FOURTH DISTRICT BIKEWAYS STRATEGY

FEBRUARY 6, 2012

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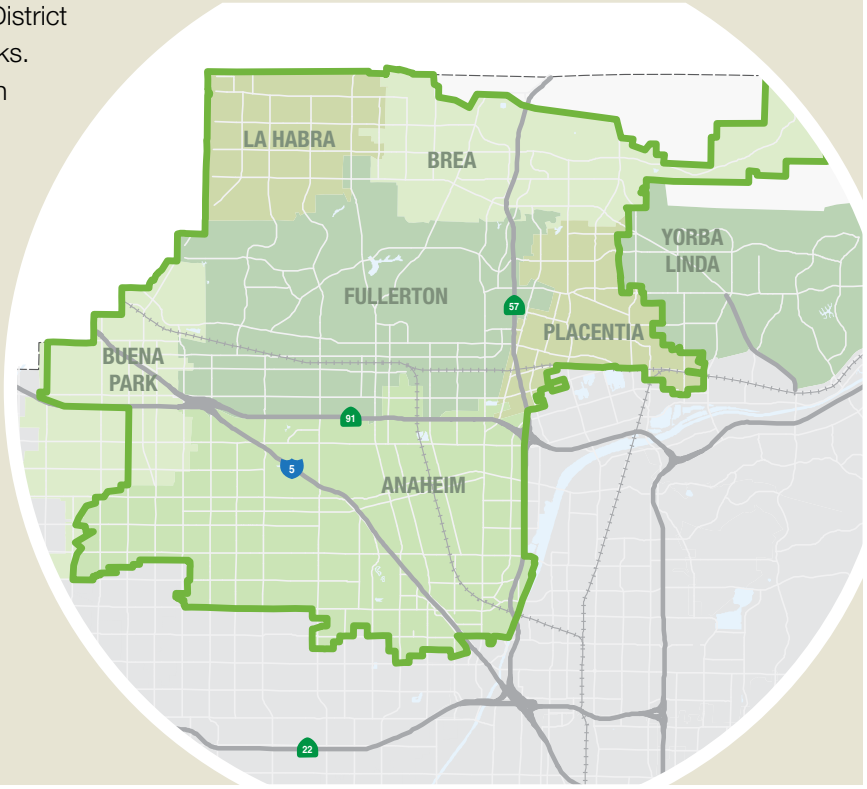
Fourth Supervisorial District Bikeways Strategy

This report summarizes the results of a study effort focused on the identification of potential regional bikeways within the Fourth Supervisorial District in Orange County.

The Fourth District Bikeways Collaborative (Collaborative) effort was facilitated by the Orange County Transportation Authority (OCTA) and completed under the leadership of Orange County Supervisor and OCTA Board Member Shawn Nelson. Many agencies participated in the Collaborative, including the County of Orange, and the cities of Anaheim, Brea, Buena Park, Fullerton, La Habra, Placentia, and Yorba Linda. The effort was focused on the identification and prioritization of regional bikeways that would serve commuter and recreational cyclists throughout the Fourth Supervisorial District.

The objective of this study was to coordinate with cities, stakeholders, and the County of Orange to develop a list of ten regional bikeway corridors to pursue for implementation. Within the ten regional corridors, the Collaborative participants have identified three "focus corridors" that will be prioritized for near-term implementation. The remaining seven corridors are organized into separate tiers for future implementation.

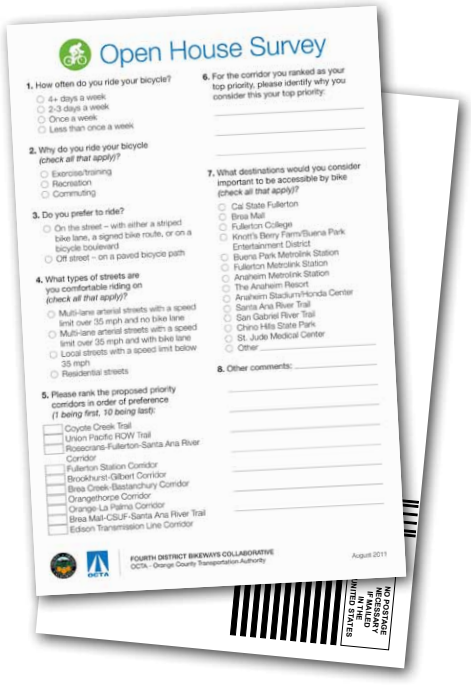
Progress towards implementation of bikeway improvements within the Fourth District is proposed to occur on two tracks. One would be the implementation of "potential near-term" projects that would be relatively easy to construct. The other would involve jointly pursuing grant funding opportunities for the implementation of larger, and potentially more costly, improvements along the three focus corridors. Together, these two efforts are intended to lead to the coordinated implementation of regionally beneficial bikeway projects within the Fourth District.



Facilitation Efforts

Communication between local agencies, bicycle advocates, and the general public was an integral part in developing the bikeways strategy. The primary elements of the Fourth District Bikeways Collaborative included the following:

- **Technical Meetings** – OCTA held three technical meetings with city and county staff to discuss the study process and recommendations. These meetings were supplemented with a series of focus area meetings involving two to three cities each to discuss technical issues and opportunities associated with specific bikeway corridors.
- **Bikeway Summits** – Three Bikeway Summits were conducted during the course of the study effort. These Summits were chaired by Supervisor Nelson, and brought together public agencies and bicycle advocates in an open forum to discuss the study efforts, progress, and recommendations.
- **Stakeholder Roundtable** – The roundtable session was conducted on Wednesday, July 20, 2011 at the Anaheim Sunkist Branch Library. Over 30 people, including members of the public, bicycle advocates, and city and county staff attended to learn about the collaborative process and to discuss key needs and opportunities for bikeway improvements within the Fourth District.
- **Open House** – OCTA conducted an Open House on Saturday, August 27, 2011 in Downtown Fullerton, timed to coincide with the Team Velocity group cycle ride, a regular cycling event that typically involves 100 to 150 participants. This open house was advertised to the cycling group and the general public. Attendees were provided the opportunity to review and comment on the proposed regional bikeway corridors and express support for their preferred corridors.
- **Online Survey** – Following the Open House, an online survey was posted on OCTA's website and made available to the public for three weeks. Between the Open House and the online survey, 108 responses were received.



STAKEHOLDER ROUNDTABLE

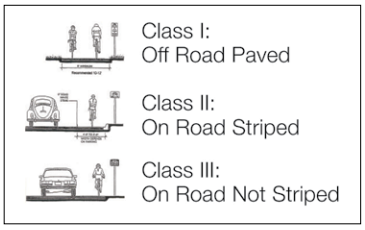
Fourth Supervisorial District Bikeways Collaborative

Regional Bikeway Corridors

The strategy focuses on ten regional bikeway corridors that would help to improve bikeways connectivity in the Fourth Supervisorial District. The Collaborative's process for identifying and defining the regional corridors included the following objectives:

- **Coordinate plans at jurisdictional boundaries** – A key element of regional bikeway planning is ensuring that cyclists can travel between cities conveniently and safely. By bringing several jurisdictions together in this Collaborative process, OCTA was able to facilitate discussions on improving links between jurisdictions, as well as coordinate planning and implementation efforts.
- **Identify existing bikeways and low-hanging fruit** – Related to the coordination of plans across jurisdictional boundaries, identification of "potential near-term" or easy to implement projects was a focus of this effort. These projects are considered to be those that can be implemented quickly with a lower capital investment, closing gaps in the regional bikeway network, and providing a high level of benefit for cyclists.
- **Improve links to existing regional facilities** – Orange County has several excellent existing regional bikeways, highlighted by the Santa Ana River Trail. A key interest expressed by stakeholders, bicycle advocates, and members of the public was to improve connectivity to and between these regional corridors in order to expand cyclist access to and enjoyment of the corridors.
- **Provide access to key destinations** – Having an integrated bikeway network that provides safe and direct access to major activity centers and destinations is important to encourage the use of cycling as an alternative to driving. Focus was placed on identifying and improving links to transit centers, employment centers, and schools (including colleges and universities).
- **Close gaps in the existing bikeway network** – There are several examples of gaps or missing segments along regional bikeway facilities. While some of these gaps are caused by significant safety or construction constraints, others have occurred for reasons that could be relatively easy to overcome (lack of funding, need for increased agency coordination) with a targeted implementation effort. Closing these gaps is an excellent opportunity to increase regional bikeway connectivity through the completion of smaller and potentially less expensive projects.

The ten regional corridors combine existing bikeway facilities with new proposed segments. Many of these corridors build on existing and proposed bikeways identified in the 2009 OCTA Commuter Bikeways Strategic Plan (CBSP). The corridors include the following:



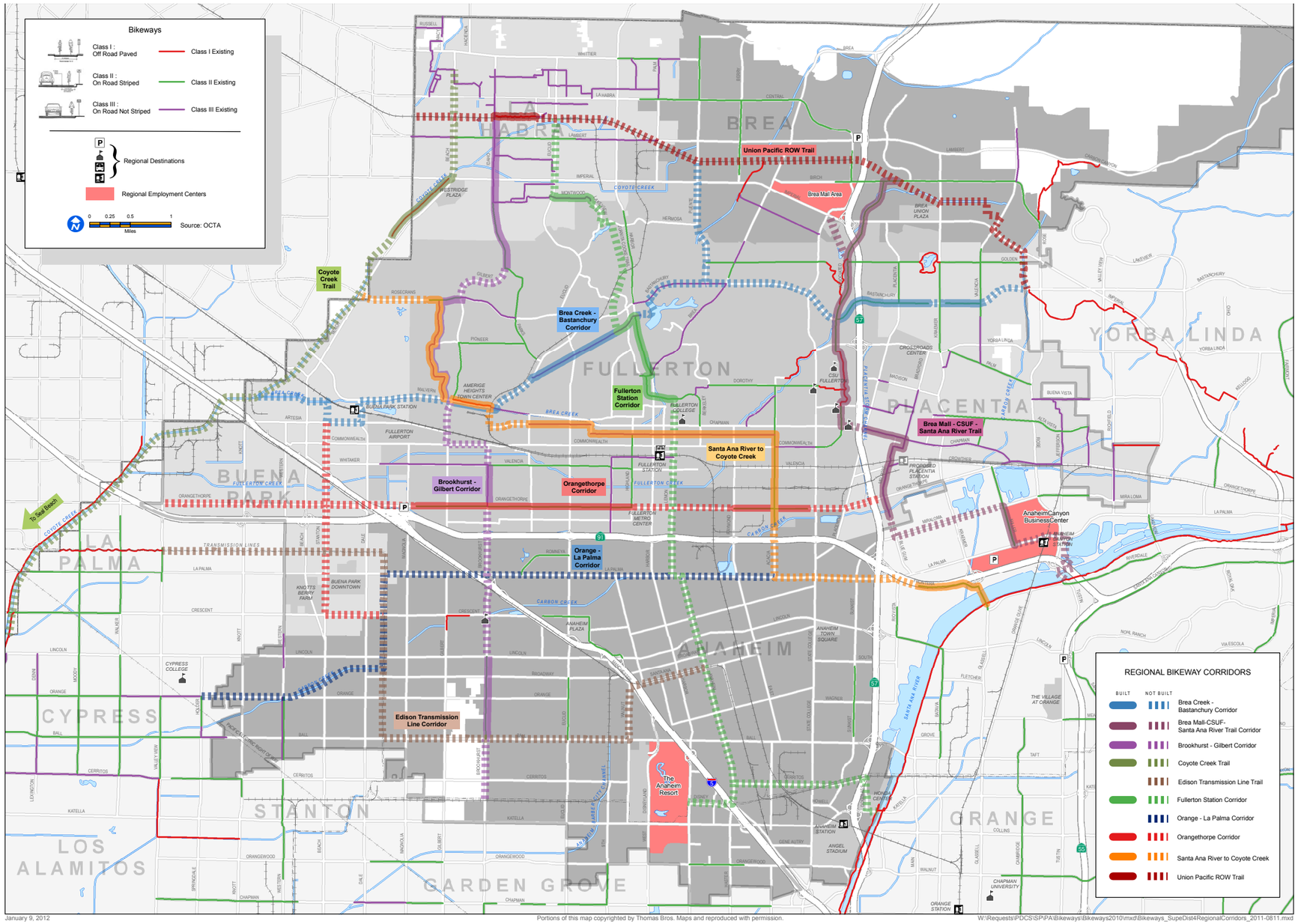
- **Brea Creek - Bastanchury** – This east-west corridor would run along Brea Creek from Coyote Creek to Bastanchury Road, then turn and follow Bastanchury Road through Fullerton and Placentia to Carbon Creek and the Yorba Linda City Limit.
- **Brea Mall - Cal State Fullerton - Santa Ana River** – This north-south corridor would have two northern branches, a western branch that would start at the Brea Mall area and an eastern branch that would connect to the Union Pacific Trail near Birch Street and Associated Road. The corridor would follow Associated Road to Cal State Fullerton, transitioning to an existing Class I bikeway through the campus. A crossing of the State Route 57 freeway would be accomplished via a pedestrian bridge at Madison Avenue or by widening the Chapman Avenue undercrossing. The corridor would then follow surface streets in Placentia and Anaheim to connect to the Anaheim Canyon Metrolink station and the Santa Ana River near Tustin Avenue.
- **Brookhurst - Gilbert** – This north-south corridor would be all Class II on-street bike lanes, following the Brookhurst Street corridor through Anaheim from south of Cerritos Avenue to Fullerton. Within Fullerton

and La Habra, the corridor would follow Gilbert Avenue, Sunny Ridge Drive, and Idaho Street, to a northern terminus at the Union Pacific Right-of-Way corridor.

- **Coyote Creek** – This north-south Class I bikeway corridor would follow the Coyote Creek corridor from its current terminus at Hillsborough Drive south to the southern segment of the existing Coyote Creek bikeway near Valley View Avenue. The corridor is located along the OC-LA county line and traverses between counties.
- **Edison Transmission** – This east-west corridor would follow an existing Southern California Edison transmission line through Buena Park and West Anaheim to Ball Road, using Ball Road, Walnut Street and Santa Ana Street to connect with the Fullerton Station corridor on Anaheim Boulevard.
- **Fullerton Station** – This north-south corridor transitions from on-street to off-street and back to on-street, using Euclid Street, the Juanita Cooke Trail right-of-way, Harbor Boulevard, Lemon Street, Anaheim Boulevard, and Cerritos Avenue to connect La Habra, Fullerton, and Downtown Anaheim to the Platinum Triangle and the Santa Ana River. A connection to The Anaheim Resort area is also provided via Anaheim Boulevard and Disney Way.
- **Orange - La Palma** – This east-west corridor primarily consists of on-street Class II bike lanes along Orange Avenue and La Palma Avenue between Holder Street and Acacia Avenue. There is a short proposed Class I segment along Carbon Creek in West Anaheim.
- **Orangethorpe** – The east-west Orangethorpe corridor would be a Class II on-street bike lane between Valley View in the west and Melrose Street in the east. The corridor includes a spur along Stanton Avenue in Buena Park to connect to the Buena Park Metrolink Station and the Edison Transmission corridor.
- **Santa Ana River to Coyote Creek** – This east-west on-street bikeway would utilize Rosecrans Avenue, Sunny Ridge Drive, Malvern Avenue, Wilshire Avenue, Acacia Street, La Palma Avenue, and Frontera Street to connect Coyote Creek with the Santa Ana River Trail through Buena Park, Fullerton, and Anaheim. A bicycle boulevard is proposed along Wilshire Avenue in Fullerton.
- **Union Pacific Right-of-Way** – This east-west corridor is a proposed Class I off-street bikeway that would extend from the western city limits of La Habra along the Union Pacific right-of-way to the eastern city limits of Brea. The corridor provides connections to a planned Class I bikeway in Whittier on the west and an existing Class I bikeway in Yorba Linda to the east.

The improvements proposed along the ten corridors include implementing new bikeway facilities and upgrading existing facilities to provide enhanced striping, signage, or safety features for cyclists. Class I off-street, paved bikeways are proposed along off-street sections of the corridors (typically along flood control channels, through parks, or within railroad rights-of-way). On-street segments are proposed to include Class II on-street bike lanes where street, bridge, and right-of-way widths permit. In constrained locations, Class III bikeways may be provided. Selected on-street segments along lower traffic volume and lower speed streets (below 35 miles per hour) may also be candidates for bicycle boulevards. The ten regional bikeway corridors are illustrated in Figure E.1.

Figure E.1 – Fourth Supervisorial District Regional Bikeway Corridors



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Proposed Tiers

Each of the ten regional priority bikeway corridors was evaluated using a set of criteria that are consistent with OCTA's 2009 CBSP and the goals of the Fourth District Collaborative. The criteria summarized below are intended to account for a range of opportunities, constraints, and others factors that could influence the implementation of each bikeway corridor, as well as the potential benefit each bikeway corridor would provide for cyclists. The criteria are listed below:

- Bikeway Priority Index Ranking (BPIR)
- Public Support
- Linkages to Existing Bikeways
- Improving Bikeway Connectivity
- Physical Constraints
- Agency Support
- Safety (Bike Collisions)
- Safety (High Traffic Volumes)

Following the completion of the evaluation, the ten regional corridors were organized into four tiers to help guide OCTA, the County, and cities in the pursuit of funding opportunities and the implementation of bikeway improvements. The first tier of projects includes three regional corridors, which have been designated as the "focus corridors" for implementation and inclusion in grant funding applications. The evaluation process determined that these corridors would provide the greatest potential benefit to cyclists in terms of regional connectivity and access to key destinations, while also possessing significant agency support and limited physical or jurisdictional constraints that could hinder implementation. The remaining three tiers of projects include corridors that have constraints that may necessitate additional coordination and time.

Tables E-1, E-2, E-3, and E-4 summarize the evaluation process, the project tiers, and the proposed focus corridors.

Table E-1 - Proposed "Focus Corridors"

TIER 1			
Corridor	**Brea Mall – CSUF – Santa Ana River (Brea, Fullerton, Placentia, Anaheim)**	**Santa Ana River to Coyote Creek (Anaheim, Fullerton, Buena Park)**	**Union Pacific ROW (La Habra, Brea, Yorba Linda)**
Bikeway Priority Index	+3	+2	+3
Public Input	+3	+3	+2
Bikeway Linkages	+3	+2	+3
Ease of Implementation	+3	+3	+1
Physical Constraints	+1	+2	+3
Agency Support	+3	+3	+3
Safety - Collisions	+3	+3	+2
Safety – Traffic Volume	+2	+2	+3
Total	+21	+20	+20
Length (miles)	9.9	11.3	8.8
Estimated Construction Cost (millions)	$3.30 - $4.94	$1.36	$7.17
Key Opportunities	• Connections to Brea Mall, Cal State Fullerton, Anaheim Cyn Metrolink, Santa Ana River • Significant portions of corridor bikeways already in place • Focus on filling in gaps/ branding corridor	• Links Downtown Fullerton, Fullerton College, Santa Ana River, Coyote Creek • Connects to existing Class II bikeway in La Mirada • Opportunity for "First in OC" Bicycle Boulevard on Wilshire Ave	• Connects to Coyote Creek and Class I trail in Yorba Linda • Good east-west route in northern part of Fourth District
Key Constraints	• Need for safe SR-57 crossing – this crossing accounts for significant portion of corridor cost • Need for safe connection to Santa Ana River from La Palma Ave	• Existing bikeway on Acacia to be temporarily removed for State College Grade Separation • Narrow sections on La Palma near SR-57 • Narrow roadway, on-street parking along Malvern Avenue segment	• Union Pacific acceptance of bikeway along active portions of rail right-of-way • Numerous at-grade roadway crossings

Table E-2 - Proposed Tier 2

TIER 2				
Corridor	**Brookhurst – Gilbert (La Habra, Fullerton, Anaheim)**	**Brea Creek – Bastanchury (Buena Park, Fullerton, Brea, Placentia)**	**Coyote Creek (La Habra, Fullerton, La Mirada, Buena Park)**	**Fullerton Station (La Habra, Fullerton, Anaheim)**
Bikeway Priority Index	+2	+1	+1	+3
Public Input	+1	+3	+3	+3
Bikeway Linkages	+3	+3	+2	+3
Ease of Implementation	+3	+2	+2	+1
Physical Constraints	+1	+2	+1	+1
Agency Support	+3	+3	+3	+2
Safety - Collisions	+3	+2	+3	+2
Safety – Traffic Volume	+3	+2	+3	+3
Total	+19	+18	+18	+18
Length (miles)	9.9	12.5	9.6	13.0
Estimated Construction Cost (millions)	$0.83	$2.47	$6.5	$1.73
Key Opportunities	• Significant portions of bikeways along the corridor are already existing	• Connects to Buena Park Metrolink station and St. Jude Hospital • Good east-west route in central portion of Fourth District	• Corridor studied extensively in the past • County of Orange Flood Control open to making service roads available for bikeways • Cities in both counties supportive	• Connects to Downtown Fullerton, Fullerton Metrolink, Downtown Anaheim, Anaheim Resort, Santa Ana River, and Platinum Triangle
Key Constraints	• Need for safe crossing at I-5/ Brookhurst interchange • Roadway narrows at BNSF rail corridor grade separation	• Significant grades in section near State College Boulevard • Narrow roadway, on-street parking along Malvern Avenue segment	• Cities must take on maintenance/ liability responsibility • BNSF rail corridor crossing	• SR-91 crossing on Lemon Street has high traffic volumes • Juanita Cooke Trail segment backs to residential properties, need to maintain existing riding trail

Table E-3 - Proposed Tier 3

TIER 3	
Corridor	Orangethorpe (Buena Park, Anaheim, Placentia)
Bikeway Priority Index	+2
Public Input	+2
Bikeway Linkages	+2
Ease of Implementation	+2
Physical Constraints	+1
Agency Support	+3
Safety - Collisions	+1
Safety – Traffic Volume	+3
Total	+16
Length (miles)	12.0
Estimated Construction Cost (millions)	$0.87
Key Opportunities	• Available roadway width/right-of-way for most of corridor length • Stanton Ave spur provides connection to Buena Park Metrolink and Entertainment District
Key Constraints	• Rail corridor crossing has been a safety concern in the past • Roadway narrows at SR-57 interchange

Table E-4 - Proposed Tier 4

TIER 4		
Corridor	Edison Transmission (Buena Park, Anaheim)	Orange – La Palma (Buena Park, Anaheim)
Bikeway Priority Index	+1	+1
Public Input	+1	+1
Bikeway Linkages	+2	+1
Ease of Implementation	+1	+1
Physical Constraints	+1	+2
Agency Support	+2	+3
Safety - Collisions	+3	+2
Safety – Traffic Volume	+3	+2
Total	+14	+13
Length (miles)	9.6	8.2
Estimated Construction Cost (millions)	$6.19	$2.44
Key Opportunities	• Connection to Anaheim Resort from West County • Connection to existing Class I trail in La Palma and beyond to existing section of Coyote Creek Bikeway	• Connects to existing bikeway in Cypress • Connects to five other Fourth District priority corridors
Key Constraints	• Numerous at-grade roadway crossings • Portions of Edison corridor are leased for other uses, need to gain access or find alternative path • Pavement construction	• Need for safe crossing at I-5 freeway

ACTION PLAN

The Action Plan for the Fourth District Bikeways Collaborative includes two near-term actions for cities and the County, with support from OCTA. These actions include the implementation of "potential near-term" projects and pursuit of funding.

Potential near-term projects are those with low construction costs that can be implemented in relatively short order as funds become available. Each jurisdiction would be responsible for the implementation of their respective projects and strategies for funding these projects. OCTA will assist local jurisdictions in their efforts through such things as letters of support, grant notifications and guidance, and design solutions (discussed in Chapters 4 and 5). Given the lower cost anticipated for implementing these potential near-term projects, this strategy recommends implementation of these improvements on all ten regional corridors in the near-term horizon.

Potential Near-Term

Implement potential near-term projects along all ten corridors, for example:

- Designation of a Class I bikeway using existing trails through Craig Regional Park on the Brea Mall - Cal State Fullerton - Santa Ana River corridor
- Striping a Class II bikeway along Rosecrans Avenue between Gilbert Avenue and the Orange County Line
- Closing the gap on Orangethorpe Avenue between Highland Avenue and Raymond Avenue
- Implementing additional Class II bike lanes on Brookhurst Street as part of future street resurfacing and reconstruction projects
- Designating Puente Street as a Class III bike route or a bicycle boulevard following the completion of the pedestrian bridge currently under construction across Brea Creek
- Converting portions of the existing paved maintenance road along Coyote Creek to a Class I bikeway between Hillsborough Drive and Stage Road

This strategy also recommends that jurisdictions work jointly on the design and construction of larger projects located along the three focus corridors.

Focus Corridors

Participate in follow-up efforts to prepare larger projects along the three focus corridors for construction that may include the following:

- Block-by-block analysis
- Detailed cost estimates
- Conceptual engineering
- Recommendations for further environmental studies
- Segments and phasing

Following funding and completion of these corridors, cities, the County, and OCTA will continue to work together to implement projects along the seven additional corridors that are classified in the three remaining tiers.

1. INTRODUCTION

This document summarizes the recommendations and action plan for the implementation of regional bikeways within the Fourth Supervisorial District in North Orange County. These recommendations are the result of a collaborative effort conducted over a nine month period, including local agencies within Orange County's Fourth District, regional agencies, and stakeholders. This effort was focused on identifying candidate regional bikeways that could best serve commuter and recreational cyclists throughout the Fourth District, and developing an action plan for the implementation of bikeway improvements. The objective of this strategy is to coordinate planning and funding efforts between the agencies to focus on the implementation of regionally beneficial bikeways.

1.1 Background

The Collaborative effort was facilitated by OCTA and completed under the leadership of Orange County Supervisor and OCTA Board Member Shawn Nelson. The Collaborative builds on previous coordination that has occurred between cities in North Orange County, with a focus on advancing regionally significant bikeways that are consistent within the Regional Priorities identified within the 2009 OCTA Commuter Bikeways Strategic Plan (CBSP) towards implementation. The CBSP is the regional blueprint for bikeways planning in Orange County, identifying existing and proposed bikeways in the county, bikeway amenities, and bikeway safety and education programs.

The objective of this strategy is to coordinate with cities, stakeholders, and the County of Orange to develop ten regional bikeway corridors to pursue for implementation. Within the ten regional corridors, the Collaborative participants have identified three "focus corridors" that will be prioritized for implementation. The remaining seven corridors are organized into separate tiers for future implementation. Descriptions and additional information about the regional corridors and the "focus corridors" are provided later in this report. A detailed discussion of the collaborative process can be found in Appendix A. Furthermore, Appendix B provides an overview of the data analysis.

1.2 Strategy Overview

With the identification of the regional corridors, progress towards implementation of bikeway improvements within the Fourth District is proposed to occur on two tracks. One would be the implementation of "low hanging fruit" projects that would be relatively easy to implement. These projects typically have low construction costs, would not necessitate the acquisition of right-of-way, and/or would require only a Categorical Exemption under the California Environmental Quality Act (CEQA) guidelines. Examples of these potential near-term projects could include restriping a roadway to include Class II on-street bike lanes or signing, striping, and fencing an existing paved flood control maintenance road as a Class I off-street bikeway.

The other track would involve pursuing grant funding opportunities for the implementation of larger, and potentially more costly, improvements along the three corridors identified as the "focus corridors". This effort would involve the designation of lead agencies (typically an individual city) for specific projects located along the focus corridors. This lead agency would be responsible for the preparation and submission of the grant application, with support provided by OCTA, the County of Orange, and other cities in the Fourth District. This support would most likely be provided in the form of a letter of support that would be submitted with the grant application, documenting that multiple cities and public agencies have worked together to prioritize this project and emphasizing the project's importance to regional bikeway connectivity.

1.3 Bikeway Classifications

Throughout this report, reference is made to different classes or categories of bikeways. The California Department of Transportation (Caltrans) defined three bikeway classifications that are commonly found throughout California. These bikeway classifications are illustrated in Figure 1.2 and summarized below:

- Class I – Off-Street Paved Bike Paths: facilities on a separate right-of-way from roadways, and are usually shared by bicyclists and pedestrians. Shared paths should not be used as high-speed bikeways, as the safety of the other non-motorized users must be considered
- Class II – On-Road Striped and Signed Bicycle Lanes: on-street facilities that use painted stripes and stencils to delineate the right of way assigned to bicyclists and motorists, and to provide for more predictable movements by each
- Class III – On-Road Shared-Lane Signed Bicycle Routes: signed on-street facilities that accommodate vehicles and bicycles in the same travel lane. Bicycles are permitted on most roadways; however, for safety purposes, signed bicycle routes are often found on streets with lower speeds and traffic volumes

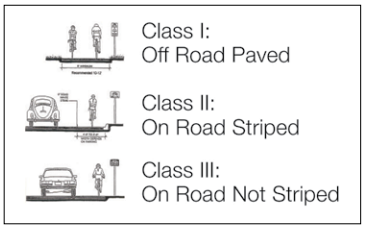


Figure 1.2 – Bikeway Classifications

Source: 2009 OCTA CBSP

2. REGIONAL BIKEWAYS CORRIDORS

An overview of the Fourth District regional bikeway corridors is provided in this section. These corridors provide extensive coverage of the Fourth District. The proposed corridors include key linkages to existing regional bikeway corridors (Santa Ana River, Coyote Creek, etc), as well as to major destinations within the Fourth District.

