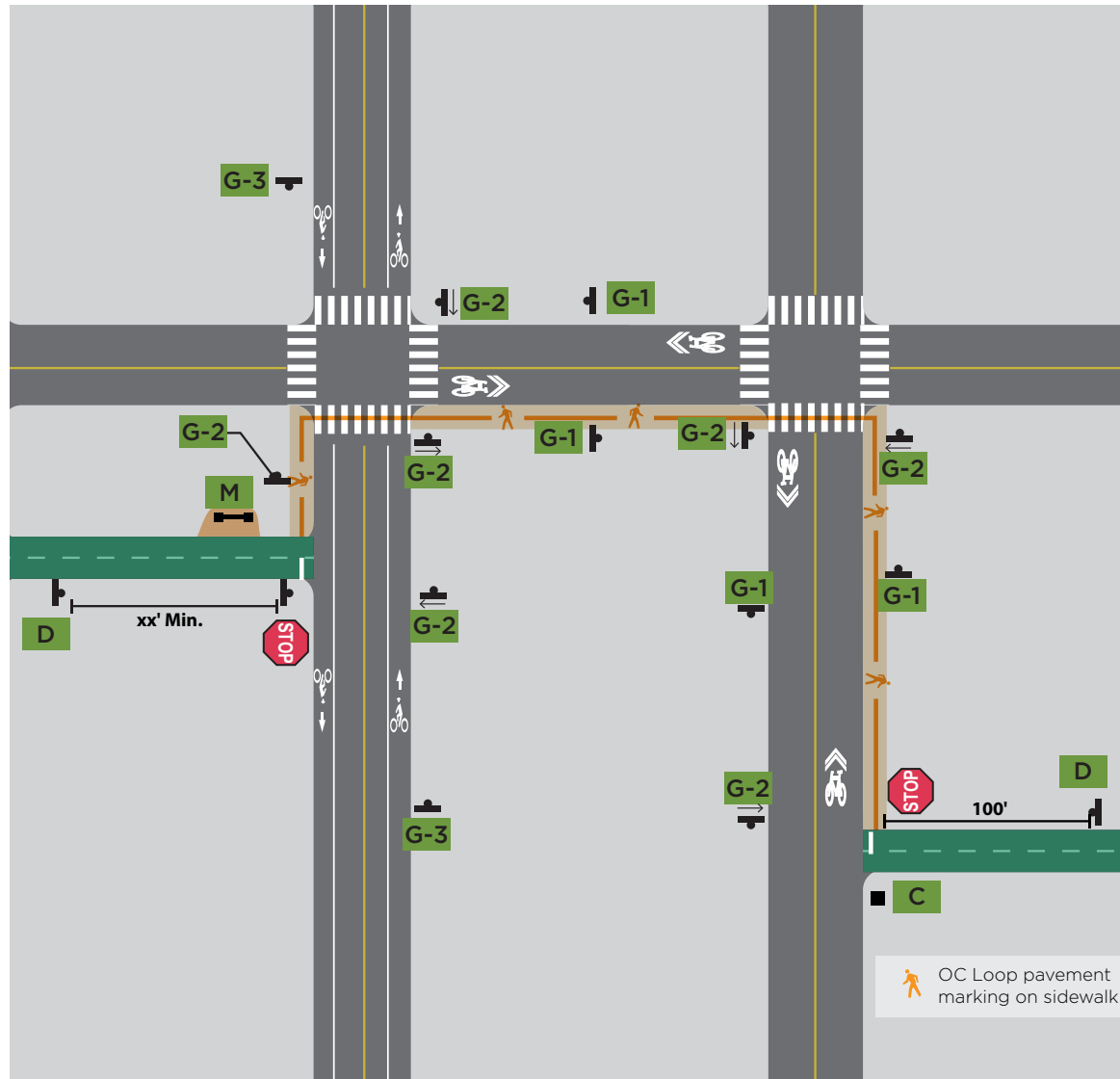
G-2- On-Street Turn Signs

Turn signs show bicyclists where to access the Loop from adjacent bikeways.

G-3- On-Street Decision Signs

Decision signs placed prior to an intersection of the pathway indicate destinations reached via the OC Loop intersection.

On-Street Connection



M- Mapboard

Consider placing a mapboard at the start of an off-street pathway that connects to an on-street bikeway.

D- Direction Signs

Direction signs should be placed in advance of turns to local destinations and services.

D-1 Supplemental Guidance Sign

Indicate direction for pedestrians and bicyclists where pathway for modes split.

C- Confirmation Signs

Confirmation signs reinforce the identity and direction of the OC Loop.

G-1- On-Street Confirmation Signs

OC Loop Confirmation plaques reinforce to bicyclists they are on the OC Loop route.

G-2- On-Street Turn Signs

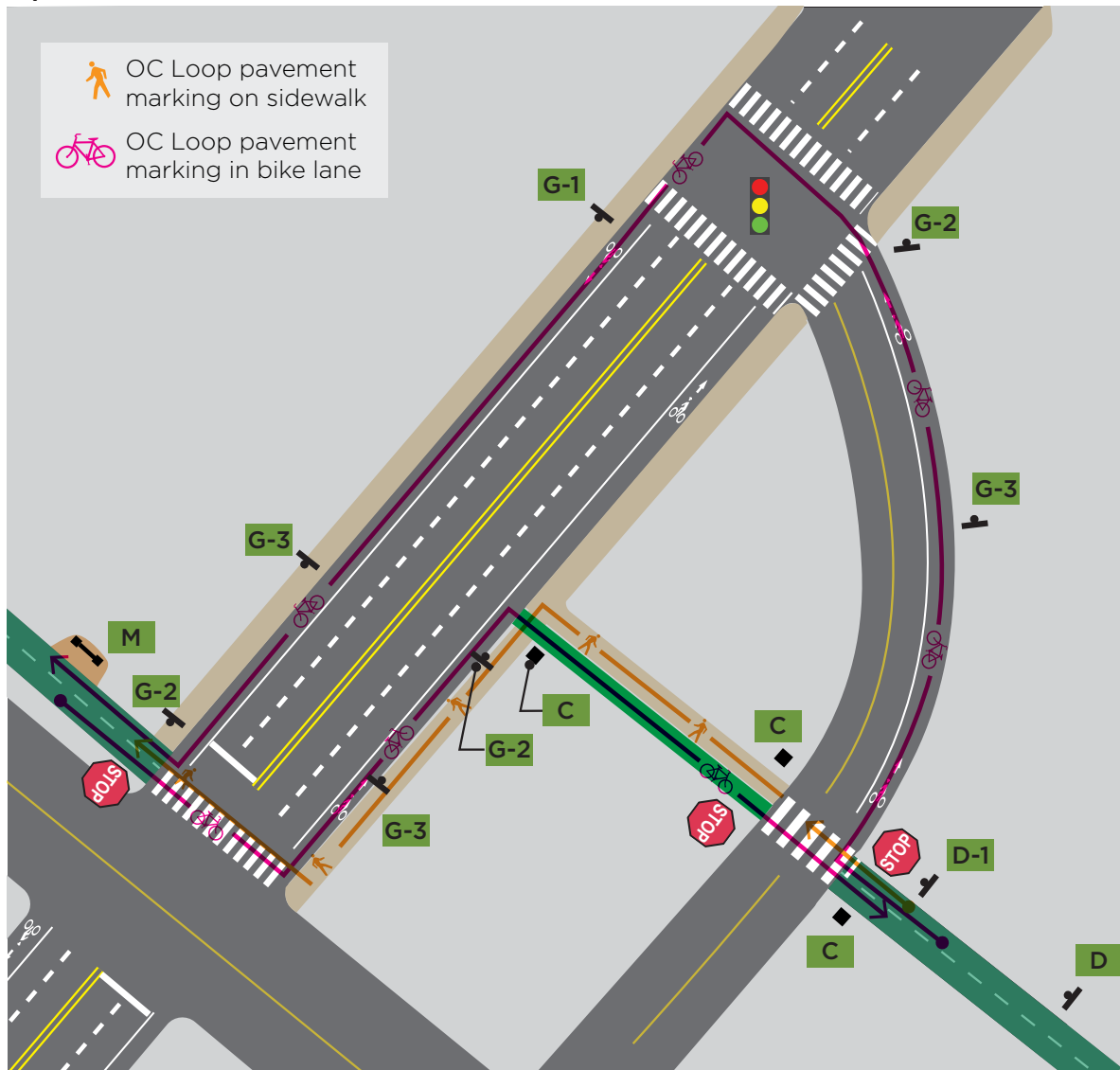
Turn signs indicate where bicyclists need to turn to stay on the OC Loop.

G-3- On-Street Decision Signs

Decision signs placed prior to an intersection indicate destinations reached via the OC Loop.



Separated Bike and Pedestrian Paths



M- Mapboard

Consider placing a mapboard at the start of an off-street pathway that connects to an on-street bikeway.

D- Direction Signs

Direction signs should be placed in advance of turns to local destinations and services and should indicate separate routes for bicycles and pedestrians when needed.

D-1 Supplemental Guidance Sign

Indicate direction for pedestrians and bicyclists where pathway for modes split.

C- Confirmation Signs

Confirmation signs reinforce the identity and direction of the OC Loop.

G-1- On-Street Confirmation Signs

OC Loop Confirmation plaques reinforce to bicyclists they are on the OC Loop route.

G-2- On-Street Turn Signs

Turn signs indicate where bicyclists need to turn to stay on the OC Loop.

G-3- On-Street Decision Signs

Decision signs placed prior to an intersection indicate destinations reached via the OC Loop.

On-Street Bike Guide Sign Design And Placement Standards

The table below details design and placement standards for the on-street bikeway sign types. Where applicable, existing CA MUTCD sign types and dimensions are identified. Design standards include specific guidelines for the application of

names, distances, and destinations. Placement standards include general guidelines for sign placement in relationship to the OC Loop, intersections, and other common circumstances not requiring site-specific placement.

Type	Sign Type	Design Standards	Placement
Confirmation Sign	<ul style="list-style-type: none"> Bicycle Route Guide Sign D-1 size: 24" wide x 18" tall OC Loop logo, modified CA MUTCD D11-1bP size: 24" wide x 4" tall 	<ul style="list-style-type: none"> Opportunities to add OC Loop logo confirmation plaque to existing D11-1 signs where appropriate. 	<ul style="list-style-type: none"> One sign per ¼ directional mile (mid-block) and at the far side of key intersections
Turn Signs	<ul style="list-style-type: none"> OC Loop Logo with arrow, modified D11-1 size: 24" wide x 18" tall 	N/A	<ul style="list-style-type: none"> Signs should be placed at the following distances before an intersection depending on the number of lanes a bicyclist must travel across in order to initiate a legal left turn: <ul style="list-style-type: none"> 25 feet before a zero lane merge 100 feet before a one lane merge 200 feet before a two lane merge
Confirmation and Decision Signs	<ul style="list-style-type: none"> Bicycle Route Guide Sign D-1 size: 24" wide x 18" tall Destination Supplemental Signs D1-3a size: 24" wide 	<ul style="list-style-type: none"> Maximum of three destinations per plaque Destinations shall use upper case and lower case letters For destination names that do not fit on one line abbreviations or two-line entry may be used Destinations shall be listed by closest proximity to the sign placement Left and straight arrows shall be aligned left on the sign; right arrows shall be aligned to the right 	<ul style="list-style-type: none"> Signs should be placed the at the following distances before an intersection depending on the number of lanes a bicyclist must travel across in order to initiate a legal left turn: <ul style="list-style-type: none"> 25 feet before a zero lane merge 100 feet before a one lane merge 200 feet before a two lane merge



In order to maintain consistency and quality control in the wayfinding system, it is important to follow a set of specifications for on-street sign placement and installation. Below are listed key specifications for the recommended OC Loop on-street wayfinding signage.

Specifications

- The standard pole for bikeway guide signs is a 2" square perforated unistrut pole.
- The pole should be placed 18" to 24" in the ground, depending upon the overall weight of the signs and the soil/pavement conditions.
- Heavy sign installations may require poles up to 36" into the ground.
- Poles of 12' in length are generally adequate to accommodate a D11-1 with a supplementary D1-3a sign. Longer poles are needed if additional signs will share the same pole.
- The D11-1 should be installed at 10' in height as measured from the top edge of the sign. This height will allow for the installation of supplementary signs while maintaining a minimum 7' clearance to the bottom edge of the bottom sign.
- When a D11-1 is mounted on a pole with an existing parking restriction sign, the D11-1 and any supplementary sign should be located above the parking restriction sign.
- Signs should not be mounted to utility poles, traffic signal mast arms, or stop signs.
- Existing poles should be used wherever practical.

Samples of existing bikeway branding signs and striping are shown at right in Figures 2.6 and 2.7.



Figure 2.6: Existing County bikeway branding on the Mountains to Sea Trail in Peters Canyon



Figure 2.7: Existing bikeway branding and mile marker wayfinding elements along the North Fork Coyote Creek Bike Trail

SAN GABRIEL RIVER/COYOTE CREEK

Introduction

The OC Loop will follow the San Gabriel River Bikeway inland from its origin along the coast in Seal Beach at the river mouth. The bikeway extends inland generally along the Los Angeles/Orange County line to the confluence between Coyote Creek and the San Gabriel River north of I-405. The Coyote Creek Bikeway begins at its confluence with the San Gabriel River Bikeway in north Long Beach and is fully constructed to the confluence between the north and west/main forks of Coyote Creek, near Artesia Boulevard at Valley View Avenue. At that point the existing bikeway continues along the north fork into Los Angeles County within the City of La Mirada for two miles.

The existing Coyote Creek Bikeway, from the San Gabriel River junction northwards along the north fork, is a key existing component of the OC Loop, but this existing facility faces many challenges. It will require investment in rehabilitation in order to meet the high expectations of the OC Loop.

The bikeway pavement is in poor condition in many areas and the bikeway surface is not marked clearly. First time users can make wrong turns and lose their way easily. Existing segments of the bikeway are especially devoid of landscape and amenities. A large percentage of the bicycle traffic at the junction of the Coyote Creek Bikeway and the San Gabriel River Bikeway currently does not continue along the Coyote Creek Bikeway for a variety of reasons. When viewed at the junction, it can be hard to believe that the bikeway actually continues north another 10 miles.

At the undercrossing of Pacific Coast Highway, the bikeway often becomes flooded during rainy periods, and with the high tide of the Ocean. A seawall, similar to the one found at Pacific Coast Highway and San Juan Creek, is a possible solution, with anticipated costs of \$700,000.

In some areas, the bikeway is improved on one bank, while in other areas it is improved on both sides. The treatment for bicycles at roadway



Figure 3.1: Existing San Gabriel River Bikeway

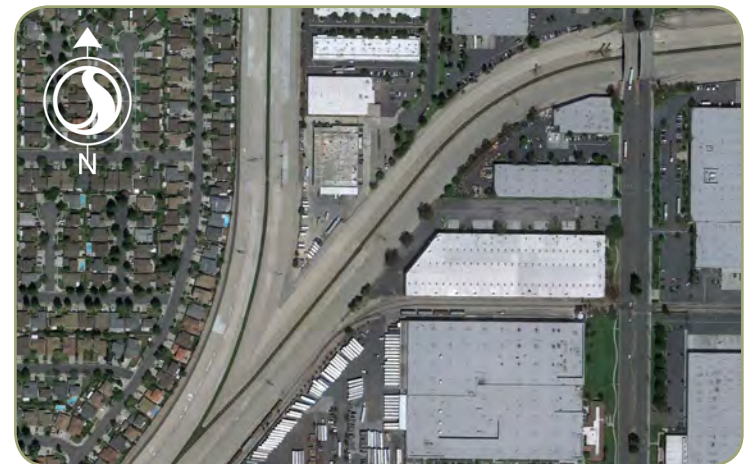


Figure 3.2: The Coyote Creek Confluence (Image from Google Earth)



STUDY AREA 1: SEGMENTS O-P-Q

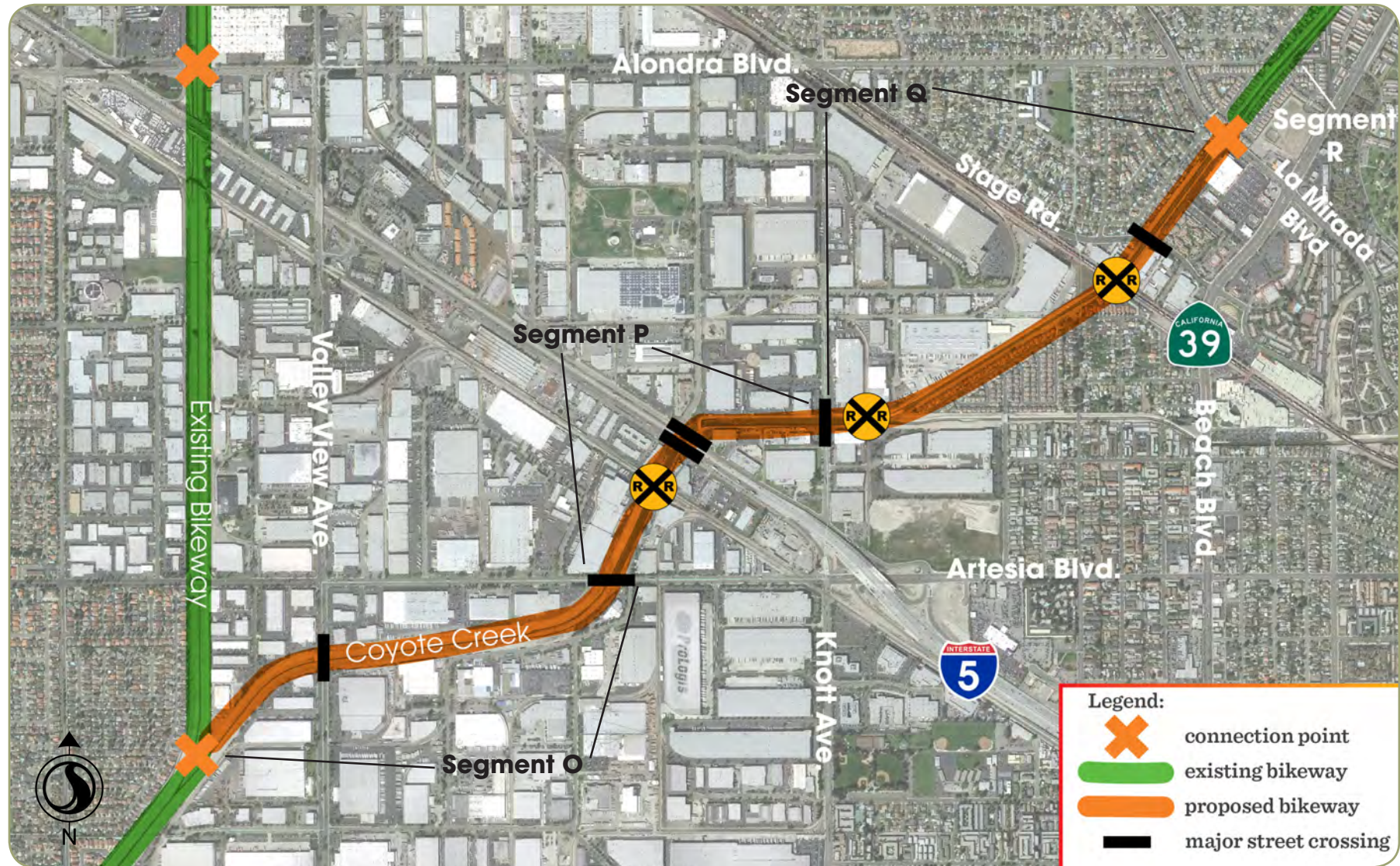


Figure 3.3

bridges is irregular and unpredictable. Bicyclists can suddenly find themselves at the end of a bikeway facing a heavily used and fast arterial highway. There may be no traffic signals to facilitate crossing, a raised median may prohibit crossing, and there may be no suitable way to use the roadway bridge to ride comfortably across the creek to reach the bikeway on the opposite bank.

The preferred routing on the Coyote Creek Bikeway for the OC Loop should be identified and improved to maximize use of built sections, existing arterial undercrossings and take advantage of regional connections. The pavement condition and wayfinding for the preferred route should be brought up to the same standards as the rest of the OC Loop. A new metal trestle bridge across Coyote Creek may be needed to address challenging at-grade street intersections, especially to optimize the route between Ball Road and Orangethorpe Street.

There has been considerable focus placed upon identifying methods to close gaps along the OC Loop. But the overall facility will suffer where existing segments receive negligible maintenance and upkeep, such as the existing Coyote Creek segment between Buena Park and Los Alamitos. Study Area 1 also proposes alternatives in the County of Los Angeles including LA County district maintained Coyote Creek. The County will need to review and approve later design phases and will need to make sure the public can access their right-of-way safely.

■ Segment O: Existing Conditions

Coyote Creek has a major fork where it divides into a North Fork and a Main Fork. It is located near Artesia Boulevard at Valley View Street. The existing Coyote Creek Bikeway extends from the south and continues along the North Fork, ending in the City of Santa Fe Springs.

The first missing segment of the OC Loop begins where the Coyote Creek Channel divides into two forks and would continue along the east fork. OCTA has identified three distinct segments within this study area, Segments O, P, and Q. Study Area 1, showing Segments O, P, and Q are detailed in Figure 3.3.



Figure 3.4: The view west towards the Creek Confluence from Valley View Avenue



Figure 3.5: Close up of Coyote Creek Channel



Segment O is the southernmost portion of Study Area 1. Segment O begins at the existing Coyote Creek Bikeway where the channel divides into its east and north forks. The segment runs east/northeast for 4,800 feet, or 0.91 miles, along the east fork of the Coyote Creek Channel to Artesia Boulevard. Segment O is located mostly within the City of Buena Park with a portion in the City of Cerritos in Los Angeles County.

Existing land uses surrounding the east fork of Coyote Creek Channel, between the confluence and Valley View Avenue, include light industrial and associated private parking lots. Unity Courier Services, East West Home Health, Medicaid, Rock-Tenn, and Nelson Dunn, Inc. are some of the larger businesses. Channel right-of-way is separated from these developments by perimeter chain link fence.

The existing Coyote Creek Bikeway is located along the west levee of the Coyote Creek Channel at the confluence of main/east and north/west tributaries. In order to continue along the east fork a bridge will be required across the north fork to access the north levee and service road along the east fork. The east fork consists of a concrete lined trapezoidal flood control channel at this point. A 12' wide concrete service road exists atop the north levee along the east fork from the confluence north and east to Valley View Avenue.

Valley View Avenue Crossing

Valley View Avenue is a north/south arterial highway. It provides 90' curb-to-curb with three northbound through lanes, three southbound through lanes, and a 14' wide raised median. Valley View Avenue carries 20,000 vehicles per day (OCTA ADT Map 2013-14).

The existing bridge for Valley View Avenue is approximately 20' higher than the bottom of the channel. The channel levee service road rises and makes a grade crossing via existing driveways at Valley View Avenue. The Valley View Avenue Bridge and service road driveways are shown in Figures 3.6 and 3.7 respectively. Because of the trapezoidal channel configuration, a dip undercrossing is well suited for this location.

Valley View Avenue to Artesia Boulevard

The east fork of Coyote Creek continues from Valley View Avenue to



Figure 3.6: The Valley View Avenue Overpass



Figure 3.7: Looking eastbound along Coyote Creek from Valley View Avenue

Artesia Boulevard in the City of Buena Park. Proceeding east from Valley View, the creek is within a concrete lined trapezoidal channel. Large office manufacturing buildings (e.g., Alco Industries and Communication Supply Corporation) adjoin the north side of the channel. These businesses are separated from the channel by a continuous chain-link fence. A stub of an apparently abandoned railroad serving goods movement ends along the frontage of two manufacturing buildings west of the intersection with Artesia Boulevard. The rail line appears disconnected north of Artesia Boulevard.

The channel and its parallel service road continue east from Valley View Avenue to Artesia Boulevard. The existing dirt and crushed rock surface is narrow and not well-defined; however, there is sufficient space within the channel right-of-way for a full-width class I bikeway. About 1,000' south of Artesia Boulevard, the trapezoidal channel narrows to form a vertical wall box channel. The channel right-of-way remains wide and usable as a class I bikeway.

Artesia Boulevard Crossing

The service road continues to follow the edge of the channel and rises to an asphalt driveway at Artesia Boulevard. The Artesia Boulevard overpass, service road driveways, and Coyote Creek box channel are shown in Figure 3.8.

Artesia Boulevard, at its intersection with the channel, is an east-west arterial highway providing three lanes in each direction with sidewalks at the bridge crossing over the channel. It carries approximately 25,000 vehicles per day (OCTA ADT Map 2013-14). Artesia Boulevard crosses the vertical wall channel on a bridge. There is ample space on both sides of the channel to accommodate the proposed class I bikeway, but the vertical wall channel does not readily allow for a dip undercrossing. A traffic signal or similar control would be required, at minimum, to facilitate bikeway crossings. While not included in the cost estimate, a separate undercrossing structure could also be provided to avoid crossing Artesia Boulevard at grade.

A perimeter fence prevents the public from entering flood control ROW from its several access points at the Artesia Boulevard bridge crossing.



