June 2023

OC LOOPS

Bike. Walk. Explore.

Orange County Bike Connectors Gap Closure Feasibility Study

Prepared for:

OCTA

ORANGE COUNTY BIKE CONNECTORS (OC LOOPS) GAP CLOSURE FEASIBILITY STUDY

Acknowledgements

The 2023 Orange County Bike Connectors (OC Loops) Gap Closure Feasibility Study was funded through a Sustainable Transportation Planning Grant provided by the California Department of Transportation (Caltrans). Orange County Transportation Authority (OCTA), in collaboration with local agencies, collaborated to develop a Study to identify feasible bikeway concepts along study corridors. The Study was managed by OCTA staff and assisted by a consulting team led by Mark Thomas.

Project Partners

City of Dana Point
City of Irvine
City of Laguna Beach
City of Laguna Hills
City of Laguna Niguel
City of Lake Forest
City of Mission Viejo
City of Rancho Santa Margarita
Orange County Public Works
Caltrans

Consultant Team

Contents

List of Figures

List of Tables

Appendices

Executive Summary

The Orange County (OC) Loops concept is built upon the successful OC Loop regional trail network in northern Orange County for people to bike, walk, and connect to some of California's most scenic beaches and inland reaches. About 88% of the OC Loop's 66 miles are already in place and used by high volumes of OC residents and visitors. Nearly 58 of the 66 OC Loop miles use existing off-street trails along the San Gabriel River, Coyote Creek, Santa Ana River, and the Coastal/Beach Trail.

During preparation of OC Active, the Countywide bicycle and pedestrian plan, the concept of additional loops were identified to serve central and southern Orange County, as well as a diagonal corridor connecting all three loops. The original OC Loop is now rebranded with an adapted logo as the OC Loops, providing expanded regional connectivity throughout Orange County. The OC Loops branding now utilizes the following naming convention:

- Original: OC North Loop
- New: OC Central Loop
- New: OC South Loop
- New: OC Connect

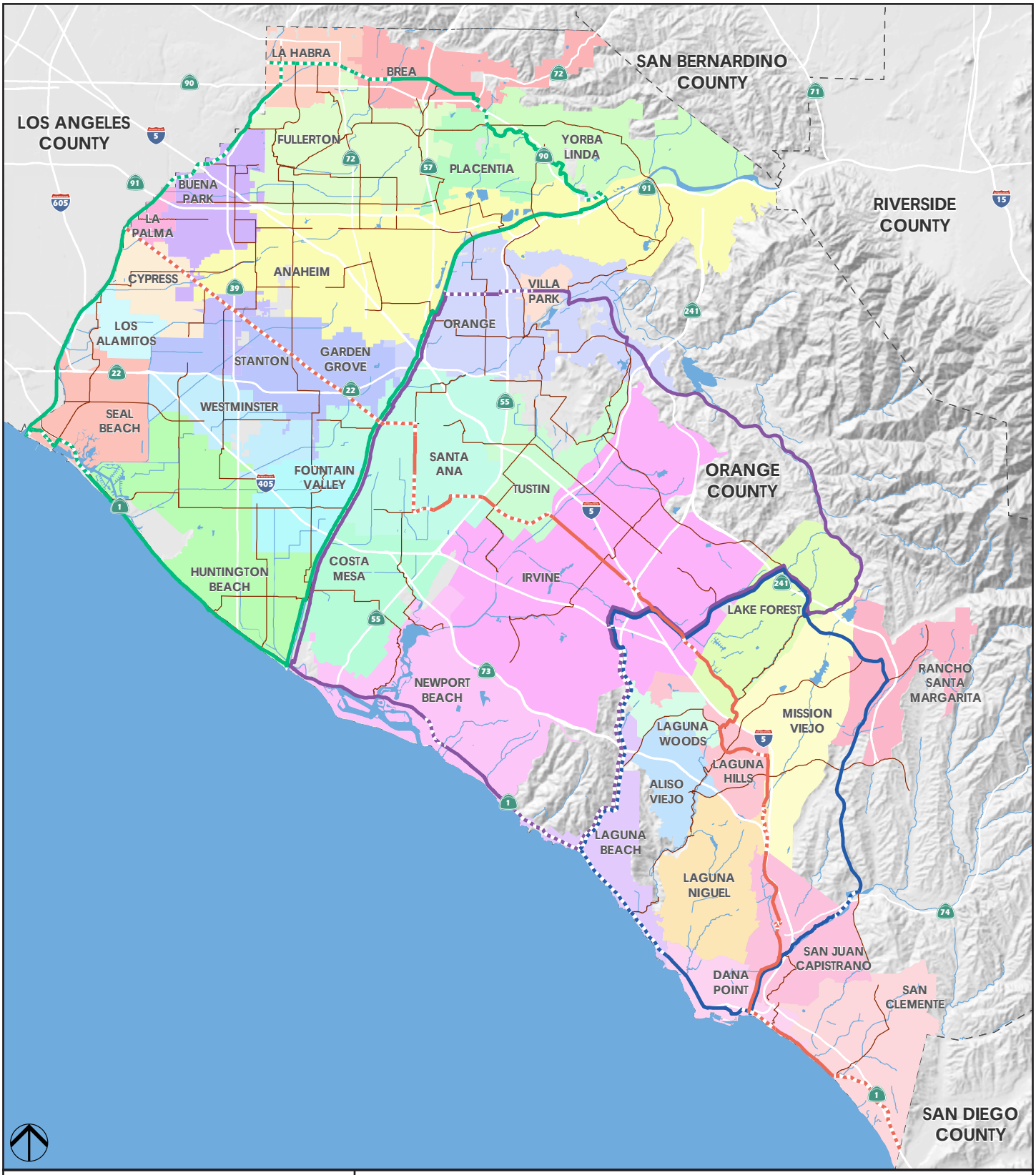
This Study builds on prior efforts including OC Active, four Orange County Regional Bikeway Strategies and Feasibility Studies, the original OC Loop Gap Closure Feasibility Study, and the summary OC Loop 70/30 Plan.

The OC Loops serves as vital infrastructure for residents who walk and bicycle to maintain their livelihood, providing safe infrastructure that improves connectivity to transit, jobs, and housing. The OC Loops also supports regional efforts to mitigate air quality impacts and improve public health, offering comfortable and convenient infrastructure that converts driving trips to active transportation trips.

The OC Loops Gap Closure Feasibility Study (Study) outlines feasible solutions which would complete the Countywide OC Loops network through construction of the OC Central Loop, OC South Loop, and OC Connect routes. Figure 1 illustrates the OC Loops and other regional bikeways network.

The Orange County Transportation Authority (OCTA) conducted the Study in coordination with the County of Orange (County), local jurisdiction staff, Caltrans, and other project partners. The recommendations presented in the Study do not supersede nor replace planning initiatives by local agencies but instead provide for additional considerations for regional bicycle connectivity. Design, construction, implementation, and maintenance of bikeway corridors will be led by local agencies with jurisdiction of the corridor right-of-way, with support from OCTA.

Figure 1 OC Loops & Regional Bikeways



OCTA

OC Loops Feasibility Study

OC Loops & Regional Bikeways

MARK THOMAS

OCTA

OC LOOPS

Bike. Walk. Explore.

LEGEND

Built	Not Built	
		OC North Loop
		OC Central Loop
		OC South Loop
		OC Connect
		Regional Bikeways

Goals/Objectives

The Study provides feasible bikeway design concepts or updates prior feasibility cost estimates for each regional bikeway loop. The Study presents findings supporting opportunities for enhanced facilities, alternative route alignments, and constraints toward project implementation.

OCTA developed the Study to continue the momentum of bikeway projects Countywide. The Study was developed with the goal of identifying additional opportunities to close gaps in the bicycle infrastructure within Central County and South County. The project contributes to furthering OCTA's mission to connect local and regional multi-modal infrastructure by working collaboratively with local agency stakeholders and the public.

8 to 80 Desired Audience

The project's approach toward designing public infrastructure is centered around an audience of cyclists aged between eight and eighty years old (8 to 80). This design approach upholds the concept that a bikeway network designed to accommodate a person on either end of the 8 to 80 age range accommodates everyone in between, including people with disabilities, mobility devices, wheelchairs, and strollers.

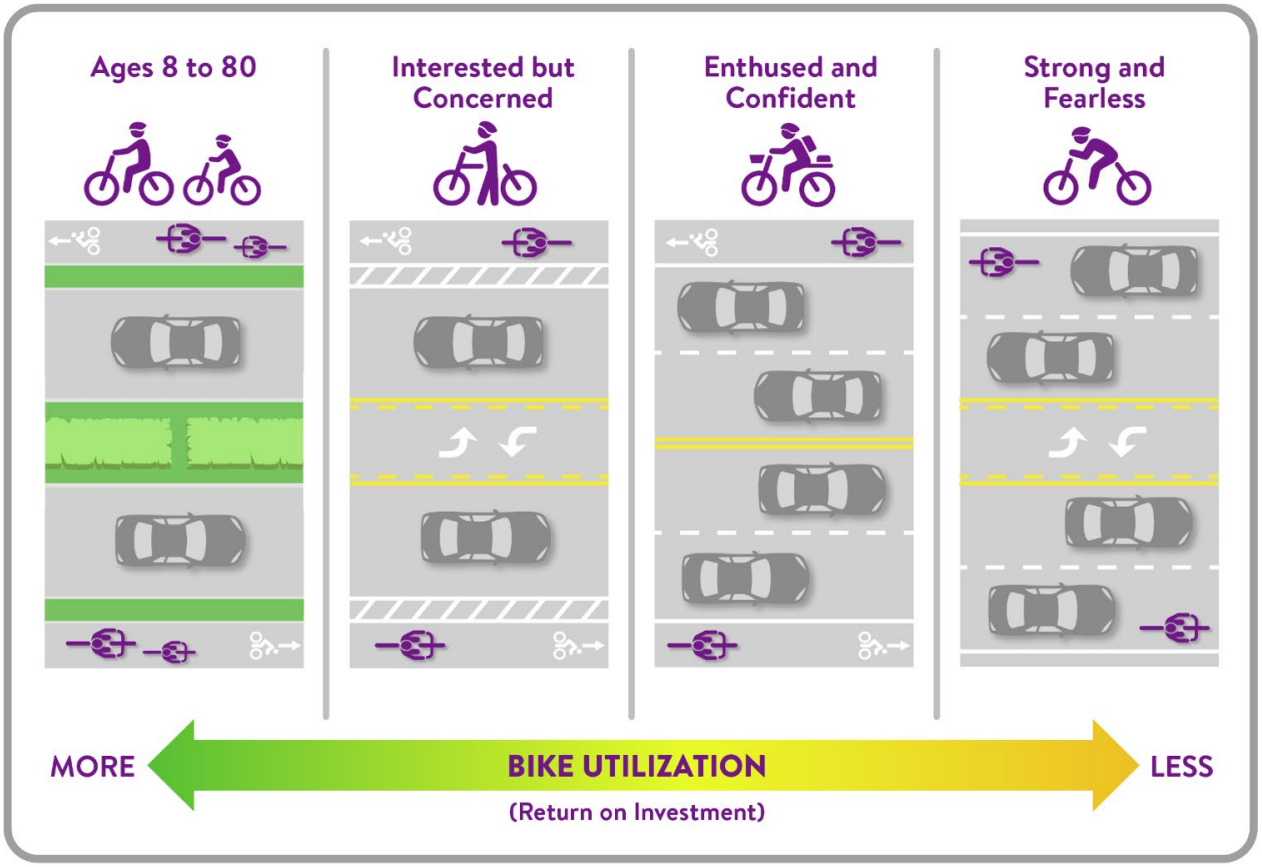
The 8 to 80 approach incorporates design features beyond standard bicycle facilities, such as providing places to rest, nighttime lighting, improved landscaping and aesthetics, separation for varying bicycle travel speeds, clear navigational guidance, and enhanced connections to key destinations.

Return on Investment

Bikeway Return on Investment (ROI) is a concept framing the benefits received from original capital investment. As it applies to bikeway types proposed in the OC Loops, the investment is the capital project installing new or enhanced bikeways, while the return includes benefits toward increased ridership, local economies, improved roadway safety, public health, and reduced vehicle miles traveled (VMT). Bikeway ROI can be measured by use of the facility, such as the volume of riders, and will vary based on how many riders the investment is able to attract. As illustrated in Figure 2 Bike Utilization based on Return on Investment, bikeways with varying levels of separation from motor vehicle traffic correspond with the types of riders willing to use the facility based on personal comfort levels.

- Ages 8 to 80: The concept that a facility built to the comfort standards of an 8-year-old and an 80-year-old also meets the comfort standards of all ages in between.
- Interested but Concerned: Users who would like to use bicycles as a mode of transportation but are hesitant due to fear of safety from motor vehicles or other personal concerns.
- Enthused and Confident: Users who feel comfortable bicycling in minimum bikeway facilities.
- Strong and Fearless: Users who are comfortable bicycling in mixed motor vehicle traffic.

Figure 2 Bike Utilization based on Return on Investment

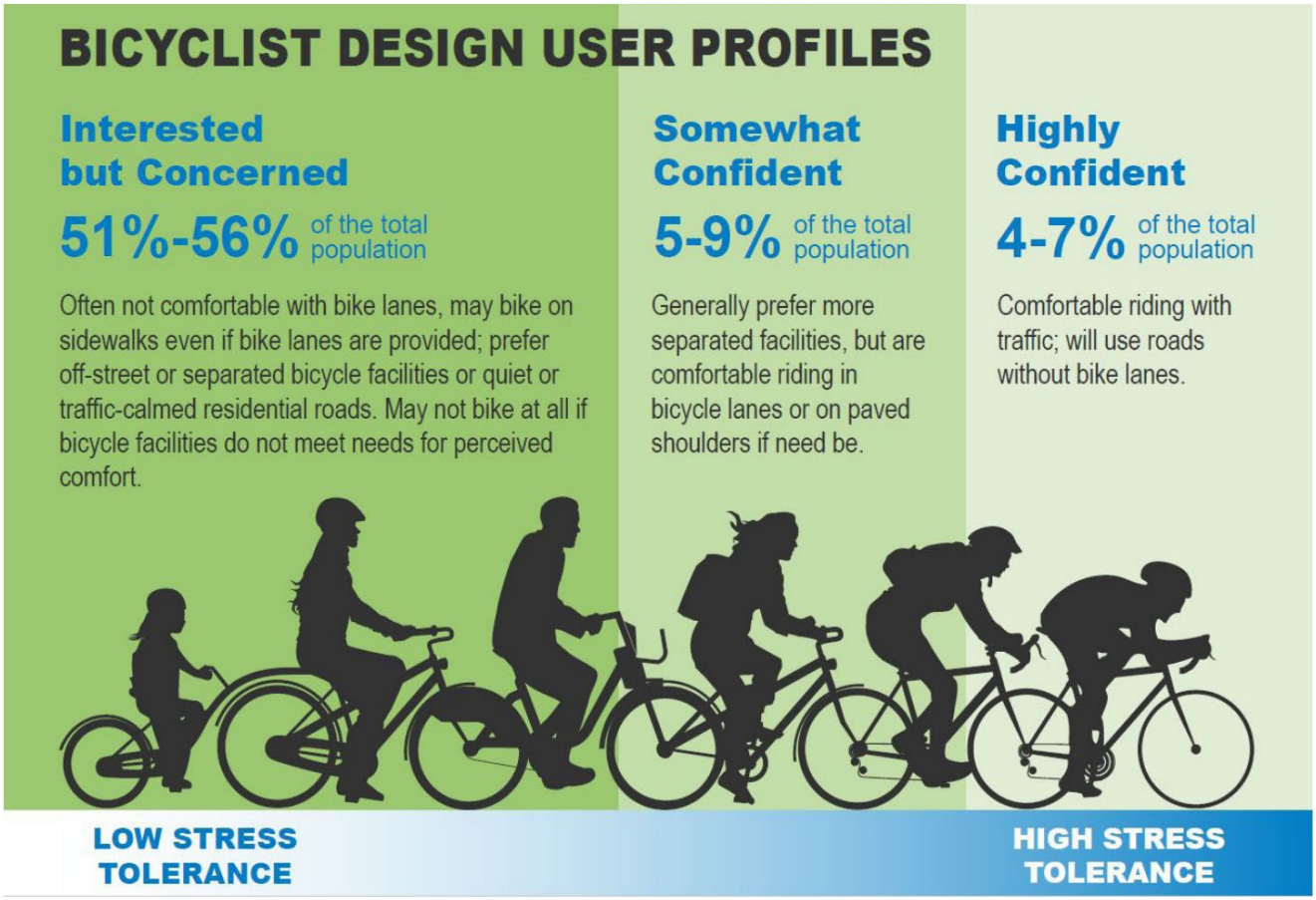


Increased Ridership

Bikeways that accommodate the Interested but Concerned user profile, as described in Figure 3 Bicyclist Design User Profiles - Federal Highway Administration Bikeway Selection Guide (2019), have the highest ROI by providing facilities that are low-stress, highly comfortable, and have the greatest potential to convert traditionally motor-vehicle-only users to bicycle-users.

- After New York City installed a protected bike lane on Columbus Avenue, bicycling increased by 56 percent on weekdays, crashes decreased by 34 percent, speeding decreased, sidewalk riding decreased, traffic flow remained similar, and commercial loading hours/space increased by 475 percent.[1]

Figure 3 Bicyclist Design User Profiles - Federal Highway Administration Bikeway Selection Guide (2019)



[1] https://www.nyc.gov/html/dot/downloads/pdf/2011_columbus_assessment.pdf

Local Economies
Bikeway facilities installed along commercial corridors have resulted in positive economic returns for businesses along the corridor. By providing a means to access the businesses without the need for an automobile, visiting the commercial corridor becomes a more feasible and enjoyable activity for people who do not own a personal vehicle, families with children, and people recreating by means of a bicycle. Businesses that rely on foot traffic, such as café's, restaurants, and small retailers will benefit from increased access and economic activity.

- In Salt Lake City, retail sales increased 8.8 percent along the newly constructed Broadway protected bike lane, compared to a 7 percent increase citywide.

Bikeway facilities installed near housing have been found to increase property values. Providing a means of transportation for commuting or recreation is a positive attribute of potential home purchases. Facilities with enhanced protection are valuable for families with children as they provide opportunities for youth to travel to and from school independently of their parents as they age.

- Property values saw a 148 percent increase within one block of the Indianapolis Cultural Trail project totaling over $1 billion in additional property value.

Public Health
In 2020, bicycling for physical exercise experienced rapid growth as a result of the COVID-19 pandemic. In the preceding years, the bicycling industry continues to experience higher demand than in previous years, with many people continuing to bicycle for sport or recreation. As people begin to return to the office post-pandemic, bicycling is more likely viewed as an option for commuting over driving a personal vehicle, significantly as the availability of electric bicycles (e-bikes) increases. Providing bicycle facilities between workplaces and residential areas increases the potential for individuals to commute via bicycle while benefiting from physical exercise.

- Bicycling as a means of transportation has been shown to reduce the risk of disease. A 2017 study[2] found cycling was associated with a lower risk of cardiovascular disease, cancer, and all-cause mortality.
- New York City's protected bike lane on 9th Avenue led to a 56 percent reduction in injuries to all street users, including a 57 percent reduction in injuries to people on bikes and a 29 percent reduction in injuries to people walking, as well as an 84 percent reduction in sidewalk riding.[3]
- The safest bicycle routes in Vancouver, BC, and Toronto were found to be cycletracks on major streets, local streets with traffic diversion, and off-street bike paths.[4]

[2] https://www.bmj.com/content/357/bmj.j1456
[3] https://www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf
[4] https://cyclingincities.spph.ubc.ca/injuries/the-bice-study/

- Cycle tracks had the lowest injury risk, about one-ninth the risk of the reference route type. Bike lanes on major streets with no parked cars and off-street bike paths had nearly half the risk of the reference. Route characteristics other than bike infrastructure were also associated with risk reductions: quiet streets (i.e., local streets); and no car parking on major streets. Shared bike infrastructure (shared lanes, multiuse paths) and pedestrian infrastructure had small risk reductions, and none were significant.[5]
- Several different data sources are used in a before–after and cross-sectional analysis including; 184 intersections, nearly 17 years of reported bicycle injury crashes at intersections, and historic bicycle volume and turning movement counts. It was found that, following the installation of Protected Bicycle Lanes, the rate of crashes per bicyclist decreased by an average of 30%.[6]
- The construction of cycle tracks has resulted in three important gains in road safety: fewer crashes in which cars hit or ran over cyclists from the rear, fewer crashes with cyclists turning left, and fewer crashes in which cyclists rode into a parked car.[7]

VMT Reductions

The State of California adopted Senate Bill 743 (SB 743), initiating a transition of measuring transportation impacts from intersection Level of Service (LOS) to Vehicle Miles Traveled (VMT). The change helps reduce transportation's impact on the environment by prioritizing capital projects that reduce the use of motor vehicles and resulting emissions. Installing bicycling facilities helps cities and counties meet VMT reduction goals by providing an alternative route to travel without a motor vehicle. Additionally, one-mile of bike lanes serves higher capacities and costs less to construct and maintain compared to one-mile of motor vehicle lanes.

- Austin's planned protected bike lane network is estimated to increase the City's traffic capacity by approximately 25,000 trips per day, through encouraging mode shift from motor vehicles to bicycles.

[5] Teschke, K., Harris, M. A., Reynolds, C. C., Winters, M., Babul, S., Chipman, M., Cusimano, M. D., Brubacher, J. R., Hunte, G., Friedman, S. M., Monro, M., Shen, H., Vernich, L., & Cripton, P. A. (2012). Route infrastructure and the risk of injuries to bicyclists: a case-crossover study. American journal of public health, 102(12), 2336–2343.

[6] Sundstrom, C. A., Quinn, S. M., & Weld, R. (2019). Bicyclist Crash Comparison of Mixing Zone and Fully Split Phase Signal Treatments at Intersections with Protected Bicycle Lanes in New York City. Transportation Research Record, 2673(12), 115–124.

[7] Jensen, Søren & Rosenkilde, Claus & Jensen, Niels. (2006). Road safety and perceived risk of cycle facilities in Copenhagen. Trafitec, for the City of Copenhagen, Denmark: 2007.

Background

Literature Review

Regional Bikeway Strategies and Feasibility Studies

Starting in 2012, OCTA coordinated with local and regional agencies to advance bikeway concepts within the five Supervisorial Districts through a two-phased approach. Phase 1 included the development of a Regional Bikeway Strategy, which identified a regional "backbone" of bikeway corridors to connect to major activity centers. Phase 2 included the development of a Feasibility Analysis, which provided further refined bikeway concepts through planning-level design recommendations and cost estimates for some corridors from Phase 1.

Fourth District Bikeways Strategy (2012)

OCTA completed the Fourth Supervisorial District Bikeways Collaborative identifying a set of regional bikeway corridors within the County of Orange and the Cities of Anaheim, Brea, Buena Park, Fullerton, La Habra, Placentia, and Yorba Linda. The project involved agency-staff technical meetings, bikeway summits, a stakeholder roundtable discussion, an Open House, and an online survey. The Fourth District Bikeways strategy Report identified a total of 10 corridors and 104.8 miles of new or enhanced bikeways and trails to implement in Supervisorial District 4.