The ten proposed regional bikeway corridors are the following:

- Brea Mall - Cal State Fullerton - Santa Ana River
- Santa Ana River to Coyote Creek
- Union Pacific ROW
- Brookhurst - Gilbert
- Brea Creek - Bastanchury
- Coyote Creek
- Fullerton Station
- Orangethorpe
- Edison Transmission Line
- Orange - La Palma

2.1 Summary of Evaluation and Ranking

Each of the ten regional priority bikeway corridors identified was evaluated using a set of criteria that are consistent with OCTA's 2009 CBSP and the goals of the Fourth District Collaborative. The criteria summarized below are intended to account for a range of opportunities, constraints, and others factors that could influence the implementation of each bikeway corridor, as well as the potential benefit each bikeway corridor would provide for cyclists. The criteria are listed below:

- Bikeway Priority Index Ranking (BPIR)
- Public Support
- Linkages to Existing Bikeways
- Improving Bikeway Connectivity
- Physical Constraints
- Agency Support
- Safety (Bike Collisions)
- Safety (High Traffic Volumes)

Following the completion of the evaluation, the ten regional corridors were organized into four tiers to help guide OCTA, the County, and cities in the pursuit of funding opportunities and the implementation of bikeway improvements. The first tier of projects includes three regional corridors, which have been designated as the "focus corridors" for implementation and inclusion in grant funding applications. The evaluation process determined that these corridors would provide the greatest potential benefit to cyclists in terms of regional connectivity and access to key destinations, while also possessing significant agency support and limited physical or jurisdictional constraints that could hinder implementation. The remaining three tiers of projects include corridors that have constraints that may necessitate additional coordination and time.

Tables 2-1, 2-2, 2-3, and 2-4 summarize the evaluation process, the project tiers, and the proposed focus corridors.

Table 2-1 - Proposed "Focus Corridors"

TIER 1			
Corridor	**Brea Mall – CSUF – Santa Ana River (Brea, Fullerton, Placentia, Anaheim)**	**Santa Ana River to Coyote Creek (Anaheim, Fullerton, Buena Park)**	**Union Pacific ROW (La Habra, Brea, Yorba Linda)**
Bikeway Priority Index	+3	+2	+3
Public Input	+3	+3	+2
Bikeway Linkages	+3	+2	+3
Ease of Implementation	+3	+3	+1
Physical Constraints	+1	+2	+3
Agency Support	+3	+3	+3
Safety - Collisions	+3	+3	+2
Safety – Traffic Volume	+2	+2	+3
Total	+21	+20	+20
Length (miles)	9.9	11.3	8.8
Estimated Construction Cost (millions)	$3.30 - $4.94	$1.36	$7.17
Key Opportunities	• Connections to Brea Mall, Cal State Fullerton, Anaheim Cyn Metrolink, Santa Ana River • Significant portions of corridor bikeways already in place • Focus on filling in gaps/ branding corridor	• Links Downtown Fullerton, Fullerton College, Santa Ana River, Coyote Creek • Connects to existing Class II bikeway in La Mirada • Opportunity for "First in OC" Bicycle Boulevard on Wilshire Ave	• Connects to Coyote Creek and Class I trail in Yorba Linda • Good east-west route in northern part of Fourth District
Key Constraints	• Need for safe SR-57 crossing – this crossing accounts for significant portion of corridor cost • Need for safe connection to Santa Ana River from La Palma Ave	• Existing bikeway on Acacia to be temporarily removed for State College Grade Separation • Narrow sections on La Palma near SR-57 • Narrow roadway, on-street parking along Malvern Avenue segment	• Union Pacific acceptance of bikeway along active portions of rail right-of-way • Numerous at-grade roadway crossings

Table 2-2 - Proposed Tier 2

TIER 2				
Corridor	Brookhurst – Gilbert (La Habra, Fullerton, Anaheim)	Brea Creek – Bastanchury (Buena Park, Fullerton, Brea, Placentia)	Coyote Creek (La Habra, Fullerton, La Mirada, Buena Park)	Fullerton Station (La Habra, Fullerton, Anaheim)
Bikeway Priority Index	+2	+1	+1	+3
Public Input	+1	+3	+3	+3
Bikeway Linkages	+3	+3	+2	+3
Ease of Implementation	+3	+2	+2	+1
Physical Constraints	+1	+2	+1	+1
Agency Support	+3	+3	+3	+2
Safety - Collisions	+3	+2	+3	+2
Safety – Traffic Volume	+3	+2	+3	+3
Total	+19	+18	+18	+18
Length (miles)	9.9	12.5	9.6	13.0
Estimated Construction Cost (millions)	$0.83	$2.47	$6.5	$1.73
Key Opportunities	• Significant portions of bikeways along the corridor are already existing	• Connects to Buena Park Metrolink station and St Jude Hospital • Good east-west route in central portion of Fourth District	• Corridor studied extensively in the past • County of Orange Flood Control open to making service roads available for bikeways • Cities in both counties supportive	• Connects to Downtown Fullerton, Fullerton Metrolink, Downtown Anaheim, Anaheim Resort, Santa Ana River, and Platinum Triangle
Key Constraints	• Need for safe crossing at I-5/ Brookhurst interchange • Roadway narrows at BNSF rail corridor grade separation	• Significant grades in section near State College Boulevard • Narrow roadway, on-street parking along Malvern Avenue segment	• Cities must take on maintenance/ liability responsibility • BNSF rail corridor crossing	• SR-91 crossing on Lemon Street has high traffic volumes • Juanita Cooke Trail segment backs to residential properties, need to maintain existing riding trail

Table 2-3 - Proposed Tier 3

TIER 3	
Corridor	Orangethorpe (Buena Park, Anaheim, Placentia)
Bikeway Priority Index	+2
Public Input	+2
Bikeway Linkages	+2
Ease of Implementation	+2
Physical Constraints	+1
Agency Support	+3
Safety - Collisions	+1
Safety – Traffic Volume	+3
Total	+16
Length (miles)	12.0
Estimated Construction Cost (millions)	$0.87
Key Opportunities	• Available roadway width/right-of-way for most of corridor length • Stanton Ave spur provides connection to Buena Park Metrolink and Entertainment District
Key Constraints	• Rail corridor crossing has been a safety concern in the past • Roadway narrows at SR-57 interchange

Table 2-4 - Proposed Tier 4

TIER 4		
Corridor	Edison Transmission (Buena Park, Anaheim)	Orange – La Palma (Buena Park, Anaheim)
Bikeway Priority Index	+1	+1
Public Input	+1	+1
Bikeway Linkages	+2	+1
Ease of Implementation	+1	+1
Physical Constraints	+1	+2
Agency Support	+2	+3
Safety - Collisions	+3	+2
Safety – Traffic Volume	+3	+2
Total	+14	+13
Length (miles)	9.6	8.2
Estimated Construction Cost (millions)	$6.19	$2.44
Key Opportunities	• Connection to Anaheim Resort from West County • Connection to existing Class I trail in La Palma and beyond to existing section of Coyote Creek Bikeway	• Connects to existing bikeway in Cypress • Connects to five other Fourth District priority corridors
Key Constraints	• Numerous at-grade roadway crossings • Portions of Edison corridor are leased for other uses, need to gain access or find alternative path • Pavement construction	• Need for safe crossing at I-5 freeway

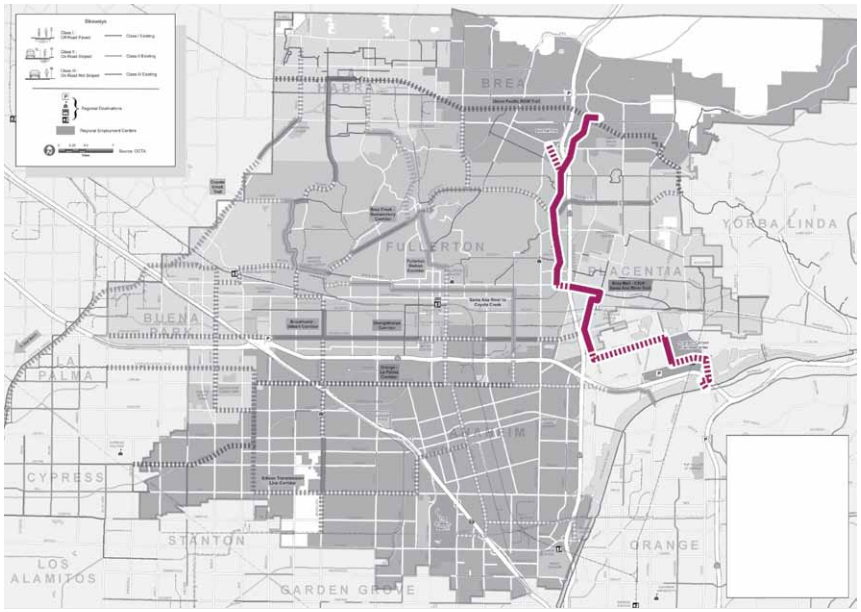
Brea Mall - CSUF - Santa Ana River Trail Corridor

Distance:
9.9 miles

Jurisdictions:
Brea, Fullerton, Placentia, Anaheim

Existing Conditions:
Constructed miles:
Class I - 1.0, Class II - 0.9, Class III - 2.2
Planned miles:
Class I - 1.1, Class II - 3.6, Class III - 1.4

Estimated Cost:
$3.30 - 4.94 million



Overview

The Brea Mall - CSUF - Santa Ana River corridor is a combination of off-street and on-street bikeway segments proposed to link Brea Mall to California State University Fullerton (CSUF) and the Santa Ana River Trail. The corridor runs north and south and feeds into other potential regional corridors, including the Union Pacific ROW corridor and the Santa Ana River to Coyote Creek Corridor. This route takes advantage of existing bicycle infrastructure and also would provide a key crossing of the SR-57 freeway.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 9.9 miles with an estimated construction cost of $3.30 to $4.94 million. The range in cost depends on the option selected for crossing the SR-57 Freeway. About 6.1 miles of bikeways are already in place within this corridor.

Several opportunities exist within this corridor, including providing connections to various key destinations. Significant portions of the corridor are already in place, allowing for funds to go towards filling in gaps and branding the corridor. The major obstacle associated with this corridor is safe crossing over or under SR-57, which accounts for a significant portion of the corridor cost. In addition, safe connection to the Santa Ana River Trail from La Palma Avenue will need to be provided as well.

Major Regional Destinations

In addition to linking Brea Mall, CSUF, and the Santa Ana River Trail, this corridor would also provide connections to the Anaheim Canyon Metrolink Station and the planned Placentia Metrolink Station.

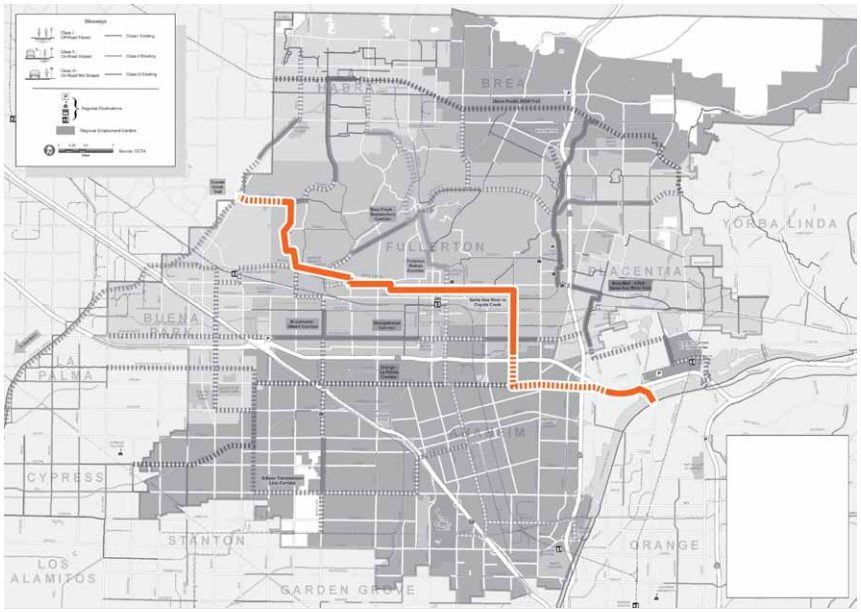
Santa Ana River to Coyote Creek Corridor

Distance:
11.3 miles

Jurisdictions:
Buena Park, Fullerton, Anaheim

Existing Conditions:
Constructed miles:
Class I - 0.6, Class II - 2.2, Class III - 3.2
Planned miles:
Class I - 0.6, Class II - 4.2, Class III - 0.9, Bicycle Blvd. - 1.5

Estimated Cost:
$1.36 million



Overview

This is a primarily east-west route that follows arterial streets from Coyote Creek on the Los Angeles-Orange County border to the Santa Ana River Trail near Kraemer Boulevard. The crossing of the State Route 91 freeway is proposed on Acacia Avenue. La Palma Avenue serves as the crossing location of the State Route 57 freeway.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 11.3 miles with an estimated construction cost of $1.36 million. There are about 5.5 miles of existing bikeways in this corridor. Opportunities within this corridor include links to regional destinations and a connection to existing Class II bike lanes in the City of La Mirada. There is also an opportunity for Orange County's first bicycle boulevard on Wilshire Avenue. Key constraints associated with this corridor include narrow roadways and sections along La Palma Avenue near SR-57 and along Malvern Avenue where there are on-street parking. Furthermore, it is expected that the existing bikeway on Acacia will be temporarily removed in preparation of the State College Grade Separation project. However, bikeway accommodations shall be made upon project completion.

Major Regional Destinations

In addition to linking Coyote Creek and the Santa Ana River Trail, this corridor would also provide connections to the Fullerton College, Downtown Fullerton, and Fullerton Metrolink Station.

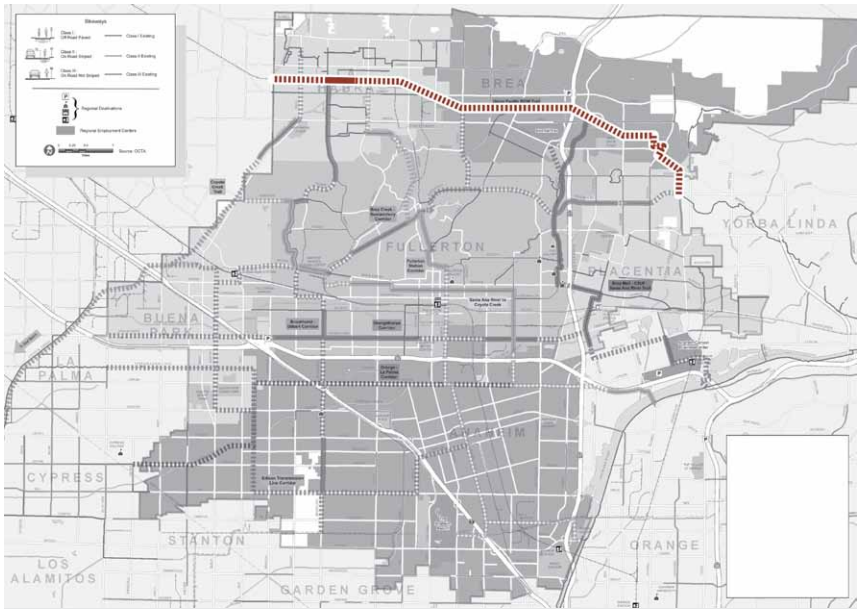
Union Pacific ROW Trail

Distance:
8.8 miles

Jurisdictions:
La Habra, Brea, Yorba Linda, Fullerton, Anaheim

Existing Conditions:
Constructed miles:
Class I - 0.5
Planned miles:
Class I - 8.3

Estimated Cost:
$7.17 million



Overview

The Union Pacific ROW is a proposed east-west corridor that would ultimately feed into other prominent existing and proposed bikeways, including the Coyote Creek Trail and a Class I trail through Yorba Linda. This off-street corridor follows a Union Pacific-owned rail corridor from the west boundary of La Habra east through Brea. Portions of the corridor are located along active railroad right-of-way, primarily in the western portions of the corridor. Most of the eastern sections of the corridor no longer have active rail traffic, and the City of Brea has recently purchased significant segments of this right-of-way.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 8.8 miles of mostly proposed Class I bikeway with an estimated construction cost of $7.17 million. The corridor provides a great opportunity to connect Coyote Creek to a Class I bike trail in Yorba Linda, and provide good east-west connection in the northern part of the Fourth District. The major obstacle associated with this corridor is acceptance of a bikeway along active portions of the Union Pacific right-of-way and the numerous at-grade roadway crossings.

Major Regional Destinations

Major regional destinations along this route include Brea Mall, Downtown Brea, and Downtown La Habra.

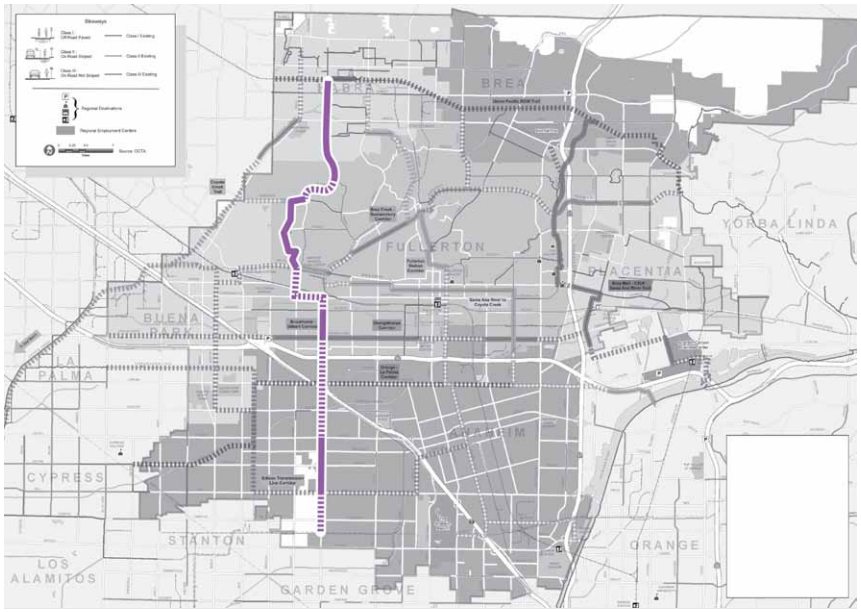
Brookhurst - Gilbert Corridor

Distance:
9.9 miles

Jurisdictions:
La Habra, Fullerton, Anaheim

Existing Conditions:
Constructed miles:
Class II - 1.1
Planned miles:
Class II - 8.8

Estimated Cost:
$0.83 million



Overview

The Brookhurst - Gilbert corridor is a north-south route consisting mostly of proposed Class II on-street bikeways. This proposed corridor would link with many of the other regional corridors. The proposed corridor would build off existing Class II bikeways and create a continuous north - south Class II on-street bikeway link in the west portion of the Fourth District.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 9.9 miles with an estimated construction cost of $0.83 million. About 1.1 miles of this corridor currently exist. Aside from providing good north and south connections within the Fourth District, significant portions of the corridor are already built, allowing for lower implementation costs. While most proposed corridors would require construction of an overcrossing or undercrossing across a freeway, an overcrossing currently exists across SR-91 along Brookhurst Street. Key constraints associated with this corridor include the need for safe crossing at the I-5 Freeway and Brookhurst Street interchange and the limited right-of-way at the BNSF rail corridor grade separation. A portion of Gilbert Street experiences steep grading, and may be a constraint or safety issue for inexperienced cyclists.

Major Regional Destinations

The proposed corridor provides connections to six of the priority corridors and linkages to local schools and parks.

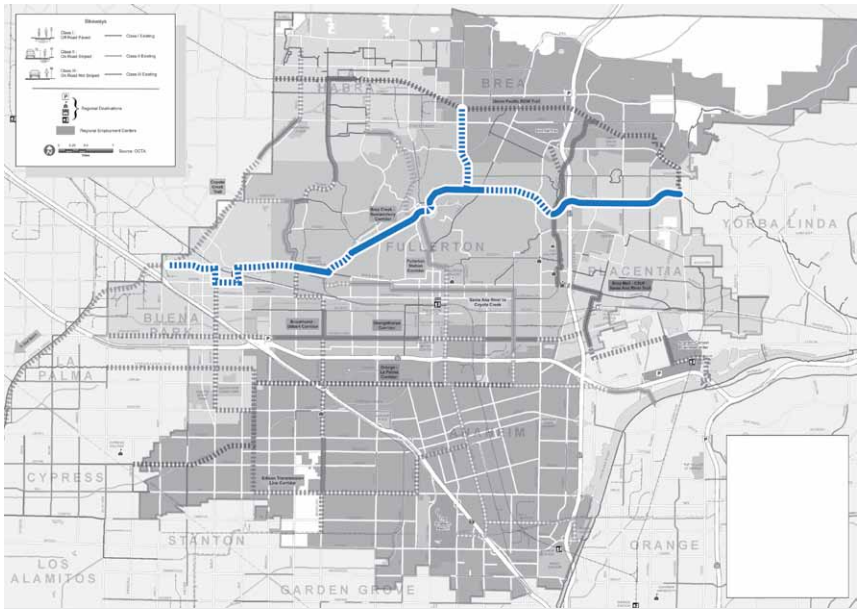
Brea Creek - Bastanchury Corridor

Distance:
12.5 miles

Jurisdictions:
Brea, Buena Park, Fullerton, Placentia, County of Orange

Existing Conditions:
Constructed miles:
Class II - 2.4, Class III - 2.3
Planned miles:
Class I - 5.0, Class II - 2.3, Class III - 0.5

Estimated Cost:
$2.47 million



Overview

The Brea Creek - Bastanchury corridor is a proposed east-west bikeway that would travel through the cities of Brea, Buena Park, Fullerton, and Placentia. The proposed corridor utilizes the Brea Creek flood channel and Bastanchury Road, with a combination of Class I and Class II bikeways. The corridor also includes an important spur along Puente Street in Fullerton and Brea, providing a vital connection to the Union Pacific ROW corridor and Downtown Brea. This proposed corridor would link with six other proposed corridors, including the Coyote Creek corridor, Santa Ana River to Coyote Creek corridor, Orangethorpe corridor, Brookhurst - Gilbert corridor, Fullerton Station corridor, Brea Mall - CSUF - Santa Ana River Trail corridor, and the Union Pacific ROW corridor.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 12.5 miles with an estimated construction cost of $2.47 million. Existing bikeways comprise about 4.7 miles of this corridor. Key opportunities within this corridor include connections to the Buena Park Metrolink station and St. Jude Hospital, as well as providing good east-west route in the central portion of the Fourth District. Major obstacles associated with this corridor include significant grades in the section near State College Boulevard, as well as limited right-of-way along Malvern Avenue due to on-street parking.

Major Regional Destinations

Major regional destinations that would be accessible from this proposed corridor include the Buena Park Metrolink Station, Saint Jude Hospital, and Downtown Brea.

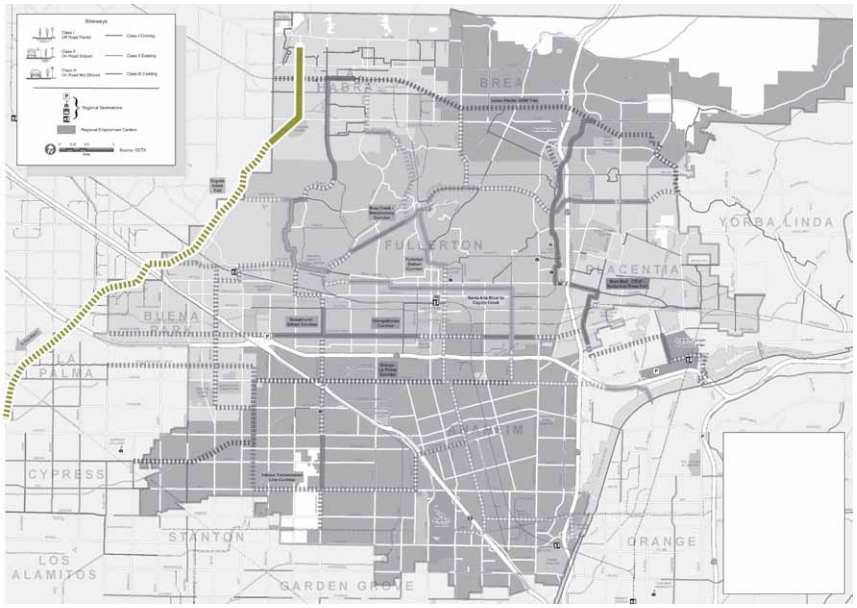
Coyote Creek Trail

Distance:
9.6 miles

Jurisdictions:
La Habra, Buena Park

Existing Conditions:
Constructed miles:
Class I - 0.6,
Planned miles:
Class I - 7.6, Class II - 1.3

Estimated Cost:
$6.5 million



Overview

The Coyote Creek Trail is a proposed north-south corridor that would travel along the Coyote Creek flood control channel between Orange and Los Angeles counties. This trail is an off-street corridor that is proposed to start in La Habra and travel through Buena Park and La Mirada. The trail would feed into other existing regional trails outside of Orange County including the Greenway Trail in Whittier and the San Gabriel River Trail to the southwest. Specific improvements for the trail are provided in the 2007 Coyote Creek Bikeway Master Plan developed by Trails4All, the California Resource Connections, Inc., the Los Angeles County Bicycle Coalition, the National Park Service, Rivers, Trails & Conservation Assistance Program, the Rails-to-Trails Conservancy, and the Lower Los Angeles and San Gabriel Rivers and Mountains Conservancy.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 9.6 miles with an estimated construction cost of $6.5 million. A short - less than one mile - segment of this corridor currently exists in La Habra and La Mirada. Several key opportunities exist within this corridor. The corridor has been studied extensively in the past, and cities in both counties are supportive of implementing a bikeway. In addition, the County of Orange Flood Control Department is open to making service roads available for bikeways. Major obstacles associated with this corridor include BNSF rail corridor crossings and the need for cities to take on maintenance and liability responsibilities.

Major Regional Destinations

Major regional destinations would include connections to the Buena Park Metrolink station via the Brea Creek Channel and the beach.

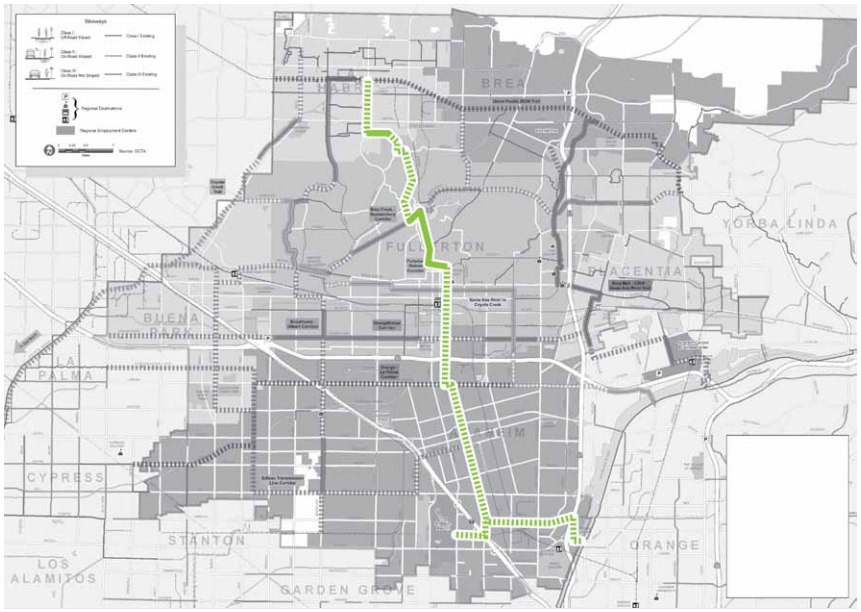
Fullerton Station Corridor

Distance:
13 miles

Jurisdictions:
La Habra, Fullerton, Anaheim

Existing Conditions:
Constructed miles:
Class II - 1.4, Class III - 1.8
Planned miles:
Class I - 1.5, Class II - 5.6, Class III - 2.7

Estimated Cost:
$1.73 million



Overview

The Fullerton Station corridor is a combination of off-street and on-street bikeway segments proposed to link La Habra to Downtown Fullerton and the Santa Ana River Trail. The corridor runs north-south and feeds into other potential regional corridors, including the Union Pacific ROW, the Brea Creek - Bastanchury corridor, Santa Ana River to Coyote Creek corridor, Orangethorpe corridor, Orange - La Palma corridor, and the Edison Transmission Line corridor.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 13 miles with an estimated construction cost of $1.73 million. Existing bikeways are in place for about 3.2 miles of this corridor. The key opportunity associated with this corridor is the connection to the various major destinations. However, there are several constraints with the implementation of this corridor, including high traffic volumes along Lemon Street over the SR-91 crossing and the need to maintain the existing riding trail on segments of Juanita Cooke Trail. An alternative route in place of the Juanita Cooke Trail segment includes utilizing existing bicycle facilities on Harbor Boulevard and the Union Pacific rail right-of-way.

Major Regional Destinations

In addition to Fullerton College and the Fullerton Transportation Center, this corridor also provides connections to the Anaheim Resort, the Platinum Triangle, and the Santa Ana River Trail.

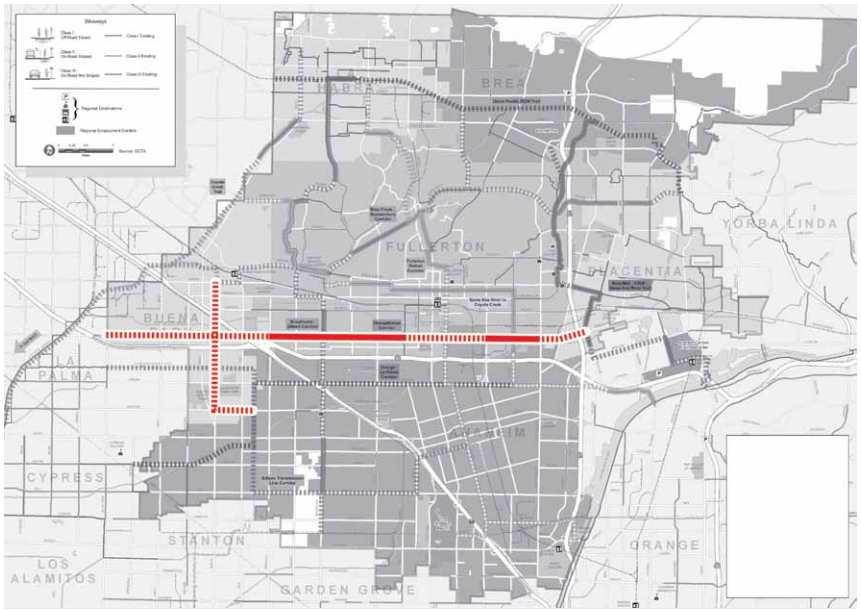
Orangethorpe Corridor

Distance:
12 miles

Jurisdictions:
Buena Park, Fullerton, and Anaheim

Existing Conditions:
Constructed miles:
Class II - 2.2
Planned miles:
Class II - 9.8

Estimated Cost:
$0.87 million



Overview

The proposed Orangethorpe Corridor would travel east and west along Orangethorpe Avenue, parallel to the SR-91 Freeway and through the cities of Buena Park, Fullerton, and Anaheim. This proposed Class II on-street striped bikeway would follow Orangethorpe Avenue from the western boundary of Buena Park to Placentia. A spur along Stanton Avenue in Buena Park between Artesia Boulevard and Crescent Street is also proposed.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 12 miles with an estimated construction cost of $0.87 million. There is about 2.2 miles of existing Class II bikeway in the corridor. Most of the corridor provides available roadway width and right-of-way to implement Class II bike lanes, allowing for ease of implementation. However, the roadway narrows at several intersections and the SR-57 freeway interchange and along Stanton Avenue, which can be a safety concern. Another key obstacle is the rail corridor crossing, which has been identified as a safety issue in the past.