Figure 3.8: Looking south towards the Artesia Boulevard Overpass, Service Roads, and Coyote Creek Box Channel



Figure 3.9: Looking north towards the UPRR Branch Line Overpass from a driveway off of Artesia Boulevard



Segment 0: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Wide channel right-of-way provides room for class I bikeway
- Existing service roads
- Trapezoidal channel configuration makes relatively inexpensive dip under crossings feasible in places
- County owned land, with no need for right-of-way acquisition
- Long, uninterrupted stretches of right-of-way

WEAKNESSES

- Industrial surroundings
- Lack of open space and greenery
- Significant barriers require crossing, and any alternatives are likely to be expensive
- Limited street alignment alternatives, due to I-5 interchanges

OPPORTUNITIES

- Connection to the established Coyote Creek Bikeway
- Access to employment clusters
- Proximity to residential neighborhoods
- Access to destinations in LA County
- Serves disadvantaged communities, which provides additional funding opportunities
- Interim (near-term) on-street routing

CHALLENGES

- Lack of non-commuter destinations
- Lack of bicycle infrastructure on surrounding streets

Segment O: Recommendations

Segment O begins at the existing Coyote Creek Bikeway. The proposed alignment crosses from the west levee of the North Fork of the channel to the north levee of the East Fork by way of a new truss bridge as shown in Figure 3.10.

Segment O follows along the north side of the channel east of the confluence. It would be constructed along the channel north service road atop the north levee from the new truss bridge to Valley View Avenue. As discussed in the General Recommendations, a fence can be constructed to help prevent users of the OC Loop from entering the Coyote Creek channel.

At Valley View Avenue, OC Loop is proposed to cross the road via an undercrossing by aligning the facility beneath the existing bridge. The undercrossing will provide an 8' minimum height, which will keep the bikeway approximately 12' above the bottom of the channel, and requires a 5' retaining wall. Connectors to street level will be provided at Valley View Avenue. This is shown in Figures 3.11 and 3.12.

The OC Loop would continue to be constructed along the north service road to where Segment O ends at Artesia Boulevard on the border with the City of La Mirada. Because Artesia Boulevard crosses a vertical wall channel, a dip undercrossing similar to Valley View Avenue is not feasible. Given existing traffic volumes on Artesia Boulevard, a traffic signal or similar treatment would be required to facilitate crossing, but the City of Buena Park has indicated a strong preference that no additional signals be installed to regulate traffic on its major roadways. In addition, a grade separation structure would provide a better experience for bicyclists.

An undercrossing is recommended to cross Artesia Boulevard by providing a new structure for the OC Loop west of the existing roadway bridge. A street level connection would also be provided to permit access directly to Artesia Boulevard.



Figure 3.10: Proposed connection from existing West Fork Bikeway

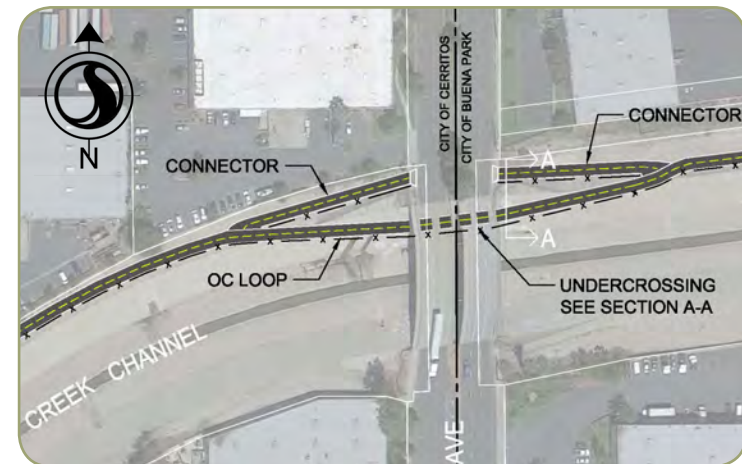


Figure 3.11: Proposed Valley View Avenue crossing



Segment O does not appear to pose any unique difficulties and could be constructed with minimum concerns for feasibility. The feasibility of the required new structure for an undercrossing at Artesia Boulevard poses the greatest uncertainty. Construction of this Segment alone, however likely will not result in significant increases in usage. While the OC Loop will be a more comfortable route for users, the Valley View Avenue and Artesia Boulevard approaches are not attractive connections, and no significant bicycle or OC Loop attractions are nearby. This Segment probably is not suitable for construction unless combined with Segments P and Q. Improvements along this corridor would need to be coordinated with the United States Army Corps of Engineers.

Cost and Funding

Improvements to Segment O are expected to cost \$7,000,000, as shown in the cost breakdown provided on the following pages. Estimated annual maintenance is approximately \$63,000, also shown in the following tables.



Figure 3.12: Looking north from Valley View Avenue with existing conditions (top right) and proposed OC Loop bikeway excluding wayfinding and landscaping



Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment O - West Fork Trail to Artesia Boulevard
 (Approx. 4900')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment O: Total Cost				
		PA/ED Environmental Costs (~15%* of project cost)		\$ 693,927.00
		Right of Way (none required)		\$ -
		Plans & Specs (~20% of project cost)		\$ 925,236.00
3100	SF	Install truss bridge crossing over Coyote Creek	\$180.00	\$ 558,000.00
5200	LF	Install fence	\$35.00	\$ 182,000.00
2	Each	Install ADA ramps	\$2,500.00	\$ 5,000.00
500	LF	Install (dip) undercrossing below Valley View Avenue at Coyote Creek	\$560.00	\$ 280,000.00
120	LF	Install (tunnel) undercrossing below Artesia Boulevard	\$10,000.00	\$ 1,200,000.00
600	SF	Install bike loop striping (includes striping on existing bike trail) (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,800.00
80000	SF	Install Bike Loop Ashpalt	\$15.00	\$ 1,200,000.00
		Mobilization (~5% of Total Cost)		\$ 171,340.00
		Traffic Control (~10% of Total Cost)		\$ 342,680.00
		Contingency 20%		\$ 685,360.00
		Subtotal (project cost)		\$ 4,626,180.00
		Construction Engineering (~15% of project cost)		\$ 693,927.00
		Segment O: Total Cost (unrounded)		\$ 6,939,270.00
		Segment O: Total Cost (rounded)		\$ 7,000,000.00

* PAVED Costs vary from 0-20% based on project size and complexity.

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment O - West Fork Trail to Artesia Boulevard
 (Approx. 4900')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
75677	SF	Asphalt Maintenance	\$ 0.75	\$ 56,757.75
5	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 480.00
0.92	miles	Sweeping	\$ 475.00	\$ 437.00
0.92	miles	Landcaping maintenance	\$ 4,275.00	\$ 3,933.00
0.92	miles	Misc	\$ 1,000.00	\$ 920.00
		Annual Maintenance Cost		\$ 62,527.75
		Segment O Total Maintenance Cost (rounded)		\$ 63,000.00

Segment P: Existing Conditions

Segment P runs parallel to the Coyote Creek channel from Artesia Boulevard to Knott Avenue. It is located entirely within the City of La Mirada in Los Angeles County. Segment P is 3,250' long and crosses the Interstate 5 Freeway, its frontage roads, and the Union Pacific Railroad (UPRR) Anaheim Branch Line.

Artesia Boulevard to UP Railroad Crossing

The Coyote Creek channel continues as a vertical wall concrete lined channel north of Artesia Boulevard. The north service road is suitable for construction of the OC Loop. The service area along the south side of the channel narrows where it is adjacent to development, limiting room for a bikeway.

Land uses adjacent to the channel include industrial and commercial uses and parking lots. Businesses include Living Spaces Furniture and Tuff Industries to the West and Forest Plywood Sales to the East.

UP Railroad Crossing

A UPRR branch line crosses Coyote Creek about 1,100' north of Artesia Boulevard. The configuration of the railroad crossing of Coyote Creek is suitable for construction of a bikeway underpass, but a new separate structure will be required because of the vertical wall configuration of the channel beneath the railroad. The UPRR branch line is estimated to accommodate 2-4 trains daily, and does not serve any passenger trains. The railroad is not expected to allow a grade crossing for the OC Loop at this crossing due to the amount of track activity.

Railroad Crossing to Firestone Boulevard South

Past the railroad ROW, the service roads continue along the edge of the concrete box channel within a wide graded area for about 400' to Firestone Boulevard South, which serves as a frontage road for the I-5 Freeway.

Firestone Boulevard South Frontage Road

Firestone Boulevard South provides one lane in each direction.

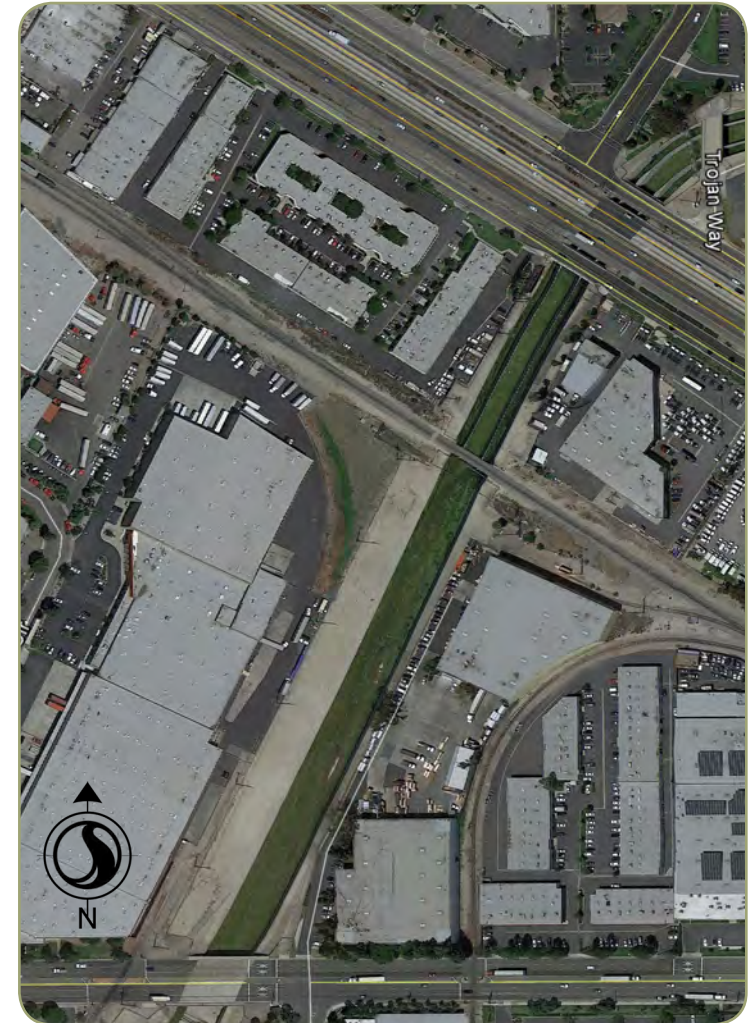


Figure 3.13: Artesia Boulevard and UP Railroad crossing (image from Google Earth)



The roadway serves relatively light traffic volumes that could potentially be crossed by OC Loop users at-grade, but the need for grade separations for the UPRR branch line to the south and the I-5 Freeway to the north, generally require that a grade separation would be required to cross under Firestone Boulevard South.

At Firestone Boulevard South, the channel service roads approach the street via gated asphalt driveways of similar width. Coyote Creek continues as a vertical wall channel beneath Firestone Boulevard South and I-5. The Firestone Boulevard South Bridge and service roads are shown in Figure 3.14 and 3.15 respectively.

I-5 (Santa Ana) Freeway and Firestone Boulevard North Frontage Road

The Santa Ana Freeway (I-5) exists immediately north of and parallel to Firestone Boulevard South. It is 105' wide and provides three southbound travel lanes, a center median, and four northbound travel lanes. Firestone Boulevard North is aligned parallel to and just north of I-5. It provides a single lane in each direction. Unpaved service roads exist on either side of Coyote Creek north of Firestone Boulevard North. Public access to both service roads is restricted by security fencing.

The I-5 Freeway is scheduled for widening at the Coyote Creek crossing in the near future, but work has not yet begun. Discussions between Caltrans and the County have confirmed that an opening for a bikeway undercrossing is proposed as part of freeway construction. Plans include a designated opening that is planned to be constructed under three of the four bridges as part of the freeway widening project (I-5 North, I-5 South, and Firestone Boulevard North). The Firestone Boulevard South bridge is not being reconstructed with the Caltrans project. It does not provide an opening for a bikeway at this time. Also the freeway plans do not provide for construction of the bikeway, only for construction of openings for a future facility, free of structural supports and utilities within an envelope of space at least 8' high and 9' wide.



Figure 3.14: The Firestone Boulevard South Overpass

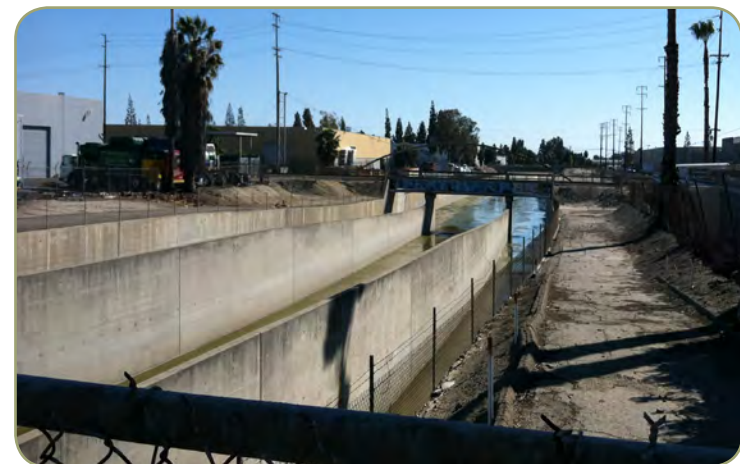


Figure 3.15: The view southward from Firestone Boulevard South

Firestone Boulevard North to Knott Avenue

Coyote Creek continues north and east from the I-5/Firestone Boulevard crossing to Knott Avenue, the northern boundary of Segment P. This section of the channel is 1,500' long. The channel continues as a vertical wall concrete lined box channel in this area.

The channel right-of-way is flanked by big box commercial and light industrial developments, such as Accu-Tech Corporation and Hawaiian Express Services (to the north) and Coyle Reproductions (to the south). A 10' wide dirt shoulder exists between the paved service roads and the businesses.

Trojan Way includes a short span bridge across the channel. The road is closed at a barricade located just north of the channel bridge. The crossing is located very near Firestone Boulevard North and appears to be the former alignment of Trojan Way before the roadway was constructed at full width just to the west of Coyote Creek. The Trojan Way Overpass is shown in Figure 3.16.

Segment P ends at Knott Avenue and connects with Segment Q. Knott Avenue is a 2-lane, low volume street, that carries approximately 3,000 vehicles per day (OCTA ADT Map 2011) with a 40 mph speed limit. The proposed bikeway will cross Knott Avenue at street level.



Figure 3.16: The Trojan Way Overpass as seen from the Firestone Boulevard overpass



Figure 3.17: The Trojan Way Overpass as seen from the Firestone Boulevard Overpass with Firestone Boulevard North railing visible



Segment P: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Bicycle and pedestrian connectivity across a major barrier
- Wide channel right-of-way provides room for class I bikeway
- Existing service roads
- County owned land, with minimal requirement for additional right-of-way
- Long, uninterrupted stretches of right-of-way
- Adjacent land use owners and tenants unlikely to have concerns over bikeway improvement

OPPORTUNITIES

- Access to employment clusters
- Could provide a pedestrian and bicycle connection in a location that may be currently under-served
- Interim (near-term) on-street routing

WEAKNESSES

- Lack of open space and greenery
- Potential difficulties with modifying the area under Caltrans jurisdiction
- Channel right-of-way narrows around freeway complex
- Significant barriers require crossings, and any alternatives are likely to be expensive
- Box channel configurations makes under crossings more difficult/expensive

CHALLENGES

- Industrial surroundings
- Lack of non-commuter destinations
- Lack of bicycle infrastructure on surrounding streets
- Potential for low usage unless adjacent Segments O and Q are also constructed concurrently

Segment P: Recommendations

Segment P is generally provided along the north service road of the Coyote Creek channel. It begins at the end of Segment O, at Artesia Boulevard, and extends to the beginning of Segment Q at Knott Avenue. Segment P is approximately 0.62 miles long and is located within the City of La Mirada in the County of Los Angeles. Coordination between the Cities of Buena Park in Orange County and La Mirada in Los Angeles County will be required. As discussed in the general recommendations, a fence can be constructed to separate the class I bikeway from the Coyote Creek channel.

An undercrossing will be constructed by provision of a new structure at Artesia Boulevard, and a street level connection will also be provided. An additional undercrossing must be constructed beneath the UPRR branch line near Firestone Boulevard.

The I-5 Freeway widening by Caltrans will provide an opening for an undercrossing beneath the I-5 Freeway mainline and Firestone Boulevard North. Caltrans' widening plans do not include the Firestone Boulevard South roadway on the south side of I-5 Freeway. The City of La Mirada has no plans to replace the Firestone Boulevard South Bridge in the near future. As a result, an undercrossing at Firestone Boulevard South must be constructed by the OC Loop as shown in Figure 3.18.

Stop signs for OC Loop users will be installed at the street-level crossing at Knott Avenue, and a marked crosswalk will be provided as shown in Figure 3.19. No signalization is necessary at the Knott Avenue crossing as Knott Avenue only carries approximately 3,000 vehicles per day (OCTA ADT Map 2013-14).

The segment appears to be feasible, but the number of undercrossings required and the need to reconstruct Firestone Boulevard South increase costs notably. Given that Segment P is entirely in Los Angeles County, implementation might be best facilitated by Los Angeles County or the City of La Mirada. Also, it almost certainly will not result in substantial usage unless Segment O and Segment Q are also addressed.

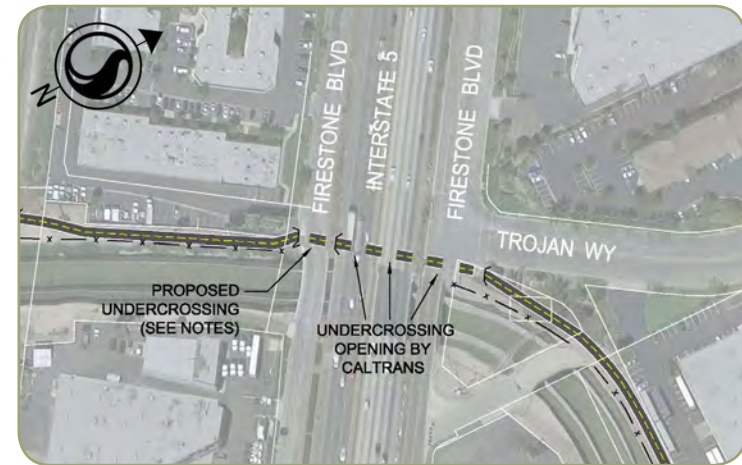


Figure 3.18: Proposed Grade Separation under I-5 freeway



Figure 3.19: Proposed at-grade crossing at Knott Avenue





Figure 3.20: Looking south from Firestone Boulevard South with existing conditions (top left) and proposed OC Loop, excluding wayfinding and landscaping

Figure 3.20 shows the proposed undercrossing beneath the Union Pacific Railroad south of Firestone Boulevard. Improvements along this corridor would need to be coordinated with the United States Army Corps of Engineers.

Cost and Funding

Improvements to Segment P are expected to cost \$8,500,000, as shown in the following tables. Estimated annual maintenance is approximately \$37,500.

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment P - Artesia Boulevard to Knott Avenue (Approx. 3100')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment P: Total Cost				
		PA/ED Environmental Costs (~15%* of project cost)		\$ 829,561.50
		Right of Way (none required)		\$ -
		Plans & Specs (~20% of project cost)		\$ 1,106,082.00
50	LF	Install undercrossing below railroad	\$35,000.00	\$ 1,750,000.00
50	LF	Install undercrossing below South Firestone Boulevard	\$25,000.00	\$ 1,250,000.00
1	LS	Removal of Trojan Way Bridge	\$200,000.00	\$ 200,000.00
2	Each	Install stop signs	\$200.00	\$ 400.00
4000	LF	Install fence	\$35.00	\$ 140,000.00
2	Each	Install ADA ramps	\$2,500.00	\$ 5,000.00
400	SF	Install bike loop striping (includes striping on existing bike trail) (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,200.00
50000	SF	Install bike loop asphalt	\$15.00	\$ 750,000.00
		Mobilization (~5% of Total Cost)		\$ 204,830.00
		Traffic Control (~10% of Total Cost)		\$ 409,660.00
		Contingency 20%		\$ 819,320.00
		Subtotal (project cost)		\$ 5,530,410.00
		Construction Engineering (~15% of project cost)		\$ 829,561.50
		Segment P: Total Cost (unrounded)		\$ 8,295,615.00
		Segment P: Total Cost (rounded)		\$ 8,500,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity.

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment P - Artesia Boulevard to Knott Avenue (Approx. 3100')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
45000	SF	Asphalt Maintenance	\$ 0.75	\$ 33,750.00
3	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 288.00
0.59	miles	Sweeping	\$ 475.00	\$ 280.25
0.59	miles	Landscaping maintenance	\$ 4,275.00	\$ 2,522.25
0.59	miles	Misc	\$ 1,000.00	\$ 590.00
		Annual Maintenance Cost		\$ 37,430.50
		Segment P Total Maintenance Cost (rounded)		\$ 37,500.00



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■ Segment Q: Existing Conditions

Segment Q extends from Knott Avenue to La Mirada Boulevard in the City of Buena Park. The Segment is about one mile long. It crosses a Burlington Northern Santa Fe (BNSF) railroad spur, the heavily used Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor, and Stage Road before ending at La Mirada Boulevard.

Knott Avenue Vicinity

Coyote Creek continues as a vertical wall concrete channel east of Knott Avenue. In this section, the channel is 75' wide. Paved flood control service roads are located on both sides of the channel and are 8' to 20' wide. Light industrial land uses surround the channel. A barbed wire fence encloses the channel and a cement wall separates the shoulders from businesses.

Knott Avenue is 62' wide and travels in the north-south direction with a single lane in each direction. It is a local industrial collector at this location and carries light traffic volumes, approximately 3,000 vehicles per day (OCTA ADT Map 2013-14).

BNSF Railroad Crossing

There is a spur railroad crossing about 300' east of Knott Avenue. The spur is lightly used, serving only a few industrial properties on the south side of the creek. The BNSF spur is estimated to accommodate 2-4 trains daily (or less), and does not serve any passenger trains. The BNSF railroad spur bridge is shown in Figure 3.21.

At the eastern side of Knott Avenue, chain link gates enclose the driveways on both sides of the concrete box channel. The 11' wide service roads begin a short distance beyond the gates and extend upstream along both sides of the concrete channel for approximately 396', where they reach a 17' wide railroad ROW. The railroad spans the channel in the north-south direction.



Figure 3.21: Looking east towards the BNSF railroad spur bridge from the Knott Avenue bridge (image from Google Streetview)



Figure 3.22: Looking south towards the LOSSAN Rail Corridor crossing from Stage Road (image from Google Streetview)



BNSF Railroad Crossing to LOSSAN Rail Corridor Crossing

The confluence of the east fork of Coyote Creek and the Brea Creek concrete box channels is located immediately east of the BNSF railroad crossing. At this point, the service road on the south side of the Coyote Creek channel follows Brea Creek to the east. The service road along the northern side of Coyote Creek continues northeast. The concrete box channel for Coyote Creek widens into a trapezoidal concrete channel just upstream of the confluence. 12' wide crushed rock service roads flank both sides of this 2,900' long section of channel between the railroad near Knott Avenue and the LOSSAN Rail Corridor. The channel changes from a trapezoid shape to a vertical wall configuration as it approaches the Metrolink railroad bridge crossing.

LOSSAN Rail Corridor Crossing

Metrolink/Southern California Regional Rail Authority operates and maintains the three-track main line railroad that connects Los Angeles, Orange County, and San Diego counties (LOSSAN) and connects to the main Burlington Northern Santa Fe (BNSF) line to the east. The LOSSAN Rail Corridor is heavily used by trains operating at relatively high speeds. The feasibility of providing a fourth track is under consideration. The LOSSAN Rail Corridor overcrossing of the channel is shown to the right in Figure 3.23.

A single-family residential housing tract exists adjacent to and southeast of the channel as does light industrial buildings (State Logistics Services and Xpedx) and associated surface parking to the immediate northwest. A perimeter fence separates the channel right-of-way from adjacent land uses. There is 5' to 8' of additional shoulder adjoining the levee service road in this area. Both the eastern and western asphalt service roads are separated from the railroad by gates and fencing.



Figure 3.23: LOSSAN Rail Corridor Crossing to Stage Road



Figure 3.24: Stage Road overpass

LOSSAN Rail Corridor to Stage Road

The Coyote Creek Channel continues north beyond the LOSSAN Rail Corridor crossing for 460' to Stage Road, as shown in Figure 3.22.

Commercial buildings (i.e. Classic Auto Management to the north and Fore Par Group to the south) are located adjacent to the channel.

Stage Road Crossing

Stage Road is 70' wide with two lanes in each direction carrying 10,000 vehicles per day (OCTA ADT Map 2011). Channel service roads connect with Stage Road via four asphalt driveways. The channel service roads are gated and locked which prevents the public from entering. The Stage Road Bridge, access gates, fencing, and the view towards the railroad ROW are shown in Figures 3.24 and 3.25 respectively.

Stage Road to La Mirada Boulevard/Malvern Avenue

The 1,277' segment of channel between Stage Road and La Mirada Boulevard passes between two residential developments and a school. The asphalt service roads are 10' to 12' wide and parallel the concrete box channel on both sides. The service road and shoulder on the east channel levee is 24' wide. Ornamental trees were planted outside of channel right-of-way to separate homes from the channel. A wide dirt shoulder exists on the west side of the channel adjacent to the service road.

On the east side of the channel, an apartment development exists near Stage Road and a commercial strip mall exists on the eastern side of the channel near La Mirada Boulevard. The apartment complex is visible in Figure 3.24. The channel right-of-way is enclosed by fencing and the service road and adjacent land uses are separated by a low wall.