Fourth District Bikeways Feasibility Study (2013)

The Fourth District Bikeways Strategy identified three corridors to advance to the Fourth District Feasibility Study. The three facilities identified for priority implementation included:

- Union Pacific ROW: 8.8 miles of bikeway providing an east-west route in the northern part of the Fourth District (La Habra, Brea, Yorba Linda)
- Coyote Creek to Santa Ana River Bikeway: 11.3 miles of bikeway linking to Downtown Fullerton, Fullerton College, Santa Ana River, and Coyote Creek (Anaheim, Fullerton, Buena Park)
- Brea Mall – CSUF – Santa Ana River Bikeway: 9.9 miles of bikeway connecting to Brea Mall, Cal State Fullerton, Anaheim Canyon Metrolink, and the Santa Ana River (Brea, Fullerton, Placentia, Anaheim)

Districts 1 and 2 Bikeways Strategy (2013)

OCTA completed the Districts 1 and 2 Bikeways Strategy identifying a set of regional bikeway corridors within the Cities of Buena Park, Costa Mesa, Cypress, Fountain Valley, Garden Grove, Huntington Beach, La Palma, Los Alamitos, Newport Beach, Santa Ana, Seal Beach, Stanton, and Westminster. The project involved focus group meetings, public workshops, in-person surveys, and small-format outreach events. The Districts 1 and 2 Bikeways Strategy Report identified a total of 10 corridors and 132.9 miles of new or enhanced bikeways and trails to implement in Supervisorial Districts.

Districts 1 and 2 Bikeways Feasibility Study (2014)
The Districts 1 and 2 Bikeways Strategy identified four corridors to advance to the Districts Feasibility Study. The four facilities identified for priority implementation include:

- Pacific Electric Right-of-Way: 15.6 miles of a combination of off-street paths and on-street bikeway segments linking Coyote Creek Trail with the Santa Ana River Trail (Buena Park, Cypress, Garden Grove, La Palma, Santa Ana, Stanton)
- Pacific Coast Highway: 21.3 miles of bikeway connecting to Coyote Creek Trail, Downtown Seal Beach, Bolsa Chica Ecological Reserve, and beaches and coastal parks via Caltrans' Route 1 (County of Orange, Huntington Beach, Newport Beach, Seal Beach)
- Magnolia-Hoover: 13.5 miles of bikeway connecting to coastal beaches, Fountain Valley Civic Center, Mile Square Park, Santa Ana River Trail, and Saddleback High School (County of Orange, Fountain Valley, Huntington Beach, Santa Ana)
- Slater-Segerstrom: 11.4 miles of bikeway connecting to San Gabriel River Trail, Westminster Mall, Westminster High School, and Westminster's Little Saigon district (Garden Grove, Huntington Beach, Santa Ana Seal Beach, Westminster)

District 5 Bikeways Strategy Report (2015)
OCTA completed the District 5 Bikeways Strategy Report identifying a set of regional bikeway corridors within the County of Orange and Cities of Aliso Viejo, Dana Point, Irvine, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. The project involved focus group meetings, community roundtable discussions, and online questionnaires. The District 5 Bikeways Strategy Report identified a total of 9 corridors and 123.5 miles of new or enhanced bikeways and trails to implement in Supervisorial District 5.

District 5 Bikeways Feasibility Study (2015)
The District 5 Bikeways Strategy Report identified three priority corridors to advance to the District 5 Bikeways Feasibility Study. The three facilities identified for priority implementation include:

- Pacific Coast Highway: 19.0 miles of bikeway connecting to Laguna Art Museum, South Coast Theatre, San Clemente Metrolink Station, and beach resorts (County of Orange, Laguna Beach, Dana Point, San Clemente)
- El Toro/Alicia/Laguna Canyon: 15.3 miles of bikeway connecting to Bommer and Shady Canyons Park, Laguna Coast Wilderness Park, Crystal Cove State Park, and the Laguna College of Art and Design (Irvine, County of Orange, Laguna Beach)
- Muirlands/Cabot/Camino Capistrano: 17.9 miles of bikeway connecting to Aliso Wood Canyons Wilderness Park, Lake Mission Viejo, Saddleback Memorial Medical Center, and Downtown Laguna Beach (County of Orange, Aliso Viejo, Laguna Beach, Laguna Woods, Laguna Hills, Mission Viejo, Rancho Santa Margarita)

OC Foothills Bikeways Strategy (2016)

OCTA completed the OC Foothills Bikeways Strategy identifying a set of regional bikeway corridors in Supervisorial District 3, including the County of Orange and the Cities of Anaheim, Irvine, Orange, Tustin, Villa Park, and Yorba Linda. The project involved focus group meetings, community roundtable discussions, public engagement via tabling events, and online and in-person surveys. The OC Foothills Bikeways Strategy identified a total of 11 corridors and 99.5 miles of new or enhanced bikeways and trails to implement in Supervisorial District 3.

OC Foothills Bikeways Feasibility Study (2016)

The OC Foothills Bikeway Feasibility Study examined portions of all eleven bikeway corridors identified in the OC Foothills Bikeway Strategy. A total of 51 miles of new or enhanced bikeways were identified for priority implementation:

- Regional Parks Connector
- Lakeview – San Diego Creek
- Cambridge – Portola
- Taft Corridor
- Walnut – Chapman
- Santiago Canyon
- Old Town – Great Park
- Warner – Edinger
- Laguna Canyon – Irvine Station
- Jeffrey Corridor
- Bastanchury Corridor

OC Loop 70/30 Plan (2015)

The initial Orange County Loop (OC Loop) was envisioned as an opportunity for people to bike and walk between scenic beaches and inland reaches by connecting 66 miles of regional bikeways. Completion of the initial OC Loop has been underway through coordination among multiple local agencies and support by OCTA. The 2015 OC Loop 70/30 Plan summarized feasibility analysis for completing the remaining 30% of the OC Loop. Stemming from the 2015 OC Loop 70/30 Plan, stakeholder partners are proceeding with grant funding pursuits and continue closing bikeway gaps in North Orange County.

OC Active: Orange County's Bike + Ped Plan (2019)

OC Active was Orange County's first countywide active transportation plan (ATP) that addressed both bicycle and pedestrian networks. OC Active provided a framework for planning projects across the county that would reduce bicycle and pedestrian collisions, advance a strategic walking and biking network, enhance walking and biking access to transit, improve high-need pedestrian areas, strengthen stakeholder partnerships, incorporate diverse community perspectives, and leverage funding opportunities. Expanding the OC Loop concept, OC Active identified new regional connectors in central and southern loops as well as a connector which traversed southeast to northwest across the county.

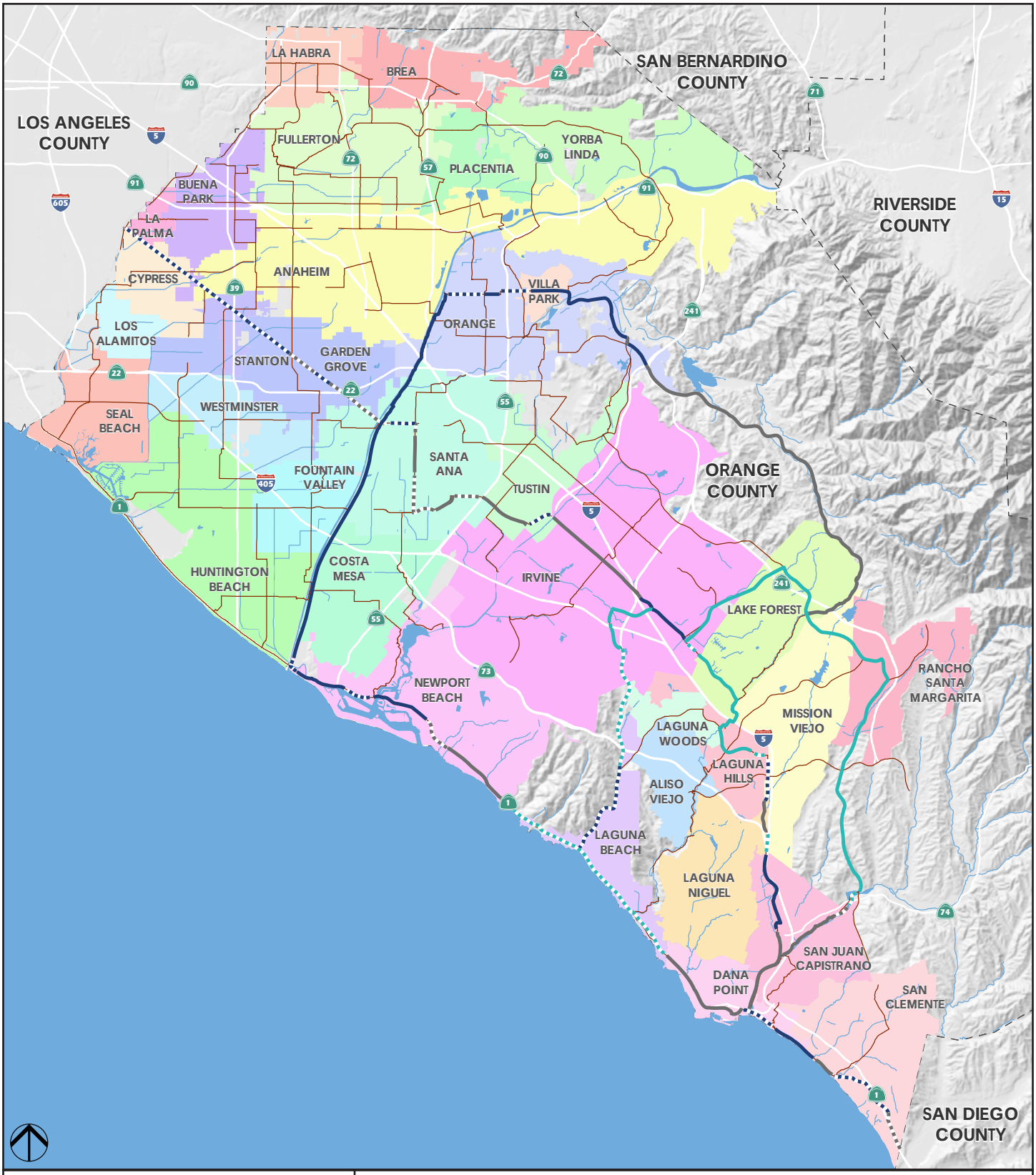
Study Segments

The bikeway segments analyzed in the Study were derived from the OC Active recommendations for regional connectors bikeways which were initially based on the prior OCTA Regional Bikeway Strategies, Feasibility Studies, and OC Loop 70/30 Plan. Each segment of the conceptual Central Loop, South Loop, and Cross County Connector was reviewed to identify recent agency efforts toward enhancements and/or implementation. The next steps for the bikeway segments were made based on past planning recommendations, work recently completed, and focus meetings with local agency staff. Three types of recommendations were considered for segments in the OC South Loop, OC Central Loop, and OC Connect: No New Feasibility Analysis, Update Cost Estimates, and Evaluate Enhancements.

- No Feasibility Analysis Proposed: The segment exists, was built, or improved recently by the local agency;
- Updated Cost Estimates: The segment has been evaluated previously in feasibility planning and cost estimate revisions are needed; and
- Feasibility Analysis Proposed: Prior feasibility studies did not include the segment. Review included evaluation for bikeway facility enhancements and potential for implementation on nearby alternative corridors with potential for lower bikeway level of stress facilities.

Figure 4 Analysis Recommendations illustrates the regional bikeways identified in past planning efforts including the bikeway segments reviewed in the Study.

Figure 4 Analysis Recommendations



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OC Loops Feasibility Study

Analysis Recommendations

MARK THOMAS

OCTA

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LEGEND

Built	Not Built	
		Updated Cost Estimates
		Feasibility Analysis Proposed
		No Feasibility Analysis Proposed
		Regional Bikeways

Class I & Class II Bikeways

Base Mapping

The four regional bikeways were available from OCTA in Keyhole Markup Language (KML) format. The project team conducted a review of the geo-data and updated linework attributes to reflect the current status of individual bikeway segments as "Built" or "Not-built" according to the recommendations in prior Feasibility Studies. Information from aerial imagery, review of local agency planning documents, and discussions with agency staff were used to inform the process.

The project team then reviewed bikeway segments to identify opportunities for additional enhancements and created a new attribute for "Recommendation". Bikeway segments with "Built" status were assigned a recommendation of "No New Analysis." Bikeway segments with "Not-built" status received a further detailed review. Where prior bikeway feasibility study recommendations were found to provide enhancements suitable for the roadway capacity and right-of-way, the segment was assigned a "Update Cost Estimate" status to reflect changes in design and construction costs over the preceding years. Where additional opportunities for enhanced facilities were identified based on roadway design, potential connections, and accessibility, bikeway segments were assigned a status of "Evaluate Enhancements."

Bikeway segments assigned Evaluate Enhancements under Recommendations were considered for facility upgrades or alignment along an alternative route. Potential enhancements were workshopped with local agency staff to determine the most appropriate facility for providing bikeway connectivity.

Following the development of enhancement recommendations for bikeway corridors, geographic information systems (GIS) software was used to parse segments based on jurisdictional boundaries.

The regional bikeways were layered with demographic data to inform areas of need based on State Transportation Goals for providing enhanced bikeway facilities in locations associated with:

- Low-income communities;
- Senate Bill (SB) 535 Disadvantaged Communities;
- Free and Reduced Priced Meal (FRPM) eligible student populations;
- Communities of Concern; and
- Environmental Justice Areas

Demographic maps are included as Appendix A.

Community Engagement

Public Outreach

Multiple strategies were utilized for public engagement related to this project. Outreach activities included presence and information at ten (10) tabling events at virtual open houses, community events, festivals, parks, and trails, two virtual workshops, agency stakeholder meetings, jurisdictional staff focus meetings, and presentations to both the OCTA Technical Advisory Committee and Bicycle and Pedestrian Active Transportation Committee.

Long Range Transportation Plan Agency Outreach

OCTA hosted two presentations on the development of the Long Range Transportation Plan (LRTP). During these meetings, OC Loops project staff presented the Study to public attendees. An introduction and background on the Study was provided during the virtual open house meetings that occurred on November 14, and November 21, 2021.

Great Opportunities Bike Clinic, San Juan Capistrano

Great Opportunities, a local community-based organization based in San Juan Capistrano, hosted a pop-up bicycle safety demonstration on February 12, 2021. A tabling to discuss the OC Loops Bike Gap Closure Feasibility Study was organized to engage with attendees to the bike safety event. Staff discussed the OC Loops project awareness and solicited input on needs and efforts to close gaps in regional bikeways countywide.

Figure 5 Great Opportunities Bike Clinic

Boys and Girls Club of Lake Forest at El Toro Park

The project team organized a tabling event at the Boys and Girls Club of Lake Forest at El Toro Park on March 11, 2022, between 3:00 PM and 5:00 PM. The event was part of the ongoing OC Loops Bike Gap Closure Feasibility Study to increase awareness of the project, gain public participation in the planning process, and support prioritization of gap closure projects countywide.

Figure 6 Bicycle Commuting from Boys and Girls Club

Bike Safety Rodeo at Bell Tower Regional Community Center

The City of Rancho Santa Margarita (RSM) and the Orange County Sheriff's Department (OCSD) hosted a Bike Safety Rodeo at the Bell Tower Regional Community Center on August 7, 2022, between 3:00 PM and 5:00 PM. The Bike Rodeo promoted safe cycling activity throughout the City and provided an opportunity to practice bicycle maneuvering skills and learn the rules of the road. The project team participated in the City event as part of the OC Loops Bike Gap Closure Feasibility Study to increase awareness of the project, gain public participation in the planning process, and support the prioritization of gap closure projects countywide.

Figure 7 OC Loop Participation at Bike Safety Rodeo

Bikestravaganza at JSerra Catholic High School

San Juan Capistrano Rotary and Great Opportunities hosted the Bikestravaganza event at JSerra Catholic High School at San Juan Capistrano on October 8, 2022, between 10:00 AM and 2:00 PM. The event promoted bicycle safety and provided the community with an opportunity to practice safe cycling and learn about bike repair and maintenance. The project team participated in the locally led event as part of the ongoing OC Loops Bike Gap Closure Feasibility Study to increase awareness of the project, gain public participation in the planning process, and support the prioritization of gap closure projects countywide.

Descanso Park Trail Tabling

The project team set up a tabling event at Descanso Park in San Juan Capistrano on December 18, 2022. The team engaged members of the public traveling at the junction between the San Juan Creek Trail and the Trabuco Creek trail where a bridge crosses Trabuco Creek. The OC Loops and cycling networks throughout the community and region were discussed with visitors to the booth.

Figure 8 OC Loops at Descanso Park

North Beach Trail Tabling

The project team set up a tabling event at the North Beach Trail entry in San Clemente on January 22, 2023. The team engaged members of the public visiting the trail and the adjacent beach.

Laguna Beach Farmers Market Tabling

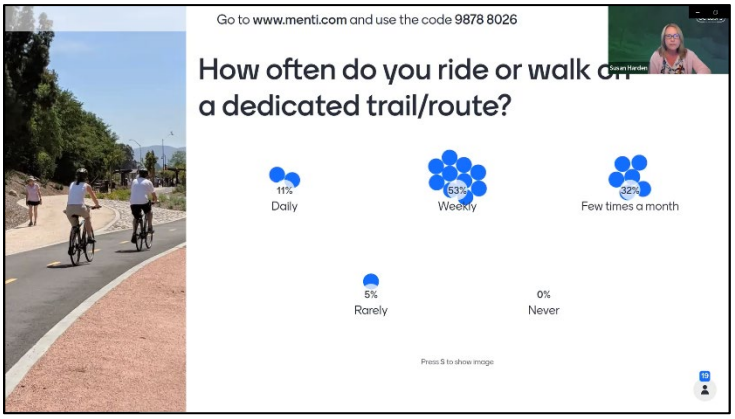
The project team set up a tabling event at the Farmers Market in Laguna Beach on February 11, 2023. The team engaged members of the public visiting the market, from local residents and visitors to the City.

Aliso Creek Trail Tabling

The project team set up a tabling event along the Aliso Creek Trail in Laguna Hills on February 5, 2023. The team engaged members of the public visiting the nearby high school, homes, and people traveling along the trail.

Virtual Community Workshop #1

Figure 9 Interactive Online Participation during Virtual Workshop



On March 24, 2022, the project team hosted a virtual community workshop, which included thirty (30) individuals from throughout Orange County. The meeting reviewed OC Loops concept, project partners, background, goals, and next steps. Public input and feedback were collected through facilitated survey questions, and a dedicated question and answer session. The video recording of the virtual workshop was posted to the OCTA project website which included the project schedule, fact sheet, and point of contact information created for the project.

Virtual Workshop #2

On February 16, 2023, the project team hosted a second virtual community workshop, which included fifty (50) individuals from throughout Orange County. The meeting reviewed OC Loops' project partners, proposed concepts, and next steps. The video recording of the virtual workshop was posted to the OCTA project website.

Summary of Input

Participants answered survey questions to help refine the OC Loops network and identify preferred facilities for cyclists of all ages and abilities within the community. Public input was collected through sticker voting boards and comments written by the project team. Results of the sticker voting board activities are shown on Figure 10, Figure 11, and Figure 12.

Following is a summary of the comments and concerns collected from the public during engagement activities:

- Accessibility to trails;
- Distracted drivers and cars parked in the bike lane;
- Fast bicyclists passing youth riders in the bike lane;
- Proximity of bikeways and multi-use trails to home;
- Motor vehicles entering or parking within the bicycle lane;
- Youth safety using on-street bikeways and crossing at intersections;
- Lack of bikeway connectivity to grocery stores, schools, and parks;
- Mixed mode type travelers on bicycle facilities, such as cyclists, pedestrians, and joggers;
- Availability of shade and other supportive infrastructures on multi-use trails;
- Safety for bicyclists, infrastructure connectivity, and bike route signage;
- Personal safety regarding electric bicycle speed within the bike lane and on the roadway;
- Road maintenance, including debris, situations of uneven roads, and cracked pavement;

Following is a summary of the interest collected from the public during engagement activities:

- Group rides for community enrichment;
- Roadway safety education workshop for bicyclists;
- Bikeway inclusivity and partnerships with public transit;
- Signage with messaging about sharing the road and notice of bike routes;
- Designing for separation between high-speed and lower-speed bicycle users;
- Wider facilities with delineation of the pedestrian space separate from the cycling space; and
- Off-street trails or similar facilities such as raised concrete barrier separated bikeways.

Figure 10 Public Input Results for "Which bikeway type do you feel comfortable on?"

Figure 11 Public Input Results for "What would bring you out to the OC Loops?"

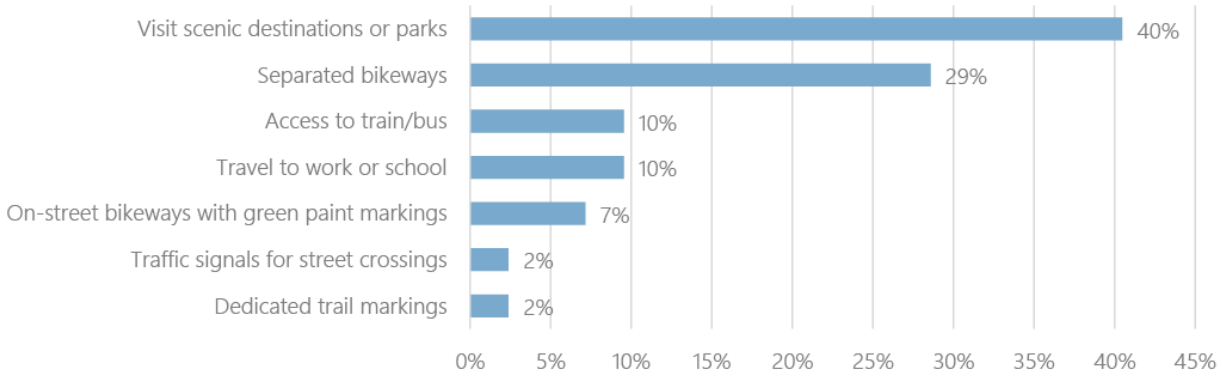
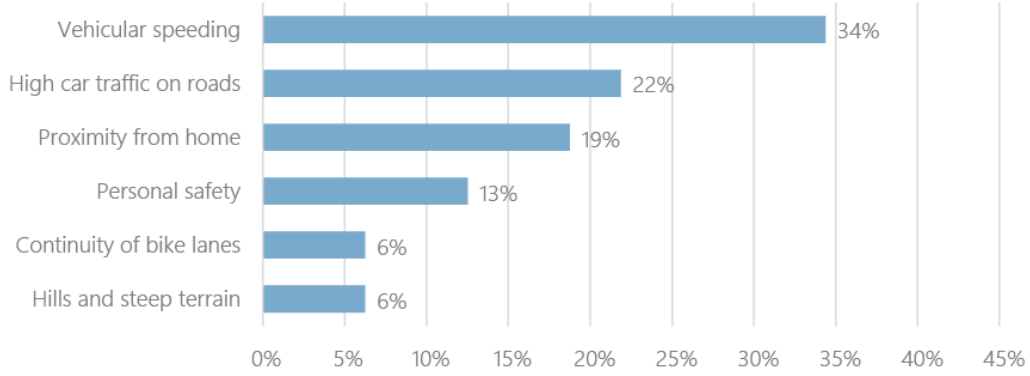


Figure 12 Public Input Results for "What obstacles exist that deter you from using the OC Loops?"



Agency Outreach

OCTA Bicycle Pedestrian Subcommittee Presentations

The project team presented to OCTA's Bicycle and Pedestrian Active Transportation Subcommittee (BPS) twice during project development. The BPS is a permanent subcommittee of the Citizens Advisory Committee, which provides input and advice on projects, studies, and outreach regarding bicyclists and pedestrians. The initial presentation on September 21, 2021, provided an introduction to the Study, including background, prior efforts by OCTA, plans for stakeholder and public engagement, and planned outcomes. The second presentation on September 20, 2022, introduced the identified bikeway networks (OC North Loop, OC Central Loop, OC South Loop, and OC Connect), summarized completed and planned outreach events, and introduced design concepts under consideration for enhancement recommendations.