Major Regional Destinations

Major regional destinations include the Buena Park Metrolink Station, Buena Park's Entertainment Corridor, Knott's Berry Farm, the Fullerton Transportation Center, and Fullerton park-and-ride lot.

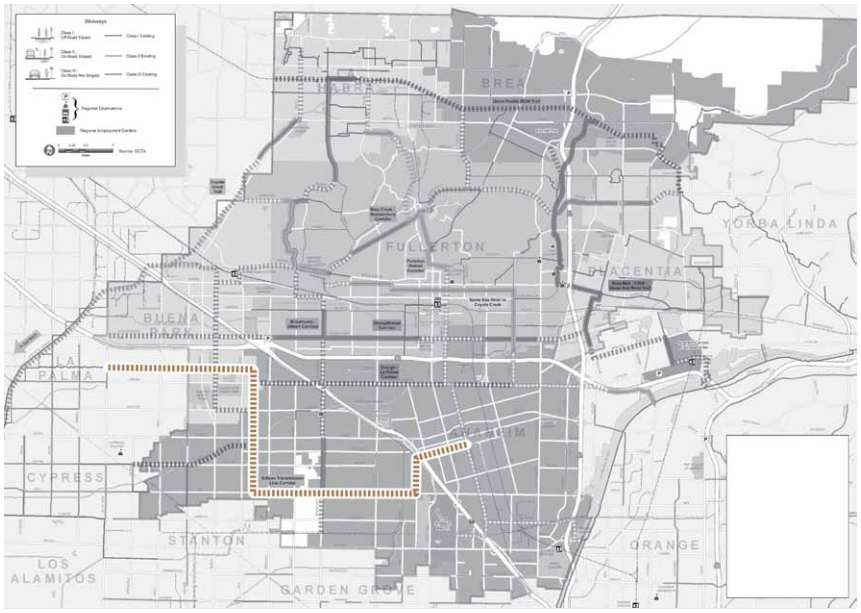
Edison Transmission Corridor

Distance:
9.6 miles

Jurisdictions:
Buena Park and Anaheim

Existing Conditions:
Constructed miles:
None
Planned miles:
Class I - 5.0, Class II - 4.6

Estimated Cost:
$6.19 million



Overview

This is an east-west off-street bikeway that would utilize an existing Southern California Edison transmission corridor between Buena Park and Anaheim. On-street segments are also proposed along Ball Road, Walnut Street, and Santa Ana Avenue.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 9.6 miles of proposed bikeways, with an estimated construction cost of $6.19 million. Key opportunities associated with this corridor include connections to the Anaheim Resort from West County, and connections to existing Class I trail in La Palma and beyond to an existing section of Coyote Creek Bikeway. The major constraints associated with this corridor include the numerous at-grade roadway crossings and gaining access to leased portions, or finding an alternative path within the corridor.

Major Regional Destinations

Key connections along this corridor include the Buena Park Entertainment District and the Anaheim Resort.

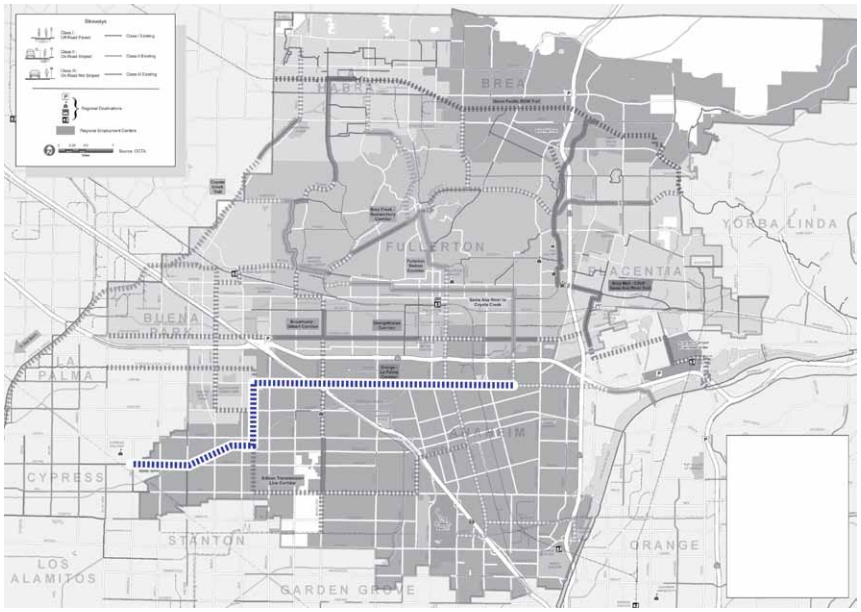
Orange - La Palma Corridor

Distance:
8.2 miles

Jurisdictions:
Anaheim

Existing Conditions:
Constructed miles:
None
Planned miles:
Class I - 2.4. Class II - 5.9

Estimated Cost:
$2.44 million



Overview

The Orange - La Palma corridor is a proposed east-west corridor that would travel through the City of Anaheim and link with the Edison Transmission Line corridor, Orangethorpe corridor, Brookhurst - Gilbert corridor, Fullerton Station corridor, and the Santa Ana River to Coyote Creek corridor. This proposed corridor would consist of mostly Class II on-street bikeways along Orange Avenue and La Palma Avenue.

Opportunities, Constraints, and Estimated Costs

The corridor spans a total of 8.2 miles of proposed bikeways, with an estimated construction cost of $2.44 million. Key opportunities associated with this corridor include connections to existing bikeways in Cypress and connections to five other Fourth District priority corridors. The major obstacles associated with this corridor include limited right-of-way along La Palma Avenue between Harbor Boulevard and East Street and along Carbon Creek. A potential alternative to the right-of-way constraint is Magnolia Avenue between Orange Avenue and La Palma Avenue. Safe crossing at the I-5 freeway is also a constraint, and would require approval from Caltrans for non-standard lane widths.

Major Regional Destinations

This corridor would provide an excellent link to schools, shopping, and residential areas in West Anaheim.

3. ACTION PLAN

The Action Plan for the Fourth District Bikeways Collaborative includes two near-term actions for cities and the County, with support from OCTA. These actions include the implementation of "potential near-term" projects and pursuit of funding.

Potential near-term projects are those with low construction costs that can be implemented in relatively short order as funds become available. Each jurisdiction would be responsible for the implementation of their respective projects and strategies for funding these projects. OCTA will assist local jurisdictions in their efforts through such things as letters of support, grant notifications and guidance, and design solutions (discussed in Chapters 4 and 5). Given the lower cost anticipated for implementing these potential near-term projects, this strategy recommends implementation of these improvements on all ten regional corridors in the near-term horizon.

Potential Near-Term

Implement potential near-term projects along all ten corridors, for example:

- Designation of a Class I bikeway using existing trails through Craig Regional Park on the Brea Mall - Cal State Fullerton - Santa Ana River corridor
- Striping a Class II bikeway along Rosecrans Avenue between Gilbert Avenue and the Orange County Line
- Closing the gap on Orangethorpe Avenue between Highland Avenue and Raymond Avenue
- Implementing additional Class II bike lanes on Brookhurst Street as part of future street resurfacing and reconstruction projects
- Designating Puente Street as a Class III bike route or a bicycle boulevard following the completion of the pedestrian bridge currently under construction across Brea Creek
- Converting portions of the existing paved maintenance road along Coyote Creek to a Class I bikeway between Hillsborough Drive and Stage Road

This strategy also recommends that jurisdictions work jointly on the design and construction of larger projects located along the three focus corridors.

Focus Corridors

Participate in follow-up efforts to prepare larger projects along the three focus corridors for construction that may include the following:

- Block-by-block analysis
- Detailed cost estimates
- Conceptual engineering
- Recommendations for further environmental studies
- Segments and phasing

Following funding and completion of these corridors, cities, the County, and OCTA will continue to work together to implement projects along the seven additional corridors that are classified in the three remaining tiers.

3.1 Potential Near-Term Projects

Each of the ten regional bikeway corridors has been reviewed to identify "potential near-term" projects. As discussed earlier in this report, these projects are defined as those which would require minimum capital investment, little or no right-of-way acquisition, and minimal environmental review. Types of projects that would fall into this category include restriping a street to implement a Class II bikeway, signing a street to designate it as a Class III bikeway, or signing and striping an existing paved off-street path or maintenance road of sufficient width to serve as a Class I off-street bikeway.

Proposed new or upgraded bikeways along each of the ten regional corridors have been reviewed at a conceptual level to determine the potential amount of construction required and the amount of complexity that exists to implement a new bikeway. Figure 3.1 illustrates the results of this effort, highlighting segments of potential near-term projects along the proposed regional corridors. Table 3-1 provides a summary of these segments, along with estimated costs.

- **Brea Creek - Bastanchury:** The portions of this corridor along Brea Creek could use an existing paved maintenance road with minimal improvements. Street crossings would be made at grade at existing signalized intersections located near the channel. Sections of Bastanchury Road identified as easy to implement have sufficient existing right-of-way and/or the adjacent off-street trail already exists.
- **Brea Mall - CSUF - Santa Ana River:** The portion of this corridor along Mira Loma Avenue in Anaheim can be implemented relatively easily, as the existing street section between the curbs is wide enough to accommodate striped bike lanes.
- **Brookhurst - Gilbert:** Several sections of Brookhurst Street in Anaheim have sufficient curb-to-curb width to accommodate striped bike lanes.
- **Coyote Creek:** The proposed sections of the Coyote Creek Trail north of Stage Road in Buena Park could be implemented with minimal investment, using an existing pave maintenance road located along the channel. The crossing of Rosecrans Avenue could occur at-grade using the existing traffic signal at Beach Boulevard.
- **Edison Transmission Line:** On-street portions along Ball Road, Walnut Street, and Santa Ana Avenue would require restriping.
- **Fullerton Station:** Proposed sections of this corridor along Euclid Street, Anaheim Boulevard, Disney Way, and Cerritos Avenue could be implemented with restriping.
- **Orange - La Palma:** A significant portion of the proposed Class II bikeway along La Palma Avenue can be implemented by restriping the existing roadway. There are some narrow sections of the roadway between Brookhurst Street and Euclid Street; Harbor Boulevard and Acacia Street; and State College Boulevard and SR-57, which will require widening.
- **Orangethorpe:** The proposed sections of this corridor in Buena Park and Anaheim have sufficient curb-to-curb width to accommodate a striped bike lane. The segment near the State Route 57 interchange is not as wide, making implementation of a striped bike lane more difficult. The segment over the I-5 bridge is also very narrow and will need to be widened.
- **Santa Ana River to Coyote Creek:** The proposed on-street bikeway along Rosecrans Avenue could be implemented with restriping. The proposed Wilshire Avenue bicycle boulevard could also be accommodated with minimal signing and striping improvements. A traffic signal at Raymond Avenue and Wilshire Avenue would be required.
- **Union Pacific ROW:** This corridor contains a few segments east of Kraemer identified as easy to implement. However, the rest of the corridor will require new paved off-street trails.

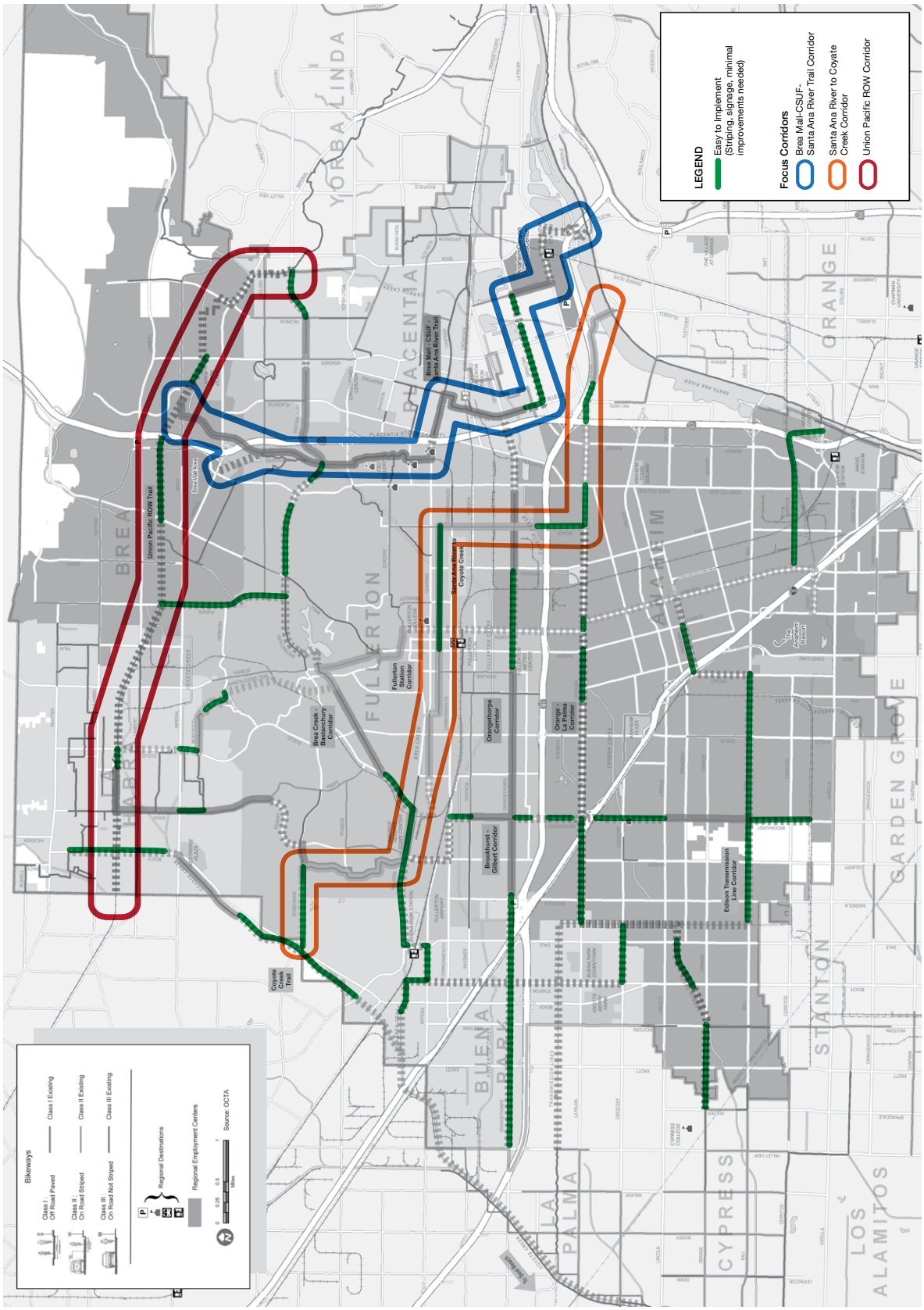


Figure 3.1 – Potential Near-Term Projects

Table 3-1 - Summary of Potential Near-Term Projects

Tier	Corridor	Location	Owner/Operator	Proposed Improvement	Length (feet)	Bike Lane Total	Bike Path/ Boulevard Total	TOTAL COST
1.	SA River to Coyote Creek	Rosecrans Ave. (Gilbert Ave to Orange County border)	City of Fullerton	Class II (on-street, striping)	5,970	$61,256		$61,256
		Malvern Ave. (Gilbert Ave to Bastanchury Rd.)	City of Fullerton	Class II (on-street, striping)	6,459	$66,931		$66,931
		Acacia Ave. (SR-91 to La Palma)	City of Anaheim	Class II (on-street, striping)	2,432	$29,003		$29,003
		Wilshire Ave. (Harbor Blvd. and Acacia Ave)	City of Fullerton	Bicycle Blvd.	6,646		$98,993	$98,993
		La Palma Ave. (Acacia Ave. and State College Blvd.)	City of Anaheim	Class II (on-street, striping)	2,591	$281,250		$28,250
		La Palma Ave. (SR-57 and Frontera St.)	City of Anaheim	Class II (on-street, striping)	428	$5,840		$5,840
	Union Pacific ROW	Kraemer to Loftus Channel	City of Brea	Class I (off-street, paving)			TBD	
		Brea Blvd. to State College Blvd.	City of Brea	Class I (off-street, paving)			TBD	
2.	Brookhurst-Gilbert	Idaho St. (Imperial Blvd. and Montwood Sandalwood Ave)	City of La Habra	Class II (on-street, striping)	1,540	$18,520		$18,520
		Brookhurst Ave (Commonwealth Ave and Valencia Dr.)	City of Fullerton	Class II (on-street, striping)	1,286	$14,421		$14,421
		Brookhurst Ave (Orangethorpe Ave and SR-91)	City of Fullerton	Class II (on-street, striping)	1,934	$21,682		$21,682
		Brookhurst Ave (SR-91 and Lincoln Ave) *except the I-5 crossing	City of Anaheim	Class II (on-street, striping)	7,786	$83,323		$83,323
	Brea Creek-Bastanchury	Brea Creek (Beach Blvd. and Stanton Ave)	County of Orange/ City of Buena Park	Class I (off-street, paving)	1,298		$173,890	$173,890
		Artesia Blvd. (Stanton Ave and Dale St.)	City of Buena Park	Class II (on-street, striping)	2,234	$26,241		$26,241
		Brea Creek (Dale St. and Bastanchury Rd.)	County of Orange/ City of Fullerton	Class I (off-street, paving)	6,459		$667,114	$667,114
		Bastanchury Rd. (Brea Creek and Valencia Mesa Dr.)	City of Fullerton	Class II (on-street, striping)	3,216	$36,060		$36,060
		Puente St. (Bastanchury Rd. to UP ROW)	City of Fullerton/City of Brea	Bicycle Blvd.	8,058		$82,316	$82,316
		Bastanchury Rd. (Brea Blvd. and west of State College Blvd.)	City of Fullerton	Class I (off-street, paving)	5,379		$587,092	$587,092
		Bastanchury Rd. (east of State College and Associated Rd.)	City of Fullerton	Class II (on-street, striping)	2,557	$30,254		$30,254
		Bastanchury Rd. (Valencia Ave and Rose Dr.)	City of Placentia	Class II (on-street, striping)	4,241	$49,427		$49,427
	Coyote Creek	Coyote Creek (Hillsborough Dr. and Stage Rd.)	LA Flood Control District/ County of Orange	Class I (off-street, paving)	11,755		$1,222,970	$1,222,970
	Fullerton Station	Euclid St. (Imperial and Montwood Ave)	City of La Habra	Class II (on-street, striping)	1,144	$14,560		$14,560
		Lakeview Dr. (Montwood Ave and Hermosa Dr.)	City of Fullerton	Class II (on-street, striping)	4,424	$50,481		$50,481
		Hermosa Dr. (Montwood Ave and Juanita Cook Greenbelt Trail)	City of Fullerton	Class II (on-street, striping)	795	$9,509		$9,509
		Cerritos Ave (Anaheim Blvd. and Douglas Rd.)	City of Anaheim	Class II (on-street, striping)	8,647	$89,593		$89,593
		Douglass Rd. (Cerritos Ave. and Katella Ave.)	City of Anaheim	Class II (on-street, striping)	2,216	$47,440		$47,440
3.	Orangethorpe	Orangethorpe Ave (Highland Ave. and Raymond Ave)	City of Anaheim	Class III (on-street, signage)	3,953	$41,087		$41,087
		Orangethorpe Ave (Valley View St. and Magnolia Ave)	City of Buena Park/ City of Fullerton	Class II (on-street, striping)	2,595	$27,509		$27,509
4.	Edison Transmission	Ball Rd. (Edison Transmission Corridor and Walnut St.)	City of Anaheim	Class II (on-street, striping)	15,937	$176,533		$176,533
	Orange-La Palma	Orange Ave (Holder St. and Western Ave)	City of Anaheim	Class II (on-street, striping)	5,293	$56,053		$56,053
		Carbon Creek (Beach Blvd. and Edison Transmission Corridor)	County of Orange/ City of Anaheim	Class I (off-street, paving)	4,013		$515,441	$515,441
		La Palma Ave (Edison Transmission corridor and Brookhurst St.)	City of Anaheim	Class II (on-street, striping)	6,592	$69,040		$69,040
		La Palma Ave (State College and Acacia Ave)	City of Anaheim	Class II (on-street, striping)	2,588	$28,220		$28,220
		La Palma Ave. (West St. and Harbor Blvd.)	City of Anaheim	Class II (on-street, striping)	2,537	$28,490		$28,490
		La Palma Ave. (Anaheim Blvd.)	City of Anaheim	Class II (on-street, striping)	2,418	$28,080		$28,080

3.2 Next Steps

The Fourth District Bikeways Collaborative will continue to be an active group, meeting regularly to discuss progress and coordination on the implementation of the Focus Corridors. Once sufficient progress and funding are achieved for these corridors, the Collaborative will work together to advance the remaining seven corridors towards implementation, in a fashion similar to that followed for the Focus Corridors.

Supervisor Shawn Nelson will continue to lead the Collaborative, involving the Fourth District cities, the County, and OCTA in the process. OCTA is exploring the potential for replicating the Fourth District Bikeways Collaborative in other Supervisorial Districts in Orange County to encourage near-term implementation of bikeways and to promote coordination between cities and the County on bikeways planning and construction.

The key near-term responsibilities of the Collaborative include the following:

- **Identify Funding Opportunities** – There are a variety of grant funding opportunities for bikeway improvements. Section 5 of this report outlines local, State, and Federal grant funding opportunities for the planning, design, and construction of bikeway projects. A near-term objective of the Collaborative will be to identify upcoming funding opportunities and match specific projects, planning efforts, or design efforts that would be eligible under these funding programs.
- **Identify Lead Agencies** – Once the Collaborative identifies grant funding opportunities and potential projects that would be eligible for available and upcoming grants, lead agencies for preparing and submitting the grant applications would be identified. In most cases, this will be a single agency and the city where the proposed project is located. There may be cases where more than one city or a city and the County may jointly apply when an individual project crosses jurisdictional lines.
- **Provide Support** – In support of the grant funding applications, cities in the Collaborative that are not identified as the lead agency for a specific project will be requested to provide letters or resolutions of support that can be included in the grant applications. Examples of resolutions and letters of support are provided in Appendix E.

4. TOOLBOX STRATEGIES

The following sections cover physical design guidelines applicable to all bikeway facility types. References for this information include the Caltrans Highway Design Manual and the Manual of Uniform Traffic Control Devices (MUTCD).

4.1 Class I Multi-Use Path Guidelines

Class I facilities are generally paved multi-use paths, separated from motor vehicle traffic. Recommended Class I paths are intended to provide commuting and recreational routes unimpeded by motor vehicle traffic. Most cyclists will find bicycle paths inviting routes to ride, especially if travel efficiency is secondary to enjoyment of cycling. Since these paths can augment the existing roadway system, they can extend circulation options for cyclists, making trips feasible which would not otherwise be possible if the cyclists had to depend exclusively on roadways.

In general, Class I facilities should not be placed immediately adjacent to roadways. Where such conditions exist, Class I facilities should be offset from the street as much as possible and separated from it by a physical barrier. These measures are intended to promote safety for both the cyclists and the motorists by preventing unintended movement between the street and the Class I facility. (See Section 1003.1 (5) of the Caltrans Highway Design Manual.)

4.1.1 Common Issues

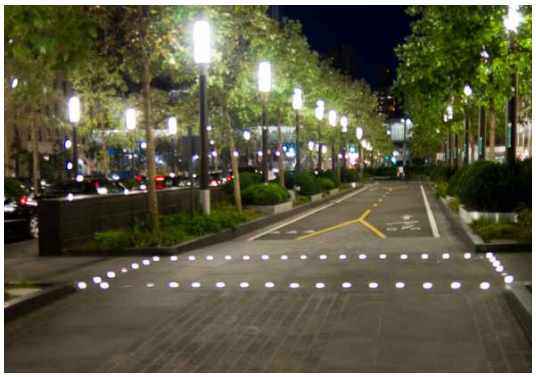
A Class I bicycle facility is located within its own separate right-of-way, with no motor vehicle traffic permitted. However, Class I facilities are typically shared with other users, such as pedestrians or equestrians. The common issues associated with the design of Class I facilities include:

- **At Grade Crossings** – While Class I facilities are located on exclusive right-of-way, most must deal with at-grade crossings at roadways or railways. At-grade crossings present several challenges, including safety issues and conflicts with automobile traffic operations. Most bicycle related collisions occur at at-grade crossings.
- **Shared Use Issues** – Class I facilities are generally regarded as multi-use and not for the exclusive use of cyclists, which can create conflicts between different types of users. These conflicts can include speed differentials. Conflicts between different user types are especially likely to occurs on regionally significant recreational trails that attract a broad diversity of users.
- **Compatibility of Multiple Use Paths** – Joint use paths by cyclists can pose problems due to the ease of which horses can be startled. Also, the requirements of a Class I bikeway facility include a solid surface, which is not desirable for horses.
- **Safety** – Safety issues have come up within some communities regarding Class I bicycle facilities. Class I bicycle facilities are typically separated and closed off from public areas, resulting in the misconception of increased crime or unsafe environment.
- **Roadside obstacles** – Roadside obstacles are a common issue and may include sign posts, light standards, utility poles, and other similar appurtenances that impede travel.

4.1.2 Opportunities and Potential Treatments

At-Grade Crossings

Several design options exist for making at-grade crossings safer. The main objective is clear signage to minimize confusion between conflicting modes of travel. Crosswalks should be implemented at all at-grade crossings to clearly show that cyclists or other users may be crossing. Pedestrian flashers are also helpful, especially at night to notify motorists of the crosswalk. If funding is available, the installation of a signalized crossing is most ideal. These guidelines should be applied to all at-grade crossings on proposed Class I bikeways in the Fourth District with major at-grade crossings, including Union Pacific ROW and Coyote Creek.



Example of in-pavement flashing crosswalks Photo Credit: bicyclinginfo.org

Shared Use Issues of Class I Facilities

In general, paths that are expected to receive heavy use should be a minimum of 14 feet wide, paths expected to experience moderate use should be at least 12 feet wide and low volume paths can be 10 feet wide. Caltrans Class I requirements call for eight feet as the minimum width with two foot clear areas on each side. Methods used to reduce trail conflicts have included providing separate facilities for different groups, prohibiting certain user types, restricting certain uses to specific hours, widening existing facilities or marking lanes to regulate traffic flow. Examples of all of these types of actions occur along southern California's coastal trails where conflicts between different user types can be especially severe during peak periods. Where right-of-way is available, potential corridors include Coyote Creek and Union Pacific Right-of-Way.

Example of a Shared Use Bike-Path (Long Beach, CA) Photo Credit: Joe Punsalan

Compatibility of Multiple Use of Paths

Where either equestrian or cycling activity is expected to be high, separate trails are recommended. On facilities where Class I designation is not needed and the facility will be unpaved, mountain bikes and horses can share the trail if adequate passing width is provided, the expected volume of traffic by both groups is low and available sight distances allow equestrians and cyclists to see and anticipate each other. Education of all path users in "trail etiquette" has also proven to be successful on shared paths. May be potentially applicable to Juanita Cook Trail and the Brea - CSUF - SART trail segment near Tustin Avenue, but prior to implementation, studies should be conducted to determine types of users and whether multiple paths are needed.

Class 1 Bike Path and adjacent horse trail on SR-56 Bike Path. (San Diego, CA) Photo credit: Joe Punsalan

Safety

A study was conducted to examine impacts of Class I bike trails to neighborhoods in relation to safety and crime (*Project Report for Property Value/Desirability Effects of Bike Paths Adjacent to Residential Areas – Delaware Center for Transportation and State of Delaware Department of Transportation, 2006)*. The study looked at bike trails in 12 different communities in North America. The results of the study show that crime on trails is minimal and must be considered in perspective with risks associated with other activities. The way to minimize crime on trails is to ensure that users exercise proper safety precautions, keep the trail well maintained, and boost trail use. The amount of crime present in and around recreational facilities is often correlated with the amount of crime in the neighboring area, and not a result of the bike trail.

Roadside Obstacles

Roadside obstacles should be set back with at least a two foot minimum "shy distance" from the curb or pavement edge with exceptions for guard rail placement in certain instances. A three foot minimum is recommended. Additional separation distance to lateral obstructions is desirable. Where there is currently insufficient width of paved surface to accommodate bicycle traffic, any placement of equipment should be set back far enough to allow room for future projects (widening, resurfacing) to bring the pavement width into conformance with these guidelines. Vertical clearance to obstructions should be a minimum of eight feet. Where practical, a vertical clearance of ten feet is desirable (See Section 1003.1 of the Caltrans Highway Design Manual.)