Figure 3.25: Looking Northeast from Stage Road



Figure 3.26: The La Mirada Boulevard Overpass



La Mirada Boulevard Crossing

La Mirada Boulevard is approximately 90' wide with three travel lanes in each direction carrying 33,000 vehicles per day (City of Buena Park ADT Map 2008). At La Mirada Boulevard, the service roads slope upwards and connect to the street via concrete driveways. A gate and fence prevent the public from using the channel service road. The La Mirada Boulevard Overpass, service road driveways, and security fencing are shown in Figure 3.26.

Beyond La Mirada Boulevard, the OC Loop continues as the newly constructed Segment R from La Mirada Boulevard to Hillsborough Drive. Segment R opened in September 2014 and is not detailed in this study. Segment R as recently constructed by the County of Orange is shown in Figure 3.27.

An existing pedestrian overcrossing is provided just north of La Mirada Boulevard. It was constructed to provide circulation between two sides of a residential community located on both sides of Coyote Creek. This overcrossing could be incorporated into the OC Loop if needed.



Figure 3.27: Recently constructed Coyote Creek Bikeway (Segment R).

■ Segment Q: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Wide channel right-of-way provides room for class I bikeway
- Existing service roads
- County owned land
- Uninterrupted stretches of right-of-way
- Nearby landowners not likely to have concerns over bikeway construction

WEAKNESSES

- Lack of open space and greenery
- Expensive improvements such as bridges and undercrossings
- Box channel configurations makes undercrossings more difficult/expensive in places
- Busy LOSSAN Railroad corridor represents a major barrier
- Channel ROW narrows around the railroad crossing
- Width of La Mirada Boulevard and Malvern Avenue will make crossings difficult

OPPORTUNITIES

- Channel branches and spur railroads could eventually become additional bikeway connections to other facilities
- Connection to the newly constructed Segment R, has current momentum and public support
- Access to employment clusters
- Proximity to residential neighborhoods
- Interim (near-term) on-street routing along Alondra Boulevard to Stage Road and La Mirada Boulevard

CHALLENGES

- Industrial surroundings
- Lack of non-commuter destinations
- Lack of bicycle infrastructure on surrounding streets



Segment Q: Recommendations

Segment Q is located primarily within the City of Buena Park with a small segment that is located in the City of La Mirada. Segment Q connects Segment P at Knott Avenue and Segment R at La Mirada Boulevard. It begins at the border between the Cities of La Mirada and Buena Park and passes through a short section of La Mirada south of the LOSSAN tracks. Segment Q is just over 1 mile long. Segment Q of the OC Loop will follow the west levee of the Coyote Creek Channel from Knott Avenue to just north of the LOSSAN tracks where it will then cross to the east levee of the channel. Due to the industrial nature of the area, it will be important to retain police access to all areas.

Segment Q begins at Knott Avenue and connects with Segment P. The proposed bikeway will cross Knott Avenue at street level. Stop signs for bikes at the street-level crossing and a marked crosswalk are recommended.

A class I bikeway will be installed along the west levee of the Coyote Creek channel beginning at the street-level crossing at Knott Avenue and continuing to the east and north.

An at-grade crossing of the lightly used BNSF railroad spur is proposed with an automatic signal and gate arms to prevent OC Loop users from crossing the track while trains are present. If an at-grade crossing is not allowed by the railroad, an undercrossing will need to be provided by providing a separate structure. The cost estimate included in this report assumes that an at-grade crossing will be allowed by the railroad.

The confluence of the Coyote Creek and Brea Creek channels occurs east of the BNSF railroad spur. Segment Q continues to follow Coyote Creek to the northeast. The class I bikeway will be constructed along the service road on the western levee of the channel. A fence will be constructed to separate the class I bikeway from the Coyote Creek channel.

At the LOSSAN Rail Corridor, the preferred crossing is an undercrossing. The undercrossing will require a minimum of 8' of vertical clearance under the



Figure 3.28: Proposed at-grade crossing of lightly used BNSF commercial rail spur, past Knott Avenue

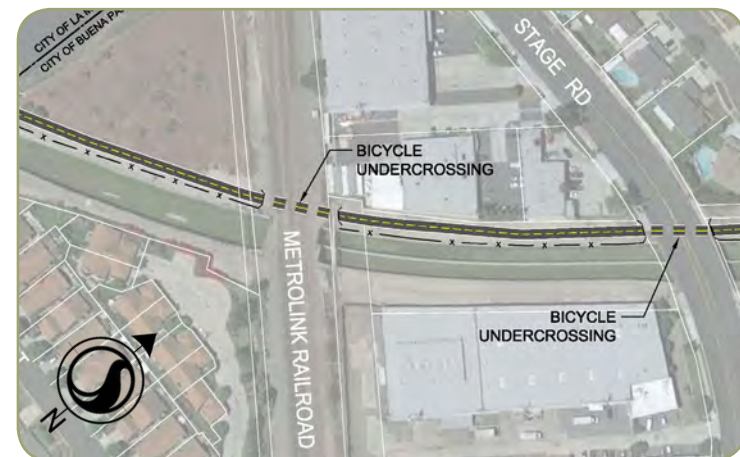


Figure 3.29: LOSSAN main line crossing

railroad. If an undercrossing is not provided, an overcrossing will be required. An overcrossing must be 30' high, to clear the height of the rail cars, with a 5% grade, to comply with ADA requirements.

An at-grade crossing is not an option at this high-volume, high-speed railroad track.

The OC Loop will continue to follow the service road on the west levee of the channel across Stage Road to La Mirada Boulevard. At Stage Road, a grade-separated undercrossing is recommended. If an undercrossing is not provided, an at-grade crossing would be required, but this would require a traffic signal or PHB signal. If an undercrossing is not provided, the widening of the Stage Road sidewalks is recommended. The cost estimate included in this report assumes that an undercrossing will be selected.

North of Stage Road, the OC Loop needs to cross the channel and continue on the east side to connect with the bikeway north of La Mirada Boulevard. Alternatively, if access can be made consistently available, the OC Loop could cross at the existing bridge north of La Mirada Boulevard. However, the existing ped/bike bridge is privately owned and maintained, and access to it for the OC Loop might not be available.

A PHB signal and marked crosswalk is recommended at La Mirada Boulevard due to cost constraints. An undercrossing would be preferred by the city but would likely add over a million dollars to the cost estimate, due to the channel walls and existing pedestrian bridge. After crossing La Mirada Boulevard, the loop will join the newly constructed bikeway on the east side of the channel.

Improvements along this corridor would need to be coordinated with the United States Army Corps of Engineers.

Cost and Funding

Improvements to Segment Q are expected to cost \$17,000,000, as shown in the following tables. Estimated annual maintenance is approximately \$68,000.

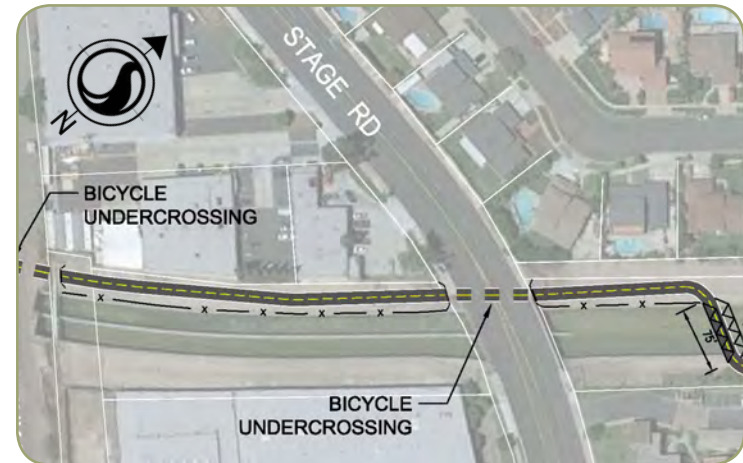


Figure 3.30: Proposed Stage Road undercrossing and bridge

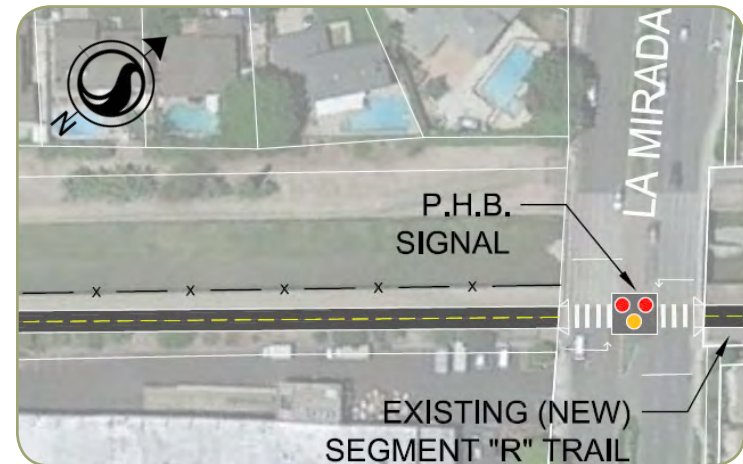


Figure 3.31: Proposed PHB at La Mirada Boulevard





Figure 3.32: Looking south towards the LOSSAN Rail Corridor from Stage Road with existing conditions (top left) and proposed OC Loop Bikeway excluding wayfinding and landscaping

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment Q - Knott Avenue to La Mirada Boulevard (Approx. 5200')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment Q: Total Cost				
		PA/ED Environmental Costs (~15%* of project cost)		\$ 1,683,228.60
		Right of Way (none required)		\$ -
		Plans & Specs (~20% of project cost)		\$ 2,244,304.80
120	LF	Install undercrossing below Metrolink Railroad	\$35,000.00	\$ 4,200,000.00
90	LF	Install undercrossing below Stage Road	\$25,000.00	\$ 2,250,000.00
1100	SF	Install truss bridge crossing over Coyote Creek	\$180.00	\$ 198,000.00
2	Each	Install stop signs	\$200.00	\$ 400.00
4	Each	Install ADA ramps	\$2,500.00	\$ 10,000.00
600	SF	Install continental crosswalk	\$3.00	\$ 1,800.00
1	Each	Install railroad crossing gate	\$100,000.00	\$ 100,000.00
1	Each	Install H.A.W.K. signal	\$175,000.00	\$ 175,000.00
5000	LF	Install fence	\$35.00	\$ 175,000.00
80	SF	Install 1' wide limit line (stop line)	\$3.00	\$ 240.00
600	SF	Install bike loop striping (includes striping on existing bike trail) (Detail B of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,800.00
80000	SF	Install bike loop asphalt	\$15.00	\$ 1,200,000.00
		Mobilization (~5% of Total Cost)		\$ 415,612.00
		Traffic Control (~10% of Total Cost)		\$ 831,224.00
		Contingency 20%		\$ 1,662,448.00
		Subtotal (project cost)		\$ 11,221,524.00
		Construction Engineering (~15% of project cost)		\$ 1,683,228.60
		Segment Q: Total Cost (unrounded)		\$ 16,832,286.00
		Segment Q: Total Cost (rounded)		\$ 17,000,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity.

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment Q - Knott Avenue to La Mirada Boulevard (Approx. 5200')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment Q: Total Cost				
1	Intersections	Intersection Maintenance	\$ 8,000.00	\$ 8,000.00
71260	SF	Asphalt Maintenance	\$ 0.75	\$ 53,445.00
5	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 480.00
0.98	miles	Sweeping	\$ 475.00	\$ 465.50
0.98	miles	Landcaping maintenance	\$ 4,275.00	\$ 4,189.50
0.98	miles	Misc	\$ 1,000.00	\$ 980.00
		Annual Maintenance Cost		\$ 67,560.00
		Segment Q Total Maintenance Cost (rounded)		\$ 68,000.00



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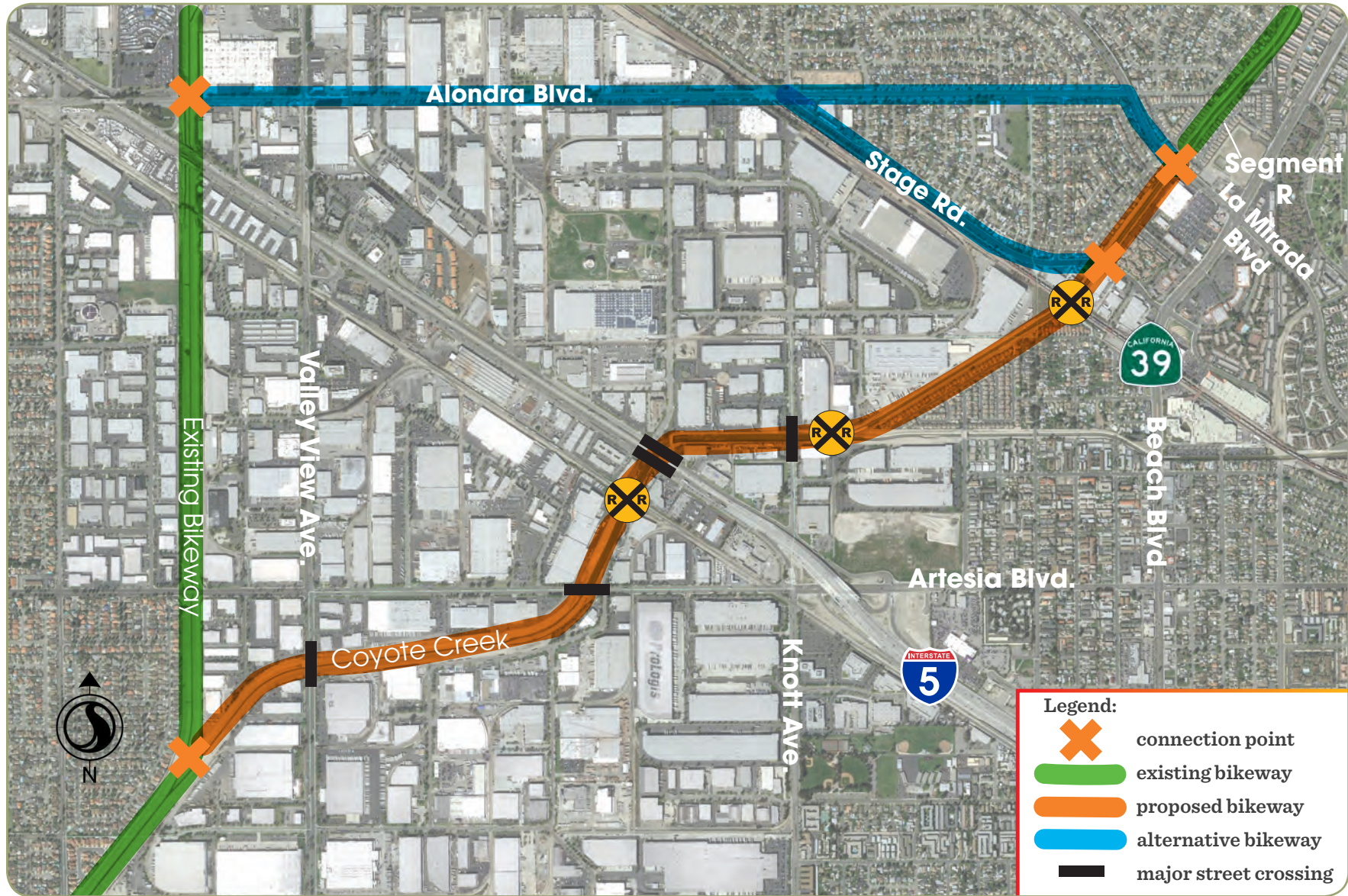


Figure 3.33: Alondra Boulevard potential interim routing around Segments O, P, and part of Q



Study Area 1: Interim Improvements and Alternatives

Due to cost and complexities, alternatives to the Coyote Creek alignment have been considered to close gaps in Segments O, P, and Q. There is an attractive interim opportunity to close these Segments using an alternate route.

The existing Coyote Creek Bikeway continues along the North Fork north of Artesia Boulevard with a class I connection beneath the I-5 Freeway to Alondra Boulevard and beyond as shown in Figure 3.33. While a portion of this bikeway is currently closed for I-5 construction, Caltrans has indicated it will be reopened to bikeway traffic upon completion of freeway construction.

The North Fork bikeway provides access to Alondra Boulevard near the I-5 freeway. The Santa Fe Springs Swap Meet is a popular nearby destination. Alondra Boulevard carries about 20,000 to 25,000 daily vehicles, on a wide cross section. The City of La Mirada has indicated that it plans to remove the third travel lane on Alondra Boulevard near Stage Road and Valley View Avenue and stripe bicycle lanes in the future pending approval by their Traffic Safety Commission and City Council. Proposed intersection improvements at Valley View Avenue and Alondra Boulevard will result in additional left turn lanes thus pushing the through lanes adjacent to the curb. The additional turn lanes would result in the bicycle lanes ending prior to the intersection and the bicyclists having to share the travel lane with vehicles. Additional right-of-way would be required to bring the bicycle lane up to the intersection. Additionally, once Alondra Boulevard crosses Valley View Avenue it is within the City of Santa Fe Springs. Continuation of the bicycle lane west would have to be coordinated with the City of Santa Fe Springs. This would provide about 80% of the missing connection fulfilled by Segments O, P, and Q via the existing North Fork bikeway and new Alondra Boulevard class II bicycle lanes.

Bicycle lanes are not currently proposed in the City of Santa Fe Springs, which regulates the section of Alondra Boulevard between the Coyote Creek North Fork and Valley View Avenue. There are six lanes striped along this portion of Alondra Boulevard, which limits the ability to provide bicycle lanes. It would be necessary for Santa Fe Springs to restripe the street to provide the full bicycle lane connection to the North Fork bikeway.



Figure 3.34: Looking east along Alondra Boulevard towards the Stage Road intersection



Figure 3.35: Split routing from Alondra Boulevard to the Coyote Creek Channel

This may necessitate the reduction from six to four travel lanes for motor vehicles, but observed traffic levels do not appear to require the 5th and 6th lanes at this time.

The optimum interim connection between Alondra Boulevard and the existing bikeway would be eastbound along Stage Road and westbound along La Mirada Boulevard to Alondra Boulevard. This split routing would remove the need for westbound bicyclists to make the difficult unprotected northbound left turn at the complex signalized intersection between Stage Road and Alondra Boulevard.

This interim route could be implemented within a year if all agencies are in support of the concept. If completion of Segments O, P, and Q are delayed by their high cost and funding limitations, OC Loop wayfinding signage could be placed along the interim alignment. However, the need to ride on-street adjacent motorists traveling at approximately 45 miles per hour may not appeal to many bicyclists or pedestrians not already riding on high speed arterials.



Figure 3.36: Looking west along Alondra Boulevard just prior to the intersection with Stage Road



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LA HABRA UNION PACIFIC RAILROAD RIGHT-OF-WAY

Introduction

The Union Pacific Railroad (UPRR) operates a branch line east-west across the City of La Habra and into the City of Brea. The railroad line is active in La Habra with goods movement serving one industrial user. It has been abandoned throughout most of Brea. The abandoned area begins approximately 1,400' east of Berry Street. The UPRR experiences unauthorized use by motorists, pedestrians, and bicyclists due to the lack of a formalized facility. Where the tracks have been abandoned, the City of Brea is proceeding with planning and construction of a class I bikeway, known as the Tracks at Brea. The Tracks at Brea project is fully planned and construction is being phased as funding is secured.

Study Area 2 includes Segments T and A. When completed, the segments in this Study Area (Segments T and A) will connect the Coyote Creek Bikeway which ends near Beach Boulevard and Imperial Highway to the City of Brea's planned bikeway project that begins where the UPRR crosses the La Habra/Brea city limit, as discussed as Segment B.

Study Area 2 is located within the City of La Habra. The City is currently preparing plans, specifications, and estimates to develop its portion of the OC Loop within Union Pacific Railroad right-of-way (UPROW) from the western edge of the City east to the Brea City Limit. Work on the environmental documentation has yet to start and no funding is secured for construction. Study Area 2 (Segments T and A) is detailed in Figure 4.2.



Figure 4.1: Existing Union Pacific Railroad Right-of-Way area in the City of La Habra



STUDY AREA 2: SEGMENTS T-A



Figure 4.2

Segment T: Existing Conditions

Segment T serves as the connection from the end of the existing Coyote Creek Bikeway near the intersection of Beach Boulevard and Imperial Highway to the Union Pacific Railroad right-of-way (UPROW). There are several alternatives for completion of this segment. Beach Boulevard is a logical and direct alternative to complete the $\frac{3}{4}$ mile connection. The Coyote Creek Channel (and its parallel service road) continues east from the Beach Boulevard and Imperial Highway intersection 1,700' before transitioning to a rock-lined creek without a service road. Additional right-of-way will be required to extend the bikeway the 1,200' east to connect with the proposed at-grade crossing of Idaho Street.

Beach Boulevard at Imperial Highway

The Coyote Creek Bikeway ends at the Imperial Highway sidewalk about 150' west of Beach Boulevard. Users are expected to travel along the south sidewalk to the intersection and cross with the signals. In order to proceed north, users would be required to cross both streets using the pedestrian signals.

The Beach Boulevard-Imperial Highway Intersection is problematic for bicycling, because of extremely long crosswalks and numerous left and right turn lanes. There are no obvious ways to avoid crossing this intersection, except via the signalized crosswalks.

Beach Boulevard from Imperial Highway to Union Pacific ROW

Beach Boulevard is a heavily used State Highway owned and operated by Caltrans. It is 140' wide from curb-to-curb with three northbound lanes, three southbound lanes, a 17' wide median, wide improved shoulders, and sidewalks. Also known as State Route 39, Beach Boulevard carries 41,000 vehicles per day along the southern portion of Segment T and 36,000 vehicles per day further north where it crosses the UPROW (OCTA ADT Map 2013-14). The posted speed limit is 45 mph in both sections. Beach Boulevard is shown in Figure 4.3 just south of its intersection with the UPROW.



Figure 4.3: Looking north along Beach Boulevard from just south of the Union Pacific Right-of-Way (image from Google Streetview)



Figure 4.4: Looking north along Beach Boulevard at the Imperial Highway intersection (Image from Google Streetview)



There are limited opportunities for a class I bikeway within Beach Boulevard right-of-way between Imperial Highway and the UPROW. The shoulders are sufficiently wide for bicycle lanes, and the roadway is shown with class II bike lanes on the City's draft bikeway master plan (under preparation). But high traffic volumes and speeds would make these challenging for inexperienced cyclists. The sidewalk is relatively wide (about 14' wide) along the west curb from Imperial Highway north for about 600'. Approximately 600' north of Imperial Highway and continuing northerly, the sidewalk narrows to 8 to 10 feet in width. Although the sidewalk could be used by cyclists, it is not properly designed for shared usage between bicyclists and pedestrians. Also northbound bicyclists on the southbound side of the street could create unexpected conflicts with turning traffic at intersections and driveways.

Preliminary Beach Boulevard bike facility concepts were discussed with Caltrans staff. They expressed a preference that bicycle and bikeway improvements should not be proposed within the travelway of Beach Boulevard due to high traffic volumes. A facility "behind the curb" is preferred; however, Caltrans staff were willing to reduce the sidewalk width to 6', as long as ADA provisions are maintained.

Imperial Highway to UPRR via Coyote Creek Continuation

There is a potentially attractive alternative route for the OC Loop between Imperial Highway and the UPROW. Coyote Creek continues east of Beach Boulevard as a flood control channel most of the way to Idaho Street. The channel has service roads that are suitable for improvement. The final 1,000' are in a naturalistic greenbelt that includes heavy landscaping including trees and shrubs. It is maintained by the adjacent property owner, an apartment complex. There is a service roadway located within the greenbelt that could be improved as a class I bikeway.

If the greenbelt area proves to be infeasible due to private property ownership, the bikeway could also potentially be constructed to the south along the rear property of the adjacent La Habra Market Place shopping center to an intersection with Idaho Street north of Imperial Highway. This

facility is indicated on the City's draft Master Bikeway Plan.

Coyote Creek continues beneath Idaho Street to Lambert Road with a single service road on its southeast side. Both streets carry high traffic volumes (21,000 and 30,000 vehicles per day on Idaho Street and Lambert Road respectively) and would require a crossing treatment for bikeway users (OCTA ADT Map 2013-14). Coyote Creek crosses beneath Monte Vista Street 350' north of Lambert Road.

Monte Vista Street is a low volume collector (3,000 vehicles per day) that is suited for carrying OC Loop traffic to the UPROW which is located 950' north of the creek crossing (City of La Habra ADT Map 2012). Monte Vista Street crosses the UPROW where the City plans an at-grade bikeway crossing.

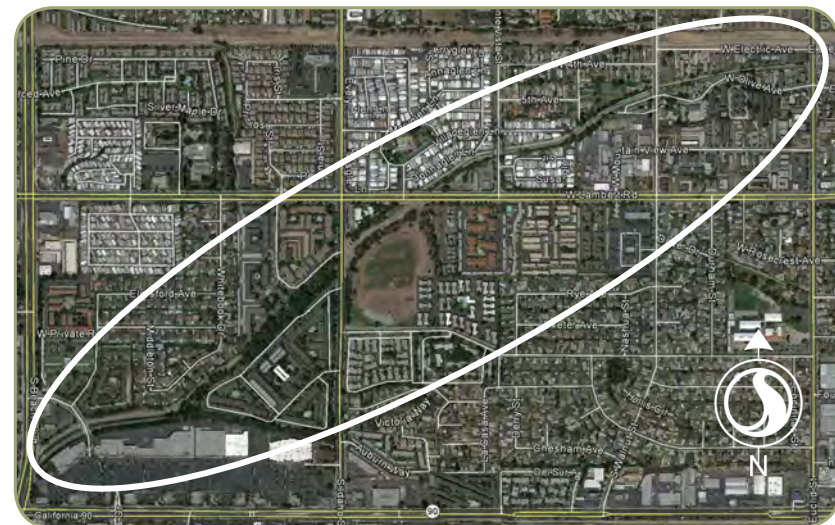


Figure 4.5: Aerial view of Coyote Creek, east of Beach Boulevard and north of Imperial Highway

This alternative route using Coyote Creek east of Beach Boulevard would provide an attractive experience for bikeway users, especially in the greenbelt area near Idaho Street. But the residential land uses in this area may be sensitive to introduction of the bikeway, and the greenbelt may be susceptible to flooding during storms. There may also be a need for some right-of-way analysis.