OCTA Technical Advisory Committee

The project team presented to OCTA's Technical Advisory Committee (TAC) twice during project development. The TAC consists of 35 local agency representatives who provide OCTA staff with technical advice related to projects and programs impacting local streets and roads. The January 26, 2022 presentation introduced the project background, engagement activities, branding concepts, and designs under consideration for enhancement recommendations. Presentation at the TAC related to the completion of the Study and next steps occurred on June 28, 2023.

Focus Meetings

The project team hosted focus meetings with local agency staff to identify and refine bikeway enhancement concepts. Focus meetings were an essential process to collaborate with local agencies on emerging and innovative bikeway designs and identify alternative corridors to provide bikeway connections on comparatively lower-stress roadways. The project team and local agency staff discussed approaches for design, implementation, and maintenance of potential bikeway enhancements and opportunities to coordinate implementation with planned capital projects. Through the focus meetings, variations of design were identified based on local agency capacity, which have been included in the proposed recommendations under *Initial Design* and *Comprehensive Design*.

> *Initial Design* includes bikeway recommendations that require minor construction, and may be achieved through signing, striping, and may serve as interim designs prior to *Comprehensive Design* implementation.
>
> *Comprehensive Design* includes bikeway recommendations that require detailed engineering design, groundbreaking, and greater capital investment. Local agencies may opt to implement *Comprehensive Design* immediately should capacity and resources allow.

Recommendations & Cost Estimates

A summary of corridors and segments are provided in the following section. Through the process of background review, base mapping, and agency engagement, the Study identified bikeway segments to receive updated cost estimates or recommendations for initial and comprehensive bikeway enhancements. Bikeway segments with prior feasibility review received updated cost estimates, and segments with recent improvements did not receive any new analysis.

The enhancement recommendations identify initial and comprehensive bikeway designs and the lead agency. Each segment was evaluated for feasibility, opportunities, constraints, and accessibility to nearby regional destinations. The initial and comprehensive bikeway enhancements recommended in this Study do not constitute prioritization over plans adopted by local agencies. The recommendations enhance regional bikeway connectivity throughout Orange County and are suggestions for consideration by City staff. In some cases, alternate routing is identified based on discussions with City staff that may achieve similar connectivity. Implementation of recommendations are to be led by City staff, whereas OCTA is available to support through programs such as the Complete Streets Program, discussed in further chapters.

Engineering cost estimates have been developed in current, non-escalated dollars, to reflect the anticipated cost of construction and additional budget would be needed to address the following items:

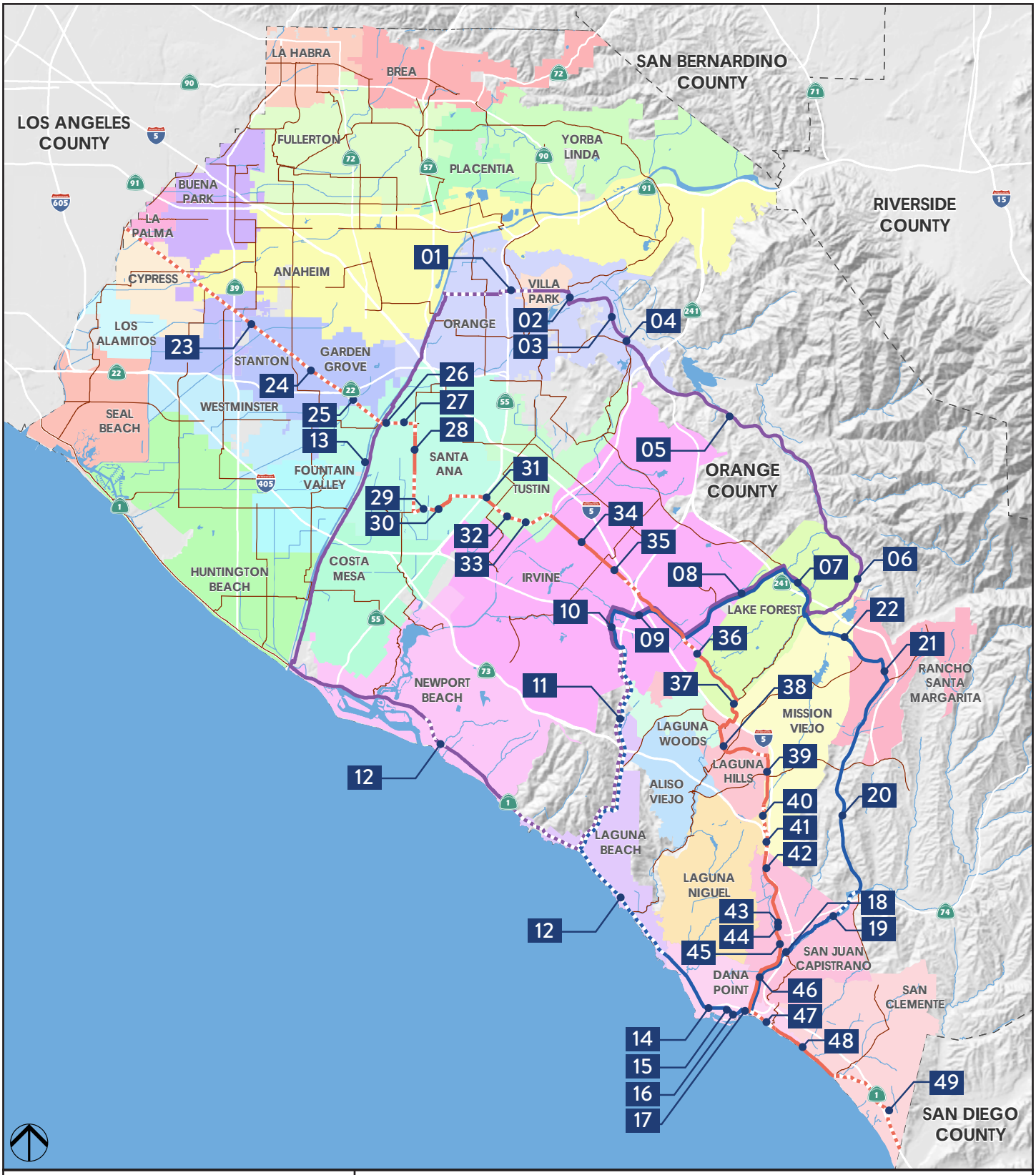
- Preliminary Design and Environmental Review
- Final Design
- Right of Way Acquisition (if needed)
- Permitting (if needed)
- Construction Management

Cost estimates in this report are rounded to the "hundred" value and are typically provided for the initial recommended bikeway design.

The original OC North Loop utilized segment lettering between Segment A and Segment T. For the purposes of this study the new OC Loops have been numbered by corridor as shown in Figure 13. Corridors are further defined as Segments, alphabetically, based on level of analysis, jurisdictional oversight, proposed treatments, and similar uniquely defining characteristics. A color-coding system is assigned to indicate the level of analysis assigned to specific segments:

	No New Analysis
	Updated Cost Estimates
	Evaluated for Enhancements

Figure 13 OC Loops Corridor Numbering



OCTA

OC Loops Feasibility Study

OC Loops Corridor Numbering

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Bike. Walk. Explore.

LEGEND

Built Not Built

OC Central Loop

OC South Loop

OC Connect

Regional Bikeways

00 Corridor Number

Taft Avenue (Corridor 01)

Taft Avenue is a 4.5-mile corridor serving the Central and South Loops. The Segment 01 extents are between the Santa Ana River Trail (SART) and Cannon Street. The corridor is within the jurisdiction of two (2) agencies, including City of Orange and City of Villa Park. Recommendations for the corridor were developed in the District 3 OC Foothills Bikeways Feasibility Study and included the following:

- Implementing a Class IV facility between the Santa River Trail and Tustin Street, and between Tustin Street and Cannon Street.
- Implementing a Class I facility on Tustin Street between the two intersections with Taft Avenue.
- Traffic control device upgrades, crossing enhancements, and sidewalk widening.

Table 1 Corridor 01A through 01D Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
01A	Santa Ana River Trail to Cambridge St	1.4 miles	Not Built	Orange	Class IV	$1,090,000
01B	Cambridge St to Tustin Ave	0.6 miles	Built	Orange	Buffered Class II	$78,000
01C	Tustin Ave to Nichols Ave	1.1 miles	Built	Villa Park	Buffered Class II	$244,000
01D	Nichols Ave to Cannon St	1.4 miles	Built	Orange	Buffered Class II	$165,000
					SUBTOTAL	$1,577,000
					CONTINGENCY (30%)	$473,100
					GRAND TOTAL	**$2,050,100**

Cannon Street (Corridor 02)

Cannon Street is a 0.4-mile corridor serving the Central and South Loops and within the jurisdiction of the City of Orange. The Segment 02 extents are between Taft Avenue and Santiago Canyon Road. Recommendations for the corridor were developed in the District 3 OC Foothills Bikeways Feasibility Study and included the following:

- Restripe vehicle travel lanes and trim raised median to accommodate new Class IV protected bike lane along each side of Cannon Street.

Table 2 Corridor 02A Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
02A	Taft Ave to E Santiago Canyon Rd	0.4 miles	Built	Orange	Buffered Class II	$124,000
					SUBTOTAL	$124,000
					CONTINGENCY (30%)	$37,200
					GRAND TOTAL	**$161,200**

East Santiago Canyon Road (Corridor 03)

East Santiago Canyon Road is a 3.1-mile corridor serving the Central and South Loops and within the jurisdiction of the City of Orange and the County of Orange. The Segment 03 extents are between Cannon Street and Jamboree Road. Recommendations for the corridor were developed in the OC Foothills Bikeways Feasibility Study and included the following:

- Restripe vehicle travel lanes and modify raised median as needed to accommodate new Class IV facility on Santiago Canyon Road.

Table 3 Corridor 03A Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
03A	Cannon St to Jamboree Rd	3.1 miles	Built	Multiple	Class IV	$645,300
					SUBTOTAL	$645,300
					CONTINGENCY (30%)	$193,600
					GRAND TOTAL	**$838,900**

Jamboree Road (Corridor 04)

Jamboree Road is a 0.2-mile corridor serving the Central and South Loops. The Segment 04 extents are between North Santiago Canyon Road and South Santiago Canyon Road. The corridor is within the jurisdiction of multiple agencies and no new analysis has been assigned given the existing facility.

Table 4 Corridor 04A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
04A	N Santiago Canyon Rd to S Santiago Canyon Rd	0.2 miles	Built	Multiple	Class I

E Santiago Canyon Road (Corridor 05)

E Santiago Canyon Road is a 12.1-mile corridor serving the Central and South Loops and is within the jurisdiction of multiple agencies. The Segment 05 extents are between Jamboree Road and Ridgeline Road (South).

Segment 05A

Recommendations for Segment 05A were developed in the District 3 Bikeways Feasibility Study and included the following:

- Intersection improvements at the SR-241/261 ramp interchanges, including bike crossings with bike signal detection, high visibility crosswalks, dashed green lines at merge locations and tightened turning radius at on-ramps.
- Provide advance green signal phasing for cyclists at both interchange intersections.

Table 5 Corridor 05A Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
05A	Jamboree Rd to SR-241 Ramps	1.0 miles	Built	Orange	Class II	$242,000
					SUBTOTAL	$242,000
					CONTINGENCY (30%)	$72,600
					GRAND TOTAL	**$314,600**

Segment 05B

No new analysis was recommended for segment 05B given the existing facility.

Table 6 Corridor 05B Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
05B	241 EB Ramps to Ridgeline Rd (South)	11.1 miles	Built	Multiple	Buffered Class II

Aliso Creek Class I Bike Path (Corridor 06)

Aliso Creek Class I Bike Path is a 2.7-mile off-street facility serving the South and Central Loops. The Segment 06 extents are between Ridgeline Road (South) and Portola Parkway-Santa Margarita Parkway. The corridor is within the jurisdiction of multiple agencies and no new analysis has been assigned given the existing facility.

Table 7 Corridor 06A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
06A	Ridgeline Rd (South) to Portola Pkwy-Santa Margarita Pkwy	2.7 miles	Built	Multiple	Class I

Portola Parkway (Corridor 07)

Portola Parkway is a 2.0-mile corridor serving the Central and South Loops within the jurisdiction of the City of Lake Forest. The Segment 07 extents are between the Aliso Creek Bikeway and Alton Parkway. The corridor was not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this Study. The corridor provides connections to major commercial destinations from the well-used Aliso Creek Bike Trail.

Existing Facility	Class II Bike Lanes
Curb-to-Curb Width	120-feet to 145-feet
Classification	Major Arterial
Posted Speed Limits	45-50 Miles per Hour
Average Daily Traffic	32,000 to 36,000
On-street Parking	No

Opportunities and Constraints

The corridor provides direct access between recreational, regional trails, and commercial destinations. The corridor serves access to a religious institution and crosses State Route 241 (SR-241) interchange freeway access ramps.

Major Regional Destinations

The corridor connects the Aliso Creek Bike Path to Whiting Ranch Wilderness Park, major shopping destinations between Alton Parkway and Bake Parkway, and a major religious institution.

Figure 14 Corridor 07 Existing Class II Bike Lanes

Conceptual Designs

Table 8 Corridor 07A Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
07A	Aliso Creek Bikeway to Alton Pkwy	2.0 miles	Built	Lake Forest	Buffered Class II	$81,500
					SUBTOTAL	$81,500
					CONTINGENCY (25%)	$20,400
					GRAND TOTAL	**$101,900**

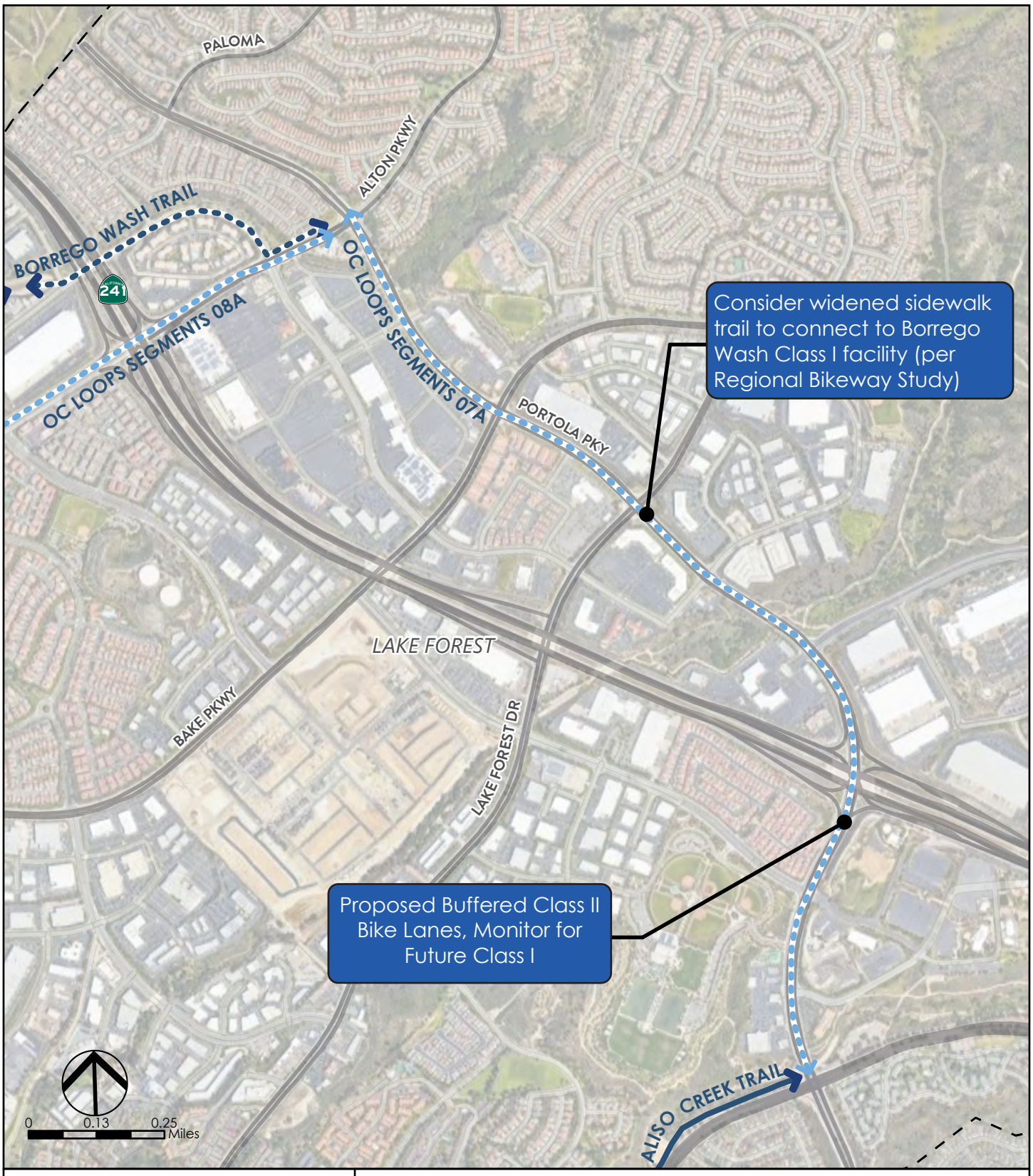
Initial Design

- Implement conflict zone striping at weave areas between motor vehicle lanes and bike lane.
- Restripe bike lane to include 2′ buffer and 6′ bike lane.
- Install 2-stage left-turns at select traffic signal locations (commercial and employment uses, parks, trailheads, etc.).

Comprehensive Design

- Install vertical element separation (delineators, median, or concrete barrier) between intersections for mid-block Class IV bikeway treatment, and Class II treatment at intersections.
- Continue Class IV bikeway treatment at intersections.
- Narrow bike lane and widen sidewalk to provide Class I facility serving bi-directional bicycle and pedestrian traffic, potentially requiring new right-of-way.
- Convert outer vehicle lane to provide on-street Class II bike lane (one-direction) and Class I facility serving bi-directional bicycle and pedestrian traffic.
- Install bicycle & pedestrian signal control at uncontrolled SR-241 interchange on/off ramps.

Figure 15 OC Loops Segment 07A



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OC Segment 07A

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- City Boundary
- Existing Class I
- Proposed Class I
- Proposed Class II

Name: 014 - OC Loops 07A

Alton Parkway (Corridor 08)

Alton Parkway is a 3.2-mile corridor serving the Central and South Loops. The Segment 08 extents are between Portola Parkway and Barranca Parkway. The corridor is within the jurisdiction of three (3) agencies, including City of Lake Forest, City of Irvine, and County of Orange. The corridor was not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this project. The corridor connects northeast to southwest, linking Cleveland National Forest foothills to more densely developed urban areas. The corridor serves as a high-speed corridor to connect vehicles with State Route 241, Interstate 5, and Interstate 405, and is designed to move high volumes of vehicles quickly.

Existing Facility	Class II Bike Lanes
Curb-to-Curb Width	90-feet to 130-feet
Classification	Major Arterial
Posted Speed Limits	50-60 Miles per Hour
Average Daily Traffic	22,000 to 32,000
On-street Parking	No

Figure 16 Corridor 08 Existing Class II Bike Lanes

The Irvine Strategic Active Transportation Plan has identified network connections to improve the facility, including converting Class II bike lanes to Class IV buffered bike lanes, where feasible, between Irvine Boulevard and Red Hill Avenue. Recommendations are provided for the intersection of Alton Parkway and Muirlands to provide free-right-turn lane crossing enhancements for pedestrians and conflict zone marking in mixing zone for bicyclists, and leading interval signal integration.

Opportunities and Constraints

The corridor has the potential to serve as a bicycle commuting corridor between housing and major employment opportunities. The full 4.3-mile corridor has an average slope of 2.3% southbound. Increased availability and access to e-bikes reduce barriers regarding slope and distance along the route. E-bikes have significantly lower costs than personal vehicles, increasing opportunities for cycling among the public with low transportation option costs. Constraints that may prevent the use of the commute corridor include long stretches of high-speed vehicle lanes and lack of destinations for bicyclists to stop and rest, exposure to the elements, and bicycle facility gaps at major intersections.

Major Regional Destinations

Alton Parkway provides connections between mid-density housing, recreational destinations, employment opportunities, and regional transit services. Specifically, Orange County Great Park, Irvine Station (serving Metrolink and Amtrak trains), Irvine Spectrum Center, and major office and industrial employment within the Irvine Spectrum.

Conceptual Designs

Table 9 Corridor 08 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
08A	Portola Pkwy to Commercentre Dr	1.7 miles	Built	Lake Forest	Buffered Class II	$735,500
08B	Commercentre Dr to Barranca Pkwy	2.5 miles	Built	Irvine	Buffered Class II	$1,107,300
					SUBTOTAL	$1,842,800
					CONTINGENCY (25%)	$460,700
					GRAND TOTAL	**$2,303,500**

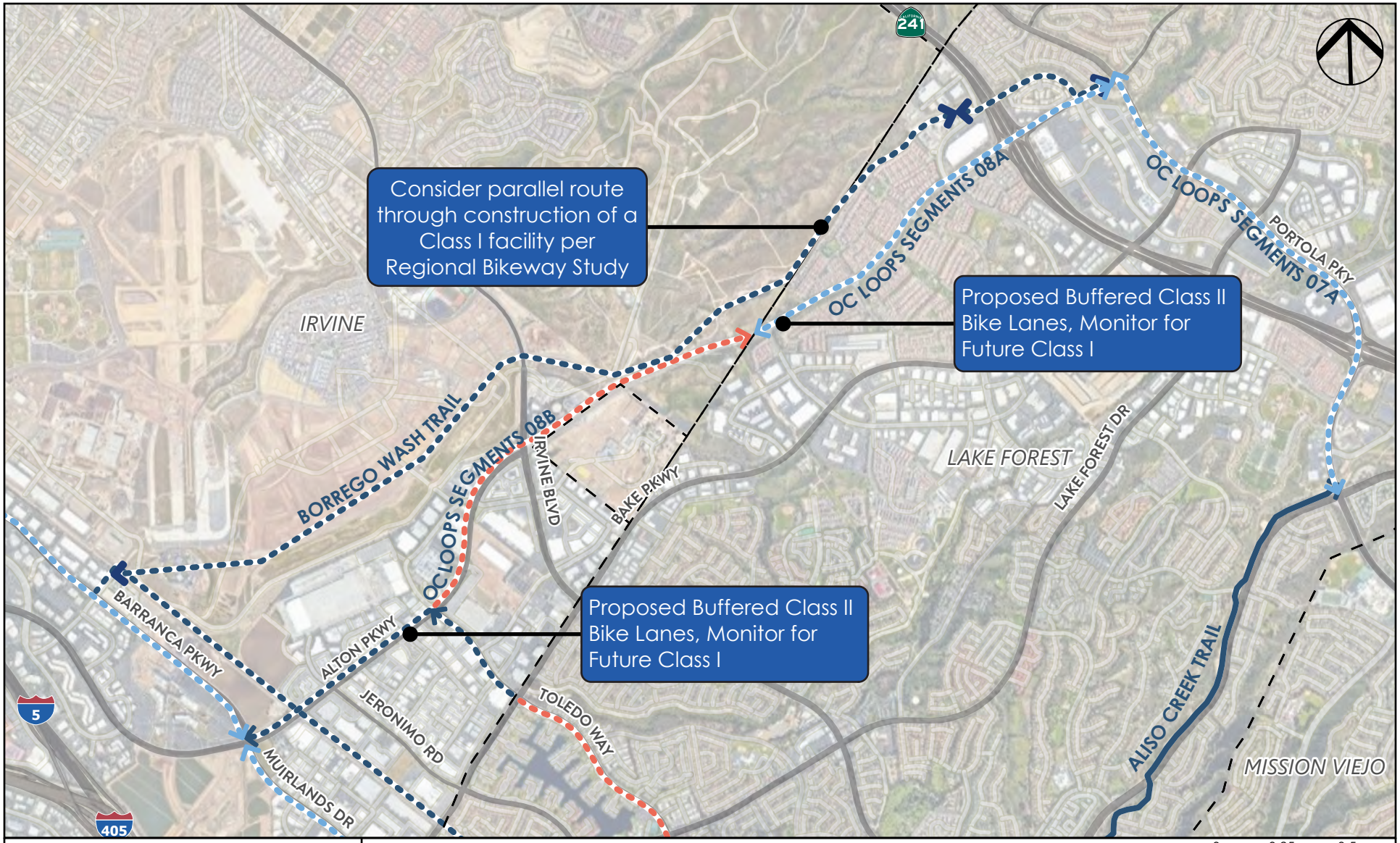
Initial Design

- Implement conflict zone striping at weave areas between motor vehicle lanes and bike lane.
- Restripe bike lane to include 2′ buffer and 6′ bike lane.
- Increase width of Class II facility to include 2′ buffer and 6′ bike lane through vehicle lane narrowing.
- Install 2-stage left-turns at select traffic signal locations (commercial and employment uses, parks, trailheads, etc.).
- Complete Class II facility gap on SR-241 overpass.