Figure 9B-1 of the CA MUTCD for Sign Placement on Shared-Use Paths

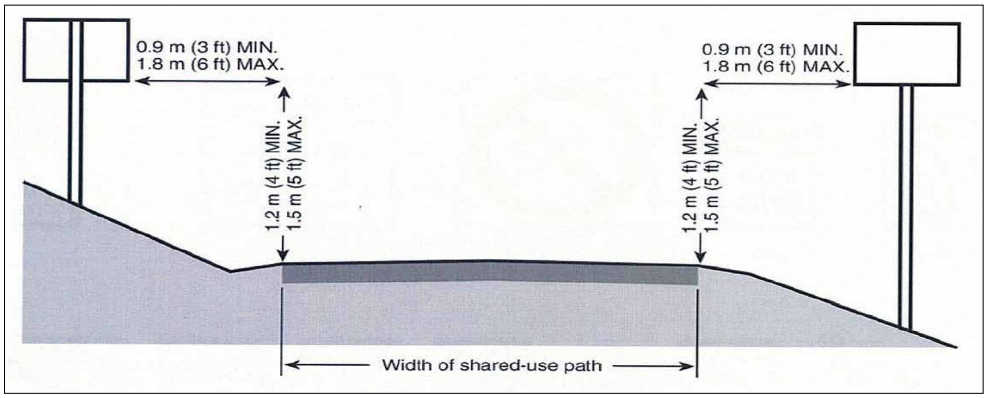
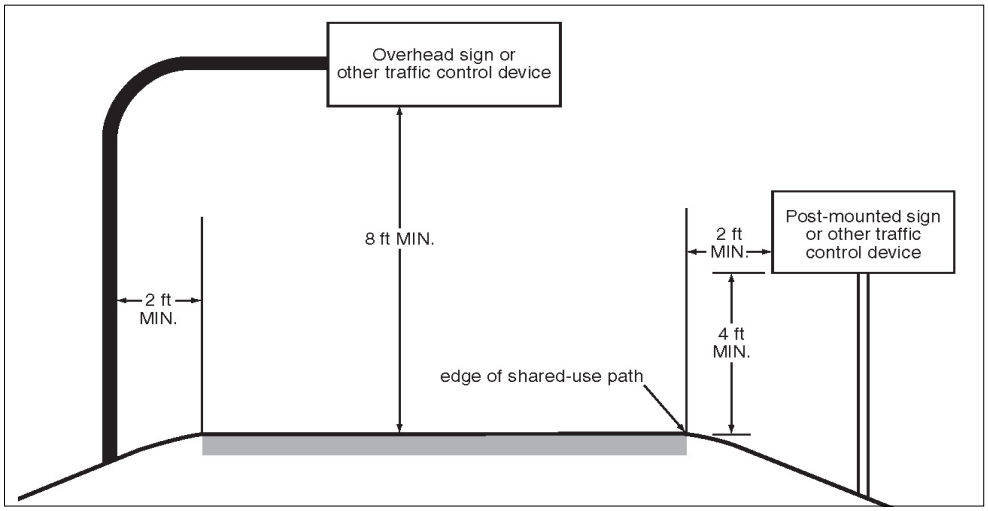


Figure 9B-1 of the 2009 MUTCD for Sign Placement on Shared-Use Paths to include overhead signage



4.2 Class II Bike Lane Guidelines

Class II bike lanes provide a striped lane for one-way bike travel on a street or highway. Installed along streets in corridors where there is significant bicycle demand, and where there are distinct needs that can be served by them. In streets with on-street parking, bike lanes are located between the parking area and the traffic lanes.

Class II bike lanes are typically have a five-foot minimum width for bike lanes located between the parking area and the traffic lanes and a four foot minimum width if no gutter exists. With a normal two foot gutter, the minimum bike lane width is five feet.

4.2.1 Common Issues

Class II facilities are located on highways and must share the road with motor vehicles. The most common issue associated with Class II bike lanes is safety. Traveling adjacent to motor vehicles, especially along high-speed corridors increases the risk of motor vehicle and bicycle related collisions and injuries. Other safety issue concerns include:

- **Steep grades** – bicycle lanes are not advisable on long, steep downgrades, where bicycle speeds greater than 30 miles per hour are expected.
- **Parking lanes** – bicycle lanes are typically located between the parking lane and vehicle traffic lane, which creates unsafe conditions when vehicles are looking to park.
- **Limited Right-of-Way** – Roadways ideal for bike lanes but with limited right-of-way can be an issue. Many roadways that are suitable for Class II bicycle lanes are located adjacent to residential or commercial uses which allow on-street parking.
- **Visibility** – visibility of cyclists on roadways or at intersections, especially freeway ramps.

4.2.2 Opportunities and Potential Treatment

There are several design options and potential treatments to increase the safety of Class II facilities.

Colored Bike Lanes

Color is applied to bike lanes to enhance the visibility of cyclists on bike lanes or the bike lanes themselves. Color can be applied to the entire bike lane or at high-risk locations where motorists are permitted to merge into or cross bike lanes. These improvements may be applicable on roadways with high traffic volumes, limited right-of-way, or as a branding tool. Portions along Rosecrans Avenue, Brookhurst Street, Gilbert Street, Orangethorpe Avenue, or Mira Loma are all potential candidates.

Design Guidelines:

- Signage and dimensional guidelines are the same as a Class II bike lane
- Avoid using blue which is commonly designated for disabled users. Green is the standard color for testing colored bike lanes.

Recommendations:

- Provide additional signage with matching color
- Use color and markings consistently
- Consider different coloring materials based on the location of the bike lanes, amount of traffic, road and weather conditions

References:

Innovative Bicycle Treatments: An Informational Report - ITE Pedestrian and Bicycle Council

Portland's Blue Bike Lanes: Improved Safety through Enhanced Visibility – City of Portland, 1999

Example of a colored bicycle lane at high conflict areas with motor vehicles. Photo credit: Michael Johnston

Sign R81 (CA MUTCD)

Sign R81-A (CA MUTCD)

Sign R81-B (CA MUTCD)

Buffered Bike Lanes

Buffered bike lanes provide space between the bike lane and traffic lane, parking lane or both. Buffered bike lanes provide a more protected and comfortable space for cyclists than a conventional bike lane. May be hard to implement on proposed regional corridors due to limited right-of-way, but Malvern Avenue and Lemon Street are potential candidates for this treatment

Buffered bike lane on Kearny Villa Road. (San Diego, CA) Photo credit: Joe Punsalan

Design Guidelines:

- Signage and dimensional guidelines are the same as a Class II bike lane
- An additional two-four foot buffer or "shy zone" between the bike lane and traffic lane and/or parking lane

Recommendations:

- Add diagonal striping on the outer buffer adjacent to the traffic lanes. Diagonal striping to be installed every six feet
- On-street parking remains adjacent to the curb
- A travel lane may need to be eliminated or narrowed to accommodate the buffers

References:

City of Los Angeles Bicycle Plan Update, City of Los Angeles

Back-in Diagonal Parking

The back-in/head-out parking is considered safer than conventional head-in/back-out parking due to better visibility when leaving. This is particularly important on busy streets or where drivers find their views blocked by large vehicles, tinted windows, etc., in adjacent vehicles in the case of head-in/back-out angled parking. Currently not applicable on proposed Fourth District corridors, but is a potential option if on-street parking is needed.

Design Guidelines:

Based on existing dimensions from test sites and permanent facilities: 16' from curb edge to inner bike lane stripe and a 5' bike lane.

Recommendations:

Test the facility on streets with existing head-in angled parking and moderate to high bicycle traffic. Additional signs to direct motorist on how the back-in angled parking works is recommended.

References:

Back-in/Head-out Angle Parking, Nelson/Nygaard Consulting Associates, 2005

City of Los Angeles Bicycle Plan Update, City of Los Angeles

This design treatment is not currently present in any State or Federal design standards. It is now a standard configuration in Seattle, WA.

Example of a back-in/head-out angled parking. (San Clemente, CA)
Photo credit: Joe Punsalan

Instructional signage above. (Solana Beach, CA)
Photo credit: Joe Punsalan

Limited Right-of-Way

Roadways with limited right-of-way, on-street parking, or both will impact the design or implementation of bicycle lanes. Options to consider for roadways with limited right-of-way include narrowing traffic lanes by one or two feet. Research has shown that reductions in lane width are generally associated with reductions in speed, however, may also reduce capacity. Some cities are also looking at converting roadways from four lanes to two lanes in order to accommodate bicycle lanes. Other options to consider include identifying parallel routes with lower traffic volumes that are more suitable for bicycle lanes.

Bike Lane Pavement Marking Guidelines

The following is the suggested pavement signage for bike lanes from the California MUTCD.

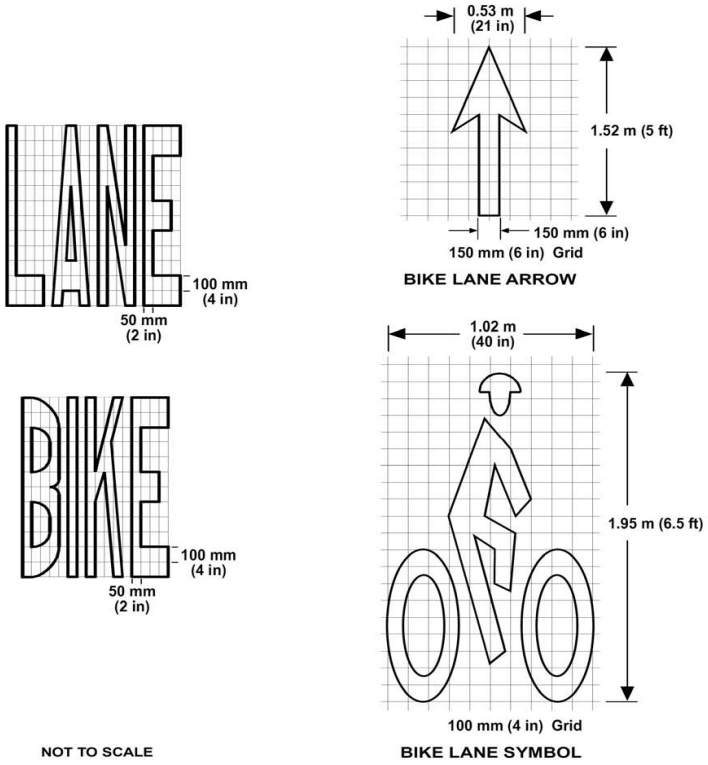


Figure 9C-6(CA) of the CA MUTCD for Bicycle Lanes

Cycle Track

A cycle track is a combination between a bike lane and shared use bike path. This facility can be both two-way or one way depending on existing road conditions, intersections and adjacent land use. The cycle track is a separate facility adjacent to a pedestrian sidewalk and physically protected from an adjacent travel lane. This treatment reduces the risk of conflicts between bicyclist and parked vehicles. May be applicable on lower-volume roadways such as Wilshire Avenue or Lemon Street.

Design Guidelines:

- One way cycle track typically 7 feet minimum
- Two-way cycle track typically 12 feet minimum
- This facility separates the cyclist from the road through either parked cars, planting strips, bollards, raised medians or a combination of these elements.
- Can be placed on slower urban streets or streets with high ADTs and speed but they should be streets that are long blocks with little to no driveways or midblock access points for vehicles.

Recommendations:

- Additional signage, traffic control treatments and pavement markings is needed to direct cyclist through the cycle track and intersections
- Priority on safety needs to be on cyclist safety through intersections

References:

City of Los Angeles Bicycle Plan Update, City of Los Angeles

Innovative Bicycle Treatments: An Informational Report - ITE Pedestrian and Bicycle Council

4.3 Class III Bike Route Guidelines

Class III bike routes are located within vehicular right-of-way and delineated by directional signage. Used where roadway speeds and traffic volume are fairly low and shoulder provides adequate room. Bike routes indicate to bicyclists that there are particular advantages to using these routes as compared with alternative routes. The following are typical guidelines as well as enhanced treatments for installing Class III bike routes.

4.3.1 Common Issues

Common issues associated with Class III facilities are similar to Class II facilities, however, Class III facilities are located on roadways with lower speeds and lower traffic volumes. Class III facilities are designated as roadways with no striped bicycle lanes, but signage to indicate bicyclists are allowed. The most common issue associated with Class III facilities is visibility of signage.

4.3.2 Opportunities and Potential Treatments

Signing

When designating a bicycle route, the placement and spacing of signs should be based on the California Manual on Uniform Traffic Control Devices, Part 9: Traffic Controls for Bicycle Facilities. For bike route signs to be functional, supplemental plaques can be placed beneath them when located along routes leading to high demand destinations (e.g. “To Downtown,” “To Transit Center,” etc.). Since bicycle route continuity is important, directional changes should be signed with appropriate arrow sub plaques. Signing should not end at a barrier. Instead, information directing the cyclist around the barrier should be provided. If used, route signs and directional signs should be used frequently because they promote reasonably safe and efficient operations by keeping road users informed of their location.

“BIKE ROUTE” - This sign is intended for use where no unique designation of routes is desired. However, when used alone, this sign conveys very little information. It can be used in connection with supplemental plaques giving destinations and distances. (See Section 1003-3 of the Caltrans Highway Design Manual and Part 9B-20 of the MUTCD for specific information on sub-plaque options.)

Roadways appropriate for bicycle use, but are undesignated, usually do not require regulatory, guide or informational signing in excess of what is normally required for motorists. In certain situations, however, additional signing may be needed to advise both motorists and cyclists of the shared use of the roadway, including the travel lane.

"SHARE THE ROAD" - This sign is recommended where the following roadway conditions occur:

- Shared lanes (especially if lane widths do not comply with Table 1) with relatively high posted travel speeds of 35 MPH or greater
- Shared lanes – NU Table 1 in areas of limited sight distance
- Situations where shared lanes or demarcated shoulders or marked bike lanes are dropped or end and bicycle and motor vehicle traffic must begin to share the travel lane
- Steep descending grades where bicycle traffic may be operating at higher speeds and requires additional maneuvering room to shy away from pavement edge conditions
- Steep ascending grades, especially where there is no paved shoulder, or the shared lane is not adequately wide and bicycle traffic may require additional maneuvering room to maintain balance at slow operating speeds
- High volume urban conditions, especially those with travel lanes less than the recommended width for lane sharing
- Other situations where it is determined to be advisable to alert motorists of the likely presence of bicycle traffic and to alert all traffic of the need to share available roadway space

Sign W16-1 and W11-1 of the CA MUTCD

Sign D11-1 (CA MUTCD)

Sign SG45 (CA MUTCD)

Sign D1-1b (R) (CA MUTCD)

Sign R4-11 (CA MUTCD)

Shared Lane Marking or "Sharrow" Design Criteria

An example of a shared line marking is provided on the following page, per the California MUTCD. The shared lane marking shall be as shown at locations where parking is allowed adjacent to the travel lane, the center of the marking should be located a minimum of 11 feet from the curb face or edge of the road. If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb. Shared Lane Markings are applicable on small or residential streets, including Puente Street.

Design Considerations:

Shared lane markings may be considered in the following situations:

- On roadways that are 35 MPH or less (CA MUTCD)
- On constrained roadways that are too narrow to stripe bicycle lanes
- To delineate space within a wide outside lane where cyclists can be expected to ride
- On multi-lane roadways where cyclists can be expected to travel within the outside lane and motorists should be prepared to change lanes to pass cyclists
- On roadways where it is important to increase motorist awareness of cyclists
- On roadways where cyclists frequently ride the wrong way
- On roadways where cyclists tend to ride too close to parked cars

Further enhancements such as a green striped lane throughout the Shared Lane Marking is another enhancement being used in cities such as Long Beach, CA and Salt Lake City.

Shared Lane Marking (Oceanside, CA) Photo credit: John Holloway

Green Striped Lane with Shared Lane Markings (Long Beach, CA) Photo credit: Joe Punsalan

Shared Lane Marking Guidelines

The following is the suggested pavement signage for bike lanes from the California MUTCD.

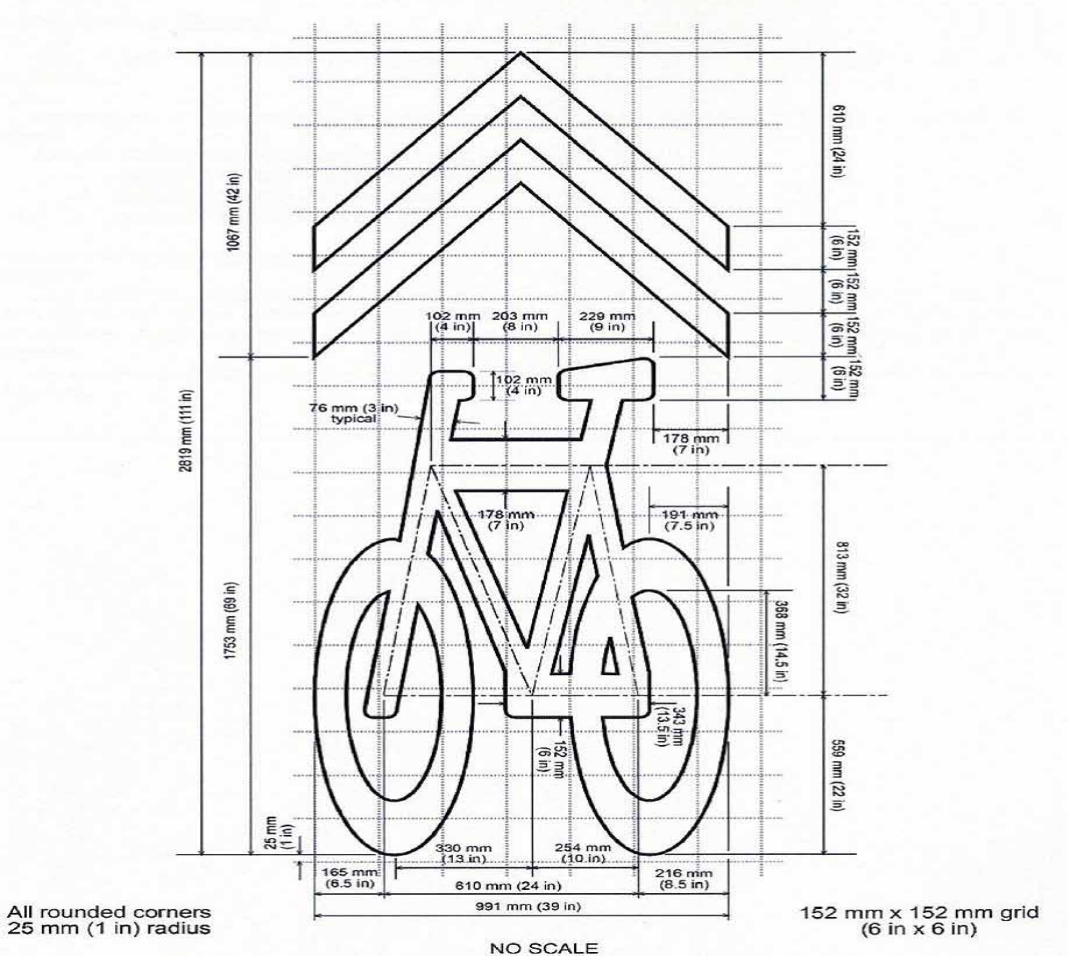


Figure 9C-104(CA) of the CA MUTCD for Shared Roadway Bicycle Marking

Bicycle Boulevard Guidelines

The purpose of creating bicycle boulevards is to provide a primary bicycle friendly route to improve safety and convenience of bicycling on local streets. Bicycle boulevards are typically used on residential streets parallel to nearby arterial roads on routes that have high or potentially high bicycle traffic. A bicycle boulevard is a roadway available to motorists, but prioritizes bicycles traffic through the use of various treatments. Motor vehicle traffic volume is reduced by periodically diverting vehicles off the street and the remaining traffic is slowed to the same speed as bicycles. Bicycle boulevards are most effective when several treatments are used in combination. Potential on Wilshire Avenue, Chapman Avenue, Lemon Street, or Puente Street.

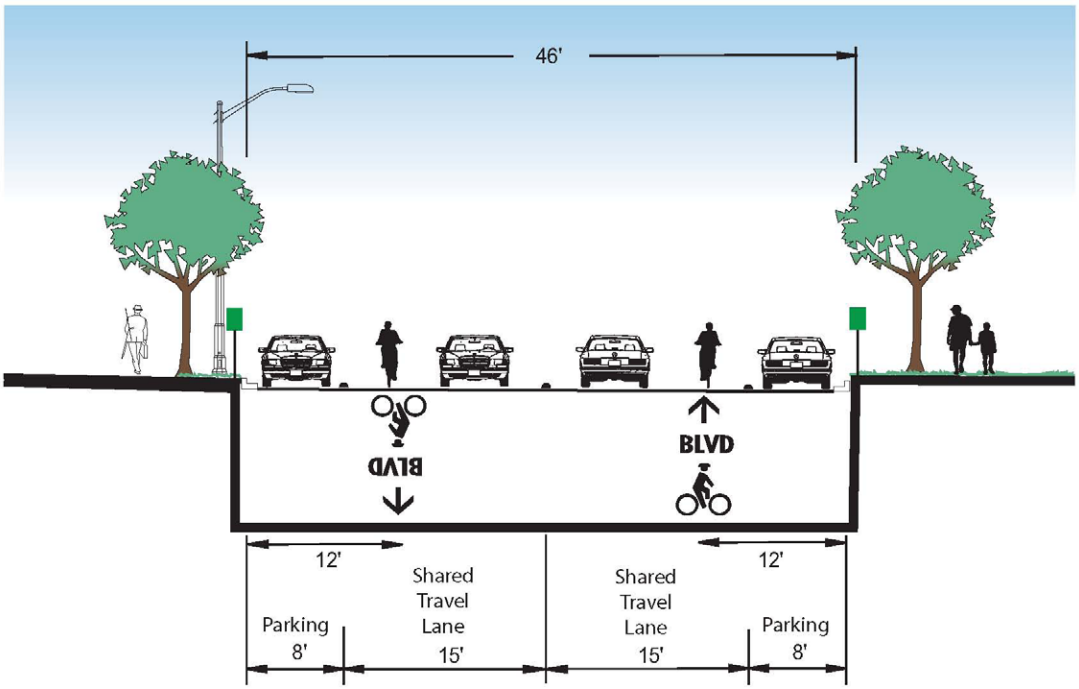
Design Guidelines:

- Increase feelings of comfort and safety for pedestrians, cyclists and the community as a whole
- Increase bicycling and walking
- Improve wayfinding
- Discourage neighborhood cut-through motor vehicle traffic
- Calm and reduce neighborhood traffic
- Provide shade for pedestrians and cyclists
- Create a pleasant corridor through the center of the City

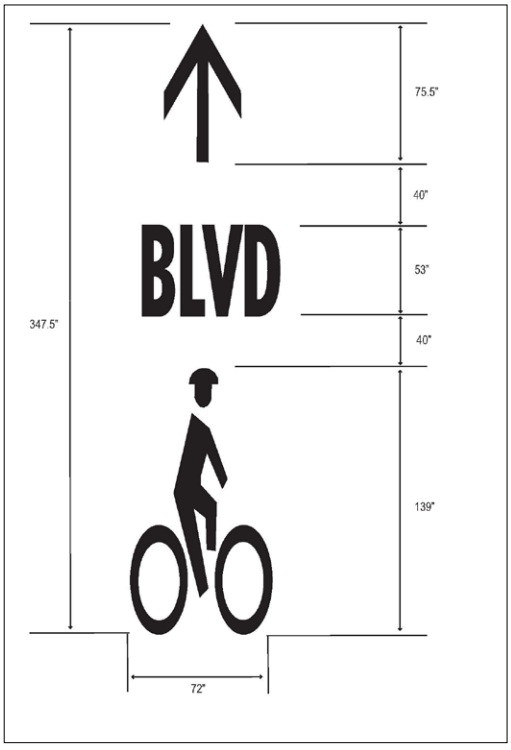
Recommendations:

- Increased directional signage and/or special street sign design at all intersections
- Continuous “Bike Boulevard” signage along the street
- Increased pavement markings and/or unique pavement markings such as colored bike lanes, Shared Lane Markings (“Sharrows”) or “Bike Boulevard” pavement legends
- Periodically re-routing vehicular traffic off of the street without affecting emergency vehicle response
- Limit stop signs and signals to the greatest extent possible except where they help the cyclist through busy intersections
- Alter major intersections with bicycle sensors, crossing actuators, directional signage. Other treatments for intersections can include traffic circles, bulb-outs and high visibility crosswalks
- Add street trees and landscaping
- Route design, amenities and signage must be consistent throughout the entire bicycle boulevard
- Install bicycle parking at specific locations along the route

The following diagram conceptually depicts how a Bicycle Boulevard can be delineated with a “Bicycle Boulevard” pavement marking.



Conceptual cross section of a bicycle boulevard with a Bicycle Boulevard Pavement Marking



Bicycle Boulevard Pavement Marking. (City of Berkeley, CA.)

Some optional Class II Bike Lane enhancements for a bicycle boulevard include:

- Colored bike lanes
- Distinct and unique directional signage
- Traffic calming (i.e., pop outs and street trees) designed to increase pedestrian and bicycle safety
- Traffic control devices for bicycles at major intersections
- Street trees and landscaping

Some optional Class III Bike Route enhancements for a bicycle boulevard include:

- Sharrows or Bike Boulevard pavement markings
- Traffic calming (curb extensions, roundabouts, street trees and speed tables) designed to increase pedestrian and bicycle safety
- Distinct and unique directional signage
- Traffic control devices for bicycles at major intersections
- Street trees and landscaping

General Guidelines for Bicycle Boulevard signs:

- Signs are a distinctive color to distinguish them from other traffic and road signs
- Signs are made with retro reflective material for improved visibility
- Lettering on signs may be no less than two inches high
- Maps of the City's bicycle system at hubs and near the intersections of bicycle boulevards
- Destination and distance signs placed every quarter mile, prior to signalized intersections, and in the block prior to the junction of other bicycle facilities
- Bike boulevard identification signs placed at least at every other corner
- No obscuring vegetation or other visual impediments

Pavement Markings

If bike lanes are the preferred alternative, they should be installed to meet Caltrans requirements. For further enhancements to the bike lanes, the inside of the lane can be painted green for further visibility. Some cities have used blue bike lanes, but they have since come under scrutiny because the ADA color designation is also blue. As a result, green appears to be becoming the new bikeway color standard.

Bicycle boulevard pavement markings are car-sized white pavement markings that depict a bicycle, the abbreviation of "BLVD" and a directional arrow. These markings are to be applied directly to the road surface, in the center of the drive lane with a four to six inch wide white paint. Markings should be placed in each direction of traffic following every intersection, near high volume driveways or other potential conflict points, and at no more than 200 foot intervals. Where the bicycle boulevard turns or jogs, the arrow should be turned 45 or 90 degrees in the appropriate direction to help aid in way-finding.

Bicycle boulevard pavement markings can also inform motorists and cyclists of the end of the path. When needed, these should be located in the same location as standard pavement markings to provide sufficient advance warning for cyclists to make appropriate decisions prior to the change. Advance warning of the end of a bicycle boulevard can be indicated on the pavement surface with "END" replacing the arrow and a count in feet until the end of the path. These should be placed 500 and 200 feet prior to the end of a bicycle boulevard.

The Bicycle Boulevard symbol is not a standard symbol in the California MUTCD. The following diagram is the measurement based on the symbol used for bicycle boulevards in the City of Berkeley, California. These symbols are to be used where bike lanes do not exist. With on-street parking, place the symbol twelve feet from curb face (measured to center of legend). Without on-street parking, place in center of travel lane.

Bicycle Boulevard pavement symbols (San Luis Obispo, CA) Photo credit: Mike Singleton

Bicycle Boulevard traffic calming (San Luis Obispo, CA) Photo credit: Mike Singleton

4.4 Traffic Control Devices

As legitimate users of California's roadways, cyclists are subject to essentially the same rights and responsibilities as motorists. In order for cyclists to properly obey traffic control devices, those devices must be selected and installed to take their needs into account. All traffic control devices should be placed so cyclists who are properly positioned on the road can observe them. This includes programmed visibility signal heads.

4.4.1 Traffic Signals and Detectors

Traffic actuated signals should accommodate bicycle traffic. Detectors for traffic activated signals should be sensitive to bicycles, should be located in the cyclist's expected path and stenciling should direct the cyclist to the point where the bicycle will be detected.

Since detectors can fail, added redundancy in the event of failure is recommended in the form of pedestrian push buttons at all signalized intersections. These buttons should be mounted in a location that permits their activation by a cyclist without having to dismount.

It is common for bicycles to be made of so little ferrous metals that they may not be easily detectable by some currently installed types of loop detectors. As a convenience for cyclists, the strongest loop detection point should be marked with a standard symbol bicycle detector, as illustrated in the figure to the right. There are several types of detector loops, including "circular," "square," "narrow," or "broad." Narrow and broad detector loops are most effective at detecting bicycles.

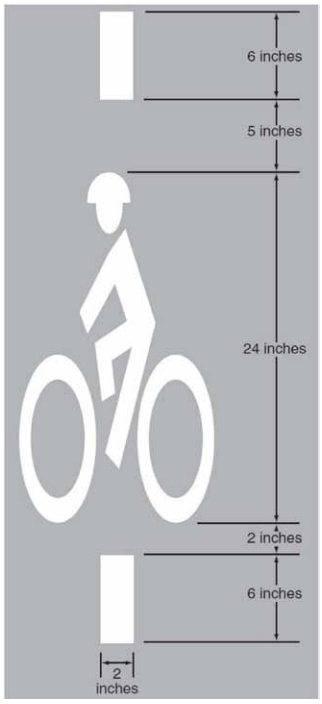


Figure 9C-7 (CA MUTCD) Bicycle Detector Symbol

Where left turn lanes are provided and only protected left turns are allowed, bicycle sensitive loop detectors should be installed in the left turn lane. Where moderate or heavy volumes of bicycle traffic exist, or are anticipated, bicycles should be considered in the timing of the traffic signal cycle as well as in the selection and placement of the traffic detector device. In such cases, short clearance intervals should not be used where cyclists must cross multi lane streets. According to the 1991 AASHTO Guide for the Development of Bicycle Facilities, a bicycle speed of 10 MPH and a perception/reaction time of 2.5 seconds can be used to check the clearance interval. Where necessary, such as for particularly wide roadways, an all red clearance interval can be used.

In general, for the sake of cyclist safety, protected left turns are preferred over unprotected left turns. In addition, traffic signal controlled left turns are much safer for cyclists than left turns at which motorists and cyclists must simply yield. This is because motor vehicle drivers, when approaching an unprotected left turn situation or planning to turn left at a yield sign, tend to watch for other motor vehicles and may not see an approaching cyclist. More positive control of left turns gives cyclists an added margin of safety where they need it most.