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Segment T: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Limited barriers along Beach Boulevard
- Potential alternative alignment along Coyote Creek channel to Union Pacific Railroad right-of-way
- Beach Boulevard may have excess right-of-way available for bicycle use subject to traffic analysis with Caltrans

WEAKNESSES

- Alignment may not be comfortable for less seasoned bicyclists
- Potential difficulties with modifying a state highway under Caltrans jurisdiction to provide a low stress facility for multi-modal use
- Coyote Creek alignment must pass through a developed greenbelt area maintained by private property owners

OPPORTUNITIES

- Access to retail clusters
- Proximity to residential neighborhoods, schools, and parks
- Connection to the existing Coyote Creek Bikeway (Segment R) to the south
- Potential use of Coyote Creek alignment from Beach Boulevard to Monte Vista Street

CHALLENGES

- High speed and traffic volume along Beach Boulevard
- Lack of bicycle infrastructure on surrounding streets
- Dedicated left and right turn lanes limit available right-of-way in places
- Could limit vehicular capacity and any potential future improvements projects along Beach Boulevard
- Coyote Creek routing could generate residential concerns especially in greenbelt area
- Potential flooding & ROW concerns along Coyote Creek



Segment T: Recommendations

Segment T connects the existing Coyote Creek Bikeway in La Habra to the proposed Union Pacific Right of Way (UPROW) Bikeway. The *2013 UPROW Bikeway Feasibility Study*, *2012 4th District Bikeways Report*, and *2008 Coyote Creek Bikeway Master Plan* all indicated that this Segment would be addressed with a class II bikeway along Beach Boulevard. The City of La Habra has also expressed that a class II facility along Beach Boulevard is preferred.

However, given the travel speeds along Beach Boulevard, the potential for future traffic increases, as well as the level of service desired for the OC Loop, an alternative design concept is being presented.

The proposed alternative concept for Segment T is a class I bikeway built along Coyote Creek between Beach Boulevard and Monte Vista Street. A connection at Fashion Square Lane is recommended to allow southbound cyclists to cross to the correct side of Beach Boulevard at the existing signal. This alternative will require crossing treatments for Idaho Street and Lambert Road. Idaho Street is appropriate for a fully actuated PHB signal while Lambert Road should utilize a traffic signal, due to higher traffic volumes. However, the City has indicated their preference may be for traditional traffic signals at both locations. Exact signals can be determined at a later phase.

The route would extend along Monte Vista Street to the UPROW using an appropriate on-street treatment. This alternative concept route is shown with the blue line in Figure 4.6.

There is little opportunity to provide a class I bikeway along Beach Boulevard. However, separated bike lanes may be possible through sidewalk widening as shown in Figure 4.7. The proposed alternative concept avoids Beach Boulevard to the extent possible. The Orange County Flood Control District has accommodated bikeways in its ROW before, suggesting that it might be accommodating of this design concept. There may be some concerns voiced by the residents who about the proposed bikeways between Beach Boulevard and Monte Vista Street. Their concerns about privacy may be alleviated by the fact that the surface of the bikeway will be below street level, but the use of the

greenbelt area is likely to generate concerns. Channel flood control capacity of the channel would have to be maintained with the proposed facility.

The proposed design concept along Coyote Creek is more expensive than the class II bike lanes along Beach Boulevard due to required infrastructure to conform to class I bikeway standards and cross over Imperial Highway, Beach Boulevard, and Lambert Road. Fully actuated signals will likely be used to facilitate crossings at Idaho Street and Lambert Road.

The feasibility of the Coyote Creek alternative is most subject to resident concerns about aesthetics, security, and privacy from introduction of a new bike facility directly behind/adjacent homes. The ability to use the greenbelt area is also unresolved, as the area is being maintained by the adjacent property owner. It is proposed that funds sufficient to construct the Coyote Creek alternative be sought, and the community and City be involved to determine feasibility preferred alignment.

If the Coyote Creek alternate route is infeasible, provision of bicycle lanes on Beach Boulevard will be the second choice. Institutionally, neither La Habra nor Caltrans seem strongly supportive of on-street bicycle lanes, but the level of support could increase if the creek alignment proves too difficult.



Figure 4.6: Coyote Creek northern alternative (in blue)

If approved as bicycle lanes, special buffer striping could be used to further separate bicyclists from motorists. Green color coating on the pavement would further enhance the bicycle user experience. As shown in Figure 4.8, this concept would result in removal of on-street parking, however, the existing use of on-street parking is minimal in this area. Businesses provide surface parking lots and residents do not front on Beach Boulevard. The cost of this alternative, including special striping treatments would be much lower than the cost of the Coyote Creek alternative.

Costs and Funding

Improvements to Segment T are expected to cost \$3,000,000, as shown in detail in the following tables. The bike lane alternative would cost \$500,000, also shown in the following detailed cost estimates. This segment currently does not have funding. Estimated annual maintenance is approximately \$70,000 or \$10,500 respectively.





Figure 4.7: Looking north along Beach Boulevard towards Fashion Square Lane with existing conditions (top left) and proposed OC Loop widened sidewalk excluding wayfinding and landscaping (separated bikeway through widened sidewalk option)



Figure 4.8: Proposed cross section of Beach Boulevard (buffered bike lane alternative)

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment T - Imperial Highway to Monte Vista Street
 (Approx. 6800')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment T: Total Cost				
		PA/ED Environmental Costs (~15%* of project cost)		\$ 286,596.23
		Right of Way (none required)		\$ -
		Plans & Specs (~20% of project cost)		\$ 382,128.30
2	Each	Install stop signs	\$200.00	\$ 400.00
10	Each	Install ADA ramps	\$2,500.00	\$ 25,000.00
1300	SF	Install continental crosswalk	\$3.00	\$ 3,900.00
400	SF	Install 2' wide Crosswalk (Basic Detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,200.00
1300	SF	Install bike lane striping (6" wide, Detail 39 of 2010 Caltrans Standard Plans)	\$3.00	\$ 3,900.00
9	Each	Install bike lane symbol	\$150.00	\$ 1,350.00
2	Each	Install P.H.B. signal	\$175,000.00	\$ 350,000.00
1500	LF	Install fence	\$35.00	\$ 52,500.00
130	SF	Install 1' wide limit line (stop line)	\$3.00	\$ 390.00
550	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,650.00
65000	SF	Install bike loop asphalt	\$15.00	\$ 975,000.00
		Mobilization (~5% of Total Cost)		\$ 70,764.50
		Traffic Control (~10% of Total Cost)		\$ 141,529.00
		Contingency 20%		\$ 283,058.00
		Subtotal (project cost)		\$ 1,910,641.50
		Construction Engineering (~15% of project cost)		\$ 286,596.23
		Segment T: Total Cost (unrounded)		\$ 2,865,962.25
		Segment T: Total Cost (rounded)		\$ 3,000,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity.

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment T - Imperial Highway to Monte Vista Street
 (Approx. 6800')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Annual Maintenance Cost				
2	Intersections	Intersection Maintenance	\$ 8,000.00	\$ 16,000.00
61280	SF	Asphalt Maintenance	\$ 0.75	\$ 45,960.00
6	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 576.00
1.29	miles	Sweeping	\$ 475.00	\$ 612.75
1.29	miles	Landcaping maintenance	\$ 4,275.00	\$ 5,514.75
1.29	miles	Misc	\$ 1,000.00	\$ 1,290.00
		Annual Maintenance Cost		\$ 69,953.50
		Segment T Total Maintenance Cost (rounded)		\$ 70,000.00



Cost Estimates, Beach Boulevard alternative

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment T - Beach Boulevard (Imperial Highway to Union Pacific ROW) (Approx. 4100')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment T: Total Cost				
		PA/ED Environmental Costs (-15%* of project cost)		\$ 46,789.65
		Right of Way (none required)		\$ -
		Plans & Specs (-20% of project cost)		\$ 62,386.20
2	Each	Install stop signs	\$200.00	\$ 400.00
2	Each	Install ADA ramps	\$2,500.00	\$ 5,000.00
170	SF	Install continental crosswalk	\$3.00	\$ 510.00
2600	SF	Install bike lane striping (6" wide, Detail 39 of 2010 Caltrans Standard Plans)	\$3.00	\$ 7,800.00
7	Each	Install bike lane symbol	\$150.00	\$ 1,050.00
24000	SF	Paint bike lanes green	\$4.00	\$ 96,000.00
100	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 300.00
8000	SF	Install bike loop asphalt	\$15.00	\$ 120,000.00
		Mobilization (-5% of Total Cost)		\$ 11,553.00
		Traffic Control (-10% of Total Cost)		\$ 23,106.00
		Contingency 20%		\$ 46,212.00
		Subtotal (project cost)		\$ 311,931.00
		Construction Engineering (-15% of project cost)		\$ 46,789.65
		Segment T: Total Cost (unrounded)		\$ 467,896.50
		Segment T: Total Cost (rounded)		\$ 500,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity.

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment T - Beach Boulevard (Imperial Highway to Union Pacific ROW) (Approx. 4100')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
7489	SF	Asphalt Maintenance	\$ 0.75	\$ 5,616.75
4	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 384.00
0.78	miles	Sweeping	\$ 475.00	\$ 370.50
0.78	miles	Landcaping maintenance	\$ 4,275.00	\$ 3,334.50
0.78	miles	Misc	\$ 1,000.00	\$ 780.00
		Annual Maintenance Cost		\$ 10,485.75
		Segment T Total Maintenance Cost (rounded)		\$ 10,500.00

Segment A: Existing Conditions

Segment A will extend parallel to and along the active Union Pacific Railroad right-of-way (UPROW). This segment of UPROW from Beach Boulevard to Palm Street in the City of La Habra is 16,065' or 3 miles long. Segment A is detailed in Figure 4.2 with the rest of Study Area 2.

If the Coyote Creek alternative alignment is developed, the OC Loop will join the UPROW Bikeway at Monte Vista Street. If the Beach Boulevard alignment is chosen, it will join the UPROW at Beach Boulevard.

Railroad Right-of-Way West of Beach Boulevard

The UPROW extends west from Beach Boulevard and passes into Los Angeles County and the City of Whittier within ½ mile. The City of Whittier is planning to extend a multi-use path known as the Whittier Greenway to the boundary between Whittier and La Habra. The Whittier Greenway is a valuable resource that can provide a high quality bikeway experience through Whittier toward the San Gabriel River Bikeway, a length of approximately 5 miles. Connection to the OC loop is considered essential to provide multi-jurisdictional connections.

Beach Boulevard to Idaho Street

The railroad bed (including the track) is 8' wide within the larger 115' UPROW. While most of the railroad bed is flat, some areas of the UPROW have landforms such as small mesas, and shoulders of the UPROW often have naturally growing vegetation. Single family and multi-family residences adjoin the north and south sides of the UPROW within the City of La Habra. The UPROW length measures 2,545' between Beach Boulevard and Idaho Street.

Idaho Street Railroad Crossing

Idaho Street is 65' with two northbound lanes, two southbound lanes, one parking lane, and a railroad crossing, shown in Figure 4.9. Idaho Street carries approximately 15,000 vehicles per day across the proposed project area (OCTA ADT Map 2013-14).



Figure 4.9: The Idaho Street railroad crossing



Figure 4.10: Looking west along the Existing Guadalupe Park Trail



Idaho Street to Monte Vista Street

Between Idaho Street and Monte Vista Street, the UPROW is about 120' wide and 1,250' long. Within that area, the single track railroad is 8' wide with the remaining space consisting of dirt and naturally growing vegetation.

A 9' wide asphalt path meanders along the northern boundary of the UPROW through Guadalupe Park, as shown in Figure 4.10. This paved path, however, is not built to class I bikeway standards as the pavement width and surface conditions vary. The path is also not signed or striped to class I bikeway standards.

Medium density residential developments, single family homes, Guadalupe Park, and the Our Lady of Guadalupe School and Roman Catholic Church exist adjacent to the railroad ROW.

To minimize the need for ROW acquisition from the Union Pacific Railroad, the City proposes the UPROW Bikeway utilize the Guadalupe Park pathway.

Monte Vista Street Railroad Crossing

Monte Vista Street is 41' wide curb to curb with one lane in each direction, one parallel parking lane, and a railroad crossing, visible in Figure 4.11. Monte Vista Street carries significantly less traffic (3,000 vehicles per day) than other streets that cross the UPROW in the project area (City of La Habra ADT Map 2012). The street is suitable for bicycling; however, it can be improved through various methods.

Monte Vista Street to Walnut Street

The UPROW is 120' wide and 1,267' long between Monte Vista Street and Walnut Street. The 9' wide Guadalupe Park path continues along the northern boundary of the UPROW until it reaches Walnut Street. The existing facility has a striped pedestrian crossing at both streets and is offset from the railroad ROW when it crosses Walnut Street. To minimize the need for ROW acquisition from the Union Pacific Railroad, the City proposes the UPROW Bikeway utilize the Guadalupe Park pathway.



Figure 4.11: Looking east from the Monte Vista Street railroad crossing



Figure 4.12: Looking south from the Walnut Street railroad crossing

The remainder of the railroad ROW in this area is comprised of dirt, sparse vegetation, and the single track railroad. The track is positioned 124' from the northern fence line and 55' from the southern fence line. Primarily single family residential exists to the north and south of the ROW in this area. The railroad right-of-way between Monte Vista Street and Walnut Street is shown in Figure 4.11.

Walnut Street Railroad Crossing

Walnut Street features one lane in each direction with 6,000 vehicles per day, room for parallel parking on both sides, and a railroad crossing (City of La Habra ADT Map 2012). The Walnut Street Railroad Crossing is shown in Figure 4.12.

Walnut Street to Euclid Street

The railroad ROW is 120' wide and 1,267' long between Walnut and Euclid Streets. The single track railroad is equidistant from the sparsely vegetated dirt shoulders. The remaining space within the 126' wide UPROW is a mix of exposed earth and naturally growing vegetation.

West Electric Avenue parallels the UPROW to the south and is 7' below railroad grade. No fencing separates the tracks and West Electric Avenue. West Electric Avenue is shown in Figure 4.13. West Loma Verde Avenue parallels the UPROW to the north. Single-family residences, a multiplex sports park (Portola Park) with three baseball diamonds and 12 tennis courts, and the Children's Museum of La Habra are just north. More single-family and apartment homes exist to the south.

Euclid Street Railroad Crossing

Euclid Street is 64' wide with two travel lanes in each direction carrying 14,000 vehicles per day where it crosses the railroad right-of-way (City of La Habra ADT Map 2012). The Euclid Street railroad crossing is pictured in Figure 4.14.

Euclid Street to Cypress Street

Roughly 12' of space exists between the single track railroad and the barbed wire fence enclosure to the north. Another 60-65' of space exists between the track and fence lines to the south.



Figure 4.13: Looking east down Electric Avenue



Figure 4.14: Looking east from the Euclid Street railroad crossing



There is limited space for a bikeway of standard width in this segment. The railroad ROW is 1,265' long between Euclid Street and Cypress Street (visible from the Euclid Street crossing in Figure 4.14).

To the north, a 50' wide swath of sparse scrub exists in an empty lot surrounded by barbed wire fencing. A new residential development exists to the north (visible at the left edge of the frame in Figure 4.14). Light industrial uses, such as Unicorn Metals and Recycling Company, occupy much of the block to the immediate south of the railroad ROW with single-family homes beyond that. Electric Avenue ends at Euclid Street; however, there is open area used by vehicles south of the tracks in this area.

Cypress Street Railroad Crossing

Cypress Street is 41' wide from curb to curb, with one travel lane in each direction and room for parallel parking on both sides. Cypress Street carries 5,000 vehicles per day where it crosses the railroad right-of-way (City of La Habra ADT Map 2012).

Cypress Street to Harbor Boulevard

In this section, the single track railroad continues through a dirt ROW averaging 72' wide. The railroad bends to the south as it approaches Harbor Boulevard. The distance between the tracks and the fence line is 32' to the north and south. About 550' east of Cypress Street, the railroad forks and a new track travels southward (resulting in a semi-perpendicular orientation). The UPROW is approximately 2,600' long between Cypress Street and Harbor Boulevard. Ownership of this section of ROW does not appear to be UPRR and may be owned by a private individual.

Land uses to the north of the ROW include single family residences and Washington Middle School. Retail fast food exists along Harbor Boulevard. Developments to the south of the railroad ROW include commercial, office, and light industrial uses, such as VIP Rubber Company, DP Mangan, Inc., and the La Habra Fencing company. Businesses south of the tracks east of the railroad spur have vehicular access occurring south of the tracks in this area. Commercial retail exists further to the south.

Harbor Boulevard Railroad Crossing

Harbor Boulevard is 84' wide from edge of pavement, with three



Figure 4.15: Looking west along UPRR ROW from Harbor Boulevard



Figure 4.16: Looking east from Harbor Boulevard railroad crossing

northbound travel lanes, three southbound travel lanes, and a 16' wide median. It carries 33,000 vehicles per day in the project area (City of La Habra ADT Map 2012). The views east and west from Harbor Boulevard are shown in Figures 4.15 and 4.16 respectively.

Harbor Boulevard to Palm Street

In this section, the railroad ROW runs diagonally at a 30° angle to east/west and travels 2,821' before reaching Palm Street. The Railroad ROW is visible in Figure 4.16 as seen from Harbor Boulevard. About 535' east of Harbor Boulevard, the railroad forks and another line travels southward. However, this rail line was recently closed. The arms have been removed and "railway no longer in use" signs were posted. The railroad ROW varies in width but remains approximately 80' wide with a mix of dirt, sparse vegetation. About 1,395' east of Harbor Boulevard, the ROW narrows to 34' north of the tracks. Land uses in this segment of railroad include a tract of single family residences to the immediate east of Harbor Boulevard and Sonora High School. The remaining land uses along the railroad to the east before Palm Street include high density commercial and office buildings, such as Vineyard North Orange County, Brightside Screen Printing, and Theta Oil Field Services, Inc. Retail developments, such as the Home Depot, Chronic Tacos, and Mod Bargains, exist to the south.

Lambert Road Railroad Crossing

Several hundred feet before the railroad reaches Palm Street, it crosses over East Lambert Road, an east-west street with two travel lanes in each direction (Figure 4.17). At this point the railroad right-of-way is in the City of Fullerton south of the centerline of Lambert Road. Lambert Road carries 33,000 vehicles per day where it crosses the railroad right-of-way (City of La Habra ADT Map 2012).

Palm Street

Palm Street features two lanes in each direction, left turn lanes, and sidewalks on both sides. It carries 9,500 vehicles per day and forms the eastern terminus of Segment A (City of La Habra ADT Map 2012). The Palm Street Intersection is shown in Figure 4.18. At Palm Street the OC Loop crosses into the Cities of Fullerton and Brea.



Figure 4.17: Looking east on Lambert Road towards Palm Street



Figure 4.18: Looking east towards the Palm Street intersection from Lambert Road



Segment A: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Wide railroad right-of-way provides room for a class I bikeway with no expectation of need for additional tracts
- Planning work has already been started by the City of La Habra
- Opportunities for use of the right of way of the existing Guadalupe Park Bikeway to minimize ROW acquisition costs.

WEAKNESSES

- Active railroad operations
- Railroad right-of-way narrows between Harbor Boulevard and Palm Street
- Proximity to residential uses raises security concerns
- Railroad policy indicating no trails adjacent rails

OPPORTUNITIES

- Potential for future connections to the other bikeways and facilities along spur track corridors, etc.
- Potential for railroad abandonment
- Proximity to residential neighborhoods, schools, parks, and retail
- Connection to existing Guadalupe Park Bikeway

CHALLENGES

- Potential difficulty in obtaining ROW from private property owners (primarily UPRR) and coordination with the railroad
- Street crossings in quick succession can deter cyclists due to interruption
- Lack of bicycle infrastructure on surrounding streets
- Preemption requirements at roadway crossings can be costly
- Narrow portions of ROW may require on-street alternate routing

Segment A: Recommendations

As described in the *2012 OCTA 4th District Bikeways Strategy*, the UPROW Bikeway is one of three proposed “Focus Corridors” in the district due to its strengths with respect to bikeway linkages, ease of implementation, agency support, and public support. The *2013 UPROW Trail Feasibility Study* explored the details of this bikeway from the Los Angeles-Orange County line to the western edge of the City of Yorba Linda on a segment-by-segment basis. Segment A of the OC Loop refers to the western portion of the UPROW Bikeway that lies within the boundaries of the City of La Habra and incorporates Segments 1 and 2 from the *UPROW Trail Feasibility Study*. While there is an existing paved pathway in Guadalupe Park just north of the UPROW (between Idaho Street and Walnut Street), the City’s proposed concept for Segment A shows a reconstructed and widened route through the park.

The proposed concept is to build a class I bikeway within a 15’ wide easement to be acquired along the north side of the active tracks in the UPROW. The bikeway would be placed north of the tracks to align with facilities in Whittier and to avoid railroad crossings as there are no active spur lines on this side for the entire length of the ROW in the City of La Habra, and it will align with the proposed facility in the City of Whittier. The proposed concept is illustrated in Figure 4.19.

The proposed concept will have seven mid-block crossings. These crossings currently use standard railroad crossing arms to protect passing freight trains. The UPROW Trail Feasibility Study proposed that standard traffic signals be installed at the four wider and more heavily traveled crossings to protect cyclist and pedestrian movements. At the three crossings with two lanes of travel and lower traffic volumes, marked crossings were proposed. The City of La Habra is currently considering a fully actuated traffic signal at each crossing. However, this study recommends a more aggressive proposal to consider underpasses at Beach Boulevard and Harbor Boulevard and traffic signals at Idaho Street and Euclid Street. The narrower and more lightly used streets including Monte Vista Street, Walnut Street, and Cypress Street can be served



Figure 4.19: Before and After of proposed bikeway along UPROW (Source: 2013 UPROW Trail Feasibility Study)

by uncontrolled crossings supplemented by marked crosswalks and potentially flashing lights.

However, further project development may identify constraints that make some of the proposed underpasses infeasible. The City of La Habra is not currently considering grade separations in order to manage project costs. Cost estimates assume that underpasses are



constructed at the wider and more heavily traveled streets, but if their construction is not feasible, then the funds will be used to install new signals, as originally planned by the City of La Habra.

The design and construction of Segment A will have to address several environmental and access issues. Toxic elements have been found in similar locations, and so it is anticipated that remediation will be required. There is also a petroleum pipeline within the proposed bikeway alignment that will have to be protected during construction. While there are several identified supplemental neighborhood access points from the north, access points to the south are limited to the seven arterial crossings due to the active rail line prohibiting new at-grade crossings. More neighborhood access points may be feasible if the rail line is abandoned, although there is no indication that this will be the case in the near future.

Another issue that will have to be addressed in the design is the reduced ROW width between Harbor Boulevard and Lambert Road and between Euclid Street and Cypress Street. The constrained ROW may require a reduced cross-section rather than the desired cross-section shown figure 4.19.

At the eastern end of the segment, at the signalized intersections of Palm Street and Lambert Road, it is proposed to widen the sidewalks and have OC Loop users cross roadways using existing crosswalks. Figure 4.20 shows the proposed concept.

According to the *UPROW Trail Feasibility Study*, the cost of Segment A will be approximately \$7 million for design and construction. The proposed concept is for the City of La Habra to secure a 15' easement in the active rail ROW, except where Guadalupe Park can be used. The prior feasibility study cost estimate did not include ROW costs, which are assumed to be about \$3 million, and environmental remediation, which is estimated at \$3 million. In addition, the prior estimate did not include the potential costs associated with construction of underpasses.

Design is underway by the City of La Habra, but construction funding has not been secured at this time. Construction will occur in phases, perhaps

from west to east, which makes it relatively feasible from a construction and funding perspective. The facility will not increase its value to regional users until it is complete and connects to the OC Loop/Coyote Creek, the Whittier Greenway, or both. Local trail users will still benefit from a low stress east-west facility within the City. The UP railroad may also request that additional alternatives be studied before proceeding, but the City has not identified a desire to review alternatives at this point.

According to the *UPROW Trail Feasibility Study*, the majority of the UPROW Bikeway is expected to be constructed in a 5 to 10 year time frame. This assumes that the City secures occasional funding through state or regional funding programs. If full funding could be generated at once, it would be suitable as a standalone project.

Costs and Funding

Improvements to Segment A are expected to cost \$30,500,000, as shown in the following tables. Plans, specifications, and estimates are under preparation for Segment A by the City using grant funding. However, the next steps do not have funding at this time. Estimated annual maintenance is approximately \$182,000.