Comprehensive Design

- Install vertical element separation (delineators, median, or concrete barrier) between intersections for mid-block Class IV bikeway treatment, and Class II treatment at intersections.
- Continue Class IV bikeway treatment at intersections.
- Narrow bike lane and widen sidewalk to provide Class I facility serving bi-directional bicycle and pedestrian traffic.
- Convert outer vehicle lane to provide on-street Class II bike lane (one-direction) and Class I facility serving bi-directional bicycle and pedestrian traffic.
- Consider parallel route through construction of a Class I facility northwest of Alton Parkway using County envisioned Borrego Wash (per Regional Bikeway Study)

Figure 17 OC Loops Segments 08A & 08B



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OC Segments 08A & 08B

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LEGEND

- City Boundary
- Existing Class I
- Proposed Class I
- Proposed Class II
- Proposed Class IV

Name: 015 - OC Loops 08A & 08B

Barranca Parkway (09)

Barranca Parkway is a 3.6-mile corridor serving the Central Loop, South Loop, and OC Connect. The Segment 09 extents are between Alton Parkway and Laguna Canyon Road. The corridor is within the jurisdiction of the City of Irvine.

Segment 09A

Recommendations for segment 09A were developed in the District 3 Bikeways Feasibility Study and included the following:

- Restripe vehicle travel lanes and existing Class II bike lanes to accommodate new Class IV protected bike lanes along both sides of Barranca Parkway.
- Lane narrowing is necessary to accommodate proposed improvement.

Table 10 Corridor 09 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
09A	Alton Pkwy to Technology Dr	2.2 miles	Built	Irvine	Class IV	$1,717,000
					SUBTOTAL	$1,717,000
					CONTINGENCY (30%)	$515,100
					GRAND TOTAL	**$2,232,100**

Segment 09B

Segment 09B was evaluated for bikeway enhancements. The corridor travels near-parallel to Interstate 405, providing connections to high-density housing and major office complexes. The roadway right-of-way is narrower than other corridors within the Study, however, still provides similar vehicle conditions (six vehicle through lanes at posted speed limits of 50 mph).

The Irvine Strategic Active Transportation Plan has identified network connections to improve the facility, including converting Class II bike lanes to Class IV buffered bike lanes wherever feasible. Recommendations are included for the intersection of Barranca Parkway and SR-133 to provide pedestrian/bicycle crossing enhancement at intersections, advanced warning signs, and conflict zone marking at free-right mixing zones.

Existing Facility	Class II
Curb-to-Curb Width	90-feet to 95-feet
Classification	Major & Primary Arterial
Posted Speed Limits	50 Miles per Hour
Average Daily Traffic	17,000 to 21,000
On-street Parking	No

Figure 18 Segment 09B Existing Conditions

Conceptual Designs

Table 11 Segment 09B Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
09B	Technology Dr to Laguna Canyon Rd	1.4 miles	Built	Irvine	Class I	$4,715,000
					SUBTOTAL	$4,715,000
					CONTINGENCY (25%)	$1,178,800
					GRAND TOTAL	**$5,893,800**

Initial

- Implement conflict zone striping at weave areas between motor vehicle lanes and bike lane.
- Restripe bike lane to include 2′ buffer and 6′ bike lane.
- Increase width of Class II facility to include 2′ buffer and 6′ bike lane through vehicle lane narrowing.

Comprehensive

- Install vertical element separation (delineators, median, or concrete barrier) between intersections for mid-block Class IV bikeway treatment, and Class II treatment at intersections.
- Continue Class IV bikeway treatment at intersections.
- Narrow bike lane and widen sidewalk to provide Class I facility serving bi-directional bicycle and pedestrian traffic.
- Consider parallel route through construction of a Class I facility northeast of Barranca Parkway using LOSSAN Corridor

Laguna Canyon Road (SR-133) (Corridor 10)

Laguna Canyon Road is a 1.5-mile corridor serving the Central and South Loops. The Segment 10 extents are between Barranca Parkway and Laguna Canyon Road (at the SR-133 junction). The corridor is within the jurisdiction of two (2) agencies, including the City of Irvine and Caltrans. The corridor was not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this project. The corridor provides connections between employment and nearby housing and the Irvine Medical and Science Complex. The roadway experiences lower motor vehicle volumes than parallel routes.

Existing Facility	Class II & Class III
Curb-to-Curb Width	75-feet to 80-feet
Classification	Primary Arterial
Posted Speed Limits	50 Miles per Hour
Average Daily Traffic	5,000 to 9,000
On-street Parking	No

Figure 19 Corridor 10 Existing Conditions

The Irvine Strategic Active Transportation Plan has identified network connections to improve the facility, including converting Class II bike lanes to Class IV buffered bike lanes where feasible between Quail Hill Parkway and SR-133, between Alton Parkway and Pasteur, and to create a Bicycle and Pedestrian Friendly Corridor (BPIC) between Alton Parkway and Quail Hill Parkway. Recommendations are included for the intersection of Laguna Canyon Road and SR-133 to provide bicycle/pedestrian intersection crossing enhancements at free-right, conflict zone improvements, and leading interval integration into signal operation.

Opportunities and Constraints

The corridor's low Average Daily Traffic (ADT) volumes allow flexibility to implement transformative treatments. Existing facilities are challenged by available infrastructure to cross Interstate 405 (I-405), and the use of Class III sharrow in the constrained areas. Routes may be improved through striping and signage to promote uninterrupted bicyclist right-of-way throughout the corridor.

Major Regional Destinations

The corridor provides access to health services at the Irvine Medical and Science Complex, natural open space preserves, and connections to State Route 133 accessing the preserved open space within Laguna Canyon.

Conceptual Design

Table 12 Corridor 10 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
10A	Barranca Pkwy to I-405 Overpass	0.6 miles	Not Built	Irvine	Buffered Class II	$1,620,400
10B	I-405 Overpass	0.1 miles	Not Built	Irvine	Standalone Class I	$5,852,400
10C	I-405 Overpass to SR-133	0.8 miles	Not Built	Irvine	Buffered Class II	$634,700
					SUBTOTAL	$8,107,500
					CONTINGENCY (25%)	$2,026,900
					GRAND TOTAL	**$10,134,400**

Initial

- Implement conflict zone striping at weave areas between motor vehicle lanes and bike lane.
- Restripe bike lane to include 2' buffer and 6' bike lane.
- Install 2-stage left-turns at select traffic signal locations (commercial and employment uses, parks, trailheads, etc.).
- Widen I-405 overpass to provide Class IV bikeways in each direction.
- Provide two-way cycle track connections to/from the Interstate 405 overpass facility.

Comprehensive

- Install vertical element separation (delineators, median, or concrete barrier) between intersections for mid-block Class IV bikeway treatment, and Class II treatment at intersections.
- Continue Class IV bikeway treatment at intersections.
- Narrow bike lane and widen sidewalk to provide Class I facility serving bi-directional bicycle and pedestrian traffic.
- Convert outer vehicle lane to provide on-street Class II bike lane (one-direction) and Class I facility serving bi-directional bicycle and pedestrian traffic.
- Construct separate Class I bridge serving bicyclists and pedestrians on westerly side of I-405 overpass.
- Provide access ramps for cyclists traveling northbound over I-405 overpass to utilize sidewalk.
- Install Class IV or Class I facilities on either side of I-405 overpass based on the design for the crossing of the freeway.
- Install sharrows within the roundabout.
- Provide modifications to enhance use of sidewalk by cyclists through roundabout (wider sidewalk, signage, and green paint striping.

Figure 20 OC Loops Segments 09A, 09B, 10A-10C

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OC Loops Segments 09A, 09B, 10A-C

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- Existing Class I
- Proposed Class I
- Proposed Class II

SR-133 (Corridor 11)

Laguna Canyon Road (SR-133) is a 7.8-mile corridor serving the Central and South Loops. The Segment 11 extents are Laguna Canyon Road (at SR-133 junction) and El Toro Road. The corridor is within the jurisdiction of Caltrans and travels through three (3) agencies, including the City of Irvine, County of Orange, and the City of Laguna Beach.

Existing Facility	Class III
Curb-to-Curb Width	45-feet to 85-feet
Classification	Major Arterial
Posted Speed Limits	35-60 Miles per Hour
Average Daily Traffic	35,000 to 36,000
On-street Parking	Intermittent

Segments 11A and 11B

Segments 11A and 11B were not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this project. The Laguna Canyon Road (SR-133) corridor provides access to Downtown Laguna Beach tourist, business, and residential uses.

Figure 21 Corridor 11 Existing Conditions

Opportunities and Constraints

The corridor serves bicycle connections between recreational activities and urban development areas of Orange County. The corridor's existing conditions are primarily suited for vehicles, as illustrated by frequent driveways, lack of crossing opportunities, and discontinuous sidewalks. Frequent curves in the roadway limit visibility, creating challenging conditions for bicyclists and pedestrians attempting to cross the roadway. The facility is currently designated as a Class III facility, though Caltrans' designated shoulders are sufficient width to accommodate a Class II facility. Alternatives to Laguna Canyon Road (SR-133) include Newport Coast Drive, approximately 4 miles to the north, and Aliso Canyon approximately 3 miles to the south. Steep topography, preserved open space including Crystal Cove State Park, private property limitations in Aliso Canyon, desired access to Downtown Laguna Beach, and longer route distances create physical challenges for bicyclists utilizing the potential alternative routes. Additionally, Caltrans has plans to improve SR-133 between State Route 73 and El Toro Road, and the City of Laguna Beach is continuing review of multi-modal improvements along Laguna Canyon Road (SR-133) between El Toro Road and downtown Laguna Beach. Therefore, routing the bikeway corridor along Laguna Canyon Road (SR-133) was advanced in this Study. Further refinement is expected as agencies evaluate the constraints and opportunities to implement multi-modal improvements.

Major Regional Destinations

The corridor provides connections to major destinations such as Downtown Laguna Beach, preserved open space and hiking trails, Laguna College of Art and Design, residential and commercial uses, as well as access to the Pacific Ocean beach.

Conceptual Design

Table 13 Segments 11A-11B Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
11A	Laguna Canyon Rd to SR-73	3.6 miles	Not Built	Caltrans	Class II	$130,300
11B	SR-73 to El Toro Rd	4.2 miles	Not Built	Caltrans	Class II	--
					SUBTOTAL	$130,300
					CONTINGENCY (25%)	$32,600
					GRAND TOTAL	**$162,900**

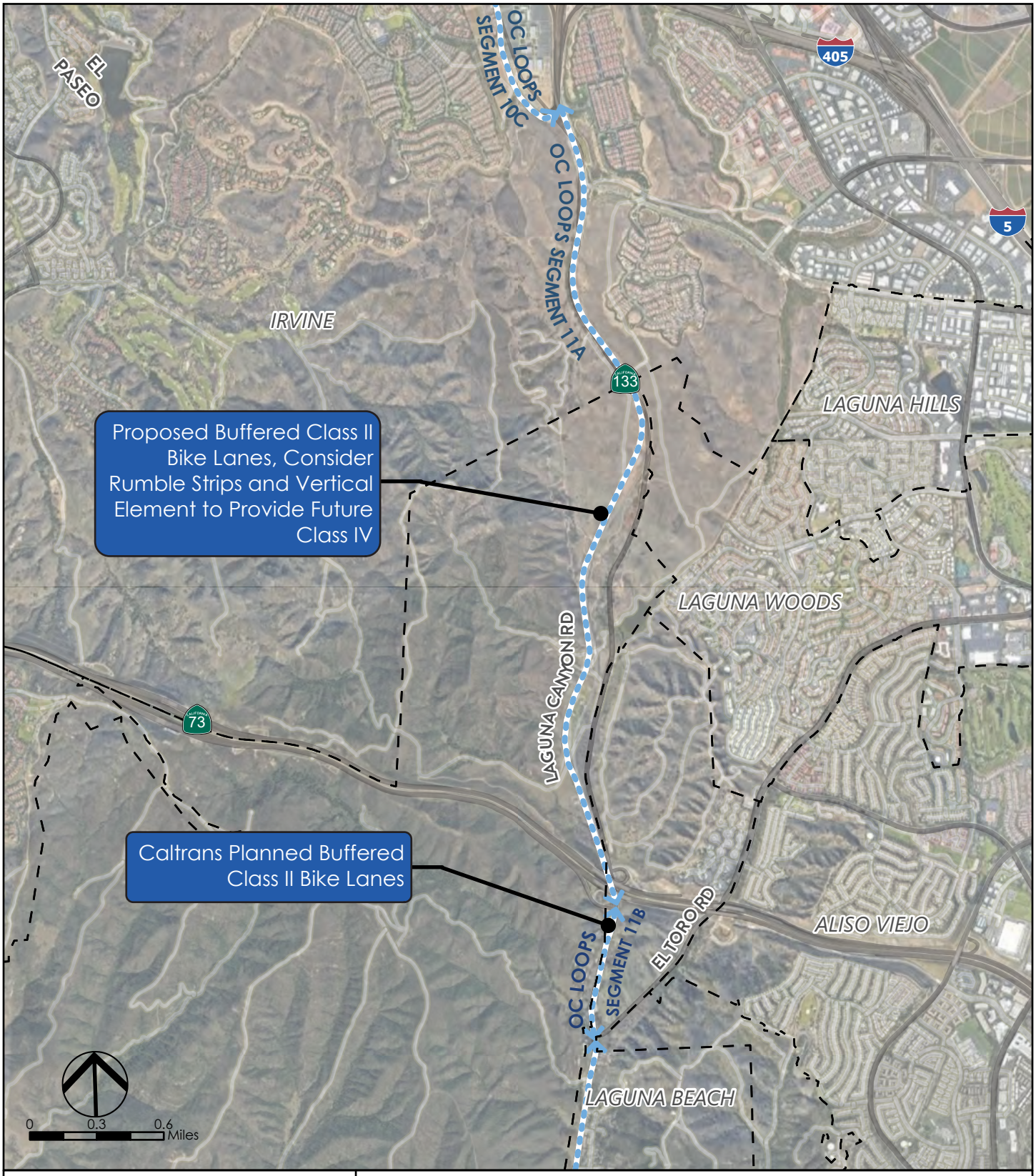
Initial

- Provide a Class II buffered facility with conflict markings at intersections and driveways on Segment 11A.
- Caltrans is planning to improve Segment 11B to provide buffered bike lanes.

Comprehensive

- Incorporate green paint at driveways, intersections, and significant roadway curves to increase visibility and separation.
- Consider rumble strips and Class IV vertical separation features along Segments 11A & 11B where high speed differential with roadway (Segment 11A is posted for speed limit of 65 mph).

Figure 22 OC Loops Segments 11A-11B



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OC Loops Segments 11A-11B

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City Boundary

Proposed Class II

Segment 11C

Segment 11C was studied in the District 5 Bikeways Strategy Report and included the following recommendations:

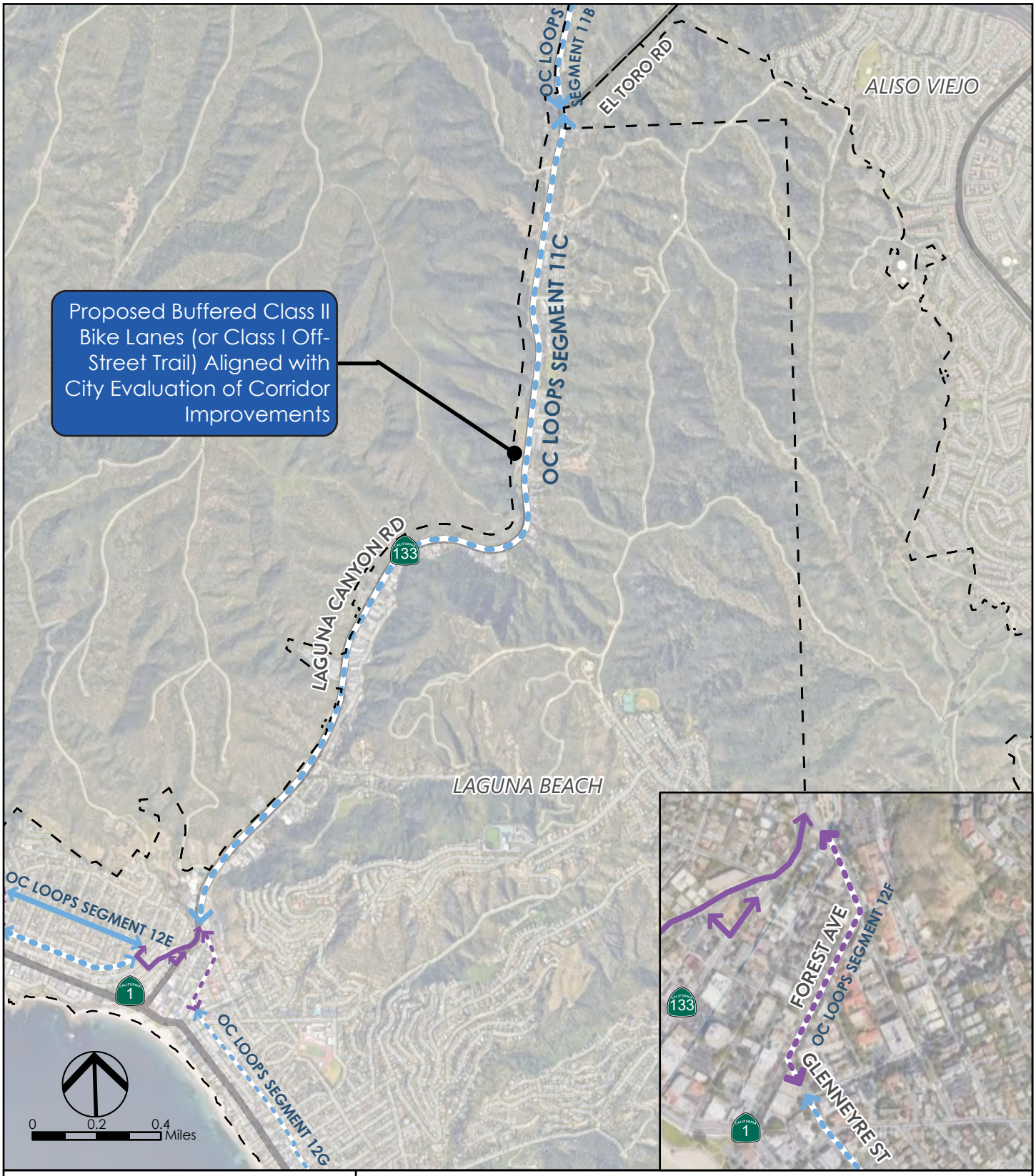
- Install a Class II buffered bike lane on either side of the street from Laguna Canyon Dog Park driveway to El Toro Road.
- Restripe the northbound right-turn lane at El Toro Road to accommodate a Class II bike lane along the left side of the right-turn lane.
- Reduce center median width to 5 feet at Canyon Acres Drive southbound approach and restripe to provide a Class II bike lane in the southbound direction.
- Install a Class II buffered bike lane on either side of the street from Canyon Acres Drive to Laguna Canyon Dog Park driveway, with a Class II bike lane in the northbound direction from Raquel Road to Laguna Canyon Dog Park driveway.
- Install Class III bicycle sharrows and signage from Broadway Street/Forest Avenue to the Festival of Arts intersection.
- Reduce center raised median width to 17 feet and restripe roadway to provide two vehicle travel lanes in each direction with a Class II bike lane on either side of the street from the Festival of Arts Intersection to Canyon Acres Drive.
- Install Class III bicycle sharrows and signage in both directions along Broadway Street.
- Maintain existing on-street parking.

Segment 11C continues to advance through efforts led by the City of Laguna Beach to improve the corridor between El Toro Road and Downtown Laguna Beach. The City will continue refining mobility improvements, including an off-street Class I or on-street Class IV facility that would increase the cost estimate notably. Continued collaboration among agencies will help ensure potential improvements to better address the broad range of mobility needs, including people traveling via car, transit, walking, cycling, and goods movement. The costs listed below are from the District 5 Bikeways Strategy Report with updates for 2023 conditions.

Table 14 Segment 11C Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
11C	El Toro Rd to Forest Ave	3.4 miles	Not Built	Laguna Beach	Varies	$455,000
					SUBTOTAL	$455,000
					CONTINGENCY (30%)	$136,500
					GRAND TOTAL	**$591,500**

Figure 23 OC Loops Segment 11C



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OC Loops Feasibility Study

OC Loops Segment 11C

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LEGEND

- City Boundary
- Proposed Class II
- Proposed Class III

Pacific Coast Highway (Corridor 12)

Pacific Coast Highway (PCH) is a 19.5-mile corridor, serving the Central Loop between Segments 12A and 12I, and the South Loop between Segments 12J-12M. The corridor is within the jurisdiction of both Caltrans and Newport Beach and travels through the City of Newport Beach, County of Orange, and the City of Laguna Beach. The Segments 12A-12C extents are between the Santa Ana River Trail (SART) and MacArthur Boulevard.

Segments 12A, 12B, and 12C

Recommendations for segments 12A-12C were developed in the District 1&2 Bikeways Feasibility Study and included the following:

- Enhancing existing bicycle facilities to provide cyclists with more comfort and a greater sense of safety while traveling in the corridor.
- In select locations, minor diversions from PCH are recommended, given existing challenges related to the curb-to-curb width of the street and constraints on bikeway implementation.
- Provide a two-foot wide buffer between the bicycle lane and adjacent travel lane where roadway and lane widths permit.
- Provide a two-stage left turn box for bicyclists at Seal Beach Boulevard, Warner Avenue, Goldenwest Street, Beach Boulevard, Newland Street, Magnolia Street, Brookhurst Street, and Superior Avenue.
- Install Share the Road signs on Pacific Coast Highway, where on-street parking is located.

Table 15 Segments 12A, 12B, and 12C Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
12A	SART to Newport Blvd	1.7 miles	Not Built	Caltrans	Buffered Class II	$282,000
12B	Newport Blvd to Dover Dr	1.4 miles	Built	Caltrans	Class II	$417,000
12C	Dover Dr to MacArthur Blvd	2.2 miles	Built	Caltrans & Newport Beach	Buffered Class II	$177,000
					SUBTOTAL	$876,000
					CONTINGENCY (30%)	$262,800
					GRAND TOTAL	**$1,138,800**

Segment 12D

Segment 12D received no new analysis given the existing Class II bikeways. The Segment 12D extents are between MacArthur Boulevard and the northern Laguna Beach City Limits.