4.4.2 Video Detection

Video detection can pick up a bicycle's presence at an intersection over a larger area. A video detection setup consists of a video detector usually mounted on a four inch riser pole or a mainline pole, and a computer with video image processing capability. Existing video detectors have a flexible detector layout allowing for reprogramming of detection zones in a matter of minutes. Video detection technology has advanced to detect bikes with the same accuracy as loop detectors.

Some advantages to video detection include adjusting signal timing once activated to allow cyclists sufficient time to cross the intersection. This treatment enhances safety for this mode of transportation. Cameras can detect bicycles that do not contain iron, unlike loop detectors and in some cases can detect pedestrians fairly well. Video detection is also not affected by asphalt work and may be used to help direct traffic during construction.

4.4.3 Bicycle Signals

Bicycle signals are typically used at intersections with heavy bicycle traffic in conjunction with high peak vehicle traffic volumes, high conflict intersections or at the connections of shared use bike lanes and busy roads.

These signals separate conflicting movements between pedestrians, vehicles and cyclists. Bicycle signals also provide priority movement for cyclists at intersections and alternates right-of-ways between the different road users.

Bicycle Signals (Tucson, AZ) Photo credit: John Holloway

A bicycle signal is an electrically powered traffic control device that may only be used in combination with an existing traffic signal. Bicycle signals shall direct cyclists to take specific actions and may be used to improve an identified safety or operational problem involving bicycles.

Only green, yellow and red lighted bicycle symbols shall be used to implement bicycle movement at a signalized intersection. The application of bicycle signals shall be implemented only at locations that meet Department of Transportation Bicycle Signal Warrants. A separate signal phase for bicycle movement shall be used. Alternative means of handling conflicts between bicycles and motor vehicles should be considered first.

Two alternatives that should be considered are:

1. Striping to direct a bicyclist to a lane adjacent to a traffic lane such as a bike lane to left of a right-turn-only lane.
2. Redesigning the intersection to direct a bicyclist from an off-street path to a bicycle lane at a point removed. A bicycle signal must meet the warrants before being considered for installation. The following is the formula used to obtain a warrant.

   1. Volume; When $W = B \times V$ and $W > 50{,}000$ and $B < 50$.

   Where:

   - W is the volume warrant
   - B is the number of bicycles at the peak hour entering the intersection
   - V is the number of vehicles at the peak hour entering the intersection
   - B and V shall use the same peak hour

   2. Collision; When 2 or more bicycle/vehicle collisions of types susceptible to correction by a bicycle signal have occurred over a 12-month period and the responsible public works official determines that a bicycle signal will reduce the number of collisions.

   3. Geometric; (a) Where a separate bicycle/multi-use path intersects a roadway. (b) At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle.

References:
California MUTCD (Revised 2006), MUTCD 2009

5. FUNDING SOURCES

Federal, State and local government agencies invest billions of dollars every year in the nation's transportation system. Only a fraction of that funding is used in development projects, policy development and planning to improve conditions for cyclists. Even though appropriate funds are limited, they are available, but desirable projects sometimes go unfunded because communities may be unaware of a fund's existence, or may apply for the wrong type of grants. Also, the competition between municipalities for the available bikeway funding is often fierce.

Whenever Federal funds are used for bicycle projects, a certain level of State and/or local matching funding is generally required. State funds are often available to local governments on the similar terms. Almost every implemented bicycle program and facility in the United States has had more than one funding source and it often takes a good deal of coordination to pull the various sources together.

According to the Federal Highway Administration's (FHWA) publication, ***An Analysis of Current Funding Mechanisms for Bicycle and Pedestrian Programs at the Federal, State and Local Levels,*** where successful local bike facility programs exist, there is usually a full time bicycle coordinator with extensive understanding of funding sources. Cities such as Seattle, Washington, Portland, Oregon and Tucson, Arizona are prime examples. Bicycle coordinators are often in a position to develop a competitive project and detailed proposal that can be used to improve conditions for cyclists within their jurisdictions. Much of the following information on Federal and State funding sources was derived from the previously mentioned FHWA publication.

5.1 Federal Sources

5.1.1 U.S. Department of Transportation Enhancement Funds SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users)

In 1991, Congress reauthorized the collection and distribution of the Federal gasoline tax and related transportation spending programs. The Intermodal Surface Transportation Enhancement Act (ISTEA), was seen as particularly significant because it provided an overall intermodal approach to highway and transit funding with collaborative planning requirements. This act was reauthorized in 1997 as the Transportation Equity Act (TEA-21), and again in 2005 as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). This grant has been extended seven times since expiring in October of 2009. Currently, it has been extended through 2011.

SAFETEA-LU funding is currently managed through State and regional agencies. Most, but not all, of the funding programs are oriented toward transportation versus recreation, with the emphasis on reducing automobile trips and providing intermodal connections. Funding criteria include completion and adoption of a bicycle master plan, quantification of the costs and benefits of the system (including saved vehicle trips, reduced air pollution), proof of public involvement and support, National Environmental Protection Act (NEPA) compliance and the commitment of local resources. In most cases, SAFETEA-LU provides matching grants of 80 to 90 percent. The amount of money available through SAFETEA-LU is substantial (over $155 billion from 1992-97), but there is always strong competition to obtain those funds.

Federal funding through the SAFETEA-LU program provides the bulk of outside funding. SAFETEA-LU is comprised of two major programs, Surface Transportation Program (STP) and Congestion Management and Air

Quality Improvement (CMAQ), along with other programs such as the National Recreational Trails Fund, Section 402 (Safety) funds, Scenic Byways funds and Federal Lands Highways funds, though municipalities are unlikely to be eligible for funding from all of these sources. Among the new concepts in the original legislation were intermodalism, transportation efficiency, funding flexibility and planning, all of which had direct benefits for cycling. The legislation also created a wide range of funding opportunities for bicycle related activities.

Transportation Enhancement Activities

Transportation Enhancement (TE) activities offer funding opportunities to help expand transportation choices and enhance the transportation experience. Under SAFETEA LU, there are 12 eligible TE activities related to surface transportation, including pedestrian and bicycle infrastructure and safety programs, scenic and historic highway programs, landscaping and scenic beautification, historic preservation, and environmental mitigation. TE projects must relate to surface transportation and must qualify under one or more of the 12 eligible categories.

Eligible Activities

- Provision of pedestrian and bicycle facilities
- Provision of pedestrian and bicycle safety and education activities
- Acquisition of scenic or historic easements and sites
- Scenic or historic highway programs including tourist and welcome centers
- Landscaping and scenic beautification
- Historic preservation
- Rehabilitation and operation of historic transportation buildings, structures, or facilities
- Conversion of abandoned railway corridors to trails
- Control and removal of outdoor advertising
- Archaeological planning and research
- Environmental mitigation of highway runoff pollution, reduce vehicle-caused wildlife mortality, maintain habitat connectivity
- Establishment of transportation museums

Within Orange County, OCTA distributes funds to local jurisdictions through a call for projects scheduled approximately every three years. OCTA's current programming policy place emphasis on landscaping, bicycle, and pedestrian facilities. The annual estimate for the TE program in Orange County is approximately $3.5 million per year.

Surface Transportation Program (STP)

Section 1007 (a)(l)(b)(3) of ISTEA allows states to spend their allocation of Surface Transportation Program (STP) funds on a range of activities similar to those of the National Highway System. Bicycle facilities are specifically listed as eligible items. STP funds can also be used for "non construction bicycle projects related to safe bicycle use." Section 1007 (b)(2)(C)(c) created a new category of transportation enhancement activities (TEA) on which States were required to spend at least 10 percent of their Surface Transportation Program funds. TEAs are very broadly defined as:

"...with respect to any project or the area to be served by the project, provision of facilities for pedestrians and cyclists, acquisition of scenic easements and scenic or historic sites, scenic or historic highway programs,

landscaping and other scenic beautification, historic preservation, rehabilitation and operation of historic transportation buildings, structures or facilities including historic railroad facilities and canals, preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails), control and removal of outdoor advertising, archaeological planning and research and mitigation of water pollution due to highway runoff."

Surface Transportation Program funds are allocated to the California Department of Transportation (Caltrans) and 75 percent of STP funds are programmed by regional agencies such as OCTA under current state law. The Federal government does not allocate funds to specific projects. Therefore, for a bicycle project to be funded, it must appear on the list of potential projects under consideration at the State, regional, or City level, whichever is appropriate.

Safe Routes to School Programs

There are two separate Safe Routes to School Programs administered by Caltrans. There is the State-legislated program referred to as SR2S and there is the Federal Program referred to as SRTS. Both programs are intended to achieve the same basic goal of increasing the number of children walking and bicycling to school by making it safer for them to do so. The differences between the two programs are as follows:

Legislative Authority

SR2S - Streets & Highways Code Section 2330-2334

SRTS - Section 1404 in SAFETEA-LU

Expires

SR2S - AB 57 extended program indefinitely

SRTS - Pending SAFETEA-LU reauthorization.

Eligible Applicants

SR2S - Cities and counties

SRTS - State, local, and regional agencies experienced in meeting federal transportation requirements. Non-profit organizations, school districts, public health departments, and Native American Tribes must partner with a city, county, MPO, or RTPA to serve as the responsible agency for their project.

Eligible Projects

SR2S - Infrastructure projects

SRTS - Stand-alone infrastructure or non-infrastructure projects

Local Match

SR2S - 10% minimum required

SRTS – None

Project Completion Deadline

SR2S - Within 4 - years after project funds are allocated to the agency

SRTS - Within 4 - years after project is amended into FTIP

Restriction on Infrastructure Projects

SR2S - Must be located in the vicinity of a school

SRTS - Infrastructure projects must be within 2 miles of a grade school or middle school

Targeted Beneficiaries

SR2S - Children in grades K-12

SRTS - Children in grades K-8

Funding

SR2S - $45M for two year cycle of funds

SRTS - $23M annual funding

The Safe Routes to School Program funds non motorized facilities in conjunction with improving access to schools through the Caltrans Safe Routes to School Coordinator. For more information visit: http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

Congestion Mitigation and Air Quality Program (CMAQ)

Section 1008 is referred to as the Congestion Mitigation and Air Quality Program (CMAQ). This part of the legislation is intended to fund programs and projects likely to contribute to the attainment of national ambient air quality standards under the 1990 Clean Air Act Amendments. Five areas of eligibility have been defined: Transportation activities in an approved State Implementation Plan (SIP) developed under the Clean Air Act Transportation Control Measures listed in Section 108 (b)(1)(A) of the Clean Air Act, which include:

(ix) Programs to limit portions of roadway surfaces or certain sections of the metropolitan area to the use of non motorized vehicles or pedestrian use, both as to time and place;

(x) Programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of cyclists in both public and private areas; and

(xv) Programs for new construction and major reconstruction of paths, tracks, or areas solely for the use by pedestrians or other non motorized means of transportation, when economically feasible and in the public interest.

“Construction of bicycle and pedestrian facilities, non construction projects related to safe bicycle use and State bicycle/pedestrian coordinator positions as established in the TEA- 21, for promoting and facilitating the increased use of non motorized modes of transportation. This includes public education, promotional and safety programs for using such facilities.”

To be funded under this program, projects and programs must come from a transportation plan (or State (STIP) or Regional (RTIP) Transportation Improvement Program) that conforms to the SIP and must be consistent with the conformity provisions of Section 176 of the Clean Air Act.

The CMAQ is administered through OCTA on the local level. Within Orange County, these funds are eligible for transportation projects that contribute to the attainment or maintenance of National Ambient Air Quality Standards in non-attainment or air-quality maintenance areas. Examples of eligible projects include enhancements to existing transit services, rideshare and vanpool programs, projects that encourage bicycle and pedestrian transportation options, traffic light synchronization projects that improve air quality, grade separation

projects, and construction of high-occupancy vehicle (HOV) lanes. On October 7, 2011 the OCTA Board of Directors approved a guideline for the use of 10% of the annual congestion mitigation and air quality (CMAQ) funds starting in fiscal year 2012-13. This funding will be programmed through the Bicycle Corridor Improvement Program (BCI) call for projects. Bicycle and pedestrian projects that promote improved air quality will be eligible.

5.1.2 Section 402 (Safety) Funds

Section 402 funds address State and community highway safety grant programs. Priority status of safety programs for cyclists expedites the approval process for these safety efforts.

5.1.3 Symms National Recreational Trails Act

The Symms National Recreational Trails Act created a trust fund for the construction and maintenance of trails. At least 30 percent of the funds must be spent on trails for non motorized users and at least 30 percent for trails for motorized users. The remainder is to be allocated to projects as determined by the State Recreational Trails Advisory Board of the California Department of Parks and Recreation, which the State must have to be eligible for the funds.

5.1.4 Federal Transit Act

Section 25 of the 1964 Urban Mass Transportation Act states that: “For the purposes of this Act a project to provide access for bicycles to mass transportation facilities, to provide shelters and parking facilities for bicycles in and around mass transportation facilities, or to install racks or other equipment for transporting bicycles on mass transportation vehicles shall be deemed to be a construction project eligible for assistance under sections 3, 9 and 18 of this Act.” The Federal share for such projects is 90 percent and the remaining 10 percent must come from sources other than Federal funds or fare box revenues. Typical funded projects have included bike lockers at transit stations and bike parking near major bus stops. To date, no projects to provide bikeways for quicker, safer or easier access to transit stations have been requested or funded.

5.1.5 Department of the Interior – Land and Water Conservation Fund (LWCF)

The U.S. Recreation and Heritage Conservation Service and the State Department of Park and Recreation administer this funding source. Any project for which LWCF funds are desired must meet two specific criteria. The first is that projects acquired or developed under the program must be primarily for recreational use and not transportation purposes and the second is that the lead agency must guarantee to maintain the facility in perpetuity for public recreation. The application will be considered using criteria such as priority status within the State Comprehensive Outdoor Recreation Plan (SCORP). The State Department of Park and Recreation will select which projects to submit to the National Park Service (NPS) for approval. Final approval is based on the amount of funds available that year, which is determined by a population based formula. Trails are the most commonly approved project.

National Recreational Trail Fund

This funding source is intended to pay for a variety of recreational trails programs to benefit cyclists, pedestrians and other non motorized users. Projects must be consistent with the State Comprehensive Outdoor Recreation Plan required by the Land and Water Conservation Act.

Rivers, Trails, and Conservation Assistance Program (RTCA)

The Rivers, Trails and Conservation Assistance Program is the community assistance arm of the National Park Service. RTCA provides technical assistance to communities in order to preserve open space and develop trails. The assistance that RTCA provides is not for infrastructure, but rather building plans, engaging public participation and identifying other sources of funding for conversation and outdoor recreation projects.

5.1.6 Other Federal Bicycle Infrastructure Funding Options

Additionally, States will be receiving $53.6 billion in state fiscal stabilization funding. States must use 18.2 percent of their funding – or $9.7 billion – for public safety and government services. An eligible activity under this section is to provide funding to K-12 schools and institutions of higher education to make repairs, modernize and make renovations to meet green building standards. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the U.S. Green Building Council (USGBC), addresses green standards for schools that include bicycle and pedestrian facilities and access to schools.

Another $5 billion is provided for the Energy Efficiency and Block Grant Program. This provides formula funding to cities, counties and states to undertake a range of energy efficiency activities. One eligible use of funding is for bicycle and pedestrian infrastructure.

5.2 State Sources

5.2.1 Streets and Highways Code – Bicycle Transportation Account (BTA)

The Bicycle Transportation Account (BTA) funds non motorized facilities and access to cities and counties that have adopted bikeway master plans. Section 2106 (b) of the Streets and Highways Code transfers funds annually to the BTA from the revenue derived from the excise tax on motor vehicle fuel. The Caltrans Office of Bicycle Facilities administers the BTA.

For a project to be funded from the BTA, the project shall:

i) Be approximately parallel to a State, county, or city roadways, where the separation of bicycle traffic from motor vehicle traffic will increase the traffic capacity of the roadway; and

ii) Serve the functional needs of commuting cyclists; and

iii) Include but not be limited to:

- New bikeways serving major transportation corridors
- New bikeways removing travel barriers to potential bicycle commuters
- Secure bicycle parking at employment centers, park and ride lots and transit terminals
- Bicycle carrying facilities on public transit vehicles
- Installation of traffic control devices to improve the safety and efficiency of bicycle travel
- Elimination of hazardous conditions on existing bikeways serving a utility purpose
- Project planning
- Preliminary and construction engineering

Maintenance is specifically excluded from funding and allocation takes into consideration the relative cost effectiveness of the proposed project.

5.2.2 State Highway Account

Section 157.4 of the Streets and Highways Code requires Caltrans to set aside $360,000 for the construction of non motorized facilities that will be used in conjunction with the State highway system. The Office of Bicycle Facilities also administers the State Highway Account fund. Funding is divided into different project categories. Minor B projects (less than $42,000) are funded by a lump sum allocation by the CTC and are used at the discretion of each Caltrans District office. Minor A projects (estimated to cost between $42,000 and $300,000) must be approved by the CTC. Major projects (more than $300,000) must be included in the State Transportation Improvement Program and approved by the CTC. Funded projects have included fencing and bicycle warning signs related to rail corridors.

5.3 Local Sources

5.3.1 Developer Impact Fees

As a condition for development approval, municipalities can require developers to provide certain infrastructure improvements, which can include bikeway projects. These projects have commonly provided Class 2 facilities for portions of on street, previously planned routes. They can also be used to provide bicycle parking or shower and locker facilities. The type of facility that should be required to be built by developers should reflect the greatest need for the particular project and its local area. Legal challenges to these types of fees have resulted in the requirement to illustrate a clear nexus between the particular project and the mandated improvement and cost.

5.3.2 New Construction

Future road widening and construction projects are one means of providing on street bicycle facilities. To ensure that roadway construction projects provide bike lanes where needed, it is important that the review process includes input pertaining to consistency with the proposed system.

5.3.3 Restoration

Cable TV and telephone companies sometimes need new cable routes within public rights of way. Recently, this has most commonly occurred during expansion of fiber optic networks. Since these projects require a significant amount of advance planning and disruption of curb lanes, it may be possible to request reimbursement for affected bicycle facilities to mitigate construction impacts. In cases where cable routes cross undeveloped areas, it may be possible to provide for new bikeway facilities following completion of the cable trenching, such as sharing the use of maintenance roads.

5.4 Other Sources

Local sales taxes, fees and permits may be implemented as new funding sources for bicycle projects. However, any of these potential sources would require a local election. Volunteer programs may be developed to substantially reduce the cost of implementing some routes, particularly multi use paths. For example, a local college design class may use such a multi use route as a student project, working with a local landscape architectural or engineering firm. Work parties could be formed to help clear the right of way for the route. A local construction company may donate or discount services beyond what the volunteers can do. A challenge grant program with local businesses may be a good source of local funding, in which the businesses can "adopt" a route or segment of one to help construct and maintain it.

5.5 Private Sources

Private funding sources can be acquired by applying through the advocacy groups such as the League of American Bicyclists and the Bikes Belong Coalition. Most of the private funding comes from foundations wanting to enhance and improve bicycle facilities and advocacy. Grant applications will typically be through the advocacy groups as they leverage funding from federal, state and private sources.

Tables 5-1 through 5-4 summarize some of the numerous funding sources available. Table 5-5 provides a summary of the funding sources along with eligible projects.

Table 5-1: Federal Funding Sources

FEDERAL SOURCES					
Grant Source	Annual Total	Agency	Application Deadline	Match Required	Remarks
SAFETEA-LU - Highway Bridge Program (HBP)	$386 million in 2009 (California)	FHWA/ Caltrans	January	20%	Contact Caltrans Division of Structures, Office of Local Programs, Program Manager.
SAFETEA-LU - Scenic Byways Program	$740,000 in 2009 (California)	FHWA/ Caltrans	January	20%	Funding for routes along National State Byways.
SAFETEA-LU - Transportation, Community and System Preservation Program (TCSP)	$30 million (Nationwide)	FHWA	January	20% or Negotiated	Extended through March 31, 2012.
Congestion Mitigation and Air Quality Improvement Plan (CMAQ) *as programmed by OCTA	$370 million in 2009 (California) $42 million in Orange County; $3-4 million for bike/ped projects	FHWA/ Caltrans	April	20%	The amount of CMAQ funds depends on the state's population share and on the degree of air pollution (administered by OCTA). The OCTA Board approved a guideline for the use of 10% of the annual CMAQ funds starting in fiscal year 2012-2013 for bike/ped projects through a competitive call to local agencies.
SAFETEA-LU - Public Lands Highway	Varies - averages $7 million/yr. state-wide (California)	FHWA/ Caltrans	June	20%	For roads and bikeways leading to and serving National Forests.
Energy Efficiency and Block Grant Program	$3 million (California)	FHWA	June	None	Provided formula funding for cities, counties and states to take part in energy efficient activities.
Transportation Enhancement (TE) *as programmed by OCTA	$80 million in 2010 (California); $3-4 million (Orange County)	FHWA/ Caltrans	Summer	25%	Calls for projects occur every three years
FTA Section 5307	Varies	Federal Transit Administration	Part of TE call for projects		
SAFETEA-LU - Highway Safety Improvement Program	$98 million in 2009 (California)	FHWA/ Caltrans	Summer	20%	Bike projects must provide a high degree of safety

Note: Shaded funding programs represent more applicable programs to pursue in the Fourth District

Table 5-1: Federal Funding Sources – Continued from Previous Page

FEDERAL SOURCES					
Grant Source	Annual Total	Agency	Application Deadline	Match Required	Remarks
Rivers, Trails and Conservation Assistance Program (RTCA)	None	National Park Service	August	None	Expenditures include bikeway plans, corridor studies and trails assistance.
Forest Highway Program	$19 million in 2009 (California)	FHWA/ Caltrans	October	20%	For roads and bikeways leading to and serving National Forests
Transportation Investments Generating Economic Recovery (TIGER)	$131 million thru 2013 (California)	FHWA	October	20%	Primary funding for road, rail, transit and port projects. However, bicycle and pedestrian improvements can be included. Project minimum is $10 million.
Recreational Trails Program (RTP)	$5 million in 2010* (California)	California Department of Parks and Recreation	October	12%	Different requirements depending on the grant funds being requested.
SAFETEA-LU - Safe Routes to School (SRTS)	$23 million in 2009 (California)	FHWA/ Caltrans	December	20%	For pedestrian facilities and bikeways leading to schools. Five E's must be incorporated.
Land and Water Conservation Fund (LWCF)	$30 million in 2010	California Department of Parks and Recreation	December	50%	Funding subject to North/ South split (60% for Southern California). Funds for outdoor recreation projects.
Community Development Block Grants (CDBG)	$3 million	HUD & California Dept of Housing and Community Development	Ongoing	10%	Available for low-income neighborhoods to improve land use and transportation infrastructure. Can be used for accessibility improvements citywide.
Federal Lands Highway Program	$611 million between 2008-10 (Nationwide)	FLH/FHWA	Ongoing	Varies	Maybe used to build bicycle and pedestrian facilities in conjunction with roads and parkways at the discretion of the grantee.
Sustainable Communities Regional Planning Grants	$68 million (Nationwide)	HUD	Ongoing	20%	Funding for preparing or implementing regional plans for sustainable development.

Note: Shaded funding programs represent more applicable programs to pursue in the Fourth District
Source: Summary of FY 2009 Apportionments for RTA-000-1664A,

Table 5-2: State Funding Sources

STATE SOURCES					
Grant Source	**Annual Total**	**Agency**	**Application Deadline**	**Match Required**	**Remarks**
Office of Traffic Safety Program (OTS)	Varies	Office of Traffic Safety	January	None	Program objective is to reduce motor vehicle fatalities and injuries through a national highway safety program. Program to include: education, enforcement and engineering.
AB 2766 Vehicle Registration Funds	$30 million in 2010	SCAQ	February	None	Competitive program for projects that benefit air quality.
State Highway Account (SHA): Bicycle Transportation Account (BTA)	$7.2 million/ yr. state-wide Allocated by project	Caltrans	March	10%	Must have an adopted Bicycle Transportation Plan. Funding available for all phases of project.
Petroleum Violation Escrow Account (PVEA)	Varies	Caltrans, CA Community Services and Development Air Resources Board	March	None	Projects must save energy, provide restitution to the public and be approved by CA Energy Commission and US DOE.
Safe Routes to School Program (SR2S)	$45 million for 2 year funding cycle	Caltrans	March	10%	Eligible for projects in the vicinity of a school and grades K-12.
Environmental Justice (EJ) Planning Grants	$9 million in 2010	Caltrans	April	10%	EJ planning grants help engage low-income and minority communities in transportation projects early in the planning process to ensure equity and positive social, economic and environmental impacts occur.
State and Local Transportation Partnership Program (SLPP)	Est. $200 million/yr. state-wide	Administered by Caltrans and California Transportation Commission (CTC)	Summer	50%	Requires developer or traffic fee match

Note: Shaded funding programs represent more applicable programs to pursue in the Fourth District

Table 5-2: State Funding Sources – Continued from Previous Page

STATE SOURCES					
Grant Source	**Annual Total**	**Agency**	**Application Deadline**	**Match Required**	**Remarks**
Environmental Enhancement and Mitigation Program (EEM)	$10 million/yr. state-wide	State Resources Agency	August	None required, but favored	Individual grants limited to $350K.
Habitat Conservation Fund Grant Program (HCF)	$2 million	CA Dept of Park and Recreation	October	50%	Will only be available until July 1, 2020.
California River Parkways	Varies	CA Natural Resources Agency	October	None	Create or expand trails for walking, bicycling and/or equestrian activities that are compatible with other conservation objectives.
State Gas Tax (local share)	Varies	Allocated by State Auditor-Controller	Varies	None	Major Projects, >$300,000.
Developer Fees or Exactions	Project-specific	Cities	Varies	None	Mitigation required during land use approval process.

Note: Shaded funding programs represent more applicable programs to pursue in the Fourth District

Table 5-3: Local Funding Sources

LOCAL SOURCES					
Grant Source	**Annual Total**	**Agency**	**Application Deadline**	**Match Required**	**Remarks**
Parking Meter Districts	**Varies**	City	Annual Budget	N/A	Parking Meter Districts can use parking meter revenues for streetscape improvements such as ped facilities, landscaping & lighting.
Redevelopment Tax Increment Financing (TIF)	**Varies**	City	Annual Budget	None	TIFs apply to redevelopment areas where bonds are issued based on expected increased tax revenues. Used for improved infrastructure, including pedestrian facilities.
Transient Occupancy Tax (TOT)	**Varies**	City	Annual Budget	None	Created to cover expenses & improvements related to tourism & to encourage more tourists to visit. This fund may be appropriate in areas where heavy tourism exists such as along the waterfront, major parks & historic neighborhoods.
Measure M2 Turnback	36.4 million in 2009	OCTA	Annual Budget	None	For streets and roadway improvements, including bicycle and pedestrian facilities.

Note: Shaded funding programs represent more applicable programs to pursue in the Fourth District

Table 5-4: Private Funding Sources

PRIVATE SOURCES					
Grant Source	**Annual Total**	**Agency**	**Application Deadline**	**Match Required**	**Remarks**
SRAM Cycling Fund	$400,000+/yr	SRAM	Ongoing	None	Bicycle organization that donates funds to Bikes Belong, Safe Routes to School, and other bicycle associations.
Surdna Foundation	Project-specific	Surdna Foundation	Ongoing	None	The Surdna Foundation makes grants to nonprofit organizations in the areas of environment, community revitalization, effective citizenry, the arts, and the nonprofit sector.
Bikes Belong	$180,000 annually	Bikes Belong Coalition	Three times a year	50%	Community grants focus on funding facilities and programs.
Kaiser Permanente Community Health Initiatives	$54 million annually	Kaiser Permanente	Ongoing	None	Numerous programs to help with Healthy Initiatives.
Health Foundations	Varies	Various foundations	Ongoing	Varies	Focus pedestrian improvements for an obesity prevention strategy. Examples include California Wellness Foundation, Kaiser & California Endowment.
Rails to Trails Conservancy	None	Rails to Trails Conservancy	N/A	None	Provides technical assistance for converting abandoned rail corridors to use as multi-use trails.
Donations	Varies	Depends on nature of project	Ongoing	Varies	Corporate or individual donations, sponsorships, merchandising or special events.
In-kind Services	Varies	Depends on nature of project	Ongoing	Varies	Donated labor & materials for facility construction or maintenance such as tree planting programs or trail construction.

Table 5-5 – Bikeway Funding Opportunities by Project Type

	Bicycle and Pedestrian Funding Opportunities	Planning	Design, ROW, Construction	Amenities	Safety/Education
Federal Sources	SAFETEA-LU Highway Bridge Program	X	X	X	X
	SAFETEA-LU Scenic Byways Program	X	X	X	X
	SAFETEA-LU Transportation Community and System Preservation Program	X	X	X	X
	Congestion Mitigation and Air Quality Improvement Plan		X	X	X
	SAFETEA-LU Federal Lands Highway	X	X		X
	Energy Efficiency and Block Grant Program	X	X		
	Transportation Enhancement		X*	X	
	FTA Section 5307		X	X	
	SAFETEA-LU Highway Safety Improvement Program	X	X		X
	Rivers, Trails and Conservation Assistance Program	X	X	X	X
	Forest Highway Program	X	X	X	X
	Transportation Investments Generating Economic Recovery		X		
	Recreational Trails Program	X	X	X	X
	SAFETEA-LU Safe Routes to School	X	X	X	X
	Land and Water Conservation Fund	X	X	X	X
	Community Development Block Grants	X			
	Federal Lands Highway Program		X		
	Sustainable Communities Regional Planning Grants	X	X		
State Sources	Office of Traffic Safety Program	X	X		X
	AB 2766 Vehicle Registration Funds	X	X	X	X
	State Highway Account: Bicycle Transportation Account	X	X	X	X
	Petroleum Violation Escrow Account	X	X	X	X
	Safe Routes to School Program	X	X	X	X
	Environmental Justice Planning Grants	X	X	X	X
	State and Local Transportation Partnership Program	X	X	X	X
	Environmental Enhancement and Mitigation Program	X	X	X	X
	Habitat Conservation Fund Grant Program	X	X	X	X
	California River Parkways	X	X		
	Developer Fees or Exactions	X	X	X	X
	State Gas Tax (local share)		X		
Local Sources	Parking Meter Districts			X	
	Redevelopment Tax Increment Financing			X	
	Transient Occupancy Tax	X	X	X	X
	Measure M2 Turnback	X	X	X	X
Private Sources	SRAM Cycling Fund	X	X	X	X
	Surdna Foundation	X	X	X	X
	Bikes Belong	X		X	X
	Kaiser Permanente Community Health Initiatives	X	X	X	X
	Health Foundations	X	X	X	X
	Rails to Trails Conservancy	X	X	X	X
	Donations	X	X	X	X
	In-Kind Services	X	X	X	X

*only Construction

APPENDIX A. DEVELOPMENT OF REGIONAL CORRIDORS

The development of the ten regional corridors was an extensive process involving coordination and meetings with Fourth District cities, collecting and reviewing existing bikeway data and reports, and analyzing opportunities, constraints, demographic data, and conditions that would encourage cycling activity.