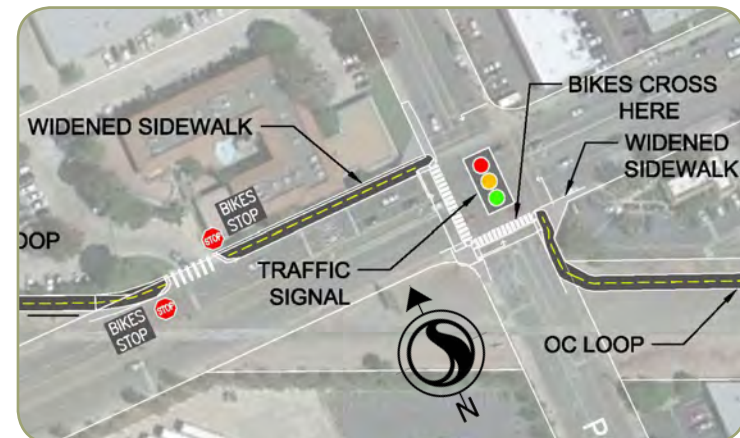


Figure 4.20: Aerial concept of widened sidewalk at Palm Street and Lambert Road

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment A - Beach Boulevard to Palm Street (Approx. 13000')

Updated: 3/31/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment A: Total Cost				
		PA/ED Environmental Costs (-10%* of project cost)		\$ 1,512,085.05
		Plans & Specs (-20% of project cost)		\$ 3,024,170.10
		Site Preparation		\$ 2,470,000.00
		Right of Way		\$ 5,826,600.00
760	SF	Install 2' wide Crosswalk (Basic Detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 2,280.00
1300	SF	Install continental crosswalk (2' wide, with 5' gaps per detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 3,900.00
16	Each	Install ADA Ramps	\$2,500.00	\$ 40,000.00
1	Each	Install traffic signal	\$250,000.00	\$ 250,000.00
1	Each	Install P.H.B. signal	\$175,000.00	\$ 175,000.00
10	Each	Install stop signs	\$200.00	\$ 2,000.00
160	LF	Install undercrossing below Beach Boulevard	\$25,000.00	\$ 4,000,000.00
130	LF	Install undercrossing below Harbor Boulevard	\$25,000.00	\$ 3,250,000.00
8500	LF	Install fence	\$35.00	\$ 297,500.00
7000	SF	Install curb extensions	\$25.00	\$ 175,000.00
1500	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 4,500.00
200000	SF	Install bike loop asphalt	\$15.00	\$ 3,000,000.00
150	SF	Install 1' wide limit line (stop line)	\$3.00	\$ 450.00
		Mobilization (-5% of Total Cost)		\$ 560,031.50
		Traffic Control (-10% of Total Cost)		\$ 1,120,063.00
		Contingency 20%		\$ 2,240,126.00
		Subtotal (project cost)		\$ 15,120,850.50
		Construction Engineering (-15% of project cost)		\$ 2,268,127.58
		Segment A: Total Cost (unrounded)		\$ 30,221,833.23
		Segment A: Total Cost (rounded)		\$ 30,500,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity. This project low due to expensive undercrossings

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment A - Beach Boulevard to Palm Street (Approx. 13000')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
2	Intersections	Intersection Maintenance	\$ 8,000.00	\$ 16,000.00
200000	SF	Asphalt Maintenance	\$ 0.75	\$ 150,000.00
12	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 1,152.00
2.5	miles	Sweeping	\$ 475.00	\$ 1,187.50
2.5	miles	landscaping maintenance	\$ 4,275.00	\$ 10,687.50
2.5	miles	Misc	\$ 1,000.00	\$ 2,500.00
		Annual Maintenance Cost		\$ 181,527.00
		Segment A Total Maintenance Cost (rounded)		\$ 182,000.00



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BREA UNION PACIFIC RAILROAD RIGHT-OF-WAY

Introduction

The City of Brea has an existing project beginning at the Brea Canyon Flood Control Channel and travels east to Valencia Avenue. The city's goal is to complete Segment B, which runs from Segment A to this existing section. This segment was previously analyzed in the *2013 Union Pacific Right-of-Way Trail Feasibility Study Report* prepared for the Orange County Transportation Authority (OCTA). Recommendations for this segment in this study are largely based on the prior feasibility study.

Segment B: Existing Conditions

This portion of the bikeway alignment begins at the at-grade crossing with Palm Street, and falls within railroad ROW that is currently active (although observed train activity is minimal). The rail line is active between Palm Street and 1,400' feet east of Berry Street, serving the Pacific Plastics, Inc. building on the south side of the rail alignment. The building generates 1 train each day totaling 2 trips (inbound and outbound) according to City of Brea staff. This is the only building that currently uses rail deliveries within the bikeway area. Because the Pacific Plastics Inc. facility is south of the rail alignment, bicycle facilities on the north side of the rail alignment would not be required to cross active rail. There are multiple unused rail spurs on the north side of the rail line that would still need to be crossed by the bike facilities.

Throughout this section, the ROW is graded earth with minor vegetation, and generally free of obstructions. On the north side there are portions with elevation changes that would require more significant grading to be usable for the bikeway. The land use in this segment is industrial, with manufacturing and storage facilities lining the ROW. Coyote Creek and



Figure 5.1: Constrained Right-of-Way south of Lambert Road
(Source: 2013 UPROW Trail Feasibility Study)



Brea Creek crossings in this region may require a separate bridge for the bikeway to maintain clear distance from the track.

The railroad crossing at Lambert Road is shared with La Habra and Fullerton. The crossing at Palm Street is shared between Brea and Fullerton. OCTA is in discussions with UPRR, and the Cities of La Habra and Brea to secure ROW for the OC Loop in Segments A and B.

Segment B: Recommendations

This segment contains the portions of the bikeway within Brea that feature an active rail line. The proposed layout calls for a 15' easement to construct a class I bikeway on the north side of the rail ROW. The prior feasibility study recommended acquiring a 10' landscaping easement, where technically feasible, to create a natural buffer between the bikeway and rail bed. This portion within Brea is categorized as a unique segment as the bikeway maintains a mostly uniform configuration along the active rail. It also serves to join the City of La Habra to Brea and terminates at an existing class I bikeway along Brea Creek.

Planning of the OC Loop upon segment B is pending greater resolution of ROW acquisition with UPRR.

Cost and Funding

The cost for this portion of bikeway is estimated at \$5,529,000, as outlined in the prior study prepared by OCTA.



Figure 5.2: Train accessing Pacific Plastics, north of the rail line
(Source: 2013 UPROW Trail Feasibility Study)

BREA AND PLACENTIA

Introduction

Segment C is not included in this study given the role of the City of Brea constructing the entirety of the segment through public and private sector activities. Segment D is 5,930' (or 1.12 miles) long from the intersection of Nasa Street and Valencia Avenue south to Bastanchury Road along Valencia Avenue, Imperial Highway, and the Carbon Canyon Creek flood control channel. The segment is located in both the Cities of Brea and Placentia. Study Area 3 (Segment D) is detailed in Figure 6.3.

The City of Brea has completed the planning and design of its "Tracks at Brea" portion of the OC Loop, which is located north and west of Segment D. The La Floresta private sector development project is currently under construction and will connect the Tracks at Brea section from the Valencia Avenue/Nasa Street intersection east to Imperial Highway connecting to the planned bikeway along the flood control channel. This will include the perimeter of the project, and will be completed by project buildout.

Segment D: Existing Conditions

The unconstructed portion of Segment D includes a 657' long section of Carbon Canyon Channel from Imperial Highway south to Bastanchury Road. Segment D is located between single family housing developments. An Active Transportation Program (ATP) Grant was submitted for Segment D in May 2014 to prepare advance preliminary design and environmental documentation for this portion of the OC Loop.

Nasa Street to South La Floresta and Carbon Canyon Channel

The La Floresta Development project is under construction by private sector developers and includes an 8-10' multi-use facility on the easterly side of Valencia Avenue and the northerly side of Imperial Highway. Valencia Avenue and Imperial Highway carry 15,000 and 48,000 vehicles per day respectively (OCTA ADT Map 2013-15). The OC Loop is proposed to cross



Figure 6.1: Imperial Highway from Valencia Avenue with the La Floresta development construction visible on the left



Figure 6.2: The Carbon Creek Channel ROW from Imperial Highway



STUDY AREA 3: SEGMENT D



Figure 6.3

Imperial Highway at the S. La Floresta Drive/Imperial Highway traffic signal and then head easterly to the Carbon Creek Channel.

Imperial Highway to Golden Avenue

The Carbon Creek Channel ROW is 100' wide and includes a 16' wide open concrete box channel at its center. The channel service road is roughly 25' below adjoining residential properties and street level. Beyond the physical channel adjoining side slopes climb steeply upward to the surrounding street and housing level. From Imperial Highway to Golden Avenue, the area of land that abuts the channel is mostly exposed earth and vegetation. Flood control service roads exist on both sides of the channel with a driveway approach from the northwest and southeast corners of Golden Avenue as it spans the channel. The service road varies from 6' to 10' in width. Figure 6.2 shows the channel ROW from Imperial Highway.

Golden Avenue Crossing

Golden Avenue currently crosses the channel over a concrete arch bridge that was constructed in 1934. Golden Avenue, where it crosses the channel, provides a single travel lane in each direction. Beyond the bridge, Golden Avenue widens to include parallel parking and sidewalks on either side of the road, as well as bike lanes to the west. Golden Avenue carries 4,000 vehicles per day and provides on-street bike lanes west of the Carbon Creek Channel (OCTA ADT Map 2012).

The bridge spans the channel and also spans narrow service roads on each side of the channel. The existing flood control channel service roads do not meet the minimum width design requirements for a class I bikeway as they pass directly under the Golden Avenue Bridge. The service road on the west side of the channel is wider upstream and downstream of the bridge. The east channel service road remains narrow from Golden Avenue south for 200' before widening. The City has received a grant for replacement of the Golden Avenue bridge and has plans for upgrades soon.

Golden Avenue to Bastanchury Road

The concrete box channel maintains a 16' width with exposed earth and sparse vegetation paralleling the channel. The channel is 100' wide in



Figure 6.4: Looking north along the Carbon Creek Channel ROW from Bastanchury Road



Figure 6.5: The Existing Yorba Linda Recreational Bikeway and Trail as seen from Bastanchury Road (image from Google Streetview)



this section and its adjoining side slopes are relatively steep. The channel intersects Bastanchury Road as an open concrete box culvert with concrete wing walls. This location is also the boundary between the City of Yorba Linda and Placentia. Figure 6.4 shows the channel as seen from Bastanchury Road.

Bastanchury Road Crossing

Bastanchury Road features two travel lanes in each direction, sidewalks and bike lanes. It should be noted that bike lanes end just east of the Carbon Creek Channel ROW. Bike lanes are not provided on Bastanchury Road west of the Carbon Creek Channel. Bastanchury Road carries 16,000 vehicles per day in the project area (OCTA ADT Map 2012).

There is no driveway access ramp from Bastanchury Road to the channel, however, there appears to be adequate space for an access way to connect both facilities. Land uses surrounding this segment include single family homes to the west and single family homes, a park with a baseball field, and the Little Friend's Pre-School to the east.

Beyond Bastanchury Road

The El Cajon Regional Riding and Hiking Trail currently terminates at Bastanchury Road within the right of way of the Carbon Canyon Channel (also known as the Yorba Linda Recreational Bikeway and Trail). Segment D completion will require a connection from the riding and hiking trail south of Bastanchury Road at the grade of the street to the service roads for the channel which are about 50 feet lower than the street as shown in Figure 6.4.

The County is currently working on analysis of the existing right-of-way in this segment.



Figure 6.6: The existing Golden Avenue bridge over the channel ROW, planned for improvement.



Figure 6.7: The existing recreational bikeway beyond Bastanchury Road on Imperial Highway (image from Google Streetview)

Segment D: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Wide channel right-of-way provides room for class I bikeway
- Picturesque Arch Bridge for Golden Avenue
- Alignment links to bikeway required of La Floresta Development Project
- Segment links to existing on-street bike lanes on Golden Avenue and Bastanchury Road

OPPORTUNITIES

- Historic 1934 Golden Avenue concrete arch bridge could provide interest for bicyclists and help foster a sense of place
- Connections to the established El Cajon Regional Riding & Hiking Trail and Bikeway and the bikeway built along the western and southern frontages of the La Floresta development
- Proximity to residential neighborhoods
- Elevation difference between channel and surrounding residences provides privacy for homeowners

WEAKNESSES

- Need to cross a state highway under Caltrans jurisdiction (Imperial Highway)
- Depth of Carbon Creek channel right-of-way
- High traffic volumes and speeds on Imperial Highway, as well as the roadway width, make crossing challenging
- Elevation change between the channel right-of-way and street level will require grade and ADA compliance
- There are three traffic signals between Valencia Avenue and the Carbon Creek Channel ROW

CHALLENGES

- Lack of bicycle infrastructure on surrounding streets
- Common resident concerns about security and privacy from off-street bikeway behind homes
- The Orange County Flood Control District owns an easement for flood control purposes only from Bastanchury Avenue to Golden Avenue. The County owns no land or rights for trail or bikeway purposes between Bastanchury Avenue to Imperial Highway. The underlying fee owners will need to be contacted to discuss acquisition of the needed easements for the trail and for the bikeway.



Segment D: Recommendations

Segment D refers to Segments 7A, 7B, 8, and 9 in the *UPROW Trail Feasibility Study*, the easternmost sections of the proposed UPROW Bikeway that would connect to the existing El Cajon Regional Riding and Hiking Trail and Bikeway.

Segment D contains the portions of the existing bikeway adjacent to the proposed La Floresta residential development along Valencia Avenue and Imperial Highway. The bikeway runs along the east side of Valencia Avenue and along the north side of Imperial Highway using the cross section shown in Figure 6.8. The La Floresta development has installed the class I bikeway along these roadways as part of the Conditions of Approval. This site features relatively little elevation change.

A traffic signal is provided at the intersection of Imperial Highway at La Floresta Drive. This signal will provide a pedestrian and bicycle crossing across Imperial Highway. From this intersection, the OC Loop will run east along the south side of Imperial Highway to Carbon Creek Channel within a county owned parcel. The County owned parcel is approximately 46' wide, providing adequate width for a proposed class I bikeway on the southern side of Imperial Highway.

Golden Avenue crosses the channel on a concrete arch bridge constructed in 1934. While the service roadways pass alongside the channel under the arch bridge, they are too narrow to permit a standard width bikeway. However, the City has indicated there are plans to improve this bridge and they have received grant funding to move forward. It is recommended that when the bridge is replaced, adequate width for the OC Loop be provided. But a connection to Golden Avenue should also be provided to connect with the existing bicycle lanes that extend to the west to several strong bicycling connections and destinations.

The channel service roads are located about 50' below the elevation of Bastanchury Road as they approach from the north. The existing El Cajon Regional Riding and Hiking Trail and Bikeway and Trail is at the same elevation as Bastanchury Road approaching from the south.



Figure 6.8: Cross section of a Bikeway along Imperial Highway (image from: City of Brea, Land Concern)

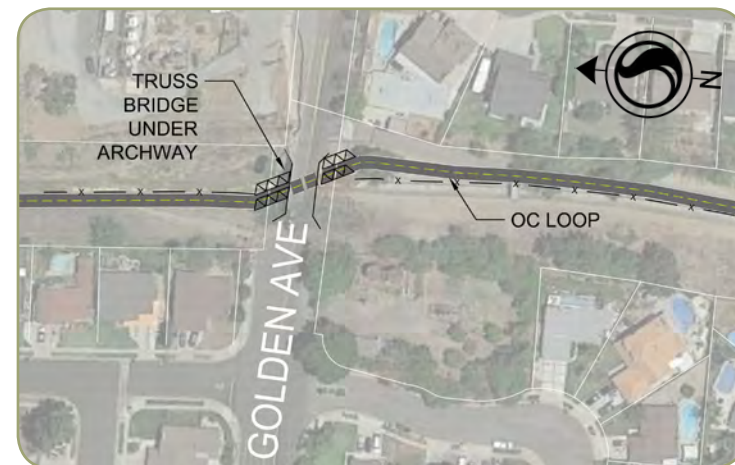


Figure 6.9: Proposed crossing under Golden Avenue

The 50' elevation differential must be addressed in addition to the connection across busy Bastanchury Road. The difficulty of this connection is compounded by the steep grade of the dirt fill that carries Bastanchury Road over the channel. The connection across Bastanchury Road will provide construction challenges. The most promising and suggested alternative is to begin the Segment as a connection to the El Cajon Regional Riding and Hiking Trail and Bikeway about 200' south of Bastanchury Road and depress the OC Loop into a box culvert tunnel beneath Bastanchury Road. The tunnel would cross the channel above the elevation of the channel culvert and exit west of the channel, daylighting on a landform that is about 20' higher than the service roads. The bikeway would continue downward at a suitable grade and join the service road system about 500' north of Bastanchury Road. The alignment may also require low retaining walls in some areas. This connection will pose greater engineering challenges than most other Segments in the OC Loop, but this alignment and variations appear feasible.

After crossing Bastanchury Road, the bikeway would connect to the El Cajon Regional Bikeway and the parallel El Cajon Riding and Hiking Trail, completing the Union Pacific Bikeway alignment.

Cost and Funding

According to the *UPROW Trail Feasibility Study*, with the exception of the piece of the bikeway that will be built in conjunction with the La Floresta Development, Segment D is slated as a project with a long-term implementation horizon and a cost of \$1.7 million. The cost of this segment could potentially be higher given the proposal to provide a bicycle undercrossing at Bastanchury Road.

Improvements to Segment D are expected to cost \$9,500,000, as shown in detail on the following tables. Estimated annual maintenance is approximately \$44,500. This Segment did receive ATP funding in late 2014 for preliminary design and environmental clearance, but funding for final design and construction must still be secured.



Figure 6.10: Carbon Creek channel existing conditions
(image from: 2013 UPROW Trail Feasibility Study)



Figure 6.11: Carbon Creek proposed conditions
(image from: 2013 UPROW Trail Feasibility Study)



Interim Alternative Alignments

Golden Avenue provides bicycle lanes west from the Carbon Canyon Channel to the east border of Tri-Cities Park. A park access road connects across the park to Rolling Hills Drive, which also provides bicycle lanes. Rolling Hills Drive extends west to the east Border of Craig Regional Park, including an undercrossing of the SR-57 Freeway. Access roads and walkways provide connections across the park to where Rolling Hills Drive resumes at the cul-de-Sac west of State College Boulevard. Rolling Hills Drive continues west to an intersection with Puente Avenue. Traffic levels along both segments of Rolling Hills Drive and on Golden Avenue are both relatively low, and both roadways are wide. Their configurations are likely comfortable for bicyclists of most skill levels. They could potentially be improved further through both striping modification to provide a buffer area between bicycle lanes and vehicle travel lanes and the installation of wayfinding elements for route guidance.

From its intersection with Rolling Hills Drive, Puente Street continues as a local street. Puente Street is discontinuous to vehicular traffic north of Rosarita Drive at the crossing of Brea Creek. At this point, an off-street multi-use path continues north and crosses Brea Creek to rejoin Puente Street near Hermosa Drive. From this intersection, Puente Street continues north to a crossing of the Union Pacific Railroad south of Lambert Road and on to an intersection with Lambert Road. Puente Street is a lightly used collector street near Imperial Highway and north to Lambert Road.

The Rolling Hills Drive/Golden Avenue alternative could be established as an interim connection between the UPRR and Carbon Creek Channel with modest investment, primarily wayfinding guide signs.

In addition a bicycle route and bike boulevard could be installed west from Puente Street along Las Palmas Drive, Montwood Avenue, and Sandalwood Avenue to Euclid Street near Imperial Highway.

This potential alignment is shown in Figure 6.12, page 105. If the UPRR alignment becomes infeasible due to railroad needs, this mostly on-street route could be established. It would not provide the same experience as the proposed route of the OC Loop, and would miss the committed Tracks at Brea route that is nearing its opening. Traffic levels along the connecting local residential streets are not challenging, but the street width and parked cars may raise concerns by bikeway users with young children on bicycles.

There is also an abandoned branch of the UPRR that is generally located east of Harbor Boulevard and extends south to Las Palmas Drive and beyond. This route may become surplus and would be an attractive bikeway. The Rolling Hills/Golden/Puente route could be signed at any time. Consideration for alternatives to the UPRR may be appropriate if the UPRR route becomes problematic, however the potential for a largely off-street facility will be strongly preferred, if feasible.

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment D - Imperial Highway to Bastanchury Road
 (Approx. 3900')

Updated: 3/31/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment D: Total Cost				
		PA/ED Environmental Costs (~15%* of project cost)		\$ 897,196.50
		Right of Way (and/or easement acquirement)		\$ 562,500.00
		Plans & Specs (~20% of project cost)		\$ 1,196,262.00
500	SF	Install 2' wide Crosswalk (Basic Detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,500.00
1	Each	Install ADA Ramp	\$2,500.00	\$ 2,500.00
1680	SF	Install truss bridge under archway and over creek	\$180.00	\$ 302,400.00
700	SF	Install truss bridge over creek	\$180.00	\$ 126,000.00
125	LF	Install undercrossing below Bastanchury Road	\$25,000.00	\$ 3,125,000.00
2200	LF	Install fence	\$35.00	\$ 77,000.00
400	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,200.00
53000	SF	Install bike loop asphalt	\$15.00	\$ 795,000.00
		Mobilization (~5% of Total Cost)		\$ 221,530.00
		Traffic Control (~10% of Total Cost)		\$ 443,060.00
		Contingency 20%		\$ 886,120.00
		Subtotal (project cost)		\$ 5,981,310.00
		Construction Engineering (~15% of project cost)		\$ 897,196.50
		Segment D: Total Cost (unrounded)		\$ 9,534,465.00
		Segment D: Total Cost (rounded)		\$ 9,500,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment D - Imperial Highway to Bastanchury Road
 (Approx. 3900')

Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
53000	SF	Asphalt Maintenance	\$ 0.75	\$ 39,750.00
4	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 384.00
0.73	miles	Sweeping	\$ 475.00	\$ 346.75
0.73	miles	Landcaping maintenance	\$ 4,275.00	\$ 3,120.75
0.73	miles	Misc	\$ 1,000.00	\$ 730.00
		Annual Maintenance Cost		\$ 44,331.50
		Segment D Total Maintenance Cost (rounded)		\$ 44,500.00



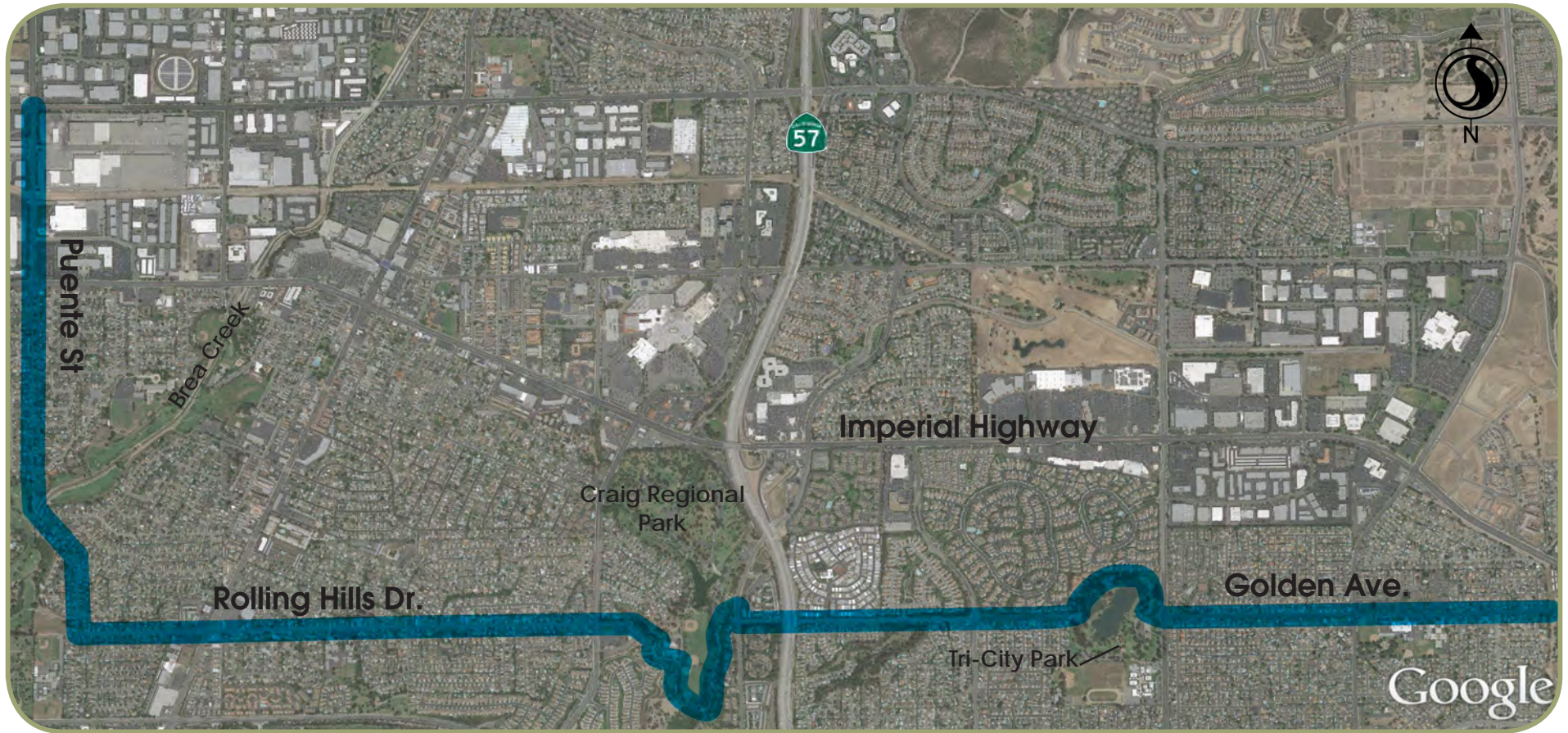


Figure 6.12: Potential Golden Avenue/Rolling Hills Drive Alternative

EL CAJON BIKEWAY

Introduction

The El Cajon Regional Riding and Hiking Trail and Bikeway, also known as the Yorba Linda Recreation Bikeway, is located primarily in the City of Yorba Linda, with portions in unincorporated County and the City of Anaheim. The class I bikeway is complete from Bastanchury Road, at the end of Study Area 3, to Grandview Avenue at the start of Study Area 4. The bikeway is generally well-signed except where it must pass through the Yorba Linda Community Center parking lot and its adjoining park. Portions of the bikeway in Study Area 4 are complete though two distinct segments remain. The City of Yorba Linda has no plan to close these segments. However, in May 2014 the County of Orange secured two Active Transportation Program (ATP) grants, in coordination with the City, to prepare preliminary analysis and environmental documentation for these segments.