Table 16 Segment 12D Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
12D	MacArthur Blvd to Northern Laguna Beach City Limits	5.0 miles	Built	Caltrans	Varies

Segments 12E, 12F, and 12G

Segments 12E-12G were evaluated for alternative alignments. The corridor is within the jurisdiction of Caltrans and travels through the City of Laguna Beach. The Segments 12E-12G extents are between the northern Laguna Beach City Limits and the southern Laguna Beach City Limits near Vista Del Sol.

Existing Facility	None
Curb-to-Curb Width	75-feet
Classification	Principal Arterial
Posted Speed Limits	45 Miles Per Hour
Average Daily Traffic	36,000 to 40,000

Opportunities and Constraints

The corridor serves bicycle connections between recreational activities and urban development areas of Orange County. The corridor's existing conditions are primarily suited for vehicles, as illustrated by frequent driveways, lack of crossing opportunities, and lack of sidewalks. Frequent curves in the roadway limit visibility, creating challenging conditions for bicyclists and pedestrians attempting to cross the roadway. The facility is currently designated as a Class III facility, with varying shoulder width and often on-street parking.

Major Regional Destinations

The corridor provides connections to Downtown Laguna Beach, tourists, business, and residential uses.

Figure 24 Corridor 12 Existing Conditions

Conceptual Design

Table 17 Segments 12E, 12F, and 12G Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
12E	Northern Laguna Beach City Limits to Broadway St (SR-133)	3.5 miles	Not Built	Caltrans	Class II	$85,000
12F	(Forest Ave) SR 133 to Nyes Pl	0.3 miles	Not Built	Laguna Beach	Class III	$50,000
12G	(Glenneyre St) Nyes Pl to Vista Del Sol	1.9 miles	Not Built	Laguna Beach	Buffered Class II/ Class III	$99,100
					SUBTOTAL	$234,100
					CONTINGENCY (25%)	$58,500
					GRAND TOTAL	**$292,600**

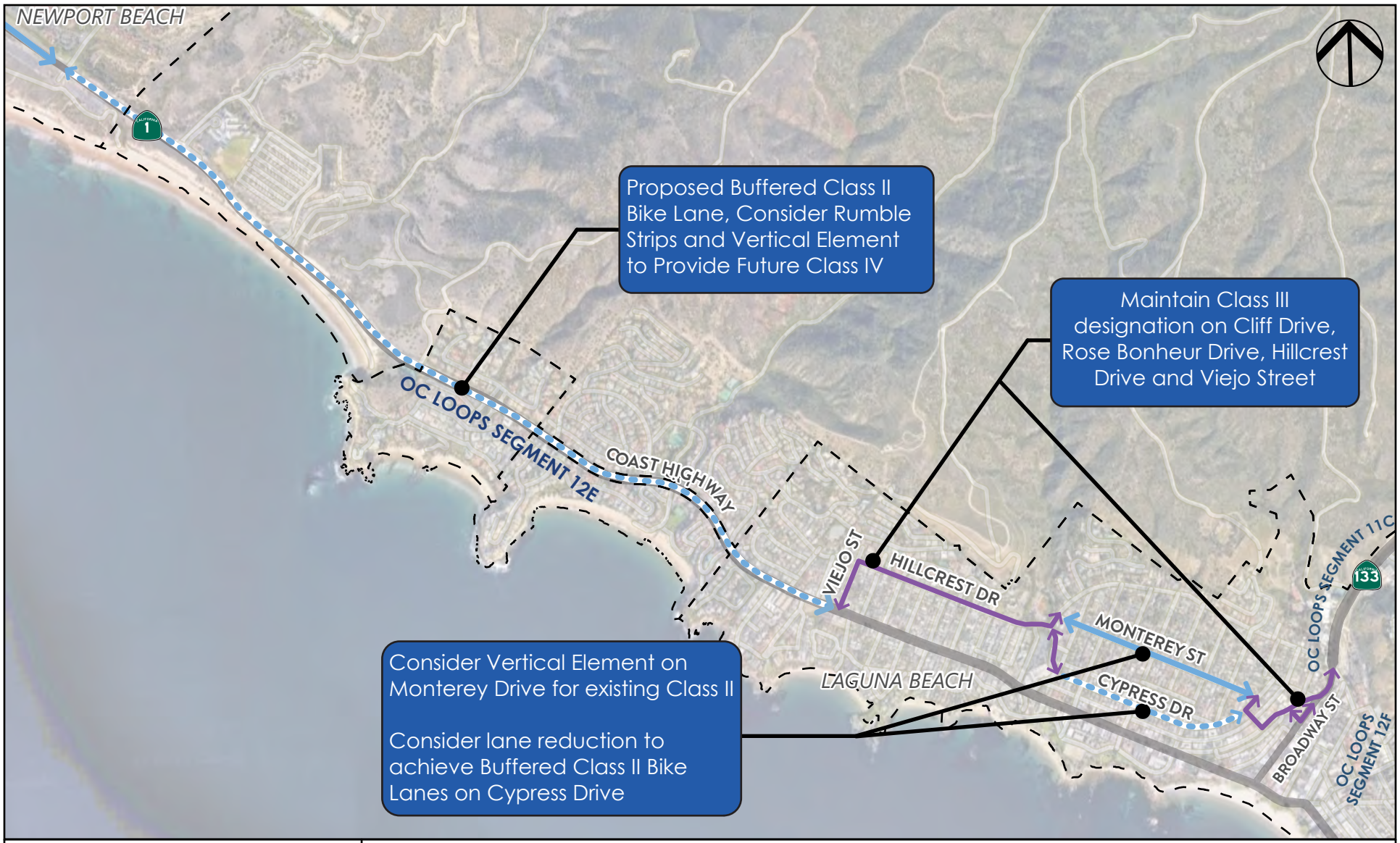
Initial

- Buffered Class II on Pacific Coast Highway between Northern Laguna Beach City Limits and Viejo Street.
- Segment 12E allows for a parallel routing using existing Class III treatments along Viejo Street, Hillcrest Drive, Cypress Drive (southbound), Monterey Drive (northbound), Rose Bonheur Drive, and Cliff Drive to Broadway Street (SR-133).

Comprehensive

- Consider lane reduction on Glenneyre Street to provide Class II bicycle lanes between Laguna Avenue-Park Avenue and Calliope Street. Lane reduction or removal of on-street parking on Glenneyre Street has previously been deemed infeasible within the City and further consideration would require extensive public dialogue to evaluate the trade-offs and benefits of a new cross-section to the roadway.
- Consider lane reduction on Pacific Coast Highway (SR-1) to provide Class I or Class IV facility within City of Laguna Beach. Consider rumble strips and Class IV vertical separation features along Segments 12E, 12F, & 12G where high-speed differential with the roadway. Lane reduction or removal of on-street parking on SR-1 would require extensive public dialogue to evaluate the trade-offs and benefits provided by a new cross-section to the roadway.
- Wayfinding to navigate along the desired route may become important if the routing diverts off Pacific Coast Highway (SR-1) to provide clear guidance to travelers.

Figure 25 OC Loops Segment 12E



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OC Loops Feasibility Study

OC Loops Segment 12E

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LEGEND

- City Boundary
- Existing Class II
- Proposed Class II
- Existing Class III

Figure 26 OC Loops Segments 12F-12H

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OC Loops Feasibility Study

OC Segments 12F-12H

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LEGEND

- City Boundary
- Existing Class II
- Proposed Class II
- Existing Class III

Name: 012- OC Loops 12F-H

Segment 12H

Segment 12H received no new analysis given the existing facility. The Segment 12H extents are between the southern Laguna Beach City Limits near Vista Del Sol and Del Prado Avenue.

Table 18 Segment 12H Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
12H	Vista Del Sol (S Laguna Beach City Limits) to Del Prado Ave	2.6 miles	Built	Caltrans	Buffered Class II

Santa Ana River Trail (Corridor 13)

The Santa Ana River Trail (SART) is a 14.0-mile off-street facility serving the Central Loop. The corridor is within the jurisdiction of multiple agencies and no new analysis has been assigned. The Segment 13 extents are between Ball Road-Taft Avenue at the City of Anaheim and Orange border and Pacific Coast Highway in the City of Newport Beach.

Table 19 Segment 13A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
13A	Taft Ave to Pacific Coast Hwy	14.0 miles	Built	Multiple	Class I

Del Prado Avenue (Corridor 14)

Del Prado Avenue is a 0.5-mile corridor serving the South Loop. The corridor is within the jurisdiction of the City of Dana Point and no new analysis has been assigned given the existing facility. The Segment 14 extents are between Pacific Coast Highway and Golden Lantern.

Table 20 Segment 14A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
14A	Pacific Coast Hwy to Golden Lantern	0.5 miles	Built	Dana Point	Class II

Golden Lantern (Corridor 15)

Golden Lantern (Golden Lantern) is a 0.3-mile corridor serving the South Loop. The corridor is within the jurisdiction of the City of Dana Point and no new analysis has been assigned given the existing facility. The Segment 15 extents are between Del Prado Avenue and Dana Point Harbor Drive.

Table 21 Segment 15A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
15A	Del Prado Ave to Dana Point Harbor Dr	0.3 miles	Built	Dana Point	Class II

Dana Point Harbor Drive (Corridor 16)

Dana Point Harbor Drive is a 0.3-mile corridor serving the South Loop. The corridor is within the jurisdiction of the City of Dana Point and no new analysis has been assigned given the existing facility. The Segment 16 extents are between Golden Lantern and Park Lantern.

Table 22 Segment 16A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
16A	Golden Lantern to Park Lantern	0.3 miles	Built	Dana Point	Buffered Class II

Park Lantern (Corridor 17)

Park Lantern is a 0.3-mile corridor serving the South Loop and located within the jurisdiction of the City of Dana Point. The Segment 17 extents are between Dana Point Harbor Drive and the San Juan Creek Trail. The corridor was included in the District 5 Feasibility Study and identified the following improvements:

- Install Class III bicycle sharrow pavement markings in both directions of Park Lantern.
- Installation of a two-stage bike box for bicyclists traveling southbound on Dana Point Harbor Drive approaching Park Lantern.

Table 23 Segment 17A Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
17A	Dana Point Harbor Dr to San Juan Creek Trail	0.3 miles	Built	Dana Point	Class III	$69,000
					SUBTOTAL	$69,000
					CONTINGENCY (30%)	$20,700
					GRAND TOTAL	**$89,700**

San Juan Creek Trail (Corridor 18)

San Juan Creek Trail is a 5.4-mile corridor serving the South Loop. The corridor is within the jurisdiction of multiple agencies and no new analysis has been assigned given the existing facility. The Segment 18 extents are between Park Lantern and Reata Road.

Table 24 Corridor 18 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
18A	Park Lantern to Avenida Siega	4.8 miles	Built	Multiple	Class I
18B	Avenida Siega to Reata Rd	0.6 miles	Built	SJC	Class I

Ortega Highway (SR-74) (Corridor 19)

Ortego Highway (State Route 74) is a 0.4-mile corridor serving the South Loop within the jurisdiction of the County of Orange. The corridor was not reviewed in prior bikeway feasibility studies; therefore, enhancements were developed as part of this project. The corridor connects San Juan Capistrano to Lake Elsinore and provides access for commuters between Riverside County and Orange County. The Segment 19 extents are along the 4-lane Ortega Highway (SR-74) between Reata Road and Antonio Pkwy-Avenida La Pata Avenue.

Existing Facility	Class II
Curb-to-Curb Width	100-feet
Classification	Primary Arterial
Posted Speed Limits	45-50 Miles per Hour
Average Daily Traffic	38,000
On-street Parking	No

Figure 27 Corridor 19 Existing Conditions

Opportunities and Constraints

The corridor can be utilized for bicycle commute trips due to its regional connectivity between existing and future housing constructed by Rancho Mission Viejo in The Ranch. The corridor has an existing 10-feet-wide Class II facility along Ortega Highway and a parallel Class I along the north side of Ortega Highway crossing over San Juan Creek and linking to Antonio Parkway. The corridor also experiences traffic and congestion related to recent area development and regional commute traffic to/from Lake Elsinore.

Major Regional Destinations

Ortega Highway provides access between single and multi-family housing, recreational and park facilities, commercial destinations, and employment opportunities. Additionally, the roadway provides direct connectivity to Lake Elsinore and other communities within the County of Riverside.

Conceptual Design

Table 25 Corridor 19 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
19A	Reata Rd to La Pata Ave	0.4 miles	Not Built	Caltrans	Buffered Class II	$18,000
					SUBTOTAL	$18,000
					CONTINGENCY (25%)	$4,500
					GRAND TOTAL	**$22,500**

Initial

- Implement conflict zone striping at weave areas between motor vehicle lanes and bike lane.
- Restripe bike lane to include 2′ buffer and 8′ bike lane.
- Install two-stage left-turn at Ortega Highway/Antonio Parkway-Avenida La Pata intersection and Ortega Highway/Reata Road intersection traffic signals.

Comprehensive

- Install vertical element separation (delineators, median, or concrete barrier) along Ortega Highway between intersections for mid-block Class IV bikeway treatment, and Class II treatment at intersections.
- Continue Class IV bikeway treatment at Ortega Highway/Antonio Parkway-Avenida La Pata intersection and Ortega Highway/Reata Road intersection.
- Install a leading bicycle and pedestrian signal at Ortega Highway/Antonio Parkway-Avenida La Pata intersection and Ortega Highway/Reata Road intersection.

Antonio Parkway (Corridor 20)

Antonio Parkway is an 8.2-mile corridor serving the South Loop. The corridor is within the jurisdiction of two (2) agencies, including the County of Orange and Rancho Santa Margarita (RSM). The corridor was not reviewed in prior bikeway feasibility studies; therefore, enhancements were developed as part of this project. The corridor connects Rancho Mission Viejo, Ladera Ranch, Las Flores, Coto De Caza, and Rancho Santa Margarita. The Segment 20 extents are between Ortega Highway (SR-74) and Avenida Empresa.

Existing Facility	Class II
Curb-to-Curb Width	100-feet to 120-feet
Classification	Major Arterial
Posted Speed Limits	55 to 60 Miles per Hour
Average Daily Traffic	27,000 to 40,000
On-street Parking	No

Figure 28 Corridor 20 Existing Conditions

Opportunities and Constraints

The corridor connects housing to various commercial, recreational, and employment opportunities in multiple communities. Existing right-of-way dedicated for a Class II facility may be utilized for improvements and enhancements. The County is considering addition of buffer to the existing bike lanes along Antonio Parkway. Constraints include the high posted speed limits (60mph) along the corridor.

Major Regional Destinations

The corridor connects major housing areas, commercial uses, office complexes, schools, daycare centers, parks, trails, and golf courses.

Conceptual Design

Table 26 Corridor 20 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	
20A	SR 74 Ortega Hwy to Rancho Santa Margarita City Limit	6.1 miles	Built	County	Buffered Class II	$11,935,400
20B	Rancho Santa Margarita City Limit to Avenida de las Banderas	1.4 miles	Built	RSM	Class I	$649,500
20C	Avenida De Las Banderas to Avenida Empresa	0.9 miles	Not Built	RSM	Class I	$730,200
					SUBTOTAL	$13,315,100
					CONTINGENCY (25%)	$3,328,800
					GRAND TOTAL	**$16,643,900**

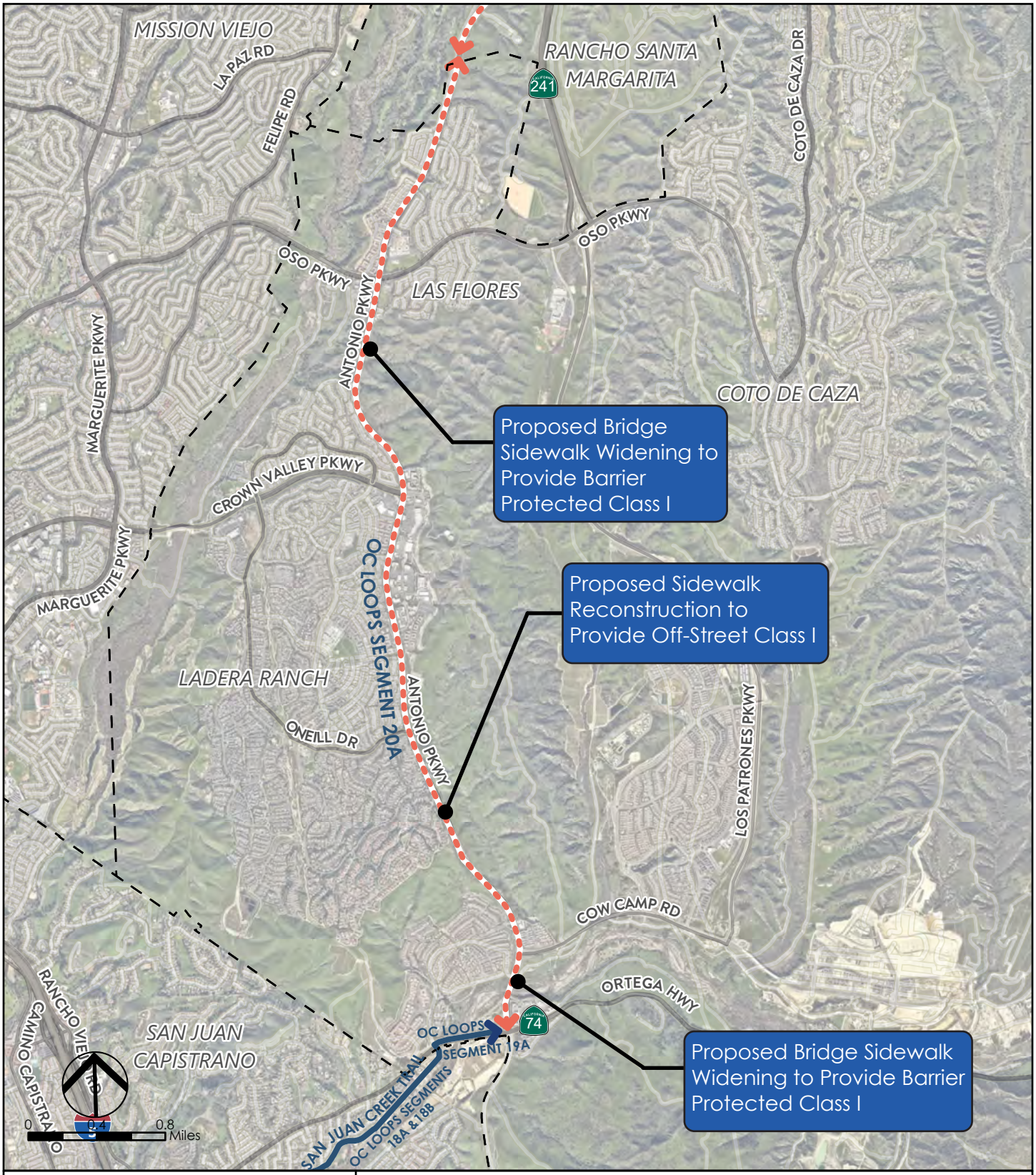
Initial

- Implement conflict zone striping at weave areas between motor vehicle lanes and bike lane.
- Restripe bike lane and outer vehicle lane to include 2′ buffer and 6′ bike lane.
- Install 2-stage left-turns at select traffic signal locations (commercial and employment uses, parks, trailheads, etc.).

Comprehensive

- Install Class I bridge structure parallel to Antonio Parkway to allow cyclists to cross San Juan Creek without riding adjacent car traffic.
- Install vertical element separation (delineators, median, or concrete barrier) between intersections for mid-block Class IV bikeway treatment, and Class II treatment at intersections. Continue Class IV bikeway treatment at intersections.
- Narrow bike lane and widen sidewalk to provide Class I facility serving bi-directional bicycle and pedestrian traffic.
- Convert outer vehicle lane to provide on-street Class II bike lane (one-direction) and Class I facility serving bi-directional bicycle and pedestrian traffic.
- Continue Class IV bikeway treatment at intersections.
- Construct a protected intersection and implement leading bicycle and pedestrian signals at Crown Valley Pkwy and Oso Pkwy for students and cyclists.
- Install a protected intersection and provide bike boxes at Avenida Empresa and Antonio Pkwy.

Figure 29 OC Loops Segments 18A, 18B, 20A



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OC Loops Feasibility Study

OC Loops Segment 18A, 18B, 20A

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LEGEND

- City Boundary
- Existing Class I
- Proposed Class IV

Avenida Empresa (Corridor 21)

Avenida Empresa is a 0.8 mile corridor serving the South Loop and within Rancho Santa Margarita's (RSM) jurisdiction. The corridor was not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this project. The Segment 21 extents are between Antonio Parkway Calle Corta.

Existing Facility	None or Class II
Curb-to-Curb Width	85-feet to 100-feet
Classification	Major Arterial
Posted Speed Limits	40 Miles Per Hour
Average Daily Traffic	12,000 to 26,000
On-street Parking	No

Opportunities and Constraints

The corridor can serve as a bicycle commuting corridor, connecting residential neighborhoods to various commercial, recreational, and employment opportunities. Right-of-way from an existing Class II facility can be utilized for improvements and enhanced to provide a Class IV or Class I facility. The corridor has multiple intersections and driveways that prevent a continuous bicycle facility.

Major Regional Destinations

The corridor connects single and multi-family homes to commercial and office complexes, medical centers, and Live Oak Canyon Trail.

Figure 30 Corridor 21 Existing Conditions

Conceptual Design

Table 27 Corridor 21 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
21A	Avenida de las Banderas to Aventura	0.3 miles	Built	RSM	Class II	$402,800
21Alt	Aventura and Calle Corta	0.3 miles	Not Built	RSM	Two-Way Class IV	$10,800
					SUBTOTAL	$413,600
					CONTINGENCY (25%)	$103,400
					GRAND TOTAL	**$517,000**

Initial

- Reduce merge lane to create room for Class II facility.
- Convert existing vehicle lane buffer to a buffered Class II facility.
- Install eastbound Class II facility with conflict markings at intersections and driveways.
- Restripe bike lane to include 2' buffer striping and consider delineators between intersections (mid-segment).

Comprehensive

- Convert free right turn to protected intersection to increase bicycle visibility.
- Extend concrete curb to create a Class I facility.
- Add amenities near bike racks such as benches, water-filling stations, and repair stations.
- Reduce number of turn lanes or turn lane width at the intersection of Santa Margarita Pkwy and Avenida Empresa to provide room for a Class II facility.
- Add a vertical barrier between vehicle right turn lane and Class II bicycle lane turning right onto Santa Margarita Parkway.
- Widen sidewalk to create a Class I facility.

Santa Margarita Parkway (Corridor 22)

Santa Margarita Parkway is a 3.2-mile corridor serving the South Loop. The corridor is within the jurisdiction of three (3) agencies, including RSM, City of Mission Viejo, and City of Lake Forest. The corridor was not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this project. It is part of the OC South Loop and connects to the Central Loop. The Segment 22 extents are between Avenida Empresa and El Toro Road.

Existing Facility	Class II
Curb-to-Curb Width	100-feet to 115-feet
Classification	Major Arterial
Posted Speed Limits	50 to 55 Miles per Hour
Average Daily Traffic	31,000 to 57,000
On-street Parking	No

Figure 31 Corridor 22 Existing Conditions

Opportunities and Constraints

The corridor can be used for bicycle commutes. Few driveways intersect with the corridor due to its surrounding residential land use, allowing for a continuous bicycle facility. There is an existing Class II facility that can be improved to increase comfort for bicyclists. Posted speed limits on the corridor are high, and six travel lanes are provided.

Major Regional Destinations

This corridor connects residential areas to parks and hiking trails, Trabuco Hills High School, employment centers, and commercial plazas. It also connects to the Aliso Creek Bikeway and OC Central Loop.