This section provides an overview of the various factors that went into the development of the ten regional corridors, including building off existing and planned bikeways identified in the CBSP, opportunities and constraints, challenges associated with implementing regional bikeway corridors, and regional priorities set forth by stakeholders and planning agencies in the Fourth District.

A.1 Existing and Proposed Bikeways

The CBSP serves as a regional blueprint for bikeway planning in Orange County. In the CBSP, existing and proposed bikeways are highlighted to illustrate the existing and future bicycle network in Orange County. The first step in developing the priority corridors was to review these existing and planned bikeways to better understand current conditions and plan for regional corridors. In addition to this review, meetings with Fourth District cities were conducted to obtain information on recent bikeway planning efforts. A summary of the existing and proposed bikeway priorities by city is summarized below.

A.1.1 Buena Park

The City of Buena Park does not have a formal Bicycle Master Plan and the city's streets are generally not equipped with designated bicycle facilities. The City's General Plan identifies a portion of the Brea Creek Channel, east of Dale Street, in the northern portion of the City as a bike path. There is also an existing Class I segment along Malvern Avenue. The current General Plan identifies 12 proposed bike routes throughout the City, however, these proposed bike routes have not been completed to date. Buena Park's new City Council has recently expressed more interest in implementing bikeway facilities, and sees the potential to connect to the Entertainment District and Buena Park Metrolink Station.

A.1.2 Fullerton

The City of Fullerton has a fairly extensive existing bicycle network and is proposing over 80 combined miles of Class I, II and III bikeways. The city's bike user subcommittee is in the final stages of completing a Bicycle Master Plan, which identifies priority projects. Priority projects include the Union Pacific Right-of-Way (ROW), Rosecrans Avenue and Euclid Avenue corridors, and the Burlington Northern Santa Fe (BNSF) ROW. The city expressed interest in including these priority projects as part of the development of the regional corridors.

A.1.3 La Habra

The City of La Habra has several existing and proposed bikeways, but the city does not have a Bicycle Master Plan. The City is currently updating its General Plan and will address the bikeway system within this update.

Major regional priorities expressed by the City of La Habra include extending the Coyote Creek bikeway and coordinating with the Union Pacific to implement a Class I bike path on the Union Pacific ROW. The City has recently coordinated with the City of La Mirada to extend the Coyote Creek bikeway.

A.1.4 Anaheim

The existing bicycle network in the City of Anaheim consists of 35 miles of Class I, II and III bikeways, with an additional 65 miles proposed. The City is currently in the process of conducting their "Anaheim Outdoors Connectivity Plan" study, a project to develop a network of green corridors within the Platinum Triangle area to improve non-motorized linkages, including bicycle facilities. Feedback obtained from this study includes interest in bikeway connectivity to the Santa Ana River Trail, east-west connections utilizing La Palma Avenue, Orangethorpe Avenue, or the Edison Transmission Line, and improving signage to notify cyclists of existing bicycle facilities.

A.1.5 Placentia

Existing bikeways in the City of Placentia are provided on a number of roadways throughout the city. The bicycle network provides bicyclists with connections between neighborhoods, parks, schools, and other community facilities. Most of the bikeways are Class II bike lanes and Class III bike routes, with approximately 10 miles of existing bikeways and 10 miles of proposed bikeways. A major regional priority for the City of Placentia is extending a bikeway along Orangethorpe Avenue from Chapman Avenue to West Lakeview Avenue at the Anaheim city limits.

A.2 Bikeway Opportunities

Several opportunities exist within the study area to improve bikeway mobility and access. A key element of the planning process and identification of potential bikeway corridors focused on finding "low-hanging fruit", projects that could be implemented quickly and that would provide greatest level of benefit for cyclists through the efficient use of public funds. Potential opportunities include:

- Closing short gaps in existing bikeways
- Utilizing existing infrastructure (flood channels, roadways, rail corridors, etc.)
- Enhancing areas of the Fourth District that are already served by bikeway facilities
- Improving access to bikeways in areas that are underserved by the existing bikeway network

A.2.1 Physical Opportunities

Figure A.1 illustrates opportunities related to closing gaps and utilizing existing infrastructure within the Fourth District. These opportunities are also briefly discussed below.

Gap Closures

The existing bicycle network within the study area consists of numerous Class II and Class III bikeway segments that do not provide continuous connections to major destinations. Many of these segments can be linked by adding striping or signage to existing infrastructure to provide continuous access. Feedback from the Stakeholder Roundtable and Open House surveys show that there is high demand from the community to implement these missing links and provide continuous access along an entire street. Examples of these links that would open up or complete regional connections are present along Orangethorpe Avenue, Brookhurst Street/Gilbert Street, and Bastanchury Road/Malvern Avenue.

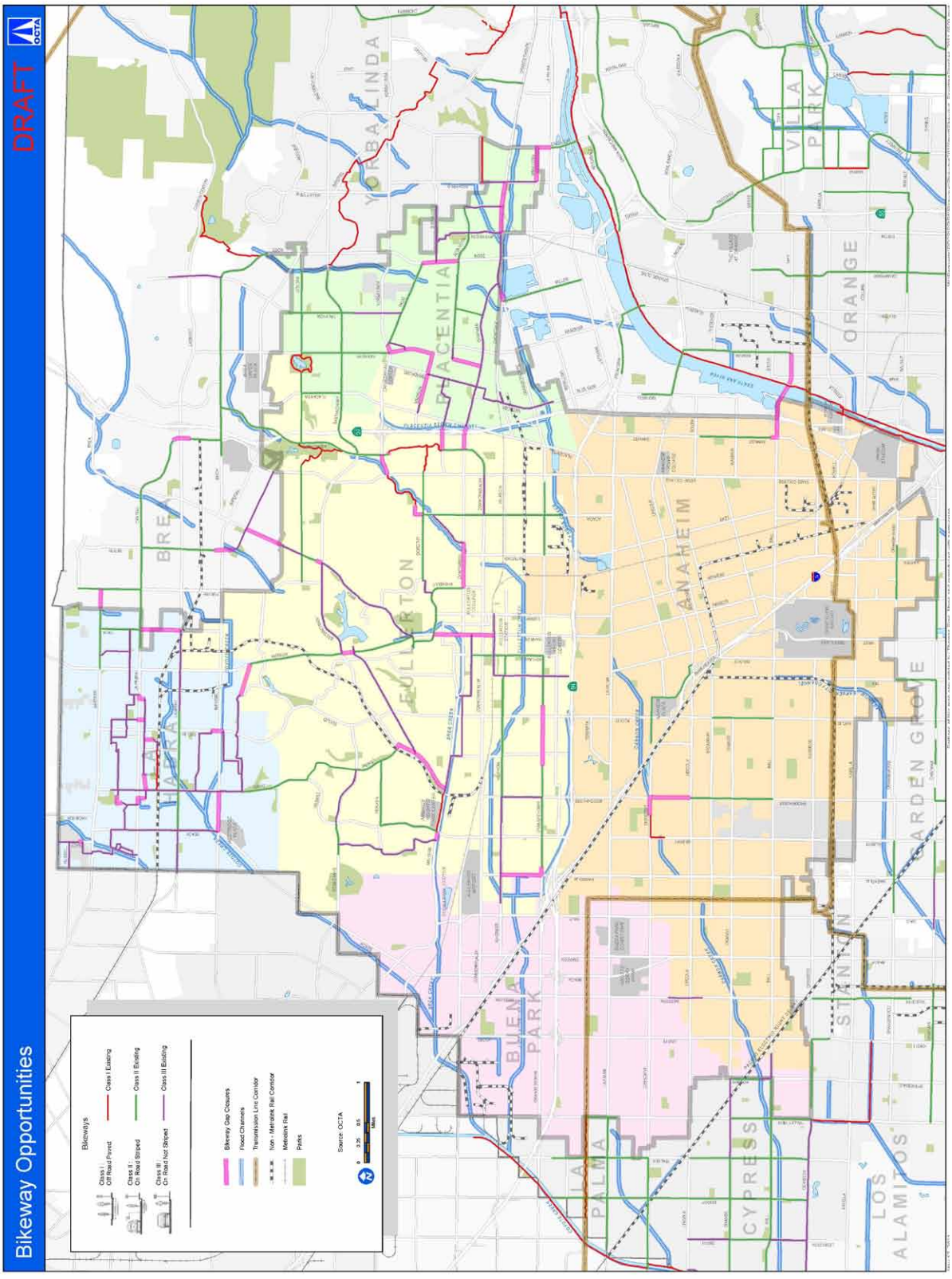


Figure A.1 – Bikeway Opportunities

Flood Channels

Flood channels are potentially a great opportunity and environment for implementing Class I bike paths. The Santa Ana River Trail in Orange County and Coyote Creek Trail in Los Angeles County are popular existing bike trails located along flood channels. Flood channels are generally wide enough to accommodate Class I bike paths, and are located away from vehicle traffic. Flood channels also provide continuous connections and linkages to other bicycle facilities and paths. There are currently six flood channels located in the Fourth District, including Coyote Creek, Brea Creek, Fullerton Creek, Carbon Creek, Placentia Storm Channel, and Carbon Canyon Channel.

Coyote Creek, Placentia Storm Channel, and Carbon Canyon provide north-south connections, while Brea Creek, Fullerton Creek, and Carbon Creek provide good east-west connections. All six channels have the potential to accommodate regional Class I bike paths.

Transmission Line Corridors

There is an existing Southern California Edison Transmission Line Corridor within the Fourth District that possesses sufficient width to accommodate a Class I bike path. The corridor provides east-west connection through the cities of Buena Park and Anaheim, with linkages to Coyote Creek and the Santa Ana River Trail. The Transmission Line is an excellent opportunity for a regional east-west Class I bike path. Coordination with Southern California Edison to gain access to the right-of-way, pavement construction, and safety issues related to the numerous at-grade crossings are challenges associated with this corridor.

Rail Corridors

Inactive rail corridors or rail corridors with limited activity within the Fourth District provide several options for potential bikeway implementation. Existing railroad corridors within the Fourth District include corridors owned by both the Union Pacific and Burlington Northern Santa Fe (BNSF) railroads. Opportunities include continuous connections between multiple cities, potential for a Class I bike path, and access to other regional bikeways. The Union Pacific rail corridor has been determined to provide the most potential, as certain portions of this corridor are inactive and several cities have been coordinating with the Union Pacific to acquire portions of the rail right-of-way.

A.2.2 Proximity to Existing Bikeways

Connections to the existing bikeway network not only help to make better use of existing public investments, these connections also improve the mobility of cyclists by increasing the distances that can be traveled and the destinations that can be accessed by bicycle. Figure A.2 highlights the proximity to the existing bicycle network within the Fourth District.

This map illustrates the excellent levels of access currently present in the northern portions of the District (in La Habra, Brea, and Fullerton), along with the challenges present in southern portions of the District. While there are differences in proximity and access to existing bikeway facilities highlighted in this graphic, the graphic also illustrates how a targeted improvement along a single corridor (for example La Palma Avenue or Brookhurst Street) would provide access from this corridor to the larger regional bikeway network.

A.3 Challenges

Implementing regional bikeways can be challenging on many levels, beginning from the planning phase and coordination between various jurisdictions to obtaining funding, acquiring right-of-way, and constructing improvements. The following section describes the challenges associated with implementing regional bikeways within the Fourth District. These major challenges are illustrated in Figure A.3.

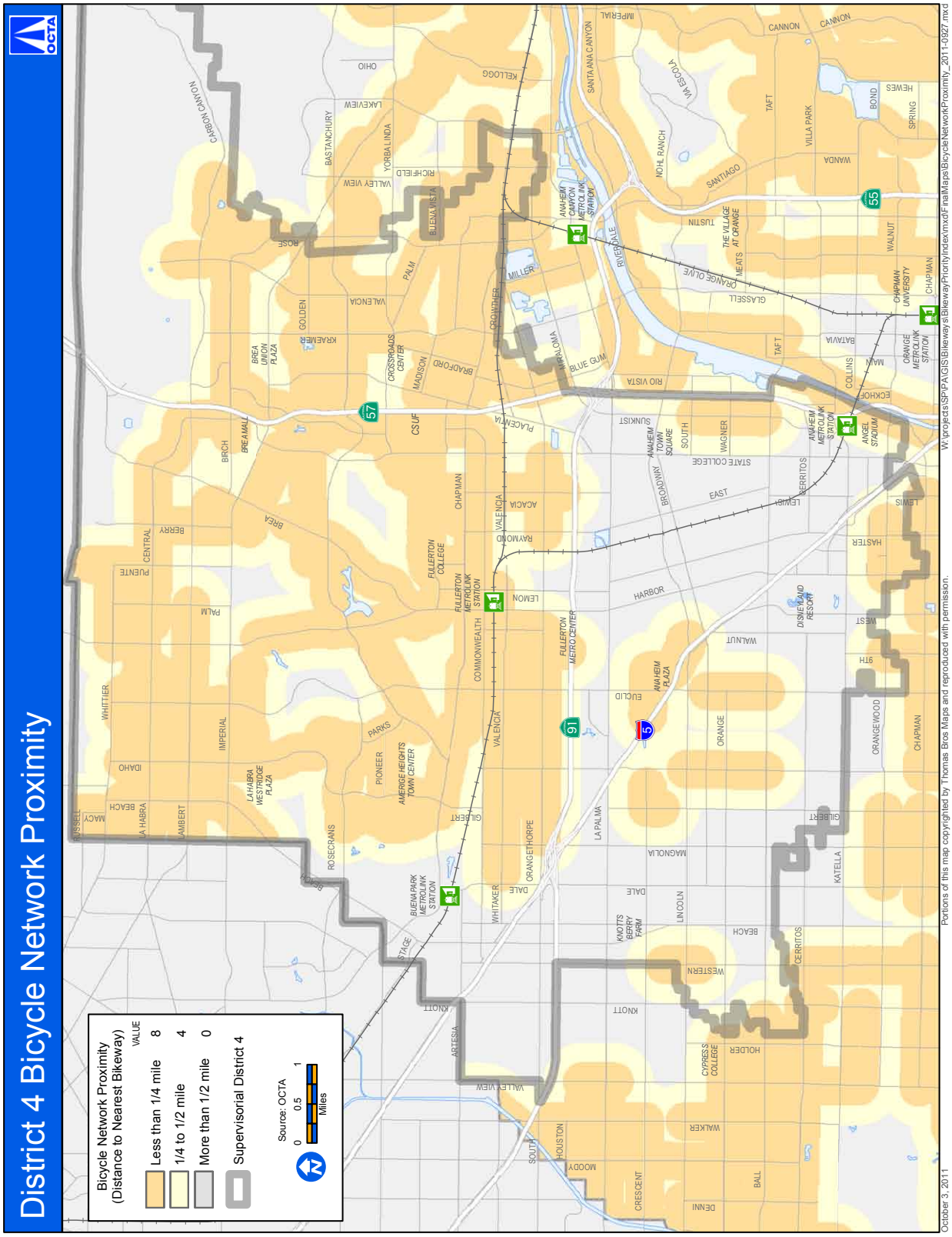


Figure A.2 – District 4 Bicycle Network Proximity

A.3.1 Agency Coordination

The proposed regional bikeways travel through various cities and in some cases, over county lines. Coordination between the cities is necessary for bikeway implementation to be successful. The purpose of this study is to bring together the cities in the Fourth District to develop strategy and implementation phasing for regional bikeway corridors. This is the first step, as future planning and cooperation will be needed to implement the proposed bikeways. In the future, issues such as maintenance and liability responsibilities must also be addressed for bikeways that cross multiple jurisdictions.

A.3.2 Acquiring Right-of-Way

The challenges associated with acquiring right-of-way include cost, availability, and coordination. Right-of-way acquisition ability is dependent on the amount of funding provided for a specific project. The availability of the right-of-way for implementing a bikeway is subject to the discretion of the owner of the right-of-way, and will require coordination between local jurisdictions and property owners. Several potential regional corridors are located within the Union Pacific rail right-of-way and would require coordination with the Union Pacific to determine the feasibility of right-of-way acquisition.

A.3.3 At-Grade Crossings

At-grade crossings along off-street bikeways present several challenges. There are currently multiple at-grade crossings along the proposed regional corridors. Appropriate crossing safety measures, including crosswalks, signage, signals, and potential grade separations should be considered at these crossings.

A.3.4 Freeway Ramp Crossings

Freeway on and off ramp crossings cause potential conflict for bicyclists; as cyclists must merge across travel lanes where vehicles are typically traveling at or near freeway speeds. Within the Fourth District, there are 36 locations where the 10 proposed regional bikeways would cross the Interstate 5 Freeway (I-5), State Route 57 Freeway (SR-57), and State Route 91 Freeway (SR-91). Options to improve conditions at freeway crossings include improved signage, striping, and other traffic control measures. Physical improvements, including roadway widening and grade separations may also be considered.

A.3.5 High Traffic Volume Corridors

High traffic volume roadways are typically major thoroughfares that provide direct, continuous connections to major destinations; however, they also typically experience higher levels of congestion and potentially expose cyclists to unsafe traffic conditions. Implementing bicycle corridors along high traffic volume corridors is beneficial in terms of providing connections to major activity centers, but the challenge lies in creating a safe environment for cyclists. Appropriate striping and signage is encouraged along these corridors to increase driver awareness of cyclists and to help guide cyclists to remain in area designated for bikeway use.

A.3.6 Steep Grades

Steep grades can pose a safety issue for cyclists and may also discourage less experienced cyclists from using a bike route. Bike paths with long, steep grades typically receive less use and are generally less attractive to the general public. The Caltrans Highway Design Manual recommends a maximum grade rate of five percent and where steep grades are necessary, the design should incorporate additional width to provide maneuverability.

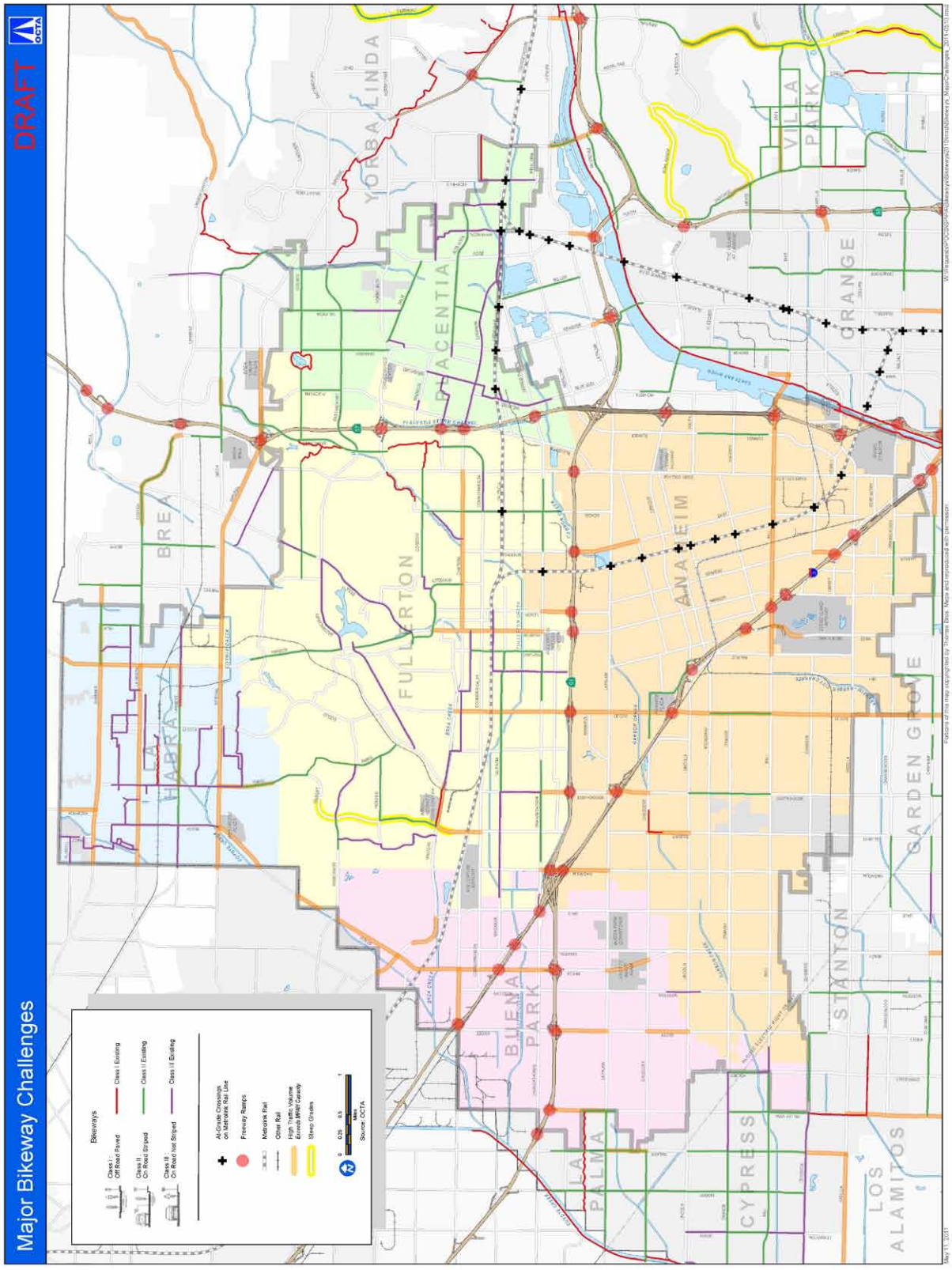


Figure A.3 – Major Bikeway Challenges

APPENDIX B. OCTA BICYCLE PRIORITY INDEX

OCTA developed a Geographic Information System (GIS) based bicycle propensity model (the Bicycle Priority Index) to assess the performance of the ten regional bikeway corridors relative to each other. This index incorporates a variety of inputs to identify areas that would be anticipated to have high levels of bicycling activity, and in this case, how of the proposed regional corridors would perform in terms of connecting and servicing these high activity areas.

The Bicycle Priority Index developed by OCTA was adapted from the Bikeway Suitability Model developed by KTU+A. OCTA adapted the base inputs and model assumptions provided by KTU+A for the Fourth District Bikeways Collaborative study effort. The index examines origins and destinations in order to estimate the potential relative demand for cycling that would be anticipated within portions of a designated study area. A brief summary of the inputs for category is summarized below:

- **Origins** – Origins are uses or destinations that are likely to attract cyclists, considering the attributes of the use, the proximity of the use to residential areas (cycling generators), and the accessibility of the use to cyclists in terms of land use, availability of bike facilities, etc. Origins include the following:

Factor	Max Value
Population Density (Base)	10
Population Growth (2035)	8
Population Density less than 18 Years Old (US Census ACS)	8
Land-Use Mix	8
Bicycle to Work (US Census ACS)	8
Bicycle Network Proximity (Existing)	8

- **Destinations** – This input considers areas with greater employment densities located in close proximity to the cycling origins above that would likely generate a greater number of cycling trips than those areas that might be located further away from their origins or have lower population and employment densities.

Factor	Max Value
Employment Density (Base)	8
Employment Growth (2035)	8
Universities / College (enrollment)	8
Metrolink Rail Stations (AM alightings)	8
Schools (Elementary, Middle, High Schools)	8
Parks, Local Retail / Public Services	4
Bus Stops (PM trips)	6

Key elements of the inputs to the Bicycle Priority Index are summarized in this Appendix.

B.1 Population

Figure B.1 illustrates population density within the Fourth District. Higher population densities are observed in the following areas:

- **Anaheim** – Downtown Anaheim and vicinity; West Anaheim, particularly along Lincoln Avenue and Ball Road corridors
- **Brea** – Densities are generally higher near the Brea Mall and Downtown Brea areas
- **Buena Park** – Areas surrounding the Buena Park Metrolink station
- **Fullerton** – Near Downtown and to the west of Downtown
- **La Habra** – Central La Habra, particularly along La Habra Boulevard
- **Placentia** – Areas immediately east of State Route 57 and along the Chapman Avenue corridor

Areas with higher population density within the Fourth District correlate well with the proposed regional bikeway corridors. Many of the areas noted in the bullets above are served by more than one potential regional bikeway corridor.

B.2 Employment

Employment density is shown in Figure B.2. The following areas are observed to have higher levels of employment density:

- **Anaheim** – Downtown Anaheim and vicinity; the Anaheim Resort area; Platinum Triangle; and Anaheim Canyon areas
- **Brea** – Brea Mall and Downtown Brea
- **Buena Park** – The Entertainment District and Orangethorpe corridor are key employment areas
- **Fullerton** – Cal State Fullerton and Fullerton College are key employment areas, along with the Orangethorpe corridor between Lemon and Placentia
- **La Habra** – Densities are highest near the intersection of Beach Boulevard and Imperial Highway
- **Placentia** – Yorba Linda Boulevard has high employment densities within the city

There is significant overlap between areas with high observed employment densities and proposed regional bikeways in the Fourth District. OCTA has recognized the important role cycling trips can fulfill within the overall regional goal to reduce vehicle miles traveled and auto trips. All areas identified in the Fourth District with an employment density over 20,000 employees per square mile are served by at least one of the proposed regional bikeway corridors.

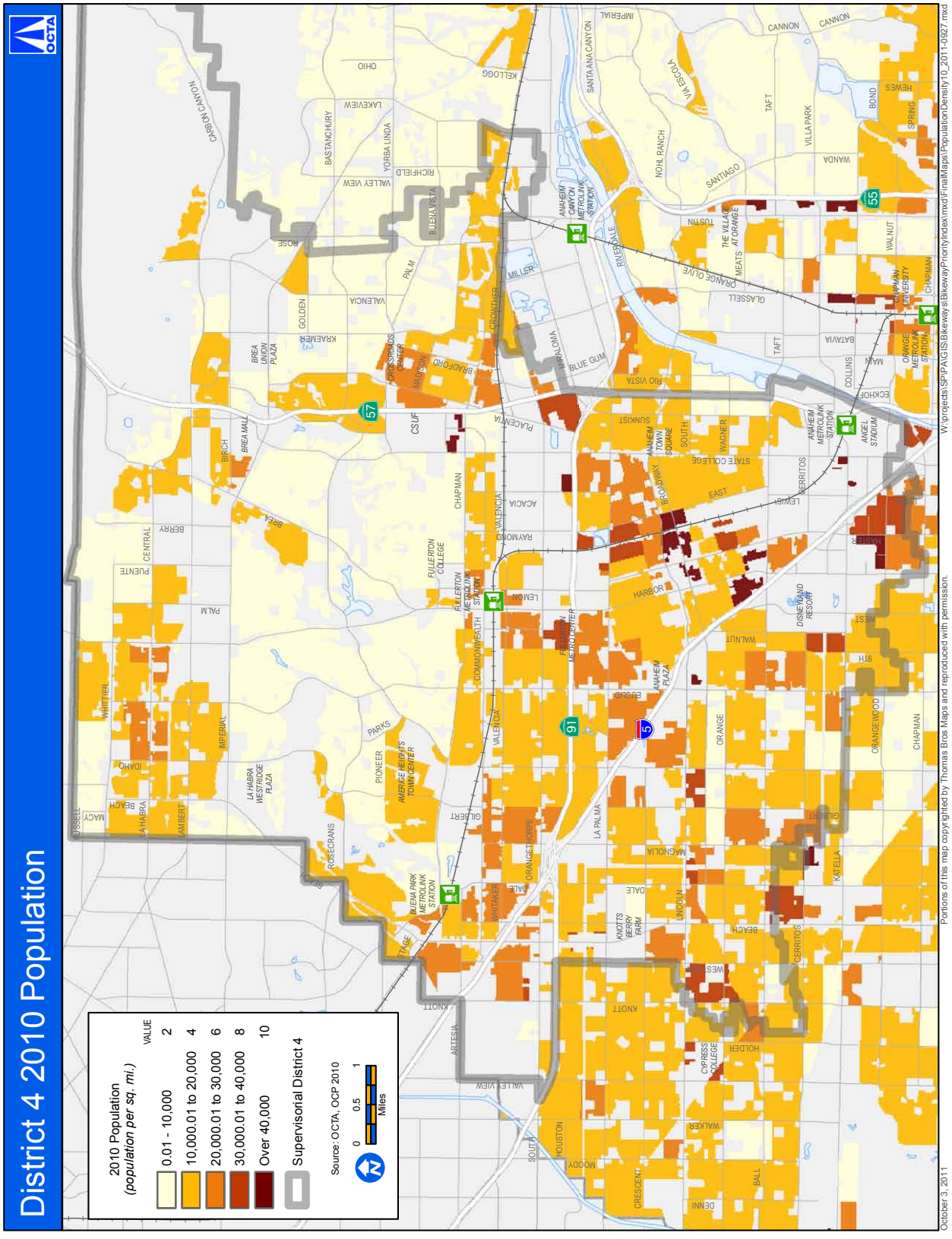


Figure B.1 – District 4 2010 Population Density

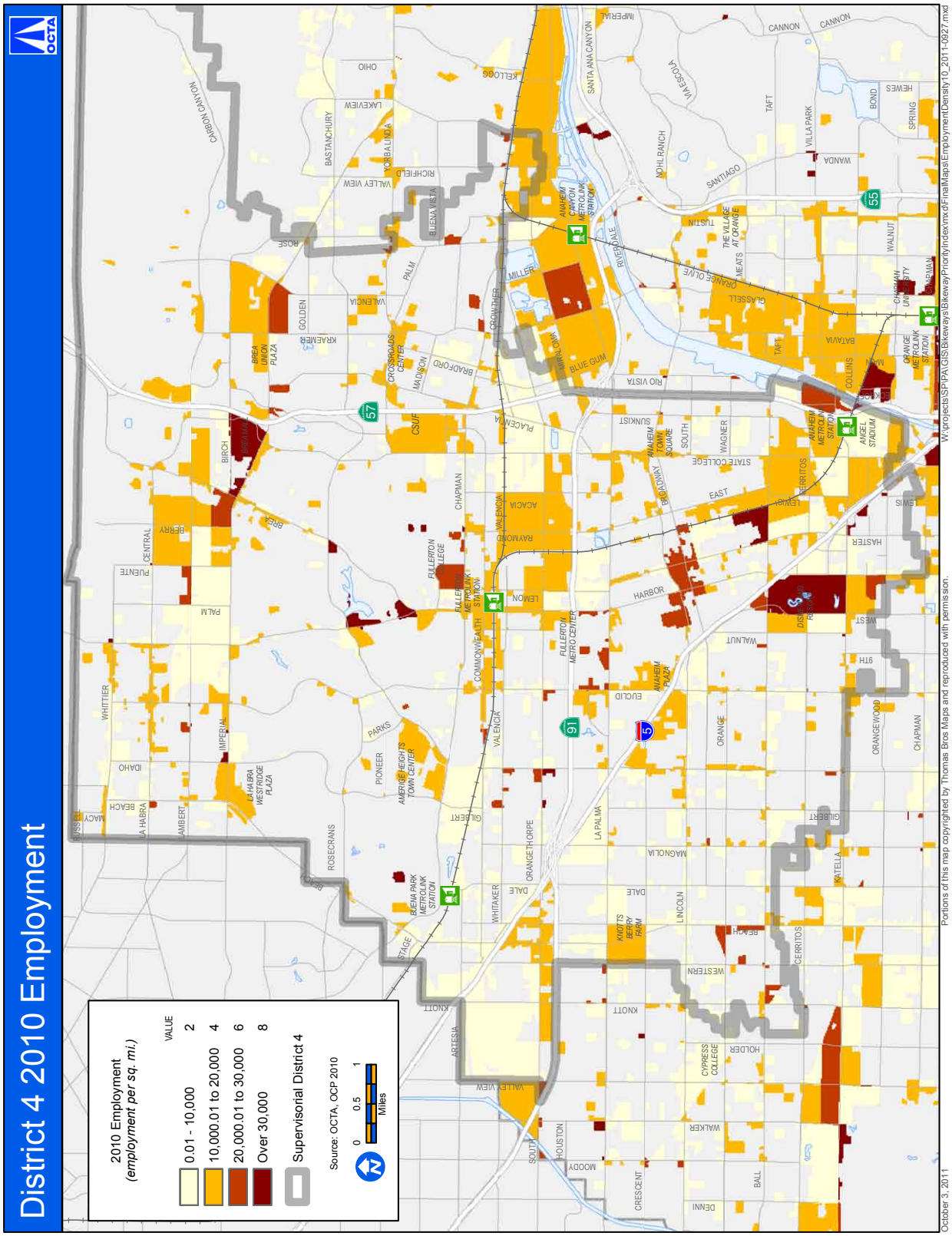


Figure B.2 – District 4 2010 Employment Density

B.3 Bicycle to Work Trips

Building on the population and employment density data, the analysis also examined information available from OCTA and the United States Census American Community Survey to identify areas with high rates of bicycle to work trips within the Fourth District. Figure B.3 illustrates this information.