The existing bikeway is widely used and can be crowded on weekends, with walkers, hikers, families with strollers, and bicyclists of all levels. The existing bikeway may not also meet current standards, and the increase in users, especially high-speed cyclists, may pose issues. It is recommended that the completed portions of the bikeway be reviewed for possible improvements.

Segment F: Existing Conditions

Segment F is located between the existing El Cajon Regional Riding and Hiking Trail and Bikeway terminus at Grandview Avenue and its resumption at Arroyo Cajon Drive in the City of Yorba Linda. Segment F is 3,924' long. Segment F is detailed in Figure 7.3. The beginning of Segment F (at Grandview Avenue) is shown in Figure 7.1. There is no potentially usable off street corridor for making this connection. The right-of-way that was used for most of the existing bikeway was subdivided for homes years ago along this segment. Alternatives will require use of the local street routes.



Figure 7.1: The existing bikeway connection as seen from Grandview Avenue

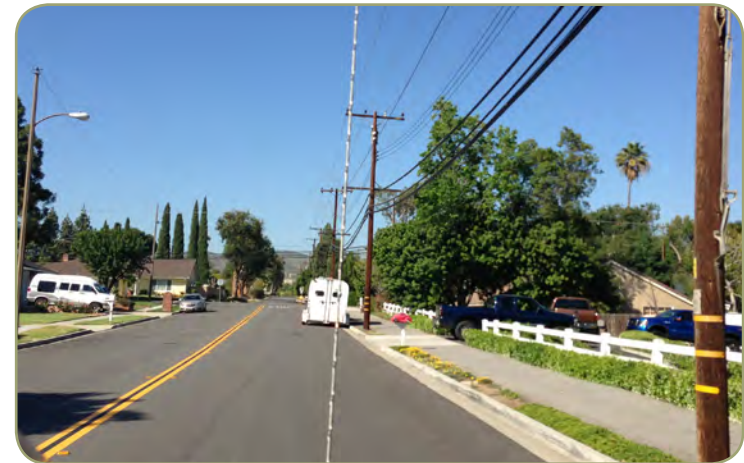


Figure 7.2: Looking north along Grandview Avenue



STUDY AREA 4: SEGMENT F-H

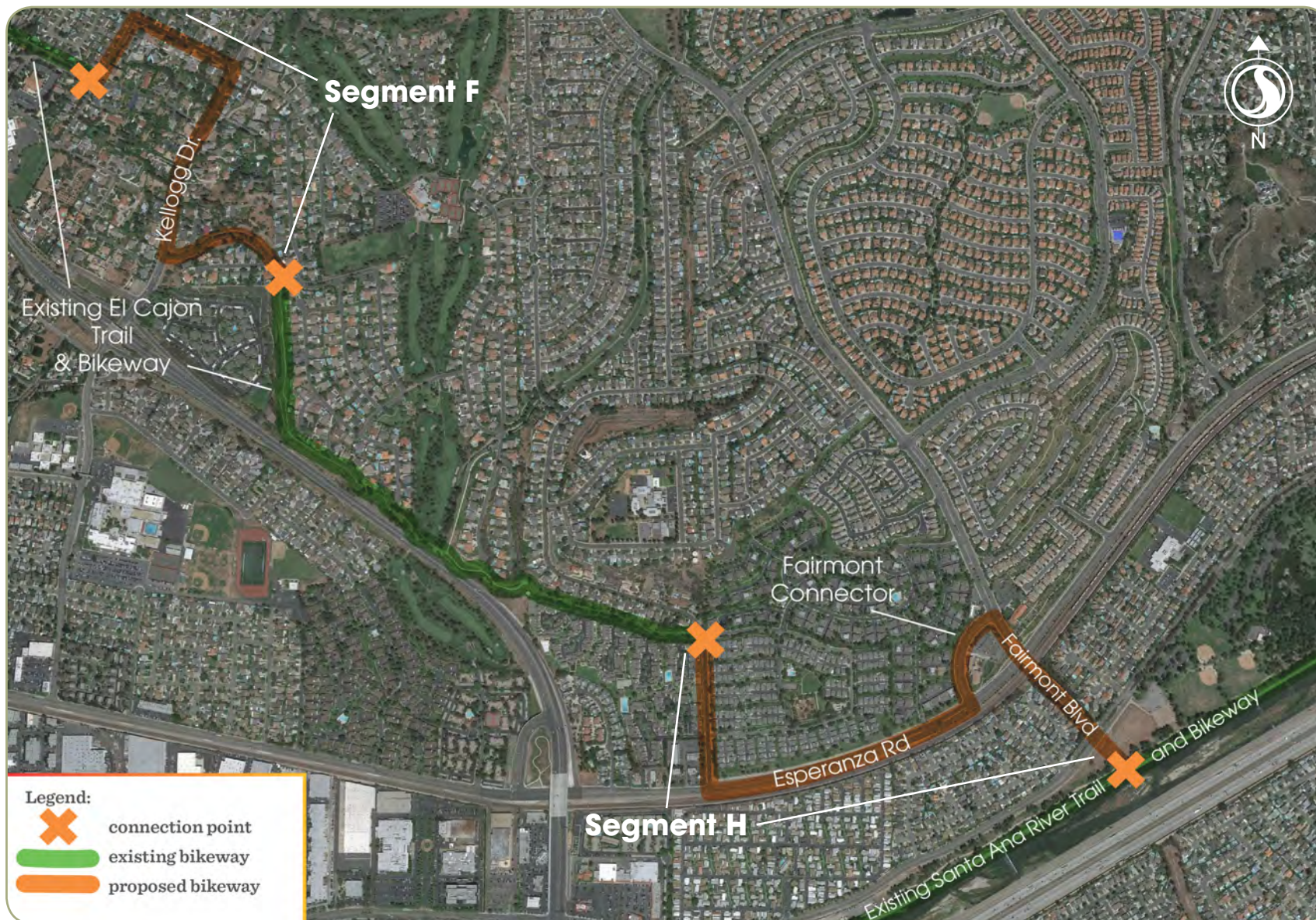


Figure 7.3

SEGMENT F



Figure 7.4



Grandview Avenue to Mountain View Avenue

Grandview Avenue features one travel lane in each direction, room for parallel parking, and a sidewalk on both sides from the existing bikeway parallel from the trail head to Mountain View Avenue. The view looking north along Grandview Avenue is shown in Figure 7.2. The roadway is not heavily used, but there is no surplus pavement for bicycle infrastructure if all travel and parking lanes are maintained. Based on field observations, the parking is generally not heavily used. The sidewalk has been improved to provide 8' of width to meet the needs of pedestrians, but the configuration is not well suited for bikeway use due to driveways, utility poles and traffic signs.

Grandview Avenue-Mountain View Avenue Intersection

The intersection of Mountain View Avenue and Grandview Avenue is controlled by stop signs in all four directions. The Grandview Avenue intersection is visible in the background of Figure 7.2.

Mountain View Avenue to Arroyo Cajon Drive

From Grandview Avenue to Kellogg Drive, Mountain View Avenue is an east-west local collector roadway that is 945' long. Mountain View Avenue is 30' wide, 13' wide on the eastbound side and 17' wide on the westbound side. Mountain View Avenue carries 2,400 vehicles per day (City of Yorba Linda ADT Map 2014). Based on field observations, on-street parking is allowed, but not heavily used. Single family homes line both sides of the street.

There is also an 8' wide sidewalk on the south side that was improved as a bike route. However, this sidewalk crosses multiple residential driveways and has traffic signs and fire hydrants that constrict the effective width to less than 6'. It is not consistently wide for use as part of the OC Loop, especially for experienced sport cyclists. Additionally, the paved path doesn't satisfy class I standards that require a buffer space between the bikeway and street. The sidewalk is suitable for slow speed travel by casual or inexperienced bicycle users. Mountain View Avenue and its sidewalk path are shown in Figure 7.5.



Figure 7.5: Looking southeast on Mountain View Avenue with its wide sidewalk visible on the right



Figure 7.6: Looking north along Kellogg Drive from the Arroyo Cajon Drive intersection

Mountain View Avenue-Kellogg Drive Intersection

The intersection of Kellogg Drive and Mountain View Avenue is controlled by a traffic signal and provides controls for crosswalk and traffic that are suitable for crossings by OC Loop users on foot or on bicycle.

Kellogg Drive at Mountain View Avenue to Arroyo Cajon Drive at Trail head

There are two on-street route alignments available from the Kellogg Drive/Mountain View Avenue intersection to the Arroyo Cajon Drive trail head, but there are no corridors suitable for an off-street route. The two most promising routes are along Kellogg Drive or along Sunmist Drive.

Kellogg Drive Route Alignment Option

From Mountain View Avenue to Arroyo Cajon Drive, Kellogg Drive is 1,683' long with one lane in each direction, a wide shoulder, and class II bike lanes in both directions as seen in Figure 7.6. Kellogg Drive carries 10,100 vehicles per day in the project area (City of Yorba Linda ADT Map 2014). Rear, side, or front yards for single family homes exist on both sides of the street and the overall area is low density residential in nature. Parking is permitted but generally appears unused along the residential frontages. The road profile is along a 4 to 5% downgrade from Mountain View Avenue to Arroyo Cajon Drive. The grade is not too steep for most cyclists, but the traffic levels and the narrow bicycle lanes and traffic levels may be uncomfortable for some users.

Kellogg Drive-Arroyo Cajon Drive Intersection

The intersection of Kellogg Drive and Arroyo Cajon Drive is controlled by stop signs on Arroyo Cajon Drive only. Due to traffic levels on Kellogg Drive, pedestrians and bicyclists may have difficulty crossing from the west side to the east side of the roadway.

Arroyo Cajon Drive

Arroyo Cajon Drive, between Kellogg Drive and Sunmist Drive, is a residential collector roadway and provides one lane of travel in each direction divided by a raised landscaped median. Each lane is 25' wide.



Figure 7.7: Arroyo Cajon Drive from the Kellogg Drive intersection



Figure 7.8: Arroyo Cajon Drive at Stonecrest Lane with connection visible in the background on the right side of the road



Rear yards for single family homes exist on both sides of the street and the overall area is low density residential in nature. This segment of Arroyo Cajon Drive is 1,300' long and travels along at a steep grade (approximately 10%) for most of this distance. The length and steepness of the grade are substantial and would be a barrier to use by most casual cyclists.

Arroyo Cajon Drive is shown in Figures 7.7 and 7.8. The median is constructed across the entrance to the trail head, prohibiting bicyclists from turning left from the bikeway to continue west along Arroyo Cajon Drive.

Beyond Arroyo Cajon Drive

Segment F ends just east of Stonecrest Lane on Arroyo Cajon Drive where the OC Loop continues on an existing portion of the El Cajon Regional Riding and Hiking Trail and bikeway. The bikeway connection on Arroyo Cajon Drive is visible in the background of Figure 7.8.

Sunmist Drive Route Alignment Option

Mountain View Avenue continues east across Kellogg Drive to an intersection with Sunmist Drive, where the intersection is controlled by an implied yield. It is a lightly used local residential street providing 36' of pavement and access to residential homes. It travels up a moderate grade (approximately 8%) in this segment that would be challenging for casual cyclists, but the steep grade spans a relatively short distance.

Sunmist Drive is a 30' wide residential street that also allows on-street parking in both directions. It runs from north to south connecting Mountain View Avenue to Arroyo Cajon Drive in the vicinity of the existing bikeway connection. Sunmist Drive is generally flat (2% grade) circumventing the steep grades on the eastern portion of Arroyo Cajon Drive.

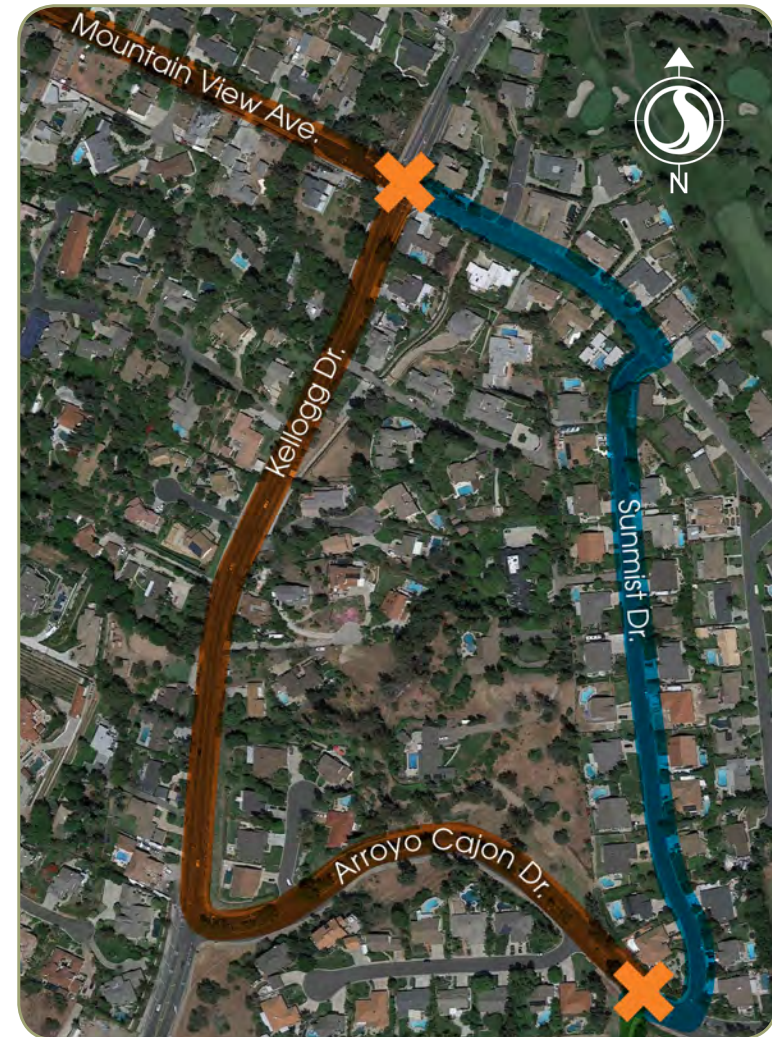


Figure 7.9: Sunmist Drive alternative from Mountain View Avenue to Arroyo Cajon Drive (see Figure 7.4 for full original alignment)

Segment F: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Relatively low volume residential streets
- Two feasible route alignments between existing portions of the El Cajon Regional Riding and Hiking Trail and Bikeway
- Existing class II bike lanes on Kellogg Drive
- Landscaped median and shoulders on Arroyo Cajon Drive provide available right-of-way for reconfiguration without affecting traffic operations

OPPORTUNITIES

- Connections to the established El Cajon Regional Riding and Hiking Trail and Bikeway
- Proximity to residential neighborhoods
- Closure in gap between established bikeways north of Grandview Avenue and south of Arrojo Cajon Drive
- Tradition of Bicycling in Yorba Linda

WEAKNESSES

- Limited right-of-way for a dedicated off-street or class II facility
- Street parking and residential driveways need to be carefully considered
- Very steep grade (approximately 10%) along Arroyo Cajon Drive
- Lack of traffic controls for bike/pedestrian crossing at Arrojo Cajon Drive/Kellogg Drive
- Residential neighborhood where pleasant aesthetics must be maintained

CHALLENGES

- Significant grades on Arroyo Cajon Drive and elsewhere may create a less than optimal cycling condition
- Lack of right-of-way for a class I bikeway



Segment F: Recommendations

This segment of OC Loop runs from Grandview Avenue at the existing El Cajon Regional Riding and Hiking Trail and Bikeway west to another portion of the existing bikeway at Arroyo Cajon Drive. The location of Segment F and the two connecting bikeways are shown in Figure 7.4. The Segment is relatively short, about ½ mile, occupying a segment where the former irrigation canal was abandoned and incorporated into private developments. As a result, this segment proposes minor improvements along public streets to make the necessary connection.

The proposed concept for Segment F consists of class III signing with sharrows plus wayfinding signs along both Grandview and Mountain View Avenues, two lightly used local residential streets. Mountain View Avenue provides a wide sidewalk along the southern side; however, this path crosses multiple residential driveways and is not always sufficiently wide for use as the OC Loop. The wayfinding signs will inform bicyclists who are traveling through this section that they can use the sidewalk bikeway/ walkway as well as the on-street class III bike route.

Grandview Avenue is approximately 38' wide, with 19' wide lanes in each direction with parking allowed along either side. There are sidewalks along both sides of the roadway and the sidewalk on the eastern side is approximately 10' wide. There are existing houses located on both sides of the road. The intersection of Mountain View Avenue and Grandview Avenue is controlled by stop signs in all four directions. Mountain View Avenue is 30' wide, with the eastbound direction being 13' wide while the westbound direction is 17' wide and parking is allowed, but does not appear to be heavily utilized based on field observations. The sidewalk/ bikeway on the southern side measures approximately 8' wide and is suitable for slow speed travel by casual bicyclists. This section of Segment F is shown in Figure 7.5.

The intersection of Kellogg Drive and Mountain View Avenue is controlled by a traffic signal. Kellogg Drive currently provides class II bike lanes in



Figure 7.10: Proposed sharrows along Grandview Avenue and Mountain View Avenue



Figure 7.11: Proposed sharrows along Sunmist Drive to existing bikeway

both directions between Mountain View Avenue and Arroyo Cajon Drive, but it is not desirable as the connector to the existing bikeway due to the steep grades on Arroyo Cajon Drive.

Sunmist Drive is considered an appropriate road for a class III bike route, although there may be some concerns voiced by residents about the use of their street for bicycle travel. The OC Loop may still use Kellogg Drive to Arroyo Cajon Drive if there are any issues with using Sunmist Drive.

Cost and Funding

Improvements to Segment F are expected to cost \$30,000, as shown in detail in the following tables. Estimated annual maintenance is approximately \$5,500. This Segment has received an award of ATP grant funding upon for more preliminary engineering and environmental documentation.



Figure 7.12: Grandview Avenue existing conditions looking eastbound



Figure 7.13: Grandview Avenue cross section





Figure 7.14: Grandview Avenue with proposed sharrow treatment

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment F - Buena Vista Avenue to Arroyo Cajon Drive (Approx. 4400')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment F: Total Cost				
		PA/ED Environmental Costs (n/a - not required)		\$ -
		Right of Way (none required)		\$ -
		Plans & Specs (minimum fee)		\$ 12,000.00
200	SF	Install continental crosswalk (2' wide, with 5' gaps, per detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 600.00
30	Each	Install bike sharrows	\$200.00	\$ 6,000.00
1	Each	Install stop sign	\$200.00	\$ 200.00
160	SF	Install buffer striping (assume 8" wide)	\$3.00	\$ 480.00
5	Each	Install poles in striping	\$50.00	\$ 250.00
10	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 30.00
1	Each	Wayfinding (included due to low contingency)	\$5,000.00	\$ 5,000.00
		Mobilization (~5% of Total Cost)		\$ 628.00
		Traffic Control (~10% of Total Cost)		\$ 1,256.00
		Contingency 20%		\$ 2,512.00
		Subtotal (project cost)		\$ 14,444.00
		Construction Engineering Cost (~25% of project cost)		\$ 3,611.00
		Segment F: Total Cost (unrounded)		\$ 30,055.00
		Segment F: Total Cost (rounded)		\$ 30,000.00

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment F - Buena Vista Avenue to Arroyo Cajon Drive (Approx. 4400')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
0	SF	Asphalt Maintenance	\$ 0.75	\$ -
4	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 384.00
0.83	miles	Sweeping	\$ 475.00	\$ 394.25
0.83	miles	Landcaping maintenance	\$ 4,275.00	\$ 3,548.25
0.83	miles	Misc	\$ 1,000.00	\$ 830.00
		Annual Maintenance Cost		\$ 5,156.50
		Segment F Total Maintenance Cost (rounded)		\$ 5,500.00



Segment H: Existing Conditions

Segment H is planned from the terminus of the existing El Cajon Regional Riding and Hiking Trail and Bikeway at Fairlynn Boulevard to the existing Santa Ana River Class I Bikeway. This portion of the OC Loop is located within the Cities of Yorba Linda and Anaheim as well as unincorporated Orange County. Segment H is 5,911' long. Segment H is detailed in Figure 7.17.

Fairlynn Boulevard to Esperanza Road

Fairlynn Boulevard travels in the north-south direction and is 40' wide from curb to curb. It is 1,283' long, includes a single lane in each direction, and has parallel parking on the west side of the street. The eastern side of the street includes a concrete sidewalk and the El Cajon Regional Riding and Hiking (dirt) Trail. The western side of Fairlynn Boulevard has a concrete sidewalk only. Fairlynn Boulevard is shown in Figure 7.15.

Residences parallel both sides of Fairlynn Boulevard. A small commercial retail center is on the west side of Fairlynn Boulevard near Esperanza Road.

The Esperanza Road/Fairlynn Boulevard intersection is signalized, and a crosswalk is provided along the east curb, extending south from the sidewalk. There is no sidewalk or pathway at the south end of the crosswalk.

Esperanza Road to Fairmont Connector

Esperanza Road is 91' wide and provides two lanes of travel in each direction, separated primarily by a two-way-left turn lane and a raised median near the Fairmont Connector intersection. Esperanza Road travels in the east-west direction and carries 15,000 vehicles per day in the project area (OCTA ADT Map 2012).

The distance from Esperanza Road to the Fairmont Connector is 2,392'. The BNSF railroad parallels Esperanza Road just to the south. Residential developments exist to the north but there is no residential frontage or nearby structures. Fragmented segments of bike lane exist in places on Esperanza Road.



Figure 7.15: Looking northward on Fairlynn Boulevard from Esperanza Road with existing Recreation Trail visible on the right



Figure 7.16: Looking eastward along Esperanza Road from Fairlynn Boulevard with buffered right turn lane and existing Recreation Trail visible on the left

SEGMENT H



Figure 7.17



The roadway provides substantially more pavement width than needed for a four-lane arterial, and significant traffic volume increases are not likely to occur. Assuming that demand doesn't appreciably increase, Esperanza Road may have surplus pavement that could be used for bikeways or for other purposes.

Fairmont Connector from Esperanza Road to Fairmont Boulevard

Fairmont Boulevard is grade separated from Esperanza Road in order to cross over the main line of the BNSF railroad. The Fairmont Connector connects Esperanza Road to Fairmont Boulevard. The connector is 1,000' long and 80' wide from curb to curb and provides two lanes of travel in each direction plus a center turn lane. Parking is allowed on the northwest side of the curving roadway. The parking is used evidently for the adjacent residential community. Sidewalks parallel both sides of the street. A landscaped slope adjoins the west side of the Fairmont Connector.

Traffic volumes on the Fairmont Connector are 4,000 vehicles per day per the OCTA 2014 Traffic Flow Map. This usage is much lower than the capacity provided by the four lane cross section. The connector appears to have excess pavement width that could potentially be re-purposed to provide bicycle improvements.

Both ends of the Fairmont Connector are signalized with limited crosswalks at the intersections. The final alignment for the OC Loop should ensure that crosswalks are provided where OC Loop traffic is expected.

The Fairmont Connector rises about 60' upward at a steep grade to reach Fairmont Boulevard. Moderately fit bicyclists may ride on this grade but casual cyclists may view the grade as a barrier to usage.

Fairmont Boulevard to East La Palma Avenue

Fairmont Boulevard is a four-lane arterial highway carrying approximately 16,000 vehicles per day (OCTA ADT Map 2012) on a bridge structure that passes over Esperanza Road and the BNSF railroad. Fairmont Boulevard continues south to La Palma Avenue. The segment of Fairmont Boulevard



Figure 7.18: Looking west on Esperanza Road from the Fairmont Connector with bike lane and El Cajon Trail facilities visible



Figure 7.19: Looking southeast on Fairmont Boulevard towards the Bridge over Esperanza Road and the BNSF Railroad

from the Fairmont Connector to La Palma Avenue is 1,413' long and 80' wide (from curb to curb) with two lanes of travel in each direction and a painted center median. A third travel lane exists in the northbound direction just before the Fairmont Connector. Sidewalks exist on both sides of the street. Access is generally restricted and there are no fronting properties. The Fairmont Boulevard Bridge, seen from the Fairmont Connector intersection, is shown in Figure 7.19.

The Fairmont Boulevard overpass was constructed to provide 10' of space for the El Cajon Regional Riding and Hiking Trail and Bikeway along the east side of the bridge with a raised barrier providing separation from motorists. The east sidewalk south of the bridge is also compatible for bicycle usage. The sidewalk from the bridge north to the connector is a standard sidewalk and does not provide sufficient room for a two-way bikeway, in part due to utilities and signposts that restrict the sidewalk width. Additional width could be provided for a bikeway, if the area now used for the third travel lane northbound can be repurposed. This seems feasible based upon existing and expected future traffic volumes and the limited length of the third lane.

The intersection of Fairmont Boulevard at La Palma Avenue is signalized. A double right turn lane exists to turn from Fairmont Boulevard onto La Palma Avenue westbound. There is a crosswalk across the east leg of La Palma Avenue that aligns with the east sidewalk.