Conceptual Design

Table 28 Corridor 22 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
22A	Avenida Empresa to Live Oak Canyon Trail	0.3 miles	Not Built	RSM	Class I	$165,400
22B	Live Oak Canyon Trail to Alicia Pkwy	0.4 miles	Not Built	RSM	Class IV	$359,000
22C	Alicia Pkwy to Melinda Rd	0.6 miles	Not Built	RSM	Class I	$501,000
22D	Melinda Rd to Lake Forest/Mission Viejo Boundary	1.8 miles	Not Built	Mission Viejo	Class I	$771,100
22E	Lake Forest/Mission Viejo Boundary to El Toro Rd	0.2 miles	Not Built	Lake Forest	Class I	$99,600
					SUBTOTAL	$1,896,100
					CONTINGENCY (25%)	$474,000
					GRAND TOTAL	**$2,370,100**

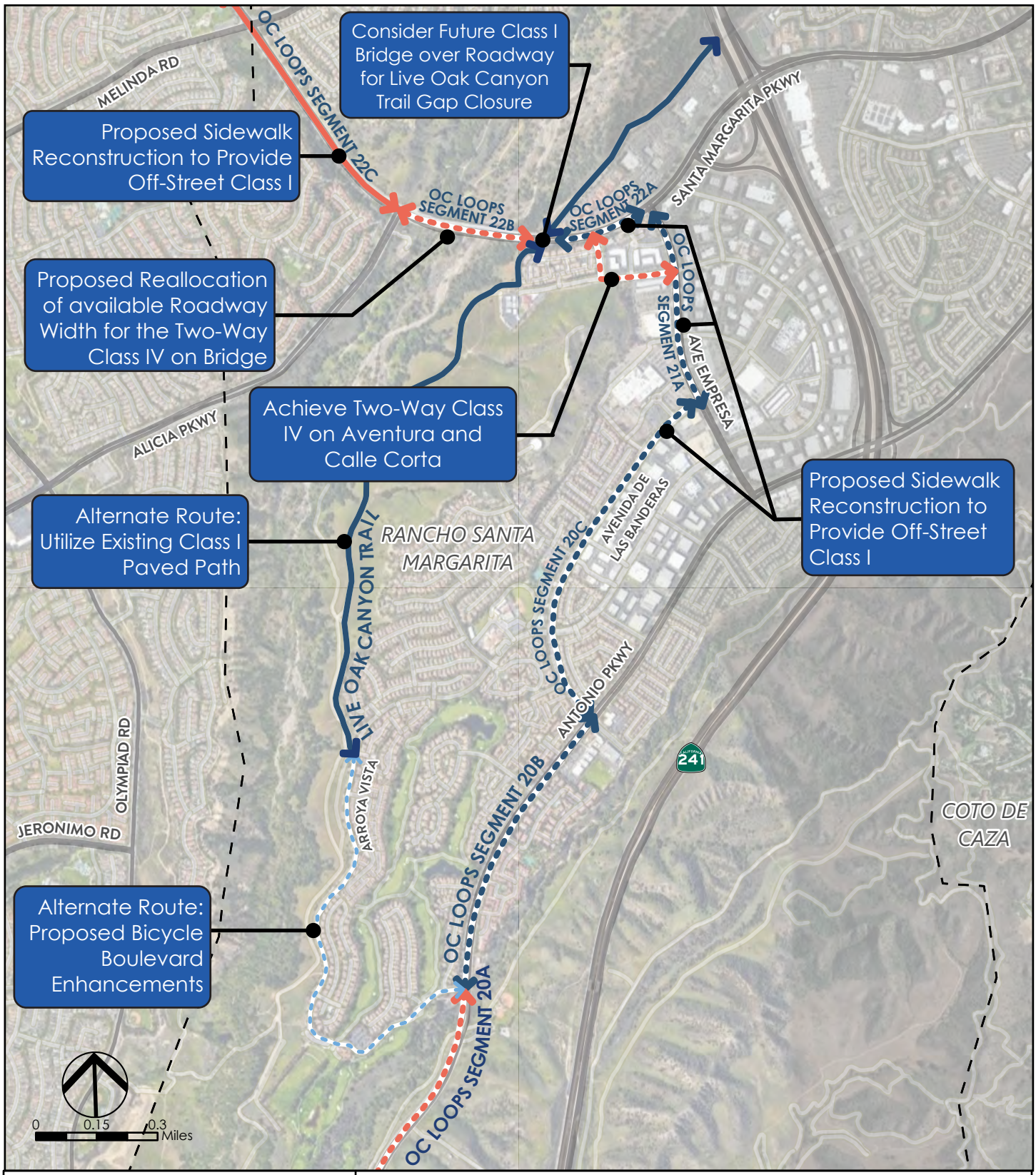
Initial

- Implement conflict markings at Avenida Empresa intersection and Alicia Parkway intersection to improve visibility.
- Install bicycle amenities at bus stop such as a water filling station, repair station, and shade.
- Extend Class II facility to intersections to avoid dropping bike lane in favor of dedicated right-turn lane.
- Provide conflict markings at intersections to increase visibility.
- Repurpose existing landscaping/sidewalk as a Class I facility between Oso Creek and Marguerite Parkway along south side of roadway consistent with City of Mission Viejo Comprehensive Bikeway Master Plan (2019).
- Add signage or pavement markings where there is a gap in the bike lane.
- Implement signage for Aliso Creek Bikeway.
- Add intersection crossing markings or signage for bicyclists crossing El Toro Road intersection.

Comprehensive

- Restripe bike lane to include 2′ buffer striping and consider delineators between intersections (mid-segment) between O'Neill Canyon overpass to Alicia Parkway intersection.
- Continue Class II buffer on eastbound route to Avenida Empresa.
- Widen road to add a Class IV separated bikeway with physical barrier.
- Widen sidewalk to add a separated Class I bicycle facility, potentially requiring new right-of-way.
- Upgrade to buffered Class II facility.
- Reduce turn lane width to allow room for a Class II at intersections and close the gap.
- Install a leading bicycle and pedestrian signal.
- Remove free right turn and implement a protected intersection.

Figure 32 OC Loops Segments 20A-20C, 21A, 22A-22C



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OC Loops Feasibility Study

Segments 20A-20C, 21A, 22A-22C

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LEGEND

- City Boundary
- Existing Class I
- Proposed Class I
- Proposed Class II
- Existing Class IV
- Proposed Class IV

In this area the primary route is proposed along Antonio Parkway, Avenida Empresa, Avenida de Las Banderas, and Antonio Parkway. An alternate route for consideration utilizes Live Oak Canyon Trail, Arroyo Vista and Las Tijeras Creek Road.

Pacific Electric (PE) Right of Way (ROW) (Corridor 23)

The PE-ROW is a 10.4-mile corridor serving OC Connect. The corridor is within the jurisdiction of seven (7) agencies, including the City of Cypress, City of La Palma, City of Buena Park, City of Anaheim, City of Stanton, City of Garden Grove, and City of Santa Ana. The Segment 23 extents are between the Coyote Creek Bikeway (along County of Orange border with Los Angeles County) and Brookhurst Street in the City of Garden Grove.

Segments 23A, 23B, 23C, 23D, 23E, 23F, 23G, 23H and 23I

Segments 23A through 23G were reviewed in the District 1&2 Bikeways Study, and recommendations included the following:

- Construct a new Class I bike path within PE ROW. The bike path is recommended to be located primarily on the north or east side of the right-of-way.
- Rehabilitate and use existing rail bridges at the Coyote Creek, the channel northwest of Crescent Avenue
- Construct new bridges over flood channels southeast of Holder Street and northwest of Western Avenue.
- New mid-block pedestrian/bicycle crossings proposed at Orange Avenue, Holder Street, Western Avenue, Cerritos Avenue, Katella Avenue, Dale Street, Lampson Avenue, Nutwood Street, and Stanford Avenue. All other crossings proposed to use nearest signalized intersection.

Table 29 Segments 23A through 23G Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
23A	Coyote Creek Bikeway to Suffield St	0.6 miles	Not Built	Cypress	Class I	$1,900,000
23B	Suffield St to Crescent Ave	0.2 miles	Not Built	La Palma	Class I	$775,000
23C	Crescent Ave to Holder St	2.0 miles	Not Built	Cypress	Class I	$2,944,000
23D	Holder St to Buena Park/Anaheim City Limits	0.3 miles	Not Built	Buena Park	Class I	$480,000
23E	Buena Park/Anaheim City Limits to Ramblewood Dr	0.8 miles	Not Built	Anaheim	Class I	$1,149,000
23F	Ramblewood Dr to Rancho Alamitos High School	1.3 miles	Not Built	Stanton	Class I	$3,555,000
23G	Rancho Alamitos High School to Brookhurst St	1.9 miles	Not Built	Garden Grove	Class I	$3,298,000
					SUBTOTAL	$14,101,000
					CONTINGENCY (30%)	$4,230,300
					GRAND TOTAL	**$18,331,300**

Segments 23H and 23I

No new analysis was conducted for segments 23H through 23K given the prior feasibility analysis which recommended on-street improvements and is under evaluation through the PE ROW study being led by OCTA in 2023. The Segment 23H-23I extents are between Brookhurst Street and Nelson Street.

Table 30 Segments 23H and 23I Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
23H	Brookhurst St to Stanford Ave	0.8 miles	Not Built	Garden Grove	Class I
23I	Stanford Ave to Nelson St	0.2 miles	Not Built	Garden Grove	Class I

Nelson St-Century Blvd-Euclid St-Paloma Ave (Corridor 24)

The Nelson St-Century Blvd-Euclid St-Paloma Ave is a 0.8-mile corridor serving OC Connect and located within the jurisdiction of the City of Garden Grove. The Segment 24 extents are between Nelson Street and Paloma Avenue. Recommendations were developed in the District 1&2 Bikeways Study and included the following:

- Signalized crossing flashers and in-pavement flashers.
- Parking-adjacent Class II bikeway.
- Widened sidewalk and bicyclist traffic signal detection.
- Curb ramps and Class III sharrows.

Table 31 Corridor 24 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
24A	PE ROW (at Nelson St) to PE ROW (at Paloma Ave)	0.8 miles	Not Built	Garden Grove	Class II	$644,000
					SUBTOTAL	$644,000
					CONTINGENCY (30%)	$193,200
					GRAND TOTAL	**$837,200**

Pacific Electric (PE) Right of Way (ROW) (Corridor 25)

Pacific Electric (PE) Right of Way (ROW) is a 2.3-mile corridor serving OC Connect. The corridor is within the jurisdiction of two (2) agencies including the City of Garden Grove and City of Santa Ana. No new analysis has been prepared given the prior feasibility analysis and is under evaluation through the PE ROW study being led by OCTA in 2023. The Segment 25 extents are between Paloma Avenue and Fairview Street.

Table 32 Corridor 25 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
25A	Paloma Ave to Westminster Ave	1.3 miles	Not Built	Garden Grove	Class I
25B	Westminster Ave to Fairview St	1.0 miles	Not Built	Santa Ana	Class I

Fairview Street (Corridor 26)

Fairview Street is a 0.1 mile corridor serving OC Connect. The Segment 26 extents are between the PE ROW and Civic Center Drive. The corridor is within the jurisdiction of the City of Santa Ana and was previously studied in the District 1&2 Bikeway Feasibility Study. Recommendations included the following:

- Use sidewalk on west side of street to link PE ROW and Civic Center Drive intersection.

Table 33 Corridor 26 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
26A	PE ROW to Civic Center Dr	0.1 miles	Not Built	Santa Ana	Class III	$5,000
					SUBTOTAL	$5,000
					CONTINGENCY (30%)	$1,500
					GRAND TOTAL	**$6,500**

Civic Center Drive (Corridor 27)

Civic Center Drive is a 1.0 mile corridor serving OC Connect. The Segment 27 extents are between Fairview Street and Bristol Street. The corridor is within the jurisdiction of the City of Santa Ana and was previously studied in the District 1&2 Bikeway Feasibility Study. Recommendations included the following:

- Construct a new Class II bicycle lane along Civic Center Drive.
- Restripe roadway to provide two travel lanes, a center two way left turn median, a bicycle lane in each direction, and on-street parking.

Table 34 Corridor 27 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
27A	Fairview St to Bristol St	1.0 miles	Not Built	Santa Ana	Class II	$400,000
					SUBTOTAL	$400,000
					CONTINGENCY (30%)	$120,000
					SUBTOTAL	**$520,000**

Bristol Street (Corridor 28)

Bristol Street is a 2.0-mile corridor serving OC Connect. The Segment 28 extents are between Civic Center Drive and Segerstrom Avenue. The corridor is within the jurisdiction of the City of Santa Ana and no new analysis has been assigned given the City plans to convert Class II bike lanes to Class IV bikeways.

Table 35 Corridor 28 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
28A	Civic Center Dr St to Segerstrom Ave	2.0 miles	Built	Santa Ana	Class IV

Segerstrom Avenue/Dyer Road (Corridor 29)

Segerstrom Avenue/Dyer Road is a 0.7-mile corridor serving OC Connect. The Segment 29 extents are between Bristol Street and the Maple Trail-Railroad. The corridor is within the jurisdiction of the City of Santa Ana and no new analysis has been assigned given the City Active Transportation Plan proposes a Class IV separated bikeway.

Table 36 Corridor 19 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
29A	Fairview St to Maple Trail-Railroad	0.7 miles	Not Built	Santa Ana	Class IV (future)

Maple Trail-Railroad (Corridor 30)

Maple Trail-Railroad is a 0.8-mile corridor serving OC Connect. The Segment 30 extents are between Dyer Road and Warner Avenue. The corridor is within the jurisdiction of the City of Santa Ana and no new analysis has been assigned given the existing facility.

Table 37 Corridor 30 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
30A	Dyer Rd to Warner Ave	0.8 miles	Built	Santa Ana	Class I

Warner Avenue (Corridor 31)

Warner Avenue is a 2.3-mile corridor serving OC Connect. The Segment 31 extents are between the Maple Trail-Railroad and Legacy Road. The corridor is within the jurisdiction of two (2) agencies including the City of Santa Ana and the City of Tustin. No new analysis has been assigned given the City Active Transportation Plan proposes a Class IV separated bikeway.

Table 38 Corridor 31 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
31A	Maple Trail to Grand Ave	0.8 miles	Not Built	Santa Ana	Class IV (future)
31B	Grand Ave to SR-55	0.3 miles	Not Built	Santa Ana	Class IV (future)
31C	SR-55 to Red Hill Ave	0.5 miles	Not Built	Tustin	Class IV (future)
31D	Red Hill Ave to Legacy Rd	0.7 miles	Not Built	Tustin	Class II

Tustin Legacy Trail (Corridor 32)

Tustin Legacy Trail is a 1.2-mile corridor serving OC Connect. The Segment 32 extents are between Legacy Road and Edinger Avenue. The corridor is within the jurisdiction of the City of Tustin and was previously studied in the District 3 Bikeway Feasibility Study. Recommendations included the following:

- Restripe vehicle travel lanes and re-align and narrow raised median to accommodate new Class IV protected bike lanes along both sides of Warner Avenue.
- Lane narrowing is necessary to accommodate proposed improvement. At the Tustin Metrolink Station:
    - Construct a new Class I bike path connection from the station platform along the south side of the existing railroad tracks with connections to the Walnut Trail and Peters Canyon Trail.
    - Due to inadequate width between the existing railroad track and the bridge support structures south of the tracks, the portion of the bike path underneath the Jamboree Road overpass would need to be constructed within the existing bridge abutment area as shown in the concept plan below.
    - Enhanced wayfinding signage will be provided to direct cyclists between the bike paths and the station area.

Table 39 Corridor 32 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
32A	Legacy Rd to Edinger Ave	1.2 miles	Not Built	Tustin	Varies	$1,812,000
					SUBTOTAL	$1,812,000
					CONTINGENCY (30%)	$543,600
					GRAND TOTAL	**$2,355,600**

Jamboree Plaza-LOSSAN (Corridor 33)

Jamboree Plaza-LOSSAN is a 0.3-mile corridor serving OC Connect. The Segment 33 extents are between Edinger Avenue and the Peters Canyon Regional Trail. The corridor is within the jurisdiction of the City of Tustin and was previously studied in the District 3 Bikeway Feasibility Study. Recommendations included the following:

- Construct a new Class I bike path connection from the station platform along the south side of the existing railroad tracks with connections to the Walnut Trail and Peters Canyon Trail.
- Due to inadequate width between the existing railroad track and the bridge support structures south of the tracks, the portion of bike path underneath the Jamboree Road overpass will need to be constructed within the existing bridge abutment area. Alternative routing along Edinger Avenue would increase conflict points where bicyclists would interface with motor vehicles. The LOSSAN right-of-way provides the highest comfort and lowest stress corridor to route the regional bikeway.
- Enhanced wayfinding signage to direct cyclists between the bike paths and the station area.

Table 40 Corridor 33 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
33A	Edinger Ave to Peters Canyon Regional Trail	0.2 miles	Not Built	Tustin	Class I	$586,000
					SUBTOTAL	$586,000
					CONTINGENCY (30%)	$175,800
					GRAND TOTAL	**$761,800**

Walnut Trail (Corridor 34)

Walnut Trail is a 3.2-mile corridor serving OC Connect. The Segment 34 extents are between the Peters Canyon Regional Trail and Sand Canyon Avenue. The corridor is within the jurisdiction of the City of Irvine and no new analysis has been assigned given the existing facility.

Table 41 Corridor 34 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
34A	Peters Canyon Regional Trail to Sand Canyon Ave	3.2 miles	Built	Irvine	Class I

Sand Canyon Avenue-Laguna Canyon Road-Technology Drive (Corridor 35)

Sand Canyon Avenue-Laguna Canyon Road-Technology is a 1.4-mile corridor serving OC Connect. The Segment 35 extents are between the Walnut Trail and Muirlands Boulevard. The corridor is within the jurisdiction of the City of Irvine and no new analysis has been assigned given the existing facility.

Table 42 Corridor 35 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
35A	Sand Canyon Ave to Barranca Pkwy	1.4 miles	Built	Irvine	Class II

Muirlands Boulevard (Corridor 36)

Muirlands Boulevard is a 2.1-mile corridor serving OC Connect. The Segment 36 extents are between Barranca Parkway and the Aliso Creek Bikeway. The corridor is within the jurisdiction of two (2) agencies, including the City of Irvine and the City of Lake Forest. The corridor was included in the District 5 Feasibility Study and identified the following improvements:

- Maintain existing Class II bike lanes on either side of Muirlands Boulevard from Los Alisos Boulevard to El Toro Road.
- Convert existing Class II bike lane to a buffered Class II bike lane in the westbound direction from Orange Avenue to the shopping center approximately 200 feet west.
- Restripe Muirlands Boulevard westbound approach lanes to install a Class II bike lane to the left of the right-turn lane at El Toro Road.
- Convert existing Class II bike lanes to buffered Class II bike lanes on either side of Muirlands Boulevard from El Toro Road to Bake Parkway.

Alternative Alignments to Muirlands

The concepts vary, with some minor modifications to existing roadways along Muirlands Road, a new trail within the LOSSAN corridor, or changes to Toledo Way travel lanes. The Cities of Lake Forest and Mission Viejo are interested in further exploring the concept of a new Class I facility within the LOSSAN corridor for a high-quality off-street facility providing greater north-south regional connectivity.

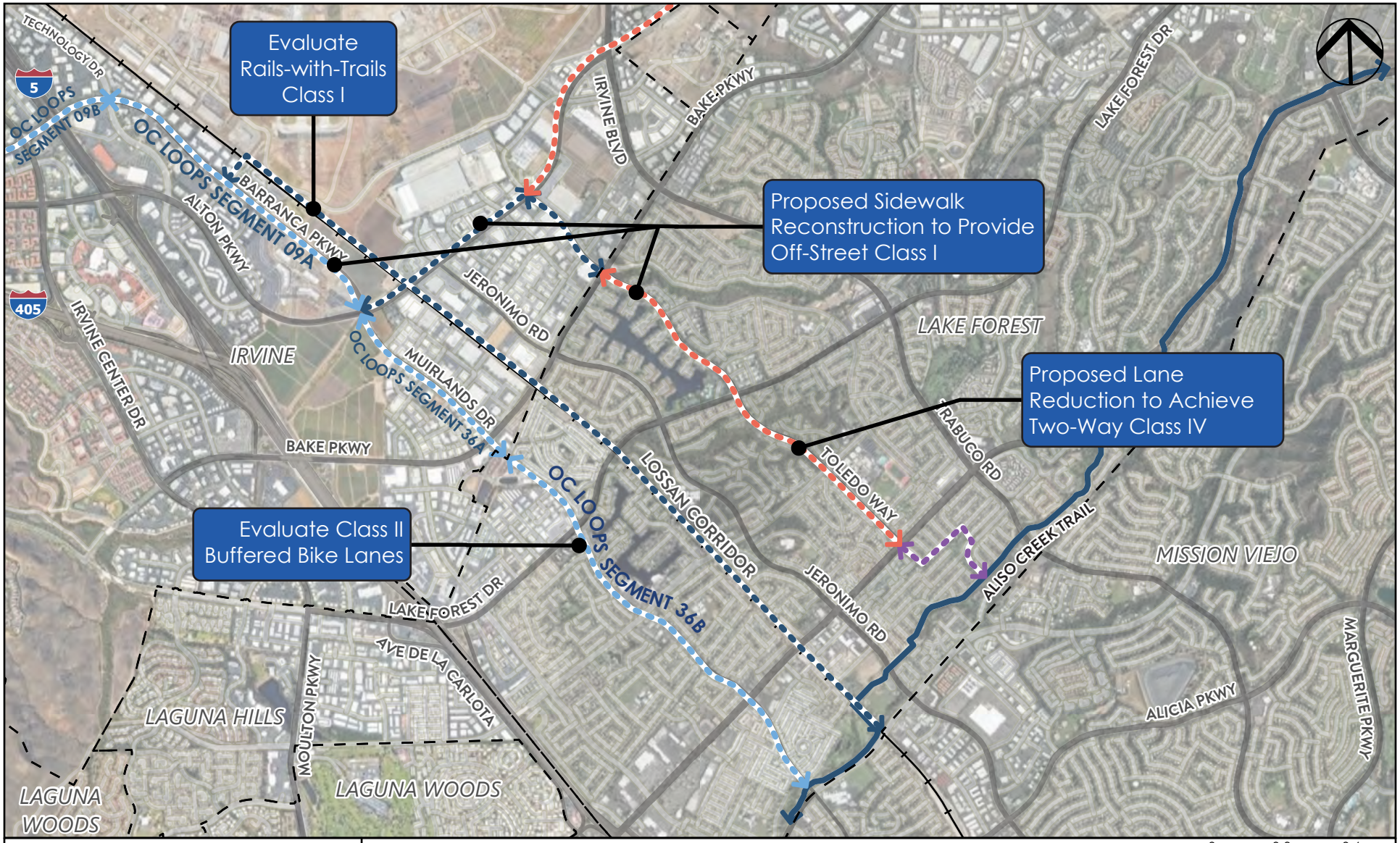
If a Class I facility is explored within the LOSSAN corridor then further coordination and review is required with Southern California Regional Rail Authority (SCRRA) which manages Metrolink train operations and the OCTA Rail division. Given the prevailing speeds of trains within the area, a 40-feet setback from the rail centerline is required per the SCRRA Design Criteria Manual. If the 40-feet setback cannot be provided, then a design exception with mitigation would need to be identified for review and approval to a well-functioning and safe facility. Additionally, incorporation of a Class I trail within the LOSSAN corridor would need to confirm the availability of land, given potential plans

for railroad facility additions. Feasibility related to right-of-way easements within the LOSSAN corridor would impact the schedule for implementation of the concept. The City of Lake Forest is interested in further review of buffered bike lanes on Muirlands Road and Jeronimo Parkway, subject to traffic operational needs, that can be considered as pavement rehabilitation projects and advanced by the City.