In examining this data, several observations can be highlighted:

- Several areas in Anaheim show high numbers of bicycle commute trips. Observed areas include residential neighborhoods around the Anaheim Resort area, in West Anaheim along Orange Avenue, and in Central Anaheim along Anaheim Boulevard and La Palma Avenue.
- As would be expected, residential areas around Cal State Fullerton show high bicycle to work trips. It would be anticipated that there are also high numbers of bicycle to school trips in this area.
- High numbers of bicycle commute trips are observed in La Habra, particularly along the Idaho Street and Euclid Street corridors.
- Within Buena Park, residential areas north of Orangethorpe Avenue generate high numbers of bicycle commute trips.

This existing data on bicycle commute trip origins is helpful in identifying corridors that would be best suited to serving bicycle commuters. These corridors would typically include Class II on-street corridors that would provide connections to employment centers. The data highlight potentially important commute trip connections along Orangethorpe Avenue, Euclid Street, La Palma Avenue, Ball Road, and Anaheim Boulevard.

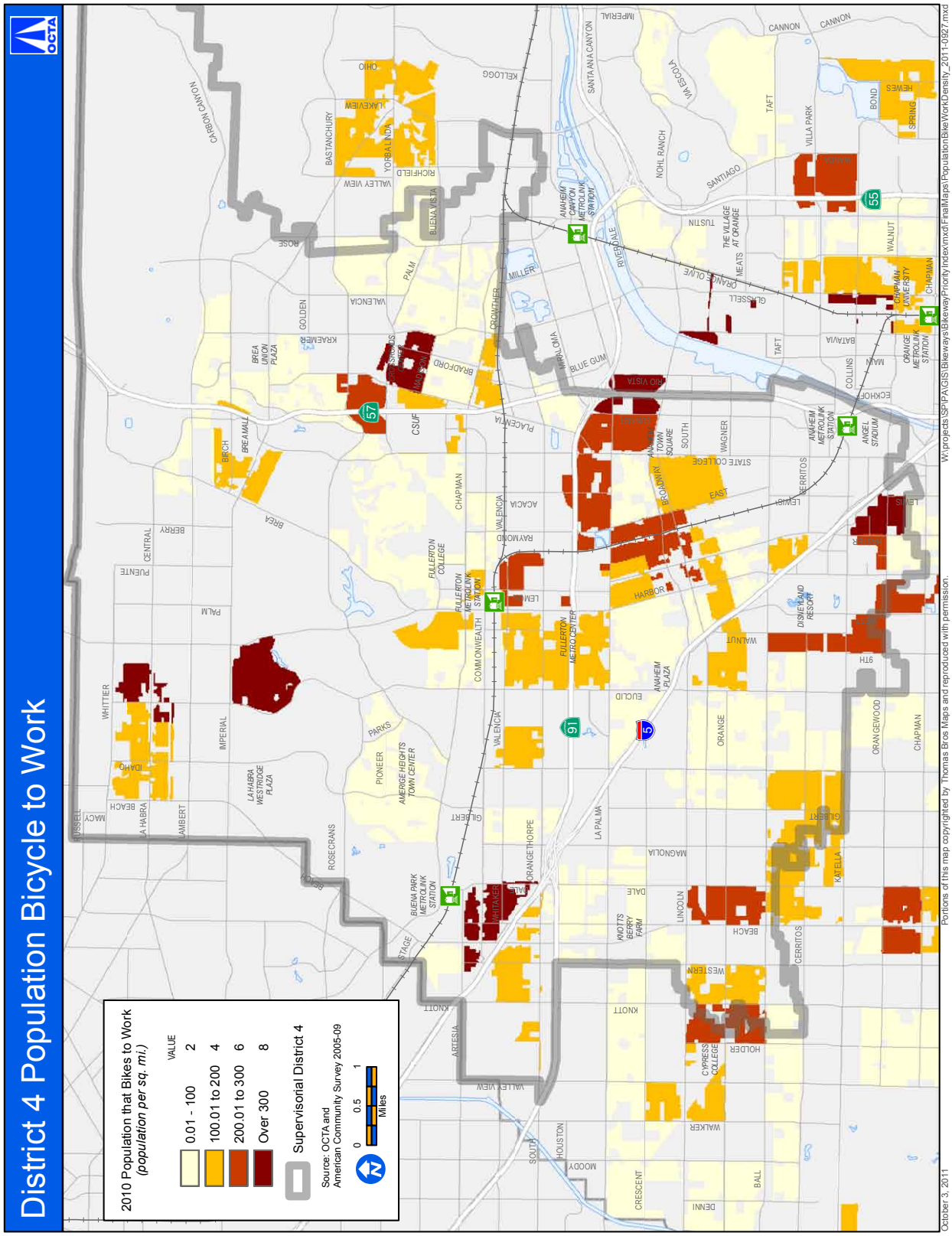


Figure B.3 – District 4 Population Bicycle to Work

B.4 Origin-Destination

OCTA staff analyzed the demographic information summarized above to identify areas within the Fourth District that would be anticipated to have higher than typical bicycle trip origins and destinations. These areas are forecast to generate and/or attract a higher number of bicycle trips, based on a variety of factors (density, existing commute trip patterns, access to bikeways, etc). Figure B.4 illustrates the results of this analysis and includes an overlay of a ¼ mile buffer around each of the ten proposed regional bikeway corridors.

Key areas for bicycle trip origins and destinations by city include the following:

- **Anaheim** – Anaheim Canyon, Anaheim Resort, Platinum Triangle, Downtown Anaheim
- **Brea** – Brea Mall and Downtown Brea areas
- **Buena Park** – Stanton Avenue and Orangethorpe Avenue corridors
- **Fullerton** – Downtown Fullerton, the Orangethorpe Avenue corridor, and Cal State Fullerton
- **La Habra** – Central La Habra, particularly along the Union Pacific right-of-way
- **Placentia** – Residential areas east of Cal State Fullerton and State Route 57

Screened back within Figure B.4 are areas with high forecast bicycle trip origins and destinations outside of the ¼ mile buffer around the regional bikeway corridors. These areas include central Placentia, the Platinum Triangle in Anaheim, and areas within Buena Park, La Habra and Brea. These forecasts highlight the importance of local bikeway connections in addition to the regional corridors, allowing more cyclists to complete their desired trips along an established bicycle facility.

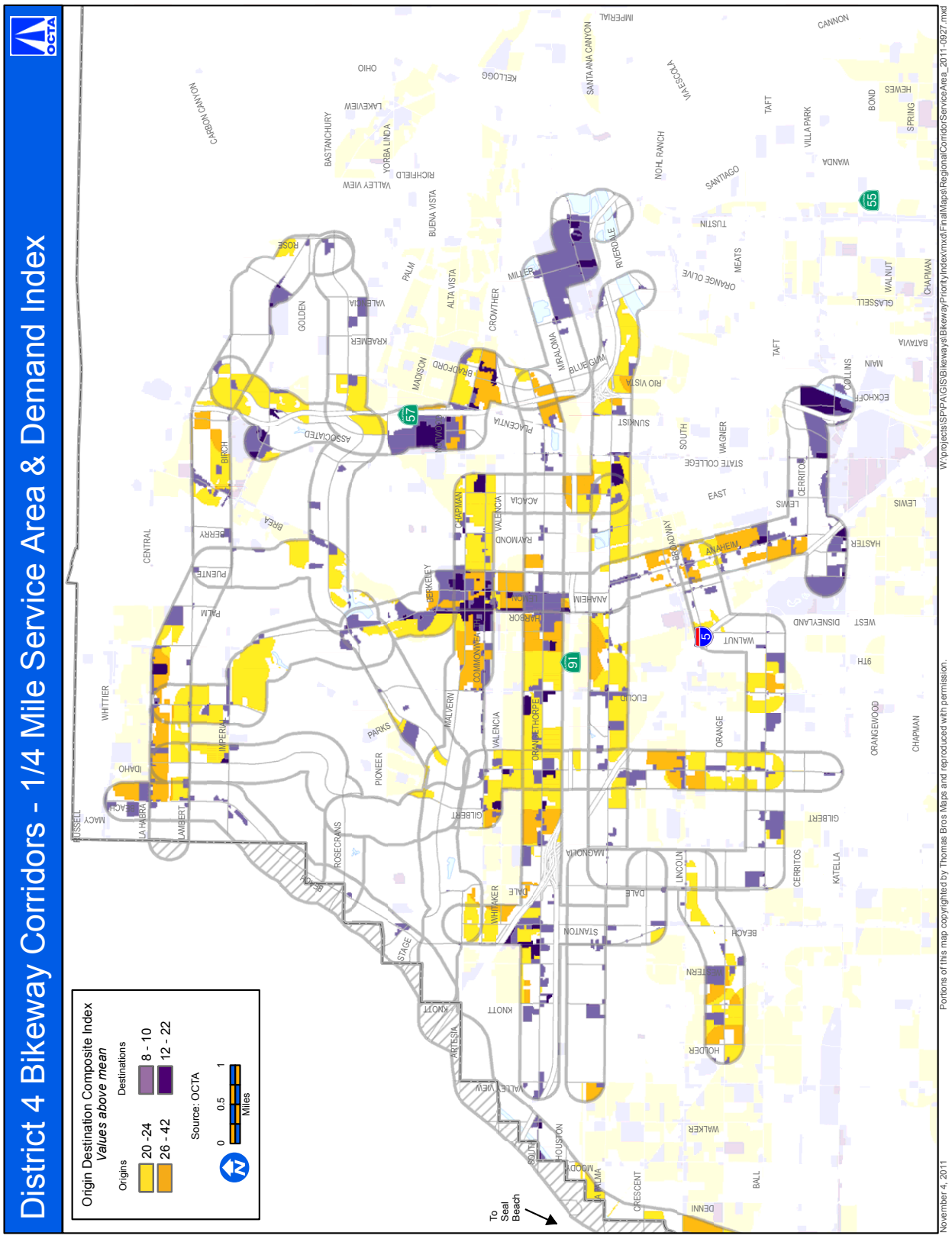


Figure B.4 – District 4 Bikeway Corridors – ¼ Mile Service Area and Demand Index

APPENDIX C. FACILITATION EFFORTS

Facilitation and outreach to the public, bicycle advocates, cities in the Fourth District, and the County of Orange was an integral part of the Collaborative effort. The facilitation effort was conducted throughout the duration of this study, with a specific focus on providing information to and receiving input from the study stakeholders all through the process. The recommendations and action plan outlined in this report reflect the input received throughout the study.

Facilitation efforts for the Fourth District Bikeways Collaborative included Summits hosted by Supervisor Nelson, a stakeholder roundtable session, a public open house, and meetings with city staff. Each event was designed to provide a forum for sharing information regional bikeway corridors, while receiving valuable input regarding bikeway alignments, opportunities, constraints, and preferences for focus corridors. The various facilitation efforts are described in greater detail below.

C.1 Fourth District Bikeway Summits

Three bikeway Summits were conducted during the course of this study, with the objective of bringing together key stakeholders that would be responsible for identifying, planning, supporting, and implementing bikeways within the Fourth District. Participants in the Summits included city staff, County staff, OCTA staff, bicycle advocates, and staff from potential funding agencies such as the South Coast Air Quality Management District (AQMD). Each Summit was hosted by Supervisor Nelson.

The Summits provided valuable input to the study effort and direction for the consultant team and OCTA staff. The initial two Summits helped to develop and finalize the ten regional bikeway corridors. The third Summit focused on the finalizing the recommendation of the three “Focus Corridors”, while also establishing a process for continued coordination among the participants in the Collaborative.

A brief summary of each Summit is provided below.

C.2.1 Summit #1

The first Summit meeting was held on Tuesday, April 26, 2011 at the OCTA administrative offices. This meeting served as an introduction to the Collaborative for study stakeholders. Supervisor Shawn Nelson shared his interest in advancing and promoting the implementation of bikeway projects in the Fourth District. OCTA staff provided background on bikeways planning in Orange County, including an overview of the roles and responsibilities of local jurisdictions and OCTA, existing and planned bikeways countywide and in the Fourth District, and opportunities and challenges associated with expanding the bikeways network. The meeting was then opened for discussion between stakeholders to identify the study goals and objectives, opportunities and challenges, and potential bikeway corridors to consider for implementation.

C.2.2 Summit #2

The second Summit was held on Wednesday, June 29, 2011 at the OCTA administrative offices. The objective of this meeting was to present the initial six regional bikeway corridors developed through the technical meetings with city staff, and to solicit comments and feedback from study stakeholders. Comments received from the stakeholders regarding the six initial study corridors included the following:

Orangethorpe Corridor

The Orangethorpe corridor provides a good east-west link across the district. There were questions about the design effort currently underway for a grade separation on Orangethorpe Avenue along the Los Angeles to San Diego (LOSSAN) rail corridor and whether the conceptual design incorporates room for an on-street bikeway. The City of Anaheim's street standards call for a wide curb-lane that would be sufficient to accommodate a striped bike lane. Suggestions were also made to extend this corridor through Placentia to connect to the Anaheim Canyon Metrolink Station or the proposed Placentia Metrolink Station.

Coyote Creek Corridor

The Coyote Creek corridor was highlighted as an important regional connection. A connection to the Coyote Creek corridor via the Brea Creek Channel was suggested. Parts of the Coyote Creek corridor are located in Los Angeles County, so coordination with La Mirada would be required.

Edison Transmission Line Corridor

The Edison Transmission corridor was cited as a good east-west link, but the presence of at-grade street crossings along this corridor could make the route less attractive to commuter cyclists. Other challenges could include traversing the Anaheim Resort Area.

Union Pacific ROW Corridor

The Union Pacific ROW corridor should extend all the way to the Orange County line in order to link to planned bikeways in Whittier. A potential connection then exists to the proposed Metro Gold Line light rail. A connection to Placentia on the east is also desirable.

Attendees at Summit #2 also expressed an interest in seeing additional corridors added to the initial six regional corridors identified in the city technical meetings. There was specific interest in identifying more north-south corridors and additional on-street corridors that would serve commuter cyclists. This input led directly to the identification of additional corridors.

C.2.3 Summit #3

The third Summit meeting was held on Wednesday, October 19, 2011 at the OCTA administrative offices to present the results of the technical analysis and evaluation of the ten regional bikeway corridors. The objective of this meeting was to obtain consensus on the corridors selected to be the "Focus Corridors" that would move forward for near-term pursuit of funding opportunities and implementation.

Discussion at the meeting was centered on the number of bikeway corridors to include in the "focus" group. Attendees reached consensus on including three corridors in the "Focus Corridor" tier and pursuing funding and implementation of projects along all three corridors in the near-term horizon.

C.2 Stakeholder Roundtable

The Stakeholder Roundtable was held on Wednesday, July 20 at the Anaheim Sunkist Branch Library. Over 30 participants were present to discuss the proposed regional bikeway corridors. The invitation for this Stakeholder Roundtable is shown in Figure C.1. An overview of the study schedule and potential regional corridors were presented to the attendees. Discussion among the stakeholders included:

- Railroad corridors generally have fewer at-grade street crossings, and should be encouraged for consideration as locations for Class I bike routes.
- Lower-volume "collector" streets should be considered for bicycle facilities, as these streets are more inviting to bicyclists in terms of scale and speed of the roadway.
- Major arterial streets should also include bikeways, as these roadways typically offer more direct paths and faster travel time for cyclists.
- Perhaps look at a combination of major and collector arterials to implement bikeways, with one being suitable for cyclists that are comfortable on high speed and high volume corridors and the other for cyclists who want to use low traffic and lower speed streets.
- Unprotected at-grade crossings along off-street bikeways are not practical. Should have grade separations where possible. At-grade crossings should have crossing lights, bicycle detectors, etc.
- More information should also be made available to cyclists in the form of signage for routes, as well as maps and information online.
- The Union Pacific ROW corridor is a great opportunity to connect major bikeways in North Orange County. The Santa Ana River Trail and San Gabriel River Trail provide great regional bike trails, but are currently not connected. The Union Pacific ROW corridor can provide linkages between these trails and provide better access between other regional bicycle routes. It would also provide a connection to the Whittier Greenway Trail, which currently does not connect to La Habra.
- The proposed Coyote Creek Trail is a great potential bike trail. Both Orange and Los Angeles counties need to work together on planning for this trail.
- A connection to Coyote Creek via Malvern and Brea Creek Channel would be good. Bastanchury Road is a great east-west corridor for consideration.
- Additional consideration should be given to providing better connections between Downtown Fullerton and Cal State Fullerton.
- There was discussion about placing bike trails within dry flood control channels. An existing example of this approach occurs in the Peters Canyon Trail in Irvine at the I-5 freeway. This concept is possible, but there are safety, floodway capacity, and other design considerations that must be evaluated in order to determine feasibility in a specific location.
- Future bikeways should focus on quality of the facility and amenities. Several older bikeways do not provide well paved routes and at times feel unsafe. Enhancements to existing bicycle amenities would be good as well.

- Bikeways on streets such as Euclid Street and Brookhurst Street are discontinuous; certain segments have bike lanes, while certain segments only have signage. Continuity of bike lanes is important. Should consider providing striping for bikeways when streets are resurfaced.
- Imperial Highway used to provide great east-west access. However, part of the highway has been converted to a freeway. Look at ways to continue allowing bicyclists to ride on shoulder of the freeway portion as there is not convenient alternative route.
- While bikeways are the focus of the study, future planning should consider accommodating pedestrian needs as well. Utility poles and signage should not be placed in the middle of sidewalks.

C.3 "Open House"

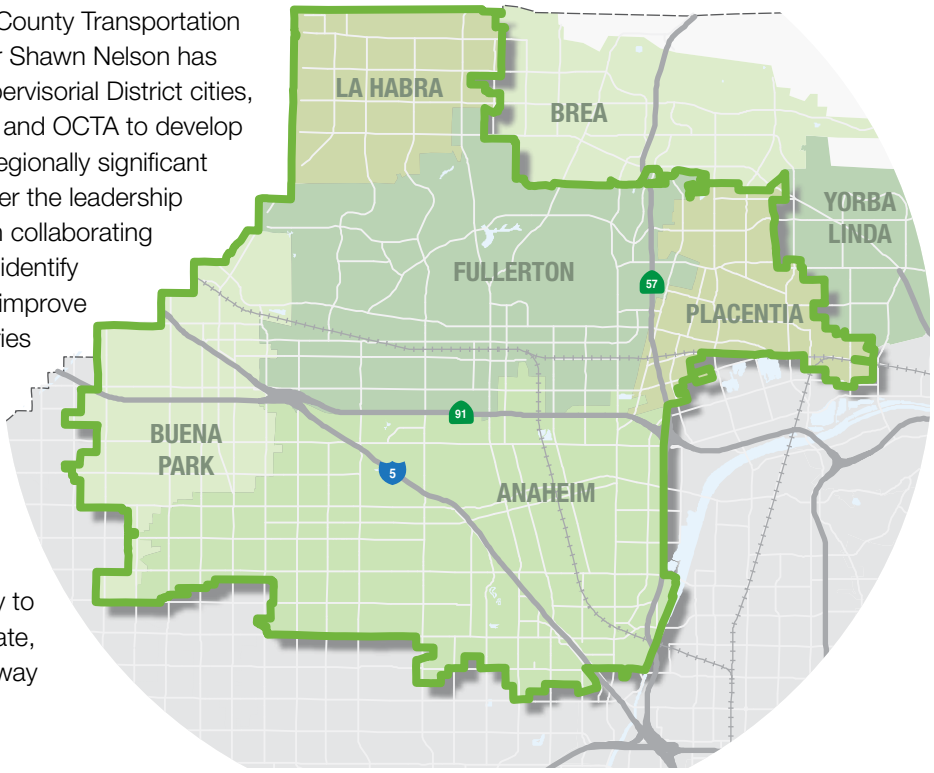
An "Open House" was held on Saturday, August 27, 2011 in Downtown Fullerton to meet with local cyclists and provide an opportunity for discussion and comments. The invitation for this open house is shown in Figure C.2. The meeting was scheduled between 9:30 AM to 10:30 AM at the meeting location of Team Velocity, a local bicycle club that meets every Saturday to cycle. There were over 100 participants at the "Open House," including Team Velocity members and local residents who provided comment and feedback on preferred routes. A short survey was also distributed at the event, asking attendees to identify their preferred or "favorite" regional corridors and their preferences for future bikeway improvements.

Figure C.1 – Stakeholder Roundtable Flyer

Fourth Supervisorial District Bikeways Collaborative

County Supervisor and Orange County Transportation Authority (OCTA) Board Member Shawn Nelson has brought together the Fourth Supervisorial District cities, the County of Orange, Caltrans, and OCTA to develop an implementation strategy for regionally significant bikeways. These agencies, under the leadership of Supervisor Nelson, have been collaborating over the past several months to identify potential bikeway corridors that improve connectivity across city boundaries for bicyclists.

As a stakeholder in the local community, your opinion is very valuable in this effort. A roundtable session is scheduled to provide you and other stakeholders with an opportunity to review the work completed to date, and to share your ideas for bikeway priorities within the study area.



Location and Time:

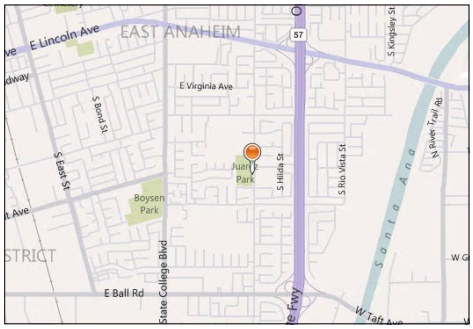
July 20, 2011
4:30 PM to 5:30 PM

Sunkist Branch Library
901 South Sunkist
Anaheim, CA 92806

Directions:

From SR-57 North:
Exit Ball Road and turn left
Right on Sunkist Street
Library and parking on the left

From SR-57 South:
Exit Lincoln Avenue and turn right
Left on Sunkist Street
Library and parking on the right



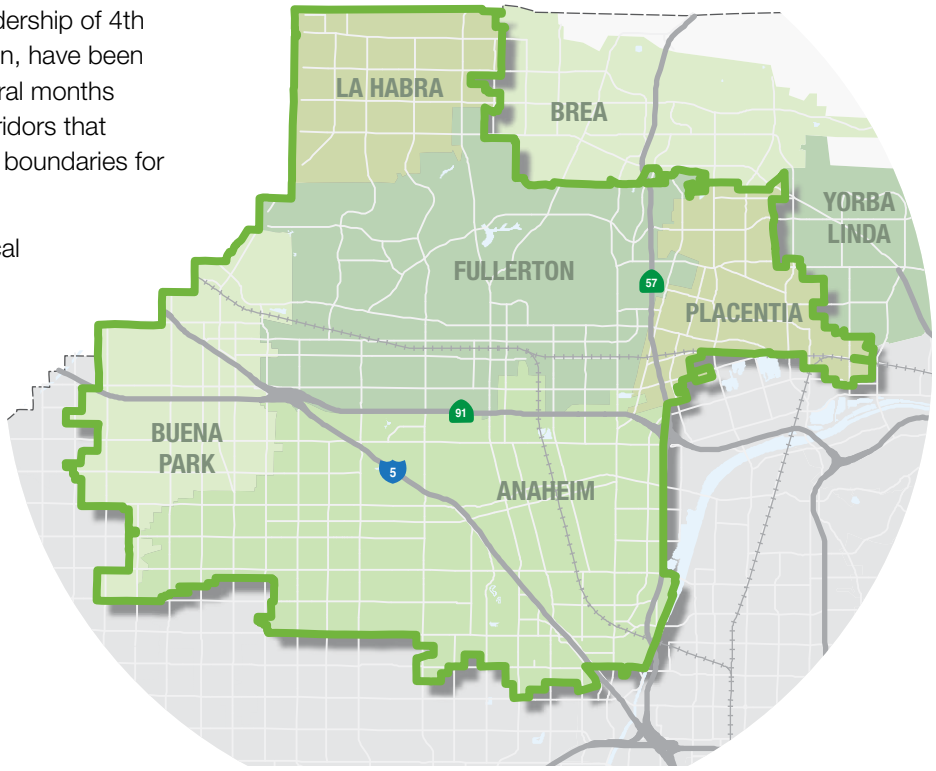
RSVP to Carolyn Mamaradlo
cmamaradlo@octa.net
714-560-5748

Figure C.2 – "Open House" Flyer

Fourth Supervisorial District Bikeways Collaborative Open House

Several agencies, under the leadership of 4th District Supervisor Shawn Nelson, have been collaborating over the past several months to identify potential bikeway corridors that improve connectivity across city boundaries for bicyclists.

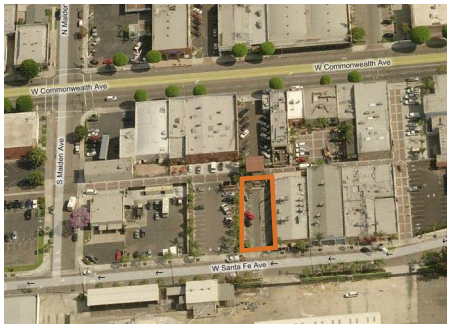
As a resident or cyclist in the local community, your opinion is very valuable in this effort. An "Open House" session is scheduled following Fullerton's Team Velocity Ride. Please join us to review the work completed to date, and to share your ideas for bikeway priorities within the study area.

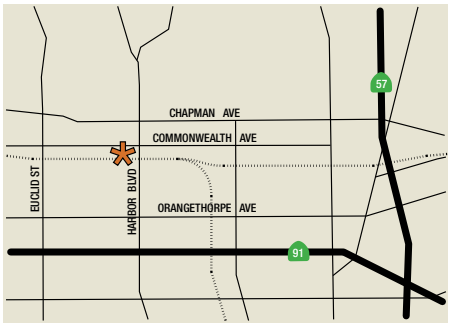


Location and Time:

August 27, 2011
9:30 AM to 10:30 AM

SOCO Walk
Public Parking Lot
125 W. Santa Fe Avenue
Fullerton, CA 92832





Questions? Contact Carolyn Mamaradlo
cmamaradlo@octa.net
714-560-5748

C.4 City Meetings and Coordination

Meetings with Planning, Traffic, and Public Works staff from the Fourth District cities were an essential element of this study, providing the opportunity for cities to provide input into the proposed regional corridors and to discuss implementation and phasing of individual projects. A series of three technical meetings were conducted with staff members from each of the Fourth District cities, the County of Orange, and the City of Yorba Linda. Each session focused on a sub-area of the Fourth Supervisorial District. The objective of each of the technical meetings is outlined below:

Technical Meeting #1: This meeting was conducted in May 2011, kicking off the collaborative process. The meeting agenda focused on discussing current bikeway planning and implementation efforts, and beginning the process for identifying potential regional corridors.