La Palma Avenue is 92' wide with two travel lanes in each direction and a wide landscaped center median. La Palma Avenue carries between 15,000 vehicles per day east of Fairmont Boulevard and 33,000 vehicles per day west of Fairmont (OCTA ADT Map 2012). The La Palma Avenue intersection with Fairmont Boulevard is shown in Figure 7.20.

Single family residential properties exist north of La Palma Avenue, but there is no direct residential frontage, and parking is not permitted on La Palma Avenue.

East La Palma Avenue to the Santa Ana Regional Riding and Hiking Trail



Figure 7.20: The southern terminus of Fairmont Boulevard at La Palma Avenue



Figure 7.21: La Palma Avenue, east of Fairmont Boulevard with existing El Cajon Regional Riding & Hiking Trail on the southerly edge



and Santa Ana River Regional Class I Bikeway

Beyond Fairmont Boulevard, the proposed route for Segment H continues to the Santa Ana River Bikeway. The Santa Ana River Bikeway is located along the north levee of the river channel. There are several alignment opportunities to connect the OC Loop, as an off-street class I facility, to the Santa Ana River Bikeway.

An unimproved vacant lot is located directly south of La Palma Avenue that was reserved for a potential future crossing for Fairmont Boulevard over the Santa Ana River and the SR-91 Freeway to Santa Ana Canyon Road. This motor vehicle connection is not expected to be constructed in the near future given the need for community consensus and funding.

Additional vacant lands exist to the east to the improved boundary of Yorba Park (City of Anaheim). An informal parking lot is provided that serves several ball fields and vehicles for users of the trail and bikeway. The existing El Cajon Regional Riding and Hiking Trail and Bikeway (located along the south side of La Palma Avenue) is shown in Figure 7.22.

The shortest distance from the La Palma Avenue/Fairmont Boulevard intersection to the Santa Ana River Bikeway and Trail is directly south along the Fairmont Boulevard preserved Right-of-Way. The connecting segment could also be provided further to the east within Yorba Park (City of Anaheim) or Yorba Regional Park (OC Parks).

The City of Anaheim has expressed interest to connect to the OC Loop if it can be extended straight south from Fairmont Boulevard. Through the preparation of their Bike Master Plan, the City envisions a bikeway and pedestrian only bridge, including possibly an OC Loop connection, across the Santa Ana River and SR-91 to serve residential neighborhoods south of the freeway. The bridge would link Fairmont Boulevard between La Palma Avenue and Santa Ana Canyon Road, south of the Santa Ana River and SR-91 freeway. This straight extension would create a four-way intersection where the OC Loop and the Anaheim bridge intersect with the Santa Ana River Bikeway.



Figure 7.22: Existing El Cajon Regional Riding and Hiking Trail and Bikeway along La Palma Avenue

Segment H: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Excess pavement on Esperanza Road may allow for an enhanced bicycle facility such as cycle track treatment
- Low traffic volumes on Fairlynn Boulevard
- Strong destination at Yorba Regional Park and Santa Ana River Trail and Bikeway
- Connections to established and popular recreational bikeways
- Proximity to residential neighborhoods, parks, and community amenities

OPPORTUNITIES

- Interest from the City of Anaheim in connecting to the OC Loop from across the Santa Ana River
- Potential for an enhanced bicycle facility along much of the route using available surplus pavement and minimal busy street crossings
- Tradition of Bicycling in Yorba Linda

WEAKNESSES

- Steep incline on the Fairmont Connector
- Limited right-of-way on the Fairmont Boulevard Bridge
- Left and right turning lanes limit available pavement right-of-way
- Limited crosswalks at major intersections

CHALLENGES

- Lack of bicycle infrastructure on surrounding streets
- High traffic volumes and speeds on the Fairmont Connector and Fairmont Boulevard
- BNSF Railroad limits north-south crossing to Fairmont Boulevard



Segment H: Recommendations

This segment of the El Cajon Segment runs from the existing trailhead at Fairlynn Boulevard and provides a bicycle facility south and east to the existing Santa Ana River Bikeway at the west edge of Yorba Regional Park. This park is a major facility in the Orange County Parks system and is located along the Santa Ana River Bikeway. The Segment is approximately one mile long and must cross the tracks of the BNSF railway, a transcontinental freight route.

The proposed concept for Segment H is a class II bike lane along the east side of Fairlynn Boulevard (for uphill traffic) and a class III sharrow lane for southbound traffic (traveling downhill). This segment of Fairlynn Boulevard has an existing grade of about 6%. It is lightly traveled by cars and most cyclists will be comfortable traveling downhill within the shared travel lane. This concept will not affect the existing dirt trail on the east side of Fairlynn Boulevard and will preserve it for community use.

Along Esperanza Road, a two-way cycle track is recommended along the north side of the roadway from Fairlynn Boulevard to the Fairmont Connector. The roadway provides excess pavement width that can be converted into a cycle track, minimizing exposure to heavy traffic levels along Esperanza Road, a four lane arterial highway. This proposed concept for Segment H along Fairlynn Boulevard is shown in Figure 7.23 and 7.25. The median buffer should provide landscaping or other aesthetic features. This concept will not affect the existing dirt trail on the east side of Fairlynn Boulevard and will preserve it for community use.

The cycle track will continue along the Fairmont Connector, a wide street that connects Esperanza Road to Fairmont Boulevard. Fairmont Boulevard is constructed at a higher grade than Esperanza Road to provide adequate vertical clearance above the east-west BNSF railroad. Given existing traffic volumes, the Fairmont connector provides excess right-of-way. A cycle track is recommended on the west side of the Fairmont Connector. Implementation of this concept avoids major intersections or signalized driveways between Fairlynn Boulevard and Fairmont Boulevard.



Figure 7.23: Fairlynn Boulevard concept



Figure 7.24: Sample rendering of a cycle track along Esperanza Road



Figure 7.25: Fairlynn Boulevard before and after proposed improvements, with cross sections. The existing parallel El Cajon Riding & Hiking Trail is visible on the right.



Given speeds and traffic volumes on Fairmont Boulevard, a class I bikeway is recommended on the east side of the roadway. The existing Fairmont Boulevard cross section provides sufficient width for the addition of a class I bikeway. Sidewalk widening is recommended on both sides of the bridge crossing over Esperanza Road.

The property south of the intersection of Fairmont Boulevard and La Palma Avenue is an undeveloped portion of Yorba Park (City of Anaheim). A class I bikeway is recommended along the south side of La Palma Avenue east to Yorba Park and south to the Santa Ana River Bikeway. The parking area will be available and suitable for OC Loop users and does not require an entrance fee.

The proposed concept for Fairmont Connector/Fairmont Boulevard, and the Santa Ana River Bikeway connection is shown in Figures 7.26 and 7.27 respectively.

The proposed concepts for Segments F and H, with the existing El Cajon Bikeway, will form a high quality class I bikeway from the Santa Ana River Bikeway north and west for about 7 miles. The bikeway will be connected to the proposed UPROW Bikeway in Brea.

Alternatives could include class II facilities along Esperanza Road, although this would not meet the desired feel for the OC Loop.

Another alternative would include a class I facility south of Esperanza Road. This may require that the roadway be narrowed and would require coordination with the railway to the south. It would also require a crossing of the railroad to connect to the Santa Ana River Trail.

Cost and Funding

Improvements to Segment H are expected to cost \$3,500,000, as shown in detail in the following table. Estimated annual maintenance is approximately \$49,500. Active Transportation Program (ATP) grant funding has been secured for preliminary analysis and environmental documentation, but final design and construction funds must still be secured.



Figure 7.26: Proposed concept for Fairmont Connector and Fairmont Boulevard

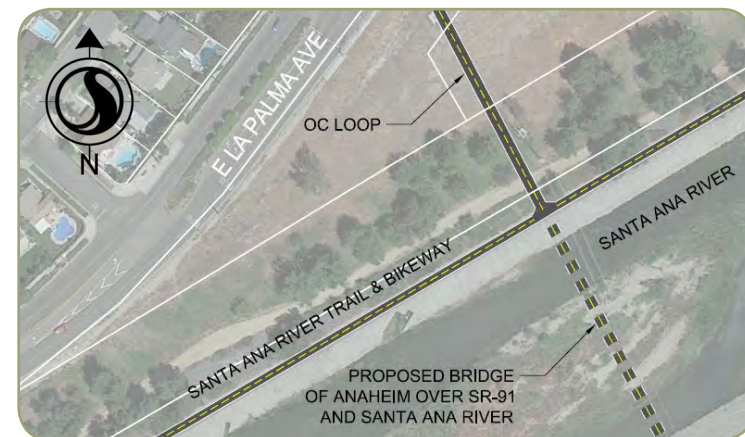


Figure 7.27: proposed concept for the Santa Ana River Bikeway connection and proposed Anaheim bridge alignment



Figure 7.28: Esperanza Road looking west before and after proposed improvements. The existing parallel El Cajon Riding & Hiking Trail is visible on the far right.





Figure 7.29: Fairlynn Boulevard Proposed cross section

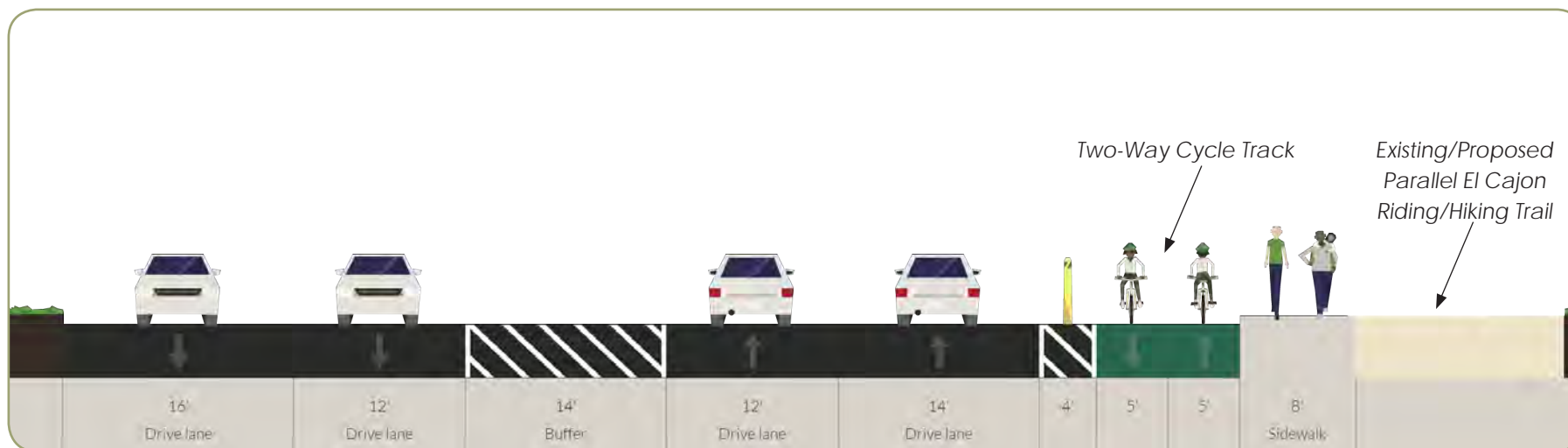


Figure 7.30: Esperanza Road/Fairmont Connector sample cross section

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment H - Yorba Linda Recreational Trail to Santa Ana River Trail (Approx. 5900')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment H: Total Cost				
		PA/ED Environmental Costs (-15%* of project cost)		\$ 316,078.20
		Right of Way (none required)		\$ -
		Plans & Specs (-20% of project cost)		\$ 421,437.60
360	SF	Install continental crosswalk (2' wide, with 5' gaps, per detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,080.00
3	Each	Install ADA Ramps	\$2,500.00	\$ 7,500.00
1	Each	Install stop signs	\$200.00	\$ 200.00
2700	SF	Install bike lane striping (6" wide) (Detail 39 of 2010 Caltrans Standard Plans)	\$3.00	\$ 8,100.00
5	Each	Install bike sharrows	\$200.00	\$ 1,000.00
20000	SF	Install curb extensions	\$25.00	\$ 500,000.00
2	Each	Install Type IV Arrows (L, R), 50 square feet	\$150.00	\$ 300.00
80	SF	Install buffer striping (assume 8" wide)	\$3.00	\$ 240.00
200	SF	Install white channelizing lines (Detail 38 of 2010 Caltrans Standard Plans)	\$3.00	\$ 600.00
2	Each	Install bike lane symbol	\$150.00	\$ 300.00
500	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 1,500.00
60000	SF	Install bike loop asphalt	\$15.00	\$ 900,000.00
3000	LF	Install raised bikeway curb	\$20.00	\$ 60,000.00
40000	SF	Perform earthwork on raised bikeway area	\$2.00	\$ 80,000.00
20	SF	Install 1' wide limit line (stop line)	\$3.00	\$ 60.00
		Mobilization (-5% of Total Cost)		\$ 78,044.00
		Traffic Control (-10% of Total Cost)		\$ 156,088.00
		Contingency 20%		\$ 312,176.00
		Subtotal (project cost)		\$ 2,107,188.00
		Construction Engineering (-15% of project cost)		\$ 316,078.20
		Segment H: Total Cost (unrounded)		\$ 3,160,782.00
		Segment H: Total Cost (rounded)		\$ 3,500,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment H - Yorba Linda Recreational Trail to Santa Ana River Trail (Approx. 5900')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
56000	SF	Asphalt Maintenance	\$ 0.75	\$ 42,000.00
6	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 576.00
1.12	miles	Sweeping	\$ 475.00	\$ 532.00
1.12	miles	Landcaping maintenance	\$ 4,275.00	\$ 4,788.00
1.12	miles	Misc	\$ 1,000.00	\$ 1,120.00
		Annual Maintenance Cost		\$ 49,016.00
		Segment H Total Maintenance Cost (rounded)		\$ 49,500.00



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COASTAL BIKEWAY

Introduction

The Coastal Bikeway (a class I, off-road, paved facility) parallels the beach beginning at the Santa Ana River Bikeway and ending at Warner Avenue at the start of OC Loop Segment K. Study Area 5 consists of segments K, L, and M and will connect the existing Coastal Bikeway along the Pacific Ocean in Huntington Beach to the San Gabriel River Bikeway at the western edge of the City of Seal Beach. The Coastal Bikeway passes through the cities of Huntington Beach and Seal Beach. Segments K, L, and M are shown in Figure 8.3.

Segment K: Existing Conditions

Segment K begins at Warner Avenue, west of Pacific Coast Highway (PCH) where the existing Huntington Beach Bikeway (Segment J) ends at a bus transit turnout shown in Figure 8.1. From this location the OC Loop would travel west between North Pacific Avenue and South Pacific Avenue to Anderson Street along an existing median greenbelt. Segment K is 6,800' or 1.3 miles long.

Pacific Avenue

Pacific Avenue extends from Warner Avenue to Anderson Street. It is a lightly used residential street, but is subject to congestion during periods of heavy beach usage by motorists searching or waiting for parking. Most of Pacific Avenue consists of two 20' wide roadways providing a travel lane in each direction and parallel parking on the outer side of each roadway. The two roadways are separated by a raised median that is about 63' wide and provides diagonal parking in some areas. The wide center median contains a 6' wide meandering sidewalk along the length of the facility. The sidewalk is not suitable for bicycling due to insufficient width and regular usage by the community for walking. Land uses along Pacific Avenue include residences to the west along the shoreline and a



Figure 8.1: The Warner Avenue loop at the northern terminus of the existing Huntington Beach Bikeway (image from Streetview)



Figure 8.2: The parking lot at the southern end of the Pacific Avenue median (image from Google Streetview)



STUDY AREA 5: SEGMENTS K-L-M



Figure 8.3

mix of residential and commercial uses to the east. Many of the existing residential homes provide garages fronting on Pacific Avenue. The area in front of the garages is often used for residential parking.

The most southerly 400' of Pacific Avenue features a different traffic treatment. Beginning at 3rd Street, both South Pacific Avenue and North Pacific Avenue provide for two way traffic. The roadway terminates at the large turnaround area at the end of Warner Avenue which acts as a traffic circle as pictured in Figure 8.2.

Pacific Avenue is a low volume residential street, providing for a low stress street bicycle route.

The City of Huntington Beach plans to install signs and stencil lane markings to designate a class III bike route along both one-way segments of Pacific Avenue between Warner Avenue and Anderson Street.

The following table provides information of the physical dimensions of the wide median route north of Warner Avenue. Sidewalk refers to the width of the longitudinal paved path. Left lawn and right lawn refer to the grassy landscaped areas on either side of the path.

Anderson Street-Pacific Coast Highway Intersection

Pacific Avenue ends on the north at a stop sign with Anderson Street. The OC Loop must route toward the right and travel west to Pacific Coast Highway. Anderson Street is a collector street with diagonal parking along the south curb, and parking is prohibited along the north curb.

The intersection of Anderson Street and Pacific Coast Highway is signalized. Crosswalks are provided on the west leg of Pacific Coast Highway and both legs of Anderson Street. Bicyclists traveling from Anderson Street to Pacific Coast Highway towards Seal Beach may have difficulty actuating the traffic signal without a crosswalk or bicycle detection equipment added to the existing signal.



Figure 8.4: Looking north from the Pacific Avenue median at 5th Street



Figure 8.5: The Anderson Street intersection with North Pacific Avenue



Table 1: Pacific Avenue Median Dimensions

Street Segment	Sidewalk	Left Lawn	Right Lawn	Other Notes
5th St to 8th St	6'	4'-12'	11'-27'	8th St is 27' wide, one lane in each direction
8th St to 11th St	6'	5'-13'	3'-13'	11th St is 27' wide, one lane in each direction. Restroom structure near 8th st.
11th St to 14th St	6'	7'-28'	4'-40'	14th St is 63' wide, one lane in each direction
14th St to 16th St	6'	6'-27'	4'-27'	16th St is 26' wide, one lane in each direction. Restroom structure near 14th st.
16th St to 19th St	6'	6'-27'	4'-27'	19th St is 30' wide, one lane in each direction
19th St to 22nd St	6'	4'-35'	4'-35'	22nd St is 27' wide, one lane in each direction. Restroom structure near 19th st.
22nd St to 25th St	6'	3.5'-23'	4'-30'	25th St is 27' wide, one lane in each direction. Restroom structure near 25th st.
25th St to Anderson St	6'	3'-13'	3.5'-9.5'	Anderson St is 43' wide, one lane in each direction



Figure 8.6: A playground in the Pacific Avenue Median Park south of 4th Street



Figure 8.7: A restroom in the Pacific Avenue Median Park seen from the 7th Street Intersection

Segment K: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Low volume residential streets
- Wide median between North and South Pacific Avenue
- Current low stress bicycling along Pacific Avenue and the Coastal Bikeway, south of Warner Avenue

WEAKNESSES

- Limited right-of-way for a dedicated bike facility due to existing public facilities within the median
- Frequency of potential bicyclist/motorist conflicts with cross streets and residential driveways
- Three stop signs between Anderson Street and Warner Avenue

OPPORTUNITIES

- Connection to the established Huntington Beach Coastal Bikeway
- Proximity to residential neighborhoods
- Highly desirable route
- The beach and park provides a strong destination
- City is currently designing a class III bike route (signing and sharrows) on Pacific Avenue

CHALLENGES

- Potential for resident opposition to changes to local wide median or expanded bike infrastructure through neighborhood, if facilities beyond the class III sharrows are explored
- Seasoned cyclists may forgo slower Pacific Avenue route for Pacific Coast Highway (and to avoid frequent stop signs on Pacific Avenue)



Segment K: Recommendations

Segment K connects the existing Coastal Bikeway with Segment L. This portion of Study Area 5 is approximately 1.3 miles long, and runs from Warner Avenue west to Anderson Street via North Pacific Avenue and South Pacific Avenue as shown in Figure 8.3.

Bike lanes on the left side of the street adjacent to the wide median are not proposed on North and South Pacific Avenue since vehicles backing out of the angled parking in the median could create a hazard for cyclists. Bike lanes along the existing 6' wide sidewalk through the median park would require widening of the sidewalk and potential loss of existing public amenities. City staff have indicated reluctance to widen the sidewalk through the median primarily due to likely resident opposition. Additionally, restroom buildings in the median park block the route.

Cross traffic at side streets and alleys stop for traffic on North and South Pacific Avenue. Traffic at 7th Street, 14th Street, 19th Street, and Anderson Street is controlled by stop signs in all directions for vehicles as well as cyclists. The many side streets and alleys create potential conflicts for cyclists. However, moving the bike lane to the left side of the street to increase visibility and reduce the conflicts with right-turning vehicles is not feasible, as discussed above.

Segment K of the OC Loop will consist of class III signing and shared lane markings painted on the existing roadway along Pacific Avenue and Anderson Street. As a result, this segment proposes minor improvements along public streets to make the necessary connections without affecting on-street parking.

Segment K connects to the end of the Coastal Bikeway by way of the sidewalk at the end of Pacific Avenue (North and South). With a low 15-mph speed limit and low traffic volumes, the OC Loop will consist of sharrows for northbound cyclists on North Pacific Avenue, and sharrows for southbound cyclists on South Pacific Avenue. Wayfinding signs are recommended to be installed along the route. Figure 8.8 shows an

example of the proposed treatment with sharrows and signs on Pacific Avenue.

Sharrows will be painted on Anderson Street between PCH and Pacific Avenue.

Cost and Funding

Improvements to Segment K are expected to cost \$36,000, and estimated annual maintenance is approximately \$8,000, as shown in detail in the following tables.



Figure 8.8 Proposed sharrow and signage along Pacific Avenue



Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment K - Warner Avenue to Anderson Street (Approx. 6400)
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment K: Total Cost				
		PA/ED Environmental Costs (n/a - not required)		\$ -
		Right of Way (none required)		\$ -
		Plans & Specs (minimum fee)		\$ 12,000.00
55	Each	Install bike sharrows	\$200.00	\$ 11,000.00
1	Each	Wayfinding (included due to low contingency)	\$5,000.00	\$ 5,000.00
		Mobilization (~5% of Total Cost)		\$ 550.00
		Traffic Control (~10% of Total Cost)		\$ 1,100.00
		Contingency 20%		\$ 3,200.00
		Subtotal (project cost)		\$ 20,850.00
		Construction Engineering (~15% of project cost)		\$ 3,127.50
		Segment K Total Cost (unrounded)		\$ 35,977.50
		Segment K: Total Cost (rounded)		\$ 36,000.00

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment K - Warner Avenue to Anderson Street (Approx. 6400)
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
0	SF	Asphalt Maintenance	\$ 0.75	\$ -
6	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 576.00
1.21	miles	Sweeping	\$ 475.00	\$ 574.75
1.21	miles	Landcaping maintenance	\$ 4,275.00	\$ 5,172.75
1.21	miles	Misc	\$ 1,000.00	\$ 1,210.00
		Annual Maintenance Cost		\$ 7,533.50
		Segment K Total Maintenance Cost (rounded)		\$ 8,000.00

Segment L: Existing Conditions

Segment L begins at the intersection of Anderson Street and Pacific Coast Highway. From there the segment continues north along Pacific Coast Highway to Seal Beach Boulevard. This segment includes a crossing of Anaheim Bay which is a navigable waterway that connects Huntington Harbor to the Ocean. Segment L is 8,300' long or 1.57 miles.

Pacific Coast Highway (PCH) is a four lane expressway-type arterial that carries extremely high traffic volumes at high speeds throughout the project area. It serves 45-48,000 vehicles per day (Caltrans Traffic Volumes 2011). The posted speed limit is 55 mph, and field observations revealed that many vehicles travel in excess of the posted speed. Most of the length of PCH in Segment L has controlled access and is bounded by the Los Alamitos Naval Weapons Station. PCH is the only public street connection across Anaheim Bay between the ocean and several miles inland.

Class II bike lane facilities of varying width and quality currently exist along this portion of PCH. While they are relatively wide, provided on 8' paved shoulders, they provide a high stress experience for bicyclists due to high speeds and traffic exposure. Most recreational cyclists will not ride along PCH from Seal Beach to Sunset Beach due to traffic conditions, but many experienced sport cyclists ride on the segment regularly. The northbound PCH bike lane is shown on the bridge crossing over Anaheim Bay in Figure 8.10.

Pacific Coast Highway just north of Anderson Street

The first 2,000' of PCH north from Anderson Street is bounded by residential rear yards on the ocean (west) side and commercial frontage on the inland side. The southbound side provides a striped bicycle lane and provides minimal vehicular access points due to the residential rear yards. The northbound side provides a wider bicycle lane but allows parallel parking within the lane. It also has many driveway crossings to serve adjacent businesses. There are no sidewalks on the west side and



Figure 8.9: The Pacific Coast Highway bike lane north of Piedmont Circle



Figure 8.10: The Pacific Coast Highway Bridge over Anaheim Bay



intermittent sidewalks on the east side. The PCH northbound bike lane north of Piedmont Circle is shown in Figure 8.9.

Pacific Coast Highway from 2,000 Feet north of Anderson Street to Seal Beach Boulevard

This portion of PCH crosses the lands of the Naval Weapons Station Seal Beach (NWSSB) and Anaheim Bay. It includes a major bridge across the bay that provides clearance for tall-mast boats. It also provides a smaller bridge across Kitts Way, an internal roadway for the NWSSB.

Caltrans has limited surplus right-of-way in the vicinity of the bridges, but the right-of-way is more limited on the ocean side than on the inland side. In the past, Seal Beach has approached Caltrans about modifying the bridges, and specifically the larger bridge over Anaheim Bay, to provide an area for bicyclists that is separated from motor vehicle traffic. During these discussions, Caltrans indicated that the bridge did not meet current design standards including seismic issues and could be modified but would require full replacement. Replacement of this major bridge over navigable waters would be a challenging task and would trigger extensive environmental reviews.