Table 43 Corridor 36 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
36A	Alton Pkwy to 440 feet east of Bake Pkwy	0.1 miles	Built	Irvine	Class II	$227,000
36B	440 feet east of Bake Pkwy to Aliso Creek Bikeway	2.0 miles	Built	Lake Forest	Class II	$473,000
					SUBTOTAL	$700,000
					CONTINGENCY (30%)	$210,000
					GRAND TOTAL	**$910,000**

Figure 33 OC Loops Segments 09A, 09B, 36A, 36B



OCTA

OC Loops Feasibility Study

OC Loops Segments 09A, 09B, 36A, 36B

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LEGEND

- City Boundary
- Existing Class I
- Proposed Class I
- Proposed Class II
- Proposed Class III
- Proposed Class IV

In this area the primary route is proposed along Muirlands Drive to reach the existing Aliso Creek Trail. Alternate routes for consideration include routing along Alton Parkway, Toledo Way or the LOSSAN Corridor.

Aliso Creek Bikeway (Corridor 37)

Aliso Creek Bikeway is a Class I trail, 1.5-mile in length serving the South Loop. The Segment 36 extents are between Muirlands Parkway and Laguna Hills Drive. The corridor is within the jurisdiction of three (3) agencies, including the City of Lake Forest, City of Mission Viejo, and City of Laguna Hills. No new analysis has been assigned given the existing off-street facility given the existing facility.

Table 44 Corridor 37 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
37A	Muirlands Blvd to Laguna Hills Dr	1.5 miles	Built	Laguna Hills	Class I

Paseo de Valencia (Corridor 38)

Paseo De Valencia is a 2.3-mile corridor serving OC Connect. The Segment 38 extents are between the Aliso Creek Bikeway (at Laguna Hills Drive) and Cabot Road. The corridor is within the jurisdiction of the City of Laguna Hills and was not evaluated in previous feasibility studies. Potential bikeway enhancements were developed as part of this project.

Existing Facility	None or Class II
Curb-to-Curb Width	60-feet to 90-feet
Classification	Major & Secondary Arterial
Posted Speed Limits	45 Miles Per Hour
Average Daily Traffic	6,000 to 32,000
On-street Parking	No

Figure 34 Corridor 38 Existing Conditions

A facility gap exists between Cabot Road, south of Oso Parkway, and Paseo De Valencia at La Paz Road. The District 5 Feasibility Analysis identified an opportunity to construct a Class I facility adjacent to the LOSSAN rail corridor from Paseo De Valencia to La Paz Road on the north side of the I-5 Freeway northbound off-ramp.

Opportunities and Constraints

Improvements along Corridor 38 provide varying levels of comfort for users of all ages and abilities.

Alternative Alignments to Paseo de Valencia

The concepts vary, with some minor modifications to existing roadways along Muirlands Road, a new trail within the LOSSAN corridor, or changes to Paseo de Valencia travel lanes. The Cities of Lake Forest and Mission Viejo are interested in further exploring the concept of a new Class I facility within the LOSSAN corridor for a high-quality off-street facility providing greater north-south regional connectivity.

If a Class I facility is explored within the LOSSAN corridor then further coordination and review is required with Southern California Regional Rail Authority (SCRRA) which manages Metrolink train operations and the OCTA Rail division. Given the prevailing speeds of trains within the area, a 40-feet setback from the rail centerline is required per the SCRRA Design Criteria Manual. If the 40-feet setback cannot be provided, then a design exception with mitigation would need to be identified for review and approval to a well-functioning and safe facility. Additionally, incorporation of a Class I trail within the LOSSAN corridor would need to confirm the availability of land, given potential plans for railroad facility additions. Feasibility related to right-of-way easements within the LOSSAN corridor would impact the schedule for implementation of the concept.

The City of Lake Forest and is interested in further review of buffered bike lanes on Muirlands Road and Jeronimo Parkway subject to traffic operational needs that can be considered as pavement rehabilitation projects are advanced by the City. A parallel planning study being undertaken by the City of Mission Viejo is considering modification of Cabot Road to include a Class I bikeway on the easterly side of Cabot Road between Rapid Falls Road and El Paseo. If completed, the improvements along Cabot Road would align well with improvements along Paseo de Valencia.

Conceptual Design

Table 45 Corridor 38 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
38A	Laguna Hills Dr to Cabot Rd	1.8 miles	Not Built	Laguna Hills	Class IV	$695,700
					SUBTOTAL	$695,700
					CONTINGENCY (25%)	$174,000
					GRAND TOTAL	**$869,700**

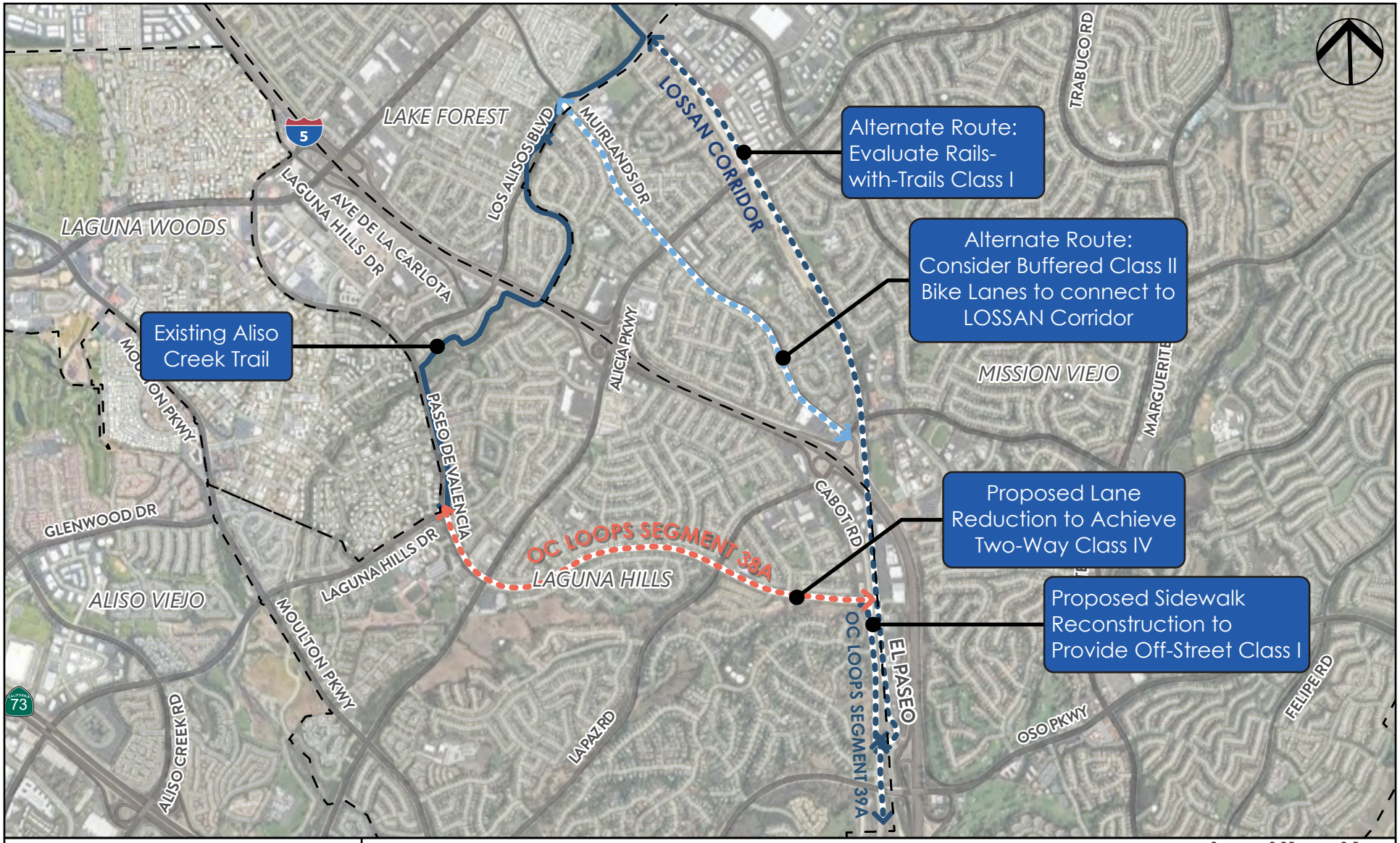
Initial

- Install Buffered Class II facility.

Comprehensive

- Consider lane reduction to provide Class IV facility on roadway (potentially two-way facility on one side or two one-way facilities on either side of the roadway.

Figure 35 OC Loops Segments 38A and 39A



OCTA

OC Loops Feasibility Study

OC Segments 38A and 39A

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LEGEND

- City Boundary
- Existing Class I
- Proposed Class I
- Proposed Class II
- Proposed Class IV

In this area the primary route is proposed along Aliso Creek Trail, Paseo De Valencia, and Cabot Road. An alternate route for consideration utilizes Muirlands Drive and the LOSSAN Corridor.

Cabot Road (Corridor 39)

Cabot Road is a 1.8-mile corridor serving OC Connect. The Segment 39 extents are between the Paseo de Valencia and Rapid Falls Drive. The corridor is within the jurisdiction of three agencies, including the City of Laguna Hills, City of Mission Viejo, and City of Laguna Niguel. A parallel planning study being undertaken by the City of Mission Viejo is considering modification of Cabot Road to include a Class I bikeway on the easterly side of Cabot Road between Rapid Falls Road and El Paseo. Based on the parallel planning study completion, the recommended facility and costs for Corridor 39 may be further refined. Recommendations for the corridor were developed in District 5 Feasibility Study and included the following:

- Restripe the southbound left-turn lane and center median at Rapid Falls Road to provide a Class II bike lane to the right of the vehicle left-turn lane.
- Convert existing Class II bike lanes to buffered Class II bike lanes on either side of Cabot Road.
- Install a Class II bike lane to the left of the right-turn lane at Oso Parkway.
- Install green paint treatment to guide bicyclists from the buffered Class II bike lane to the proposed Class II bike lane to the left of the right-turn lane at Oso Parkway.

Table 46 Corridor 39 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
39A	Paseo de Valencia to 780 feet south of Oso Pkwy	0.9 miles	Not Built	Laguna Hills	Buffered Class II	$335,000
39B	780 feet south of Oso Pkwy to 3,470 feet south of Oso Pkwy	0.5 miles	Not Built	Laguna Hills	Buffered Class II	$77,000
39C	3,470 feet south of Oso Pkwy to Rapid Falls Rd	0.4 miles	Not Built	Laguna Hills	Buffered Class II	$101,000
					SUBTOTAL	$513,000
					CONTINGENCY (30%)	$153,900
					GRAND TOTAL	**$666,900**

Oso Creek Trail (Corridor 40)

Oso Creek Trail is a 1.0-mile corridor serving OC Connect. The Segment 40 extents are between the Cabot Road (at Rapid Falls Drive) and the Laguna Niguel/Mission Viejo Train Station. No new analysis has been assigned given the existing facility.

Table 47 Corridor 40 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
40A	Cabot Rd to Laguna Niguel/Mission Viejo Train Station	1.0 miles	Built	Multiple	Class I

Oso Creek Trail (Corridor 41)

The Oso Creek Trail extension south of the Laguna Niguel/Mission Viejo Train Station would provide bikeway connectivity serving OC Connect. The Segment 40 extents are between the Laguna Niguel/Mission Viejo Train Station and the Rancho Capistrano Driveway. The 0.8-mile connection in the City of Laguna Niguel would continue along Oso Creek south of the train station, cross to the west bank, and connect to Rancho Capistrano, where an at-grade crossing of the LOSSAN railroad is provided to link with Camino Capistrano. The corridor was not reviewed in prior regional bikeway feasibility studies; therefore, enhancements were developed as part of this project.

A facility gap exists between the Metrolink Station and Cabot-Forbes Bike Path. The District 5 Feasibility Analysis identifies opportunity to construct a Class I facility along the west side of Forbes Road between the train station and Rancho Capistrano.

Opportunities and Constraints

The Oso Creek Trail extension facility would provide a comfortable route for users of all ages and abilities. However, feasibility related to railroad setbacks, right-of-way easements, and negotiations may delay the implementation of the project. A flat maintenance access road is provided on both sides of Oso Creek that can be improved and hardened to prevent erosion during rain events. The City of Laguna Niguel has condition recent land development projects to design and construct a portion of the extension for 0.2 miles south of the current Oso Creek Trail terminus, however, the extension will not reach the Rancho Capistrano Driveway.

Existing Facility	None
Curb-to-Curb Width	62-feet
Classification	Secondary Arterial
Posted Speed Limits	35 Miles Per Hour
Average Daily Traffic	5,000
On-street Parking	Yes

Figure 36 Corridor 24 Existing Conditions

Conceptual Design

Table 48 Corridor 41 Existing Conditions, Segmentation, Proposed Enhancements, and Cost Estimates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
41A	Laguna Niguel/Mission Viejo Train Station to Rancho Capistrano Drwy	Varies	Not Built	Multiple	Class I	$1,268,000
					SUBTOTAL	$1,268,000
					CONTINGENCY (25%)	$317,000
					GRAND TOTAL	**$1,585,000**

Initial

- Extend the Class I Oso Creek Trail extension southerly to Rancho Capistrano.

Comprehensive

- Not applicable.

Figure 37 OC Loops Segments 40A, 41A, 42C

OCTA

OC Loops Feasibility Study

OC Loops Segments 40A, 41A, 42C

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LEGEND

- City Boundary
- Existing Class I
- Proposed Class I
- Proposed Class II

Camino Capistrano (Corridor 42)

Camino Capistrano is a 2.0-mile corridor serving OC Connect and located within the jurisdiction of the City of San Juan Capistrano (SJC). The Segment 42 extents are between the Rancho Capistrano Driveway and La Zanja Street. Recommendations were developed in District 5 Feasibility Study and included the following:

- Narrow roadway and restripe Camino Capistrano from south of Junipero Serra Road to Calle Chueca to accommodate a Class I bike path along the west side of Camino Capistrano.
- Install a new signalized crosswalk along the west leg of Camino Capistrano at Oso Road.
- Install a Class I bike path adjacent to the LOSSAN rail corridor from Camino Capistrano to the Silverado San Juan Capistrano Memory Care Community parking lot.
- Widen existing Class I shared path along the west side of Camino Capistrano to 12 feet to meet Caltrans Highway Design Manual 1003.1 standards.

Table 49 Corridor 42 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
42A	La Zanja St to Calle Chueca St	0.5 miles	Built	SJC	Class I	$570,000
42B	Calle Chueca St to Junipero Rd	0.4 miles	Built	SJC	Class I	$570,000
42C	Junipero Rd to Rancho Capistrano Drwy	1.1 miles	Built	SJC	Class I, IV, & Buffered II	$692,400
					SUBTOTAL	$1,832,400
					CONTINGENCY (30%)	$549,800
					GRAND TOTAL	**$2,282,200**

La Zanja Street (Corridor 43)

La Zanja Street is a 0.2-mile corridor serving OC Connect and located within the jurisdiction of the City of San Juan Capistrano (SJC). The Segment 43 extents are between Camino Capistrano and Avenida De La Vista. Recommendations were developed in the District 5 Feasibility Study and included the following:

- Install Class III bicycle sharrows and signage in both directions of La Zanja Street.
- Provide a break in the center median at the La Zanja Street eastbound approach with Camino Capistrano to provide a bicycle left turn lane.

Table 50 Corridor 43 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
43A	Camino Capistrano to Avenida De La Vista	0.2 miles	Built	SJC	Class III	$110,000
					SUBTOTAL	$110,000
					CONTINGENCY (30%)	$33,000
					GRAND TOTAL	**$143,000**

Avenida De La Vista (Corridor 44)

Avenida De La Vista is a 0.3-mile corridor serving OC Connect and located within the jurisdiction of the City of San Juan Capistrano (SJC). The Segment 44 extents are between La Zanja Street and the Trabuco Creek Trail. Recommendations were developed in the District 5 Feasibility Study and included the following:

- Install Class III bicycle sharrows and signage in both directions of Avenida De La Vista from Trabuco Creek Trail to La Zanja Street

Table 51 Corridor 44 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
44A	La Zanja St to Trabuco Creek Trail	0.3 miles	Built	SJC	Class III	$13,000
					SUBTOTAL	$13,000
					CONTINGENCY (30%)	$3,900
					GRAND TOTAL	**$16,900**

Trabuco Creek Trail (Corridor 45)

The Trabuco Creek Trail is a 0.9-mile corridor serving OC Connect. The Segment 45 extents are between Avenida De La Vista and the San Juan Creek Trail. The corridor is within the jurisdiction of the City of San Juan Capistrano (SJC) and no new analysis has been assigned given the existing facility.

Table 52 Corridor 45 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
45A	Avenida De La Vista to San Juan Creek Trail	0.9 miles	Built	SJC	Class I

San Juan Creek Trail (Corridor 46)

The San Juan Creek Trail is a 0.9-mile corridor serving OC Connect. The Segment 46 extents are between the Trabuco Creek Trail and Pacific Coast Highway. The corridor is within the jurisdiction of the Cities of Dana Point and San Juan Capistrano and no new analysis has been assigned given the existing facility.

Table 53 Corridor 46 Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
46A	Trabuco Creek Trail to Pacific Coast Highway	0.9 miles	Built	Multiple	Class I

Park Lantern-Coast Highway (Corridor 47)

Park Lantern-Coast Highway is a 1.2-mile corridor serving OC Connect and located within the jurisdiction of the City of Dana Point. The Segment 47 extents are between the San Juan Creek Trail and Palisades Drive. The corridor was evaluated in the District 5 Feasibility Study and include the following:

- Relocate the existing K-rail 3 feet to the north and restripe the existing 15-foot travel lane to a 12-foot travel lane on the north side of the K-rail.
- Restripe the 11-foot travel lanes south of the K-rail to construct an 11-foot shared path using the existing sidewalk along the south side of the segment.
- Install Class III bicycle sharrows along the vehicle travel lanes south of the K-rail.
- Restripe eastbound approach pavement markings and center striped median at Park Lantern/Double Tree Hotel intersection.

Table 54 Corridor 47 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
47A	San Juan Creek Trail to Park Lantern	0.2 miles	Not Built	Dana Point	Class I, Class II	$302,000
47B	Park Lantern to Doheny Park Rd	0.2 miles	Not Built	Dana Point	Class I	$170,000
47C	Doheny Park Rd to Palisades Dr	0.8 miles	Not Built	Dana Point	Class I	$1,200,000
					SUBTOTAL	$1,672,000
					CONTINGENCY (30%)	$501,600
					GRAND TOTAL	**$2,173,600**

Coast Highway (Corridor 48)

Coast Highway is a 1.6-mile corridor serving OC Connect and located within the jurisdiction of the City of Dana Point. The Segment 48 extents are between Palisades Drive and Camino Capistrano. The corridor was reviewed in the District 5 Feasibility Study and include the following:

- Maintain Existing Class IV cycle track.
- Remove existing K-rail and replace with raised island as a Class IV cycle track separator.
- Construct curb extensions at the Camino Capistrano north leg (per City of San Clemente proposed plans).
- Restripe new crosswalks along the north and west legs of Coast Highway at Camino Capistrano (per City of San Clemente proposed plans).
- Install lane line extension striping through intersection for Class II bike lanes (per City of San Clemente proposed plans).

Table 55 Corridor 48 Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
48A	Palisades Dr to Camino Capistrano	1.6 miles	Built	Dana Point	Buffered Class II	$4,100,000
					SUBTOTAL	$4,100,000
					CONTINGENCY (30%)	$1,230,000
					GRAND TOTAL	**$5,330,000**

El Camino Real (Corridor 49)

El Camino Real is a 4.7-mile corridor serving OC Connect. The Segment 44 extents are between the Camino Capistrano and Avenida Estacion. The corridor is located within the jurisdiction of the City of San Clemente.

Segment 49A

Segment 49A received no new analysis given the existing Class IV separated bikeway.

Table 56 Segment 49A Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
49A	Camino Capistrano to Avenida Estacion	1.0 miles	Not Built	San Clemente	Class IV

Segment 49B

The El Camino Real Segment 49B extents are between the Avenida Estacion and Avenida San Gabriel. Segment 49B was evaluated in the District 5 Feasibility Study and include the following:

- Install road diet from Boca de la Playa to Escalones to accommodate one vehicle travel lane in each direction, a two-way center left-turn lane, and a Class II bike lane on either side of the street.
- Install road diet from east of Avenida Palizada to Avenida Granada to accommodate one vehicle travel lane in each direction, a two-way left-turn lane, and I Class II bike lane on either side of the street.
- Install road diet from Avenida Rosa to Avenida Cordoba to accommodate one vehicle travel lane in each direction, a two-way left-turn lane, and a Class II bike lane on either side of the street.
- Maintain existing on-street parking.

Table 57 Segment 49B Existing Conditions, Segmentation, and Cost Estimate Updates

Segment	Extents	Length	Status	Agency	Bikeway Type	Estimate
49B	Avenida Estacion to Avenida San Gabriel	2.4 miles	Not Built	San Clemente	Class II	$575,000
					SUBTOTAL	$575,000
					CONTINGENCY (30%)	$172,500
					GRAND TOTAL	**$747,500**

Segment 49C

Segment 49C received no new analysis given City plans for implementing Class II bike lanes. The Segment 49C extents are between the Avenida San Gabriel and Christianitos Road given the City Plans for future Class II bike lanes.

Table 58 Segment 49C Existing Conditions

Segment	Extents	Length	Status	Agency	Bikeway Type
49C	Avenida San Gabriel to Christianitos Rd	1.3 miles	Not Built	San Clemente	Class II (Future)

Recommended Gap Closures Cost Estimate Summary

The total construction cost estimate for Segments 1-49 gap closure projects included in this report is $84,998,200. We recommend project soft costs per the following percentages of construction costs:

- Preliminary Design and Environmental Review: 15%
- Final Design: 20%
- Right of Way Acquisition (if needed, to be determined)
- Permitting (if needed, to be determined)
- Construction Management 15%

Next Steps

Equity Considerations

A displacement-risk assessment was prepared to minimize the potential displacement of current residents. The analysis reviewed existing conditions and characteristics of the community to identify neighborhood trends over time. The analysis evaluates multiple demographic factors associated with potential displacement such as household income and race and ethnicity, to determine if communities at-risk of displacements overlap with the OC Loops to best inform the project recommendations.

A high-level, GIS-based analysis was conducted to identify areas along the OC Loops that may be susceptible to equity displacement. A one-mile buffer from the OC Loops was used to capture census tracts from three dataset indicators. These three indicators were analyzed using data from the Southern California Association of Governments (SCAG) Environmental Justice Areas, the California Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen 4.0 and United States Census Median Household Income databases. While several other factors can be included as part of a more detailed analysis, these datasets provided the key indicators of potential displacement; income, predominantly minority population, and change in the minority population.

Race/Ethnicity and Household Income

The project team used CalEnviroScreen data for this analysis to compare the race/ethnicity percentage over time. The analysis specifically looked for increases in the percentage of white population. Eight of the twenty-eight census tracts identified in the OC Loops demonstrate an increase in the percentage of white residents, as illustrated in Figure 38. About a third of all census tracts adjacent to the OC Loops have experienced an increase in percent white population over the past eight years. While this can be an indicator of gentrification, it should be noted that it is unclear from this data alone if households of color are moving via involuntary or forced movement, or through voluntary residential mobility.

Median Household Income

The project team also evaluated the project area to identify where median household income falls below the California poverty line of $60,188. The block groups identified primarily follow the OC Connect through Cypress, Stanton, Garden Grove, Santa Ana, and Laguna Woods, with a few other census tracts throughout the OC Loops like Buena Park and Anaheim, as shown in Figure 39.

Minority Populations

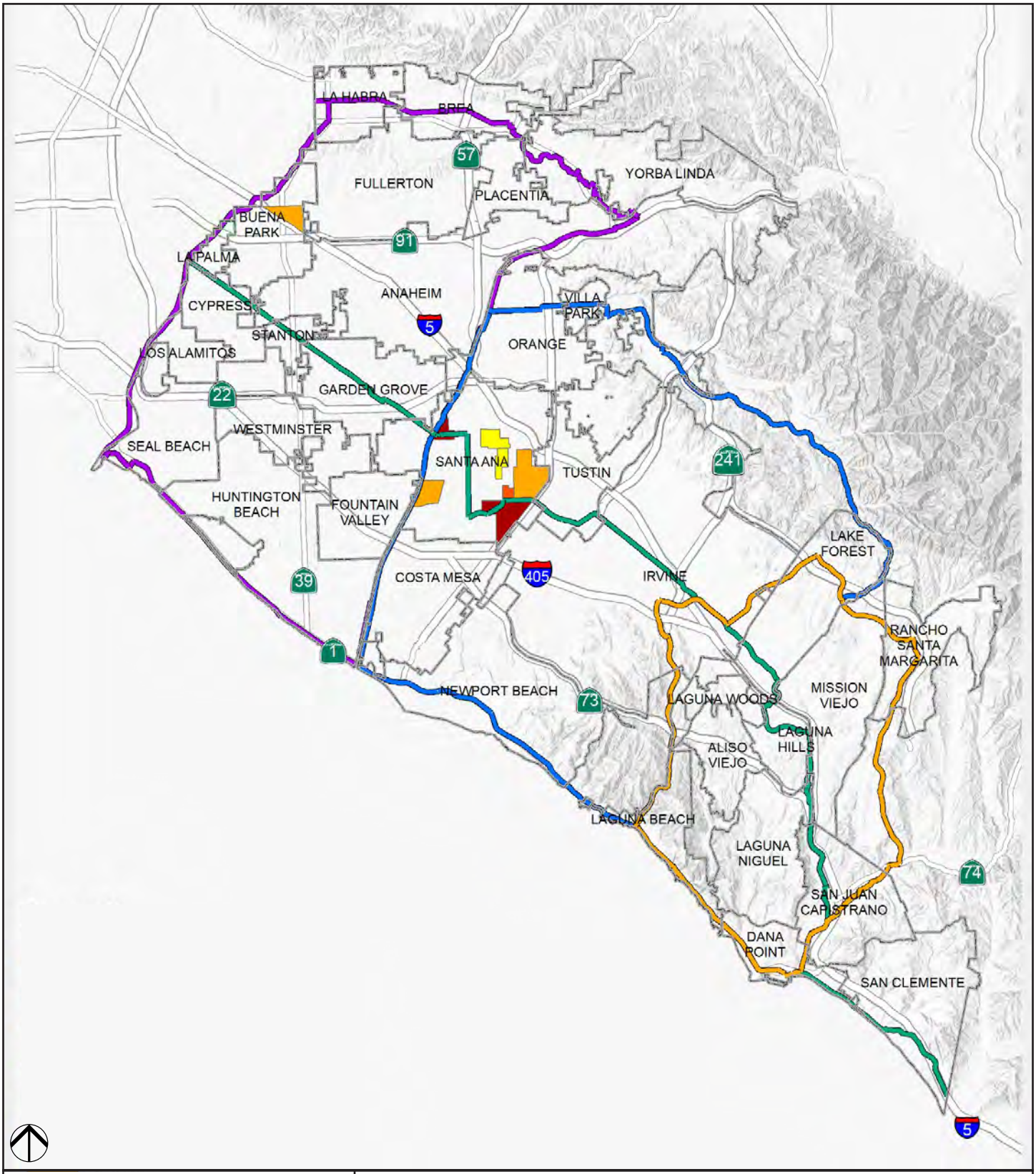
The percentage of minority population follows the same trajectory as median household income, symbolizing a correlation between communities of color and poverty. Of these areas, Santa Ana and Buena Park pose the greatest risk of displacement in proximity to the OC Loops, as shown in Figure 40. Not only are the block groups identified as low-income communities of color, but some are also experiencing increases in the percentage of white population (see Figure 38 Increase in White Population). The convergence of multiple criteria indicates a potential for gentrification to gradually transform the neighborhoods and pose a risk of increasing the cost of living, forcing the displacement of residents.

Potential for Displacement

Understanding where at-risk of displacement communities are located informs the project recommendations to minimize this risk. The project team places equity at the forefront of this process so that all residents can enjoy the creation of the OC Loops for years to come, while maintaining affordability for current residents.

A composite model was developed to highlight where the high levels of ethnicity change, and overall minority population and low median household income. The census tracts that encompass these high levels of potential displacement, as shown in Figure 41 Potential for Displacement, are primarily found in the eastern half of Santa Ana and in Buena Park. Within Downtown Santa Ana and just east of Downtown and several census tracts in the City's southeastern neighborhoods show the highest potential for displacement. Buena Park, north of SR-91 and I-5, also have the highest potential for displacement outside of Santa Ana. Moderate levels follow the OC Connect corridor between Santa Ana and La Palma. The OC North Loop and OC Connect have the most affected neighborhoods with the highest potential for future displacement.

Figure 38 Increase in White Population



OCTA

OC Loops Feasibility Study

Increase in White Population

MARK THOMAS

OCTA

OC LOOPS

Bike. Walk. Explore.

LEGEND

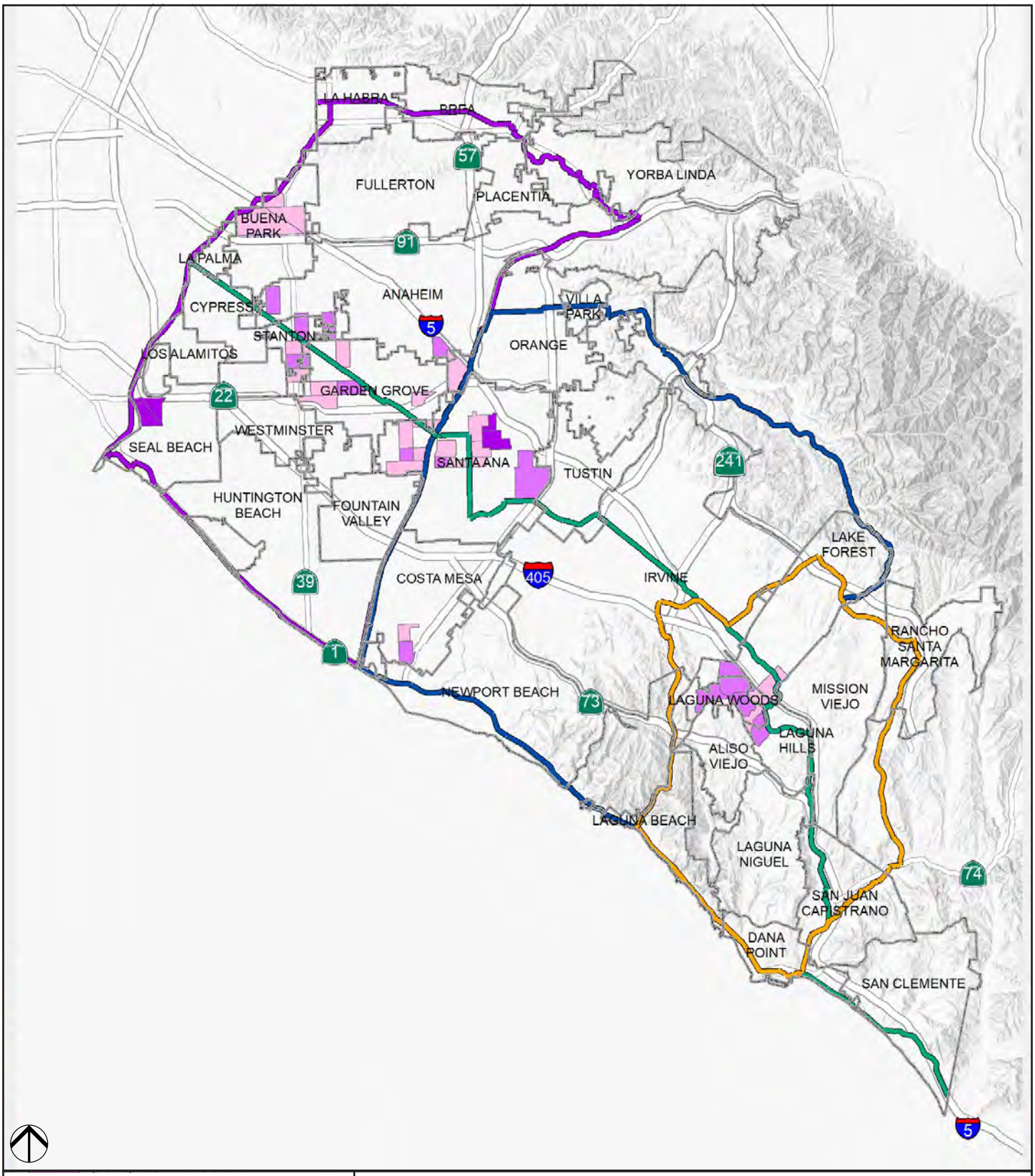
- OC South Loop
- OC Connect
- OC Central Loop
- OC North Loop

INCREASE IN WHITE POPULATION

- 0-25%
- 26-50%
- 51-75%
- >75%

Source: CalEnviroScreen

Figure 39 Median Household Income



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Median Household Income

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OC LOOPS

Bike. Walk. Explore.

LEGEND

- OC South Loop
- OC Connect
- OC Central Loop
- OC North Loop

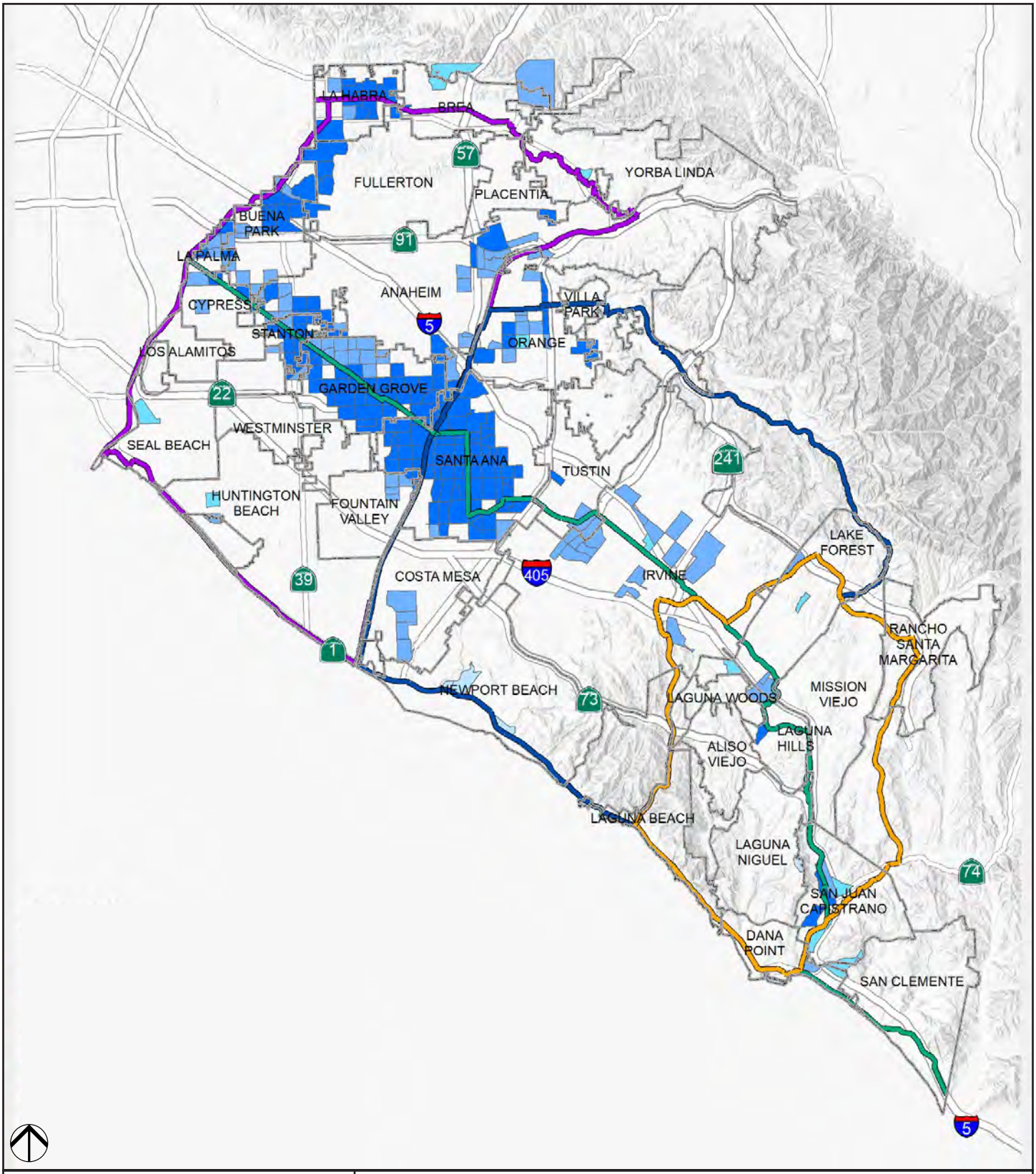
MEDIAN HOUSEHOLD INCOME*

- $50-$61K / Year
- $40-$50K / Year
- <$40K / Year

*Census Tracts below the CA poverty rate < $60,188 / Year

Source: SCAG

Figure 40 Minority Populations



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Minority Populations

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OC LOOPS

LEGEND

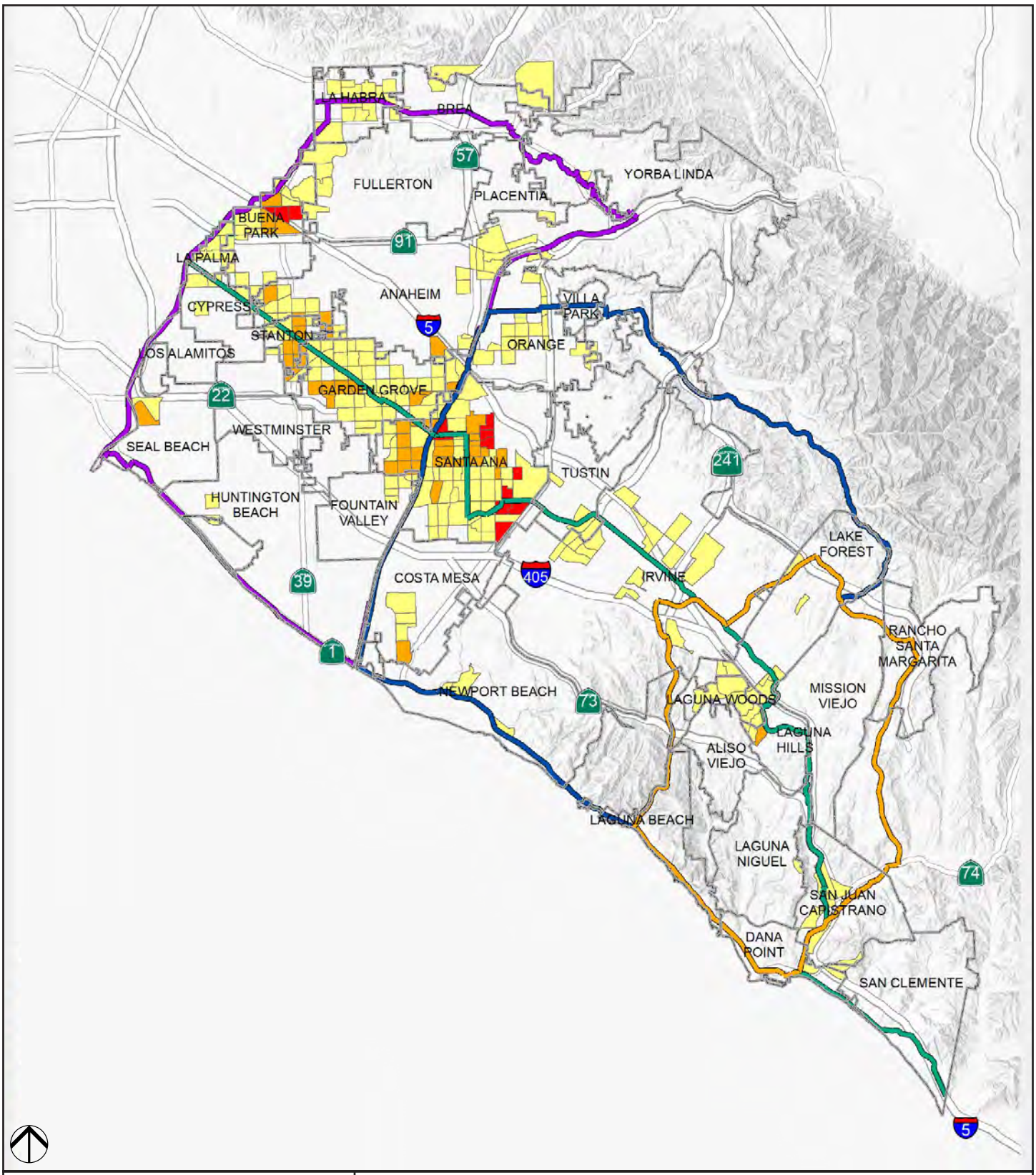
- OC South Loop
- OC Connect
- OC Central Loop
- OC North Loop

PERCENT OF MINORITY POPULATION

- 0-25%
- 26-50%
- 51-75%
- 76-100%

Source: SCAG

Figure 41 Potential for Displacement



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Potential for Displacement

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OC LOOPS

LEGEND

- OC South Loop
- OC Connect
- OC Central Loop
- OC North Loop

POTENTIAL FOR DISPLACEMENT

- Low
- Medium
- High

Source: SCAG, CalEnviroScreen

Prevention and Mitigation of Displacement

Investing in transit, bicycle, and pedestrian infrastructure makes an area more desirable to live in, therefore, increasing housing values and rental prices, which can contribute to displacement. However, this leads to an increase in housing values and rental prices which can contribute to displacement. This does not mean lower income and neighborhoods at risk for displacement should not receive investment. Instead, preventative policies can be adopted to protect existing residents from displacement associated with gentrification following capital investment. Thoughtful policies aim to maintain affordability for existing residents while allowing room for investments that increase safety, comfort, and well-being.

The project team assessed the sociodemographic conditions and (other indicators from above) of the project area to determine which communities are at the greatest risk of displacement. These communities received additional analysis and consideration to help inform recommendations along the OC Loops.

Caltrans is developing a statewide Transportation Equity Index tool to encourage equitable outcomes by suggesting priority populations from a transportation perspective. The Urban Displacement Project has created an interactive mapping tool per census tract showcasing gentrification and sociodemographic indicators from 1990 to 2015. According to the Urban Displacement Project, Orange County holds 55% of census tracts with exclusion risk or ongoing exclusion, this is the largest concentration of communities that are vulnerable to gentrification and displacement in Southern California, according to this tool.

The policies and programs to prevent displacement around transportation investment are split into the following categories: affordable housing, land use and zoning, engagement, equity planning, and partnerships.

Affordable Housing

Affordable housing is central to the displacement discussion and there is overlap with the four preceding categories. Broadly speaking, policies should preserve affordability through increased housing supply, funds for public housing and assistance programs, and rent control. Ways to go about this include incentives for developers, subsidy programs, and individual access to resources and education of available programs.

- Adopt policies to preserve affordability. This includes local action to preserve affordable housing, the use of the Rental Assistance Demonstration to reinvest in public housing units, and the use of small area fair market rents to ensure continued access to changing neighborhoods for housing voucher holders.
- Encourage more housing development. The report describes changing federal guidelines and rules related to manufactured housing and condominiums, employing local property acquisition funds, reforming land-use regulations that impede supply, and adopting inclusionary zoning in suitable markets.

- Identify incentives (e.g., tax breaks and credits) for planners, developers, and local governments to control displacement.
- Approve policies to ensure continued affordability of housing units and the ability of residents to remain in their homes:
    - Consider code enforcement policies that assist residents with home improvements;
    - Consider implementing rent controls; and
    - Preserve federally subsidized housing programs.
- Consider location-efficient mortgages that provide competitive rates and low down payments to those who want to live in "location-efficient communities" that are convenient to resources and reduce the need to drive Increase individuals' assets to reduce dependence on subsidized housing:
    - Consider homeownership programs; and
    - Explore job creation strategies and programs.
- Ensure that new housing-related investments benefit current residents:
    - Review development proposals to determine whether the changes could cause displacement. For example, conduct a health impact assessment: https://www.cdc.gov/healthyplaces/hia.htm
- Density bonuses work best in fast growing housing markets. The bonus allows developers to build higher or more densely than the zoning code currently allows in exchange for including a percentage of income restricted affordable units.

Land Use/Zoning

Looking at policies across the region regarding land use, regional leaders are evaluating the potential of displacement of active transportation plans and transportation projects. The factors considered include housing, health, and employment. When developing these plans and projects, it is helpful to avoid requiring vehicle enhancement capacity to accommodate users who do not have a car, which is most often a representative factor in low-income neighborhoods. Narrowing the focus on land use - Mixed-use developments reduce the need to take as many car trips, as most needs are theoretically in the same place, within walking distance, and near major transit hubs. Inclusionary zoning requirements expand the supply of affordable housing by dispersing it throughout the city, instead of confining populations/earners to specific parts, or out entirely, of a neighborhood or city.

- Neighborhood Stabilization Overlay (NSO), or neighborhood conservation districts, are a tool used to establish more strict zoning requirements in particular neighborhoods vulnerable to development pressures and displacement. These overlays are intended to serve as short-term interventions in vulnerable neighborhoods experiencing rising housing costs and increasing numbers of property demolitions.
- Prioritize active transportation projects that do not require vehicle enhancement capacity.
- Mixed-income communities offer a variety of housing prices that could include single and multi-family units, which provide housing choices for multiple income levels.

- Adopt inclusionary zoning policies - Inclusionary zoning is a promising policy strategy that allocates a percentage of the rental or for-sale units in housing developments for low- and moderate-income residents. In return, developers receive cost offsets as compensation for their affordable housing contributions.
- Prioritize active transportation projects in areas where affordable housing is being developed.
- Zoning New Sites for Mobile Homes or Zone Current Land for Mobile Homes.

Engagement

Including residents through a participatory planning process can spread knowledge of climate and economic benefits, relieve social tension, and integrate voices of community-led organizations. Decision makers who understand a community's economic and social position will likely gain greater support and less resistance to housing and transportation projects. Providing community members with opportunities for project input will contribute to the success of new development and increase rapport for future projects.

- Engage community residents before and after neighborhoods change. This includes building support for new development, including affordable housing, and ensuring residents' concerns are addressed. Policymakers can also address social tensions, prevent or reduce political displacement, and foster meaningful integration through support for community-led organizations.
- Involve the community:
    - Allow the community to provide input into the design and redevelopment of their neighborhoods;
    - Educate the community on their available options; and
    - Create organized bodies and partnerships that develop programs to mitigate gentrification.
- Strengthen vulnerable residents' ability to have a voice and active role in the development of their neighborhood by investing in community organizing and setting community engagement plan requirements.
- Rent control policies set a cap for annual rent increases for either a specific locality or for designated unit types, like multi-family properties. Localities would couple a rent control policy with the creation of a rent review board that sets the caps on rent increases and hears petitions from landlords asking to raise rents beyond the established cap.
- Emergency Rental Assistance. Emergency rental assistance is provided to residents facing the threat of eviction as a short-term, stop