Technical Meeting #2: This meeting occurred in October 2011, and provided a summary of the stakeholder and public outreach efforts, as well as an overview of the technical analysis and evaluation of the proposed regional corridors.

Technical Meeting #3: This meeting was conducted at the end of November 2011 to review the final report and recommendations for the focus corridors and regional bikeway corridors.

The larger technical meetings were supplemented with additional sub-area focus meetings that involved a smaller sub-set of cities to focus in on particular corridors, segments, and connections between cities. This sub-set of meetings was conducted in May and June of 2011, early in the Collaborative process, so that this input could serve as the foundation for the development of the regional bikeway corridors. Cities participating in each session are summarized in Table 4-1.

Table C-1 – Sub-Area Meeting City Attendees

Agency	Session #1	Session #2	Session #3
Anaheim	•	•	
Brea			•
Buena Park	•		
Fullerton	•	•	
La Habra	•		
Placentia		•	
Yorba Linda			•
County of Orange	•	•	

C.5 Open House and Online Survey

A short survey was developed to obtain feedback on cyclists' priorities and preferences. This survey included multiple choice questions, ranking questions, and open-ended questions. The survey was distributed at the "Open House" and also made available online using the online survey operator Survey Monkey. The online survey was available over a three week period between August 30, 2011 and September 19, 2011. Notice of the survey availability was distributed through the following methods:

- OCTA website
- Stakeholder email lists

A total of 108 survey responses were received, including 52 mail-in surveys distributed at the Open House and 56 surveys collected online. A brief summary of the survey results is provided on the following pages. The responses from the mail-in and online surveys were combined for this analysis. The survey is shown in Figure C.3.

Figure C.3 – Survey

Open House Survey

1. How often do you ride your bicycle?

- ◯ 4+ days a week
- ◯ 2-3 days a week
- ◯ Once a week
- ◯ Less than once a week

2. Why do you ride your bicycle *(check all that apply)?*

- ◯ Exercise/training
- ◯ Recreation
- ◯ Commuting

3. Do you prefer to ride?

- ◯ On the street – with either a striped bike lane, a signed bike route, or on a bicycle boulevard
- ◯ Off street – on a paved bicycle path

4. What types of streets are you comfortable riding on *(check all that apply)?*

- ◯ Multi-lane arterial streets with a speed limit over 35 mph and no bike lane
- ◯ Multi-lane arterial streets with a speed limit over 35 mph and with bike lane
- ◯ Local streets with a speed limit below 35 mph
- ◯ Residential streets

5. Please rank the proposed priority corridors in order of preference *(1 being first, 10 being last):*

- ☐ Coyote Creek Trail
- ☐ Union Pacific ROW Trail
- ☐ Rosecrans-Fullerton-Santa Ana River Corridor
- ☐ Fullerton Station Corridor
- ☐ Brookhurst-Gilbert Corridor
- ☐ Brea Creek-Bastanchury Corridor
- ☐ Orangethorpe Corridor
- ☐ Orange-La Palma Corridor
- ☐ Brea Mall-CSUF-Santa Ana River Trail
- ☐ Edison Transmission Line Corridor

6. For the corridor you ranked as your top priority, please identify why you consider this your top priority:

_____

_____

_____

7. What destinations would you consider important to be accessible by bike *(check all that apply)?*

- ◯ Cal State Fullerton
- ◯ Brea Mall
- ◯ Fullerton College
- ◯ Knott's Berry Farm/Buena Park Entertainment District
- ◯ Buena Park Metrolink Station
- ◯ Fullerton Metrolink Station
- ◯ Anaheim Metrolink Station
- ◯ The Anaheim Resort
- ◯ Anaheim Stadium/Honda Center
- ◯ Santa Ana River Trail
- ◯ San Gabriel River Trail
- ◯ Chino Hills State Park
- ◯ St. Jude Medical Center
- ◯ Other _____

8. Other comments: _____

_____

_____

_____

_____

_____

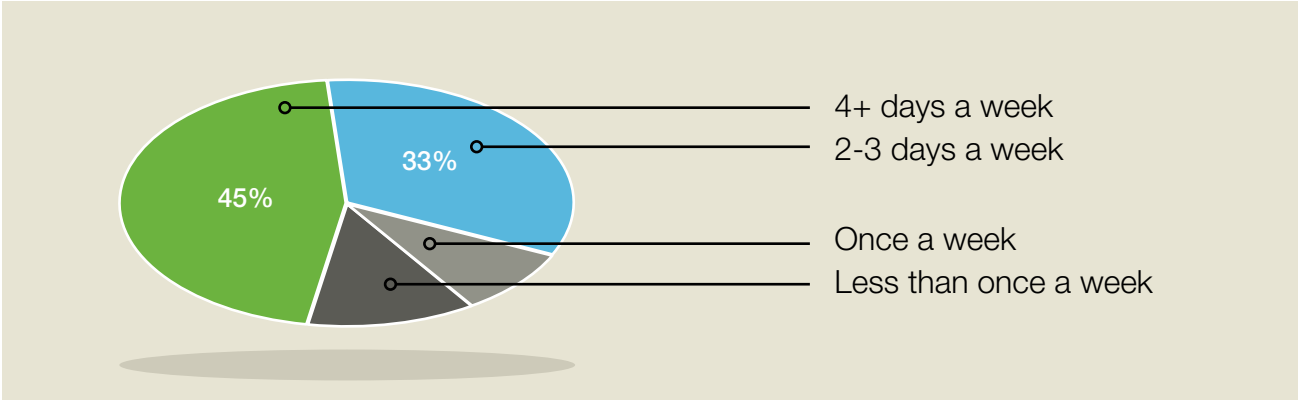
_____

_____

C.5.1 Cycling Frequency (Question 1 – How often do you ride your bicycle?)

Survey participants were asked to select one of four options regarding how often they ride their bicycle. The options included: 1) 4+ days a week, 2) 2-3 days a week, 3) once a week, and 4) less than once a week. The results show that a substantial number of survey participants cycle frequently, with 45 percent cycling 4+ days a week and 33 percent cycling 2-3 days a week. Twenty-one percent of surveyed participants cycle once a week or less. Table C-2 illustrates the cycling frequency of surveyed passengers.

Table C-2 – Cycling Frequency



C.5.2 Cycling Purpose (Question 2 – Why do you Ride your bicycle?)

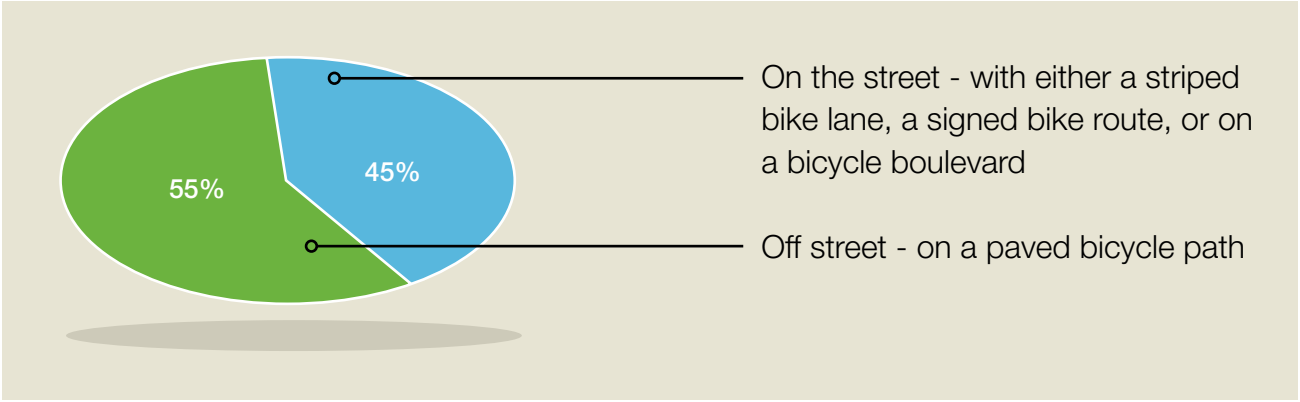
To obtain a better understanding of cycling purposes, surveyed participants were asked to identity their primary cycling purpose. The results show that surveyed participants primarily cycle for exercise or training purposes (80 percent), followed by recreational purposes (65 percent), and lastly commuting purposes (51 percent). Table C-3 summarizes the distribution of cycling purposes.

Table C-3 – Cycling Purpose

C.5.3 On-Street vs. Off-Street Cycling (Question 3 – Where do you prefer to ride?)

Surveyed participants were asked to identify whether they prefer to cycle on bicycle facilities located on-street or off-street. On-street bicycle facilities include striped bike lanes, signed bike routes, or a bicycle boulevard while off-street facilities include a paved bicycle path located on a separate right-of-way. The majority of surveyed participants indicated they prefer to ride their bike on an off-street paved bicycle facility (55 percent), while 45 percent of surveyed participants indicated they would prefer on-street bicycle facilities. Table C-4 illustrates the distribution of cycling preferences of on-street versus off-street bicycle facilities.

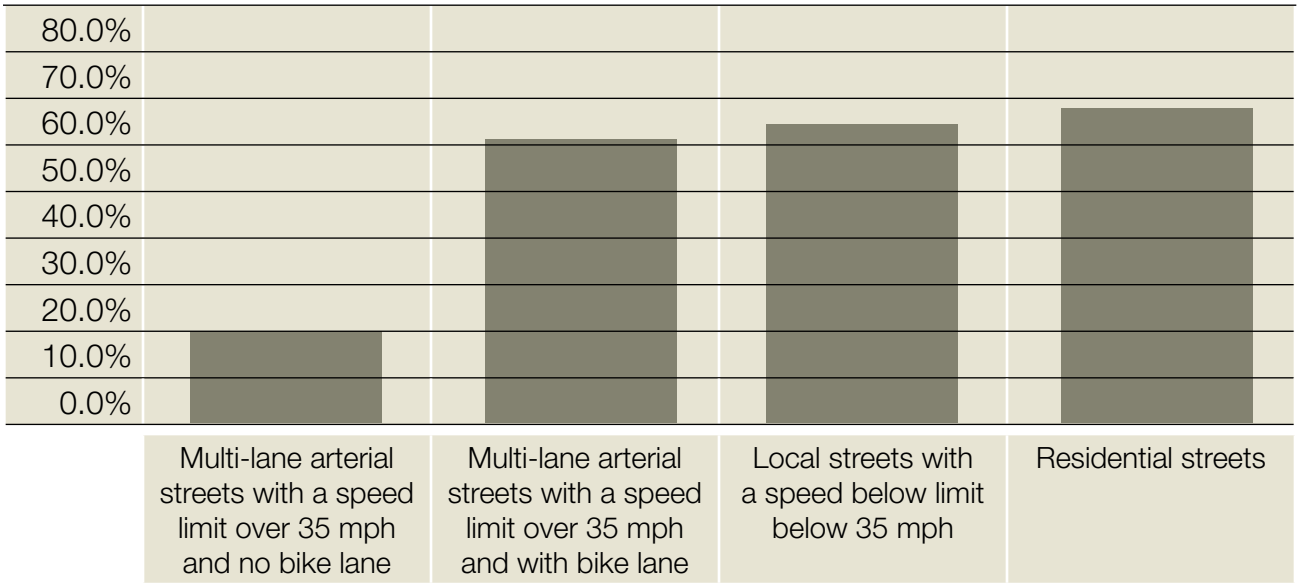
Table C-4 – Cycling Preference – On-Street vs. Off-Street



C.5.4 Cycling Preference – Type of On-Street Bicycle Facility (Question 4 – What types of streets are you comfortable riding on?)

The majority of surveyed participants were comfortable riding on a multi-lane arterial with a speed limit over 35 mph, so long as the arterial had striping for a bicycle lane. Only 19 percent of surveyed passengers indicated they were comfortable cycling on a multi-lane arterial with a speed limit over 35 mph and no bike lane. Residential streets were identified as the type of roadway cyclists are most comfortable cycling on (69 percent). Table C-5 provides a breakdown of the type of on-street bicycle facility surveyed participants prefer.

Table C-5 – Cycling Preference – Type of On-Street Bicycle Facility



C.5.5 Question 5 – Rank the proposed priority corridors

Surveyed participants were asked to rank the ten priority corridors on a scale of 1 though 10, with 1 being the highest and 10 being the lowest. Table C-6 lists ten corridors in ascending order of their average ranking.

Table C-6 Top 5 Bicycle Corridors

Rank	Corridor
1	Fullerton Station Corridor
2	Santa Ana River to Coyote Creek Corridor
3	Brea Creek – Bastanchury Corridor
4	Brea Mall-CSUF-Santa Ana River Trail
5	Coyote Creek
6	Union Pacific ROW
7	Orangethorpe Corridor
8	Orange-La Palma Corridor
9	Brookhurst Gilbert Corridor
10	Edison Transmission Line Corridor

C.5.6 Reason for Selecting Top Priority Corridor (Question 6 – Why is the corridor selected in the previous questioning your top priority?)

Surveyed participants were asked to leave comments on the reason behind selecting their top priority corridor. Of the 108 survey participants, 96 responded to this open-ended question. The comments can be categorized into the following categories:

1. Corridor accessibility
2. Good for commuting
3. Located close to my home
4. Corridor safety

The most common reason behind selecting a priority corridor was accessibility. A significant amount of surveyed participants were interested in bikeways that connected to activity centers, train stations and the existing Santa Ana River Trail. Other participants expressed interest in their top priority trail simply because it was close to where they lived. About 20 percent stated their top priority trail would allow them to have a safer commute to work, while a few participants expressed interest in the trail due to safety concerns associated with other routes.

C.5.7 Major Destinations (Question 7 – Which destinations would you consider important to be accessible by bike?)

Currently, the Santa Ana River Trail is a major thoroughfare for cyclists, providing a continuous Class I bikeway from Yorba Linda to Huntington Beach, and linking with numerous existing and proposed bikeways. A significant percentage (82 percent) of surveyed participants considered a connection to the Santa Ana River Trail to be important. Other major destinations surveyed participants were interested in include the Fullerton, Buena Park and Anaheim Metrolink stations, Cal State Fullerton and Fullerton College, the San Gabriel River Trail, the Anaheim Stadium/Honda Center, and the Anaheim Resort. Some free response answers requested that bikeways connect to schools, shopping areas, employment centers and parks in the region.

Table C-7 – Major Destinations

St. Jude Medical Center	21%
Chino Hill State Park	35%
San Gabriel River Trail	49%
Santa Ana River Trail	82%
Anaheim Stadium/Honda Center	36%
The Anaheim Resort	26%
Anaheim Canyon Metrolink Station	16%
Anaheim Metrolink Station	48%
Fullerton Metrolink Station	61%
Buena Park Metrolink Station	31%
Knott's Berry Farm/Buena Park Entertainment	14%
Fullerton College	41%
Brea Mall	33%
Cal State Fullerton	55%

C.5.8 Comments (Question 8 – Comments)

A free response section was provided to allow surveyed participants to leave comments, suggestions, and opinions regarding the bikeway study or bikeways in general. A significant majority of comments pertained to safety issues along on-street bikeways. Several comments note that on-street bikeways can be improved to increase safety for cyclists and motorists. Others noted that while certain on-street bikeways may provide good connections, off-street Class I bikeways provide for safer routes.

APPENDIX D. EVALUATION CRITERIA AND CORRIDOR RANKING

This section summarizes the evaluation criteria used to assess and rank the priority corridors, followed by tables summarizing the performance of each corridor and a comparison to the other corridors.

D.1 Evaluation Criteria

Each of the ten regional priority bikeway corridors identified in the Fourth District was evaluated using a set of criteria that are consistent with OCTA's 2009 CBSP and the goals of the Fourth District Collaborative. The criteria summarized below are intended to consider a range of characteristics and factors associated with each of the proposed bikeway corridors, and provide a comparison of the performance of each bikeway corridor relative to the others. The evaluation criteria are consistent with the CBSP and address the goals set by the Collaborative.

D.1.1 Bikeway Priority Index Ranking (BPIR)

The Bikeway Priority Index is based on several factors including population density, employment density, and conditions or uses (geographic features, schools, transit stops, etc) that attract or discourage potential bicycle usage. Corridors are ranked based on their performance in the model assessment. Figure D.1 illustrates the performance of each corridor.

- +3 – > 366 in BPIR
- +2 – 333-366 in BPIR
- +1 – < 333 in BPIR

D.1.2 Public Support

The public outreach conducted for this study obtained input from stakeholders and cyclists in the Fourth District. The outreach effort included surveys requesting that stakeholders and members of the public rank the priority corridors in their order of preference.

- +3 – < 5 points
- +2 – 5-6 points
- +1 – > 6 points

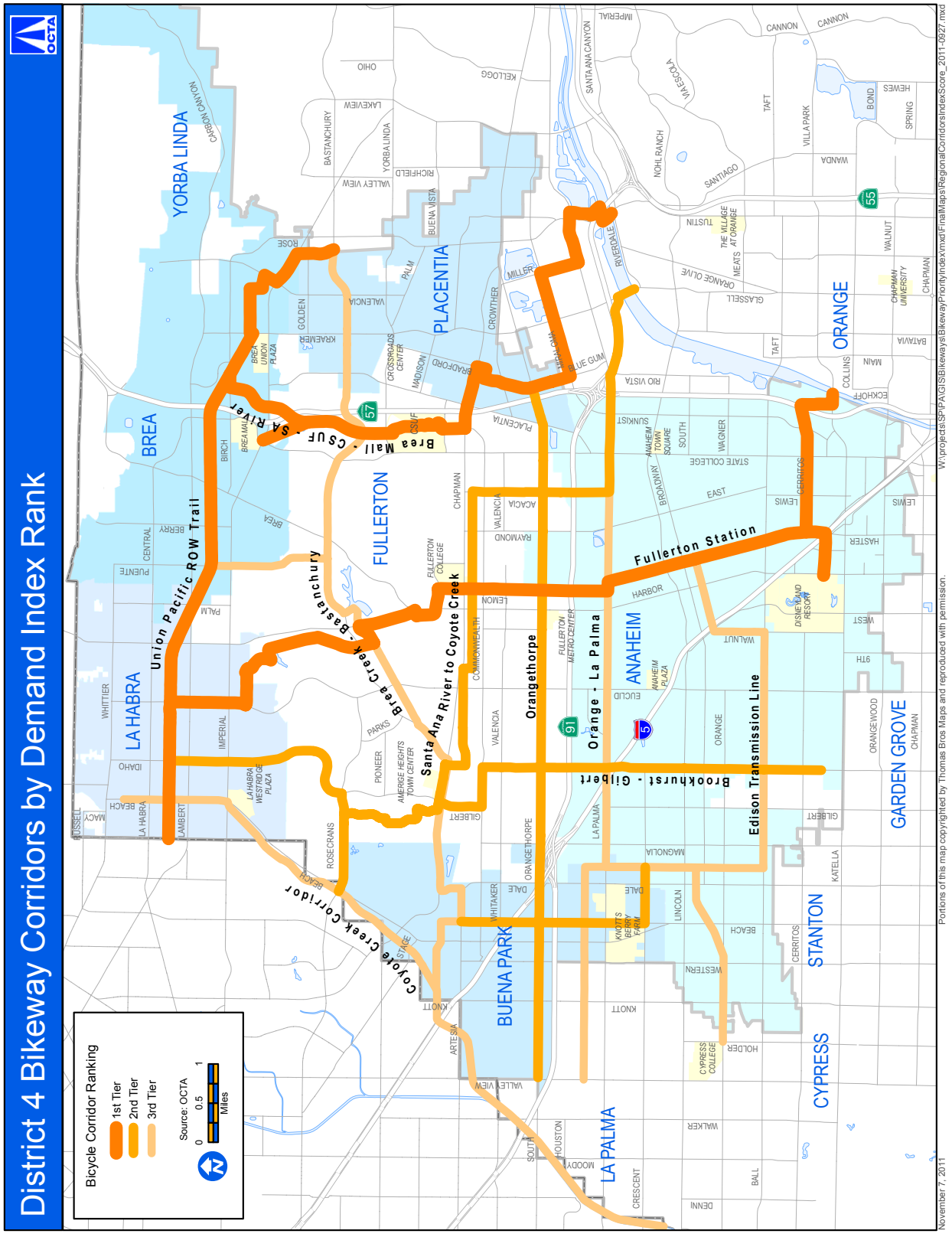


Figure D.1 – District 4 Bikeway Corridors by Demand Index Rank

D.1.3 Linkages to Existing Bikeways

A key element for the priority corridors is to promote regional connectivity between bikeway facilities. Connections to existing bikeways help to improve cyclist mobility and increase potential connections to employment centers, activity centers, and educational facilities. The priority corridors have been evaluated based on the number of connections to existing bikeway facilities.

- +3 – 6 or more bikeways
- +2 – 4-5 bikeways
- +1 – 3 or less bikeways

D.1.4 Improving Bikeway Connectivity

A key challenge to regional bikeway mobility is linking discontinuous bikeway segments in order to allow commuter and recreational cyclists to travel greater distances and between cities. Existing bike facilities also provide a solid base for implementation of a regional bike route and create opportunities for easy to implement projects that would provide a greater regional benefit through the creation of a continuous regional bikeway. The priority corridors have been reviewed to determine what percentage of the proposed corridor already includes existing bicycle facilities. The scoring method is listed below.

- +3 – at least 50% of proposed corridor already existing
- +2 – 25% to 50% of proposed corridor already existing
- +1 – Less than 25% of proposed corridor already existing

D.1.5 Physical Constraints

Physical constraints include freeway crossings, interchanges, and railroad crossings that would require special or more costly physical treatments to implement the proposed bikeway improvement.

- +3 – None
- +2 – 1 minor constraint/chokepoint
- +1 – 2+ minor constraints/chokepoints

D.1.6 Agency Support

Agency support is critical for project implementation. Multiple agencies supporting a single project can also provide a boost when pursuing funding grant opportunities. On the flip side, some agencies or companies can delay or block projects if they are not supportive due to concerns about project design, safety, or conflicts.

- +3 – No anticipated issues or concerns with agency/community support/implementation
- +2 – Limited issues or concerns anticipated with agency/community support/implementation
- +1 – Significant issues or concerns anticipated with agency/community support/implementation

D.1.7 Safety (Bike Collisions)

Improve bicycle facilities in a corridor where bikeway-involved collisions have occurred in 2010. Scoring is based on the number of collisions in the corridor or in adjacent roadway corridors for off-street bike facilities.

- +3 – 3+ Collisions
- +2 – 1-2 Collisions
- +1 – No Collisions Reported

D.1.8 Safety (High Traffic Volumes)

This criterion is focused on average daily traffic volumes within the proposed corridor or the next parallel street corridor for off-street routes. Providing enhanced bicycle facilities in areas with high traffic volumes helps to improve bicyclist safety.

- +3 - > 25,000 ADT
- +2 – 10,000 to 25,000 ADT
- +1 - < 10,000 ADT

D.2 Performance

Tables D-1, D-2, D-3, and D-4 summarize the evaluation process, the project tiers, and the proposed focus corridors.

Table D-1 – Proposed Focus Corridors

TIER 1			
Corridor	**Brea Mall – CSUF – Santa Ana River (Brea, Fullerton, Placentia, Anaheim)**	**Santa Ana River to Coyote Creek (Anaheim, Fullerton, Buena Park)**	**Union Pacific ROW (La Habra, Brea, Yorba Linda)**
Bikeway Priority Index	+3	+2	+3
Public Input	+3	+3	+2
Bikeway Linkages	+3	+2	+3
Ease of Implementation	+3	+3	+1
Physical Constraints	+1	+2	+3
Agency Support	+3	+3	+3
Safety - Collisions	+3	+3	+2
Safety – Traffic Volume	+2	+2	+3
Total	+21	+20	+20
Length (miles)	9.9	11.3	8.8
Estimated Construction Cost (millions)	$3.30 - $4.94	$1.36	$7.17
Key Opportunities	• Connections to Brea Mall, Cal State Fullerton, Anaheim Cyn Metrolink, Santa Ana River • Significant portions of corridor bikeways already in place • Focus on filling in gaps/ branding corridor	• Links Downtown Fullerton, Fullerton College, Santa Ana River, Coyote Creek • Connects to existing Class II bikeway in La Mirada • Opportunity for “First in OC” Bicycle Boulevard on Wilshire Ave	• Connects to Coyote Creek and Class I trail in Yorba Linda • Good east-west route in northern part of Fourth District
Key Constraints	• Need for safe SR-57 crossing – this crossing accounts for significant portion of corridor cost • Need for safe connection to Santa Ana River from La Palma Ave	• Existing bikeway on Acacia to be temporarily removed for State College Grade Separation • Narrow sections on La Palma near SR-57 • Narrow roadway, on-street parking along Malvern Avenue segment	• Union Pacific acceptance of bikeway along active portions of rail right-of-way • Numerous at-grade roadway crossings

Table D-2 – Proposed Tier 2

TIER 2				
Corridor	**Brookhurst – Gilbert (La Habra, Fullerton, Anaheim)**	**Brea Creek – Bastanchury (Buena Park, Fullerton, Brea, Placentia)**	**Coyote Creek (La Habra, Fullerton, La Mirada, Buena Park)**	**Fullerton Station (La Habra, Fullerton, Anaheim)**
Bikeway Priority Index	+2	+1	+1	+3
Public Input	+1	+3	+3	+3
Bikeway Linkages	+3	+3	+2	+3
Ease of Implementation	+3	+2	+2	+1
Physical Constraints	+1	+2	+1	+1
Agency Support	+3	+3	+3	+2
Safety - Collisions	+3	+2	+3	+2
Safety – Traffic Volume	+3	+2	+3	+3
Total	+19	+18	+18	+18
Length (miles)	9.9	12.5	9.6	13.0
Estimated Construction Cost (millions)	$0.83	$2.47	$6.5	$1.73
Key Opportunities	• Significant portions of bikeways along the corridor are already existing	• Connects to Buena Park Metrolink station and St. Jude Hospital • Good east-west route in central portion of Fourth District	• Corridor studied extensively in the past • County of Orange Flood Control open to making service roads available for bikeways • Cities in both counties supportive	• Connects to Downtown Fullerton, Fullerton Metrolink, Downtown Anaheim, Anaheim Resort, Santa Ana River, and Platinum Triangle
Key Constraints	• Need for safe crossing at I-5/ Brookhurst interchange • Roadway narrows at BNSF rail corridor grade separation	• Significant grades in section near State College Boulevard • Narrow roadway, on-street parking along Malvern Avenue segment	• Cities must take on maintenance/ liability responsibility • BNSF rail corridor crossing	• SR-91 crossing on Lemon Street has high traffic volumes • Juanita Cooke Trail segment backs to residential properties, need to maintain existing riding trail

Table D-3 – Proposed Tier 3

TIER 3	
Corridor	Orangethorpe (Buena Park, Anaheim, Placentia)
Bikeway Priority Index	+2
Public Input	+2
Bikeway Linkages	+2
Ease of Implementation	+2
Physical Constraints	+1
Agency Support	+3
Safety - Collisions	+1
Safety – Traffic Volume	+3
Total	+16
Length (miles)	12.0
Estimated Construction Cost (millions)	$0.87
Key Opportunities	• Available roadway width/right-of-way for most of corridor length • Stanton Ave spur provides connection to Buena Park Metrolink and Entertainment District
Key Constraints	• Rail corridor crossing has been a safety concern in the past • Roadway narrows at SR-57 interchange

Table D-4 – Proposed Tier 4

TIER 4		
Corridor	Edison Transmission (Buena Park, Anaheim)	Orange – La Palma (Buena Park, Anaheim)
Bikeway Priority Index	+1	+1
Public Input	+1	+1
Bikeway Linkages	+2	+1
Ease of Implementation	+1	+1
Physical Constraints	+1	+2
Agency Support	+2	+3
Safety - Collisions	+3	+2
Safety – Traffic Volume	+3	+2
Total	+14	+13
Length (miles)	9.6	8.2
Estimated Construction Cost (millions)	$6.19	$2.44
Key Opportunities	• Connection to Anaheim Resort from West County • Connection to existing Class I trail in La Palma and beyond to existing section of Coyote Creek Bikeway	• Connects to existing bikeway in Cypress • Connects to five other Fourth District priority corridors
Key Constraints	• Numerous at-grade roadway crossings • Portions of Edison corridor are leased for other uses, need to gain access or find alternative path • Pavement Construction	• Need for safe crossing at I-5 freeway

APPENDIX E. SAMPLE LETTER OF SUPPORT

The following is an example of a letter of support that would be prepared by an individual city and submitted as part of a grant funding application.

Date

Funding Agency
Address
City, State Zip

Subject: Letter of Support for Funding Grant Application for *(insert Project Name)*

To Whom It May Concern:

The City of *(insert name)* is submitting this letter in support of the funding grant application submitted by *(insert lead agency)* for the *(insert project name)*. This proposed bikeway project represents an important piece of the regional bikeway network in North Orange County, and we recognize the benefits that the project will provide not only to (insert city name), but all cities within this section of the county.

This proposed project was identified as a focus corridor as part of the Fourth Supervisorial District Bikeways Collaborative, a joint effort involving our city, the project applicant, the Orange County Transportation Authority (OCTA), and other neighboring local agencies. Our city was an active participant in the Fourth Supervisorial District Bikeways Collaborative. This collaborative effort focused on regional bikeway planning and identification of bikeway projects and improvements that would provide benefits throughout the Orange County's Fourth District.

Improving bikeway facilities within the Fourth Supervisorial District is a key priority for our city. Bikeway facilities help to provide our residents and commuters with alternatives to automobile travel, and providing safe and convenient bikeways helps to encourage people to travel by bicycle. We enthusiastically support the consideration of the *(insert project name)* for funding through this program.

Sincerely,

City Contact
Title