The project team discussed this portion of PCH with Caltrans in late 2014. The state indicated that the bridge was still a concern but that they would work with the OC Loop to the extent reasonably possible. Caltrans noted concerns regarding incompatibility between high speed traffic and bicycle traffic, and recent state policy revisions have shown greater sensitivity to this type of issue. In the past, the NWSSB has expressed security concerns related to increased pedestrian and bicycle traffic across Anaheim Bay. Use of NWSSB right-of-way for bikeway development may be a challenge due to these reasons.

The intersection of Seal Beach Boulevard and Pacific Coast Highway is signalized. Pedestrian crossings are provided across the east, north, and west legs of the intersection. Seal Beach has constructed a bikeway that begins at the southwest corner of the intersection. There is no crosswalk to connect this bikeway across the south leg of PCH. Northbound bicycle traffic in the bike lanes on PCH must now cross all three crosswalk legs to reach the bikeway provided in Seal Beach or maneuver across lanes of PCH to the left turn lane.



Figure 8.11: Pacific Coast Highway at Seal Beach Boulevard. Note the right turn lane displacing the bike lane.

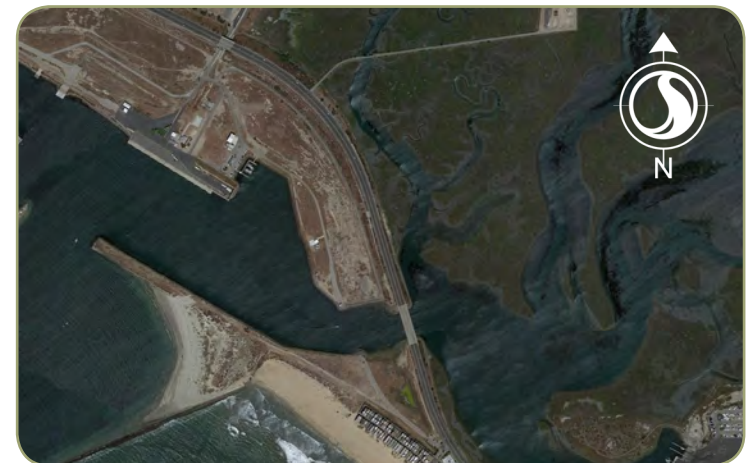


Figure 8.12: Pacific Coast Highway crossing Anaheim Bay between Huntington Beach and Seal Beach (Image from Google Earth)

Segment L: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Existing class II bike lane on Pacific Coast Highway
- Alignment largely uninterrupted from Mariner Drive to Seal Beach Boulevard
- History of bicycling with the communities of Seal Beach and Huntington Beach
- Potential for a class I bikeway parallel to Pacific Coast Highway from Mariner Drive to Seal Beach Boulevard

OPPORTUNITIES

- Highly desirable route connecting Huntington Beach and Seal Beach
- Tradition of bicycling along Pacific Coast Highway

WEAKNESSES

- Limited right-of-way on existing Pacific Coast Highway Bridge
- Existing PCH bridge over Anaheim Bay cannot easily be expanded to provide a Class I facility. Bridge replacement would be costly.
- High speed and traffic volumes on Pacific Coast Highway

CHALLENGES

- Potential difficulties in modifying a state highway under Caltrans jurisdiction (PCH, State Route 1), while meeting Caltrans Design Standards
- Adjacent naval weapons station and ecological reserve right-of-way may be difficult to access if Caltrans right-of-way is not sufficient
- Caltrans Highway Design Manual currently doesn't provide standards for cycle track concept



Segment L: Recommendations

Segment L provides significant challenges, and success in closing this gap relies upon coordination with and cooperation of multiple agencies, such as Caltrans and the Department of Defense. The proposed connection is shown in Figure 8.3.

The OC Loop is proposed to be a class IV bikeway (cycle track) along the west side of Pacific Coast Highway. In addition, the class II on-street bike lanes will be maintained northbound along PCH from Anderson Street to Seal Beach Boulevard and for southbound PCH between Seal Beach Boulevard and Phillips Street.

The cycle track will be created along the west side of PCH at Anderson Street by restriping and slightly narrowing the lanes of PCH to provide 12' for the bikeway. The existing shoulder is 8' wide, so an additional four feet must be secured from other roadway elements. This will require exceptions to Caltrans Design Standards, but Caltrans staff have indicated that they

would work with the OC Loop to provide an appropriate corridor where PCH is bounded and unable to provide additional right-of-way.

The cycle track will require a physical buffer such as a raised curb, delineators, bollards, etc. The cycle track will provide two-way bicycle travel. Cyclists will enter the cycle track from Anderson Street at the existing signal, but minor adjustments to signal phasing may be required.

Between Anderson Street and Seal Beach Boulevard the bikeway would cross Phillips Street. The existing right-turn pocket onto Phillips Street from southbound PCH will need to be removed to provide space for the bikeway and buffer.

Northerly of Phillips Street, the bikeway would shift westerly slightly toward the Ocean and be constructed on a separate alignment from PCH. The bikeway would vary from 6' to 15' from PCH for most of the distance.

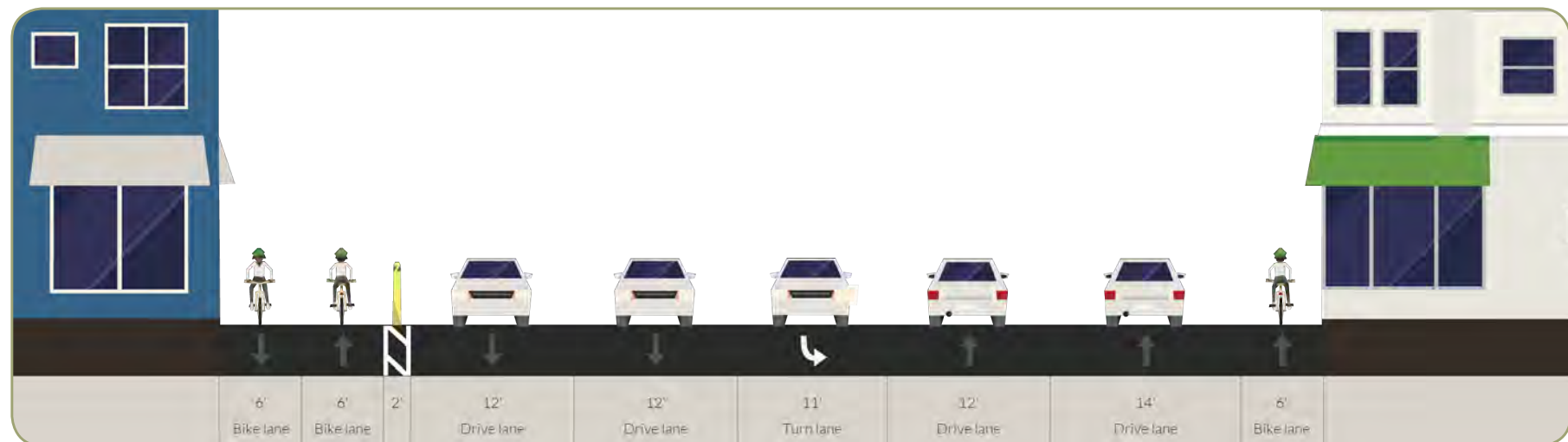


Figure 8.13: Proposed cross section for Pacific Coast Highway west of Anderson Street.

Where PCH crosses over Anaheim Bay, widening of the existing bridge would require extensive construction and Caltrans coordination. A separate truss bridge structure is proposed to carry the OC Loop across Anaheim Bay adjacent to the PCH vehicle bridge. A similar bridge was provided in Northern California adjacent to a drawbridge connecting the City of Alameda to the Oakland Airport, giving precedent to this solution, although this bridge is not adjacent a Caltrans facility. The required bridge will be as long as the bridge that serves PCH, but it will be built to much lighter standards. It will not carry motor vehicle traffic except for service vehicles.

North of the proposed bridge, the OC Loop can be aligned to be lower than PCH, decreasing traffic noise. At the Kitts Way overcrossing about 0.8 miles north of the Anaheim Bay Bridge an additional truss bridge is proposed to carry the OC Loop over the secured NWSSB roadway.

The class IV bikeway on PCH will continue north to Seal Beach Boulevard and connect directly with the existing class I bikeway on the southwest corner of Seal Beach Boulevard at PCH. OC Loop users will not need to cross PCH or Seal Beach Boulevard to continue north.

Cost and Funding

Improvements to Segment L are expected to cost \$7,500,000, as shown in detail on the following page. Estimated annual maintenance is approximately \$52,000.



Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment L - Anderson Street to Seal Beach Boulevard (Approx. 8400')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment L: Total Cost				
		PA/ED Environmental Costs (~20%* of project cost)		\$ 902,275.20
		Right of Way / Site Entitlements		\$ 270,000.00
		Plans & Specs (~20% of project cost)		\$ 902,275.20
5400	SF	Install truss bridge over Anaheim Bay	\$180.00	\$ 972,000.00
2800	SF	Install truss bridge over Kitts Highway	\$180.00	\$ 504,000.00
8000	SF	Install bike lane striping (6" wide, per Detail 39 of 2010 Caltrans Standard Plans)	\$3.00	\$ 24,000.00
150	SF	Install bike lane drop striping (6" wide, per Detail 39A of 2010 Caltrans Standard Plans)	\$3.00	\$ 450.00
2	Each	Install bike sharrows	\$200.00	\$ 400.00
4	Each	Install Type IV Arrows (L, R), 50 square feet	\$150.00	\$ 600.00
2700	SF	Install buffer striping (assume 8" wide)	\$3.00	\$ 8,100.00
300	SF	Install white channelizing lines (Detail 38 of 2010 Caltrans Standard Plans)	\$3.00	\$ 900.00
5	Each	Install bike lane symbol	\$150.00	\$ 750.00
20	SF	Install 4" solid white line 50' long	\$3.00	\$ 60.00
4000	LF	Install lane striping (Detail 10 of 2010 Caltrans Standard Plans)	\$5.00	\$ 20,000.00
2600	SF	Install double yellow line striping (Detail 22 of 2010 Caltrans Standard Plans)	\$3.00	\$ 7,800.00
900	SF	Install bike loop striping (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 2,700.00
120000	SF	Install bike loop asphalt	\$15.00	\$ 1,800,000.00
		Mobilization (~5% of Total Cost)		\$ 167,088.00
		Traffic Control (~10% of Total Cost)		\$ 334,176.00
		Contingency 20%		\$ 668,352.00
		Subtotal (project cost)		\$ 4,511,376.00
		Construction Engineering (~15% of project cost)		\$ 676,706.40
		Segment L: Total Cost (unrounded)		\$ 7,262,632.80
		Segment L: Total Cost (rounded)		\$ 7,500,000.00

* PA/ED Costs vary from 0-20% based on project size and complexity

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment L - Anderson Street to Seal Beach Boulevard (Approx. 8400')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment L: Total Cost				
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
56000	SF	Asphalt Maintenance	\$ 0.75	\$ 42,000.00
8	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 768.00
1.59	miles	Sweeping	\$ 475.00	\$ 755.25
1.59	miles	Landcaping maintenance	\$ 4,275.00	\$ 6,797.25
1.59	miles	Misc	\$ 1,000.00	\$ 1,590.00
		Annual Maintenance Cost		\$ 51,910.50
		Segment L Total Maintenance Cost (rounded)		\$ 52,000.00

Segment M: Existing Conditions

Segment M is 7,270', or 1.38 miles long, and travels primarily through the City of Seal Beach from Seal Beach Boulevard to the San Gabriel River Bikeway. There are different options for closure of this segment. These include opportunities for class I bikeways, but connections along existing streets may be more appropriate.

Seal Beach Boulevard Bikeway and Sidewalk

Seal Beach Boulevard is 40' wide, with a single travel lane in each direction west of Pacific Coast Highway. It provides parallel parking and sidewalks on both sides of the street. Seal Beach Boulevard carries 7,000 vehicles per day in the project area (OCTA ADT Map 2012).

A 13' wide bikeway/wide sidewalk exists on the south side of Seal Beach Boulevard, south of and adjacent to the existing curb, from PCH to Electric Avenue. The bikeway pavement is in fair condition and tree branches obstruct some of the usable width. It will require refurbishment for inclusion in the OC Loop. This short bikeway is not heavily used at present due to challenges for bicyclists who wish to continue south to Huntington Beach. The existing bikeway along Seal Beach Boulevard is shown in Figure 8.14.

Electric Avenue

Electric Avenue is a residential collector consisting of a couplet pair of one way streets that are separated by the Electric Avenue Median Park. The Electric Avenue Median is shown from Marina Drive in Figure 8.15. Electric Avenue extends from Seal Beach Boulevard north to 6th Street.

North Electric Avenue is 28' wide from curb to of curb and is marked to provide a 15' travel lane and a 13' bike lane that also allows for parking. It includes an 8' wide sidewalk on the east side of the street.



Figure 8.14: Looking west along the Seal Beach Boulevard bikeway towards Landing Avenue



Figure 8.15: The Electric Avenue Median Park seen from Marina Drive (image from Google Streetview)



South Electric Avenue, located on the west side of the 100' wide median park, mirrors North Electric Avenue. South Electric Avenue also includes a 6' to 10' wide sidewalk on the east side of the street. Electric Avenue carries 3,000 vehicles per day total (OCTA ADT Map 2012).

The median park is 100' wide and landscaped with lawn and trees. It includes a 6' wide sidewalk that runs longitudinally. A driveway approach and crosswalk connect to the sidewalks at each intersection. Road crossings of the median park occurs at 14th Street, 12th Street, Main Street, an alley between Main and 8th Street, 6th Street, and Marina Drive. Between 7th and 8th Streets, the sidewalk detours around an existing library via an approximately 7' wide sidewalk on the right and left side of the building. The median pathway continues through the median park past the library parking lot, and north to Marina Drive. The dimensions of the park are shown in Table 2.



Figure 8.16: Aerial image of the Electric Avenue Median Park (image from Google Earth)

Table 2: Electric Avenue Median Park Dimensions

Street Segment	Sidewalk	Left Lawn	Right Lawn	Other Notes
Seal Beach Blvd to 14th St	6'	50'-95'	0'-19'	seating area just past Seal Beach Bl
14th St to 12th St	6'	21'-90'	3'-75'	n/a
12th St to Main St	6'	12'-74'	16'-75'	park ends 125' east of Main St
Main St to 6th St		0'-45'	0'-80'	existing train car and library near Main St



Figure 8.17: Train and library in the median of Electric Avenue

Marina Drive-The San Gabriel River Bikeway

At 6th street, the two couplet roadways of Electric Avenue terminate. Northbound Electric Avenue is controlled by a stop sign, but traffic on 6th Street does not stop. The segment potentially continues along 6th Street for a short block to Marina Drive. The route then would turn left on Marina Drive and proceed to the all-way stop at 5th Street. Traffic on 5th Street must stop at Marina Drive, but traffic on Marina is not controlled at 5th Street. The two intersections are compatible for southbound bicycle travel but inconvenient for northbound travel. But traffic levels on these roadways are low enough that crossings can be made without difficulty.

No crosswalk currently crosses Marina Drive at Electric Avenue. From Electric Avenue to 1st Street, Marina Drive features 12' wide travel lanes and 12' combined bike and parking lanes which are only marked on the travel lane side leaving insufficient space for vehicle parallel parking and cyclists.

Westbound Marina Drive also includes an approximately 34' wide landscaped shoulder north of the curb that features a 13' wide class I bikeway with landscaped buffers on either side, pictured in Figure 8.18.

From 1st Street to the San Gabriel River Bikeway, Marina Drive provides a single travel lane in each direction, plus 13' wide bike lanes that allow parking, plus sidewalks in both directions. It also provides a raised landscaped median. Marina Drive carries 6,000 vehicles per day in the project area (OCTA ADT Map 2012). There is no class I bikeway or sidewalk along this section of Marina Drive.

The existing San Gabriel River Bikeway connection at Marina Drive is depicted in Figure 8.19. This completes the 66 mile OC Loop.



Figure 8.18: The existing Marina Drive Bikeway (image from Google Streetview)



Figure 8.19: The existing San Gabriel River Bikeway connection at Marina Drive (image from Google Streetview)



Segment M: Strengths, Weaknesses, Opportunities, and Challenges

STRENGTHS

- Low volume residential streets and access to retail on Main Street
- Wide median between North and South Electric Avenue
- Existing class I bikeway on Marina Drive and Seal Beach Boulevard
- Existing class II bike lanes on Electric Avenue
- Potential for a coastal alternative along the beach

OPPORTUNITIES

- Connection to the established San Gabriel River Bikeway
- Proximity to residential neighborhoods
- Tradition of cycling along the coast
- Highly desirable route
- Main Street Seal Beach, Seal Beach Pier, and the beach provide strong destinations

WEAKNESSES

- Large number of small conflicts with cross streets and residential driveways could frustrate cyclists
- San Gabriel River Bikeway access from Marina Drive is narrow

CHALLENGES

- Seasoned cyclists may forgo Electric Avenue route for Pacific Coast Highway itself
- Potential for resident opposition to changes to local median park, coastal alignment, or expanded bike infrastructure through their neighborhood

Segment M: Recommendations

Segment M is located in the City of Seal Beach and will connect Segment L, which ends at Seal Beach Boulevard and Pacific Coast Highway (PCH), with the San Gabriel River Bikeway. The Segment M route is via Seal Beach Boulevard, Electric Avenue, 6th Street, and Marina Drive as shown in Figure 8.21.

The proposed alternative for Segment M will improve the existing class I bikeway along Seal Beach Boulevard west of PCH to meet OC Loop standards. These will include minor widening of the pavement and regular trimming of the trees.

Currently, the bike lanes on North and South Electric Avenue are striped along the outside edge of the travel lane and allow parking. This can create a hazard for cyclists in the “door zone” as occupants of parked cars may open the driver’s side doors in front of unsuspecting cyclists, causing them to swerve into the travel lane or collide with the car door.

To reduce the potential for “dooring” collisions along North and South Electric Avenue, it is proposed that the bike lanes will be restriped to be located along the left side of the street adjacent to the median from Seal Beach Boulevard to 6th Street. This concept is illustrated in Figure 8.20 and 8.23. Placement of bicycle lanes along the left edge of the road also increases visibility approaching intersections and driveways and reduces conflicts with right-turn vehicles.

Sharrows will be painted on the short section of 6th Street approaching Main Street. The left side bicycle lanes must be terminated because the median is interrupted at Main Street.

Along Electric Avenue bikes and vehicles stop at 12th Street, Main Street, and 6th Street at these all-way stop controlled intersections.

Bicyclists traveling in both directions will cross Marina Drive at the all-way stop for 5th Street to access the existing class I bikeway on the north side of Marina Drive.



Figure 8.20: Proposed cross section of Electric Avenue left side bike lanes



Eastbound bicyclists may also use the existing bicycle lanes on the south side of the street. The proposed OC Loop would continue along the existing class I bikeway on Marina Drive that exists from 6th Street to 1st Street. Vehicles on Marina Drive do not need to stop at Caravel Way, but stop signs are advised for the bikeway crossing of Caravel Way to reduce conflicts.

There is a busy all way stop at 1st Street. A new signal is under consideration at this intersection, but OC Loop users will be served adequately by the existing configuration.

West of 1st Street, cyclists will use the existing on-street bike lanes to reach the San Gabriel River Bikeway. Eastbound cyclists will need to use the crosswalks at the 1st Street intersection to reach the bikeway along the north curb or they may use the existing bike lanes.

The San Gabriel River Bikeway crosses Marina Drive at an existing grade crossing. Traffic levels are not high enough to require a traffic signal or other device, but a marked ladder-style uncontrolled crosswalk is proposed across Marina Drive at the San Gabriel River Bikeway access point for cyclists to enter the eastbound bike lane.

Several alternatives to the project proposed above are feasible, but are not the preferred approach at this time. They are discussed here:

Segment M Class I Median Bikeway Alternative

This alternative would improve the existing class I bikeway on Seal Beach Boulevard, provide a new class I bikeway through the Electric Avenue Median Park, and use the existing class I bikeway on Marina Drive. This alternative is not recommended, but does provide some desirable features for consideration as an alternative.

The Segment M Alternative would provide a class I bikeway within the Electric Avenue Median Park by widening the existing sidewalk to consist of a walking and biking trail from Seal Beach Boulevard to south of Main Street. The existing 6' sidewalk would be widened to 15', providing for a 10' bikeway and a 5'

walking path. The class I bikeway through the median park would connect with the class I bikeway on Seal Beach Boulevard via the sidewalk ramp and crosswalks at the Seal Beach Boulevard/Ocean Avenue and Electric Avenue all-way stop controlled intersection.

The walking path meanders through the median park, and at intersections the path is angled toward the corner on one side or the other of the median. Vehicles on the side street stop at the intersections. Sidewalk ramps are provided at each corner crossing and an all-way stop exists at 12th Street. Bike stop signs would be installed at 12th Street.

North of Main Street, the building housing the Mary Wilson Branch of the Orange County Library and City of Seal Beach Senior Citizens Center is located in the median park. Between Main Street and 7th Street the median park sidewalk follows along the outer edge of both sides of the median. The northbound class II bike lane would follow the sidewalk on the east side of the median, and the southbound bike lane would follow the sidewalk on the west side of the median.

From 6th Street to the end of Segment M at the San Gabriel River Bikeway, the proposed improvements for the class I bikeway Alternative would be the same as for the Segment M Preferred Alternative.

A class I bikeway through the median park would likely face strong resident opposition and engineering challenges. It would also result in frequent conflicts between park users and OC Loop users. Therefore, the recommendation is for a class II bike lane. The class I bikeway in the median park could be explored as a long-term option.

Ocean Avenue Alternative

This alternative would use Ocean Avenue to connect from Seal Beach Boulevard to 1st Street. Ocean Avenue is the closest public roadway to the Beach in this area.

It provides better access to the Pier and to the Rivers End wayside park for the San Gabriel River Bikeway. Bicycle traffic would be served by sharrow treatments along this roadway. This route is appropriate for designation by signing as an alternate route to the Electric Avenue alignment. However the traffic levels on Ocean Avenue, especially during summer weekends are too high to meet the comfort levels and requirements of all users of the OC Loop.

Beachfront alternative

A beachfront sidewalk exists from Seal Beach Boulevard to the Seal Beach pier. It is not wide enough for heavy bicycle traffic and has some blind corners. A route further toward the shoreline would be feasible, similar to the beach bikeway system to the west in Long Beach.

Construction of this type of facility would require cooperation with the California Coastal Commission and it could become quite controversial based upon similar proposals in other communities. It would be an attractive addition, but it is not recommended, because the Electric Avenue alignment is more direct and does not pose substantial challenges that could delay completion of the OC Loop.

Cost and Funding

The preferred alternative for Segment M is expected to cost \$700,000, as indicated in the following table. Estimated annual maintenance is approximately \$24,000. There are currently no funding sources secured for improvements.



Figure 8.21: Proposed route along Seal Beach Boulevard, Electric Avenue, Sixth Street and Marina Drive.



Figure 8.22: Existing beachfront path





Proposed Rendering

Existing

Figure 8.23: Electric Avenue with left side bike lanes

Cost Estimates

County of Orange

ENGINEERING COST ESTIMATE

Location: Segment M - Seal Beach Boulevard to San Gabriel River Trail (Approx. 7400')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
Segment M: Total Cost				
		PA/ED Environmental Costs (~20%* of project cost)		\$ 86,481.00
		Right of Way (none required)		\$ -
		Plans & Specs (~20% of project cost)		\$ 86,481.00
7	Each	Install stop signs	\$200.00	\$ 1,400.00
3200	SF	Install bike lane striping (6' wide, per Detail 39 of 2010 Caltrans Standard Plans)	\$3.00	\$ 9,600.00
200	SF	Install continental crosswalk (2' wide, with 5' gaps, Detail RSP A24F of 2010 Caltrans Standard Plans)	\$3.00	\$ 600.00
2	Each	Install bike sharrows, 50 square feet	\$200.00	\$ 400.00
16	Each	Install bike lane symbol	\$150.00	\$ 2,400.00
25	Each	Trim trees around existing bike trail	\$200.00	\$ 5,000.00
300	SF	Install bike loop striping (includes striping on existing bike trail) (Detail 8 of 2010 Caltrans Standard Plans)	\$3.00	\$ 900.00
20000	SF	Install bike loop asphalt (does NOT include existing bike trail that connects to Gap N)	\$15.00	\$ 300,000.00
		Mobilization (~5% of Total Cost)		\$ 16,015.00
		Traffic Control (~10% of Total Cost)		\$ 32,030.00
		Contingency 20%		\$ 64,060.00
		Subtotal (project cost)		\$ 432,405.00
		Construction Engineering (~15% of project cost)		\$ 64,860.75
		Segment M: Total Cost (unrounded)		\$ 670,227.75
		Segment M: Total Cost (rounded)		\$ 700,000.00
* PA/ED Costs vary from 0-20% based on project size and complexity				

County of Orange

MAINTENANCE COST ESTIMATE

Location: Segment M - Seal Beach Blvd. to San Gabriel River Trail (Approx. 7400')
 Updated: 3/25/2015

Quantity	Unit	Item	Unit Price	Total Cost Per Item
0	Intersections	Intersection Maintenance	\$ 8,000.00	\$ -
20000	SF	Asphalt Maintenance	\$ 0.75	\$ 15,000.00
7	Signs	Sign Maintenance (approximately 5/mile)	\$ 96.00	\$ 672.00
1.4	miles	Sweeping	\$ 475.00	\$ 665.00
1.4	miles	Landcaping maintenace	\$ 4,275.00	\$ 5,985.00
1.4	miles	Misc	\$ 1,000.00	\$ 1,400.00
		Annual Maintenance Cost		\$ 23,722.00
		Segment M Total Maintenance Cost (rounded)		\$ 24,000.00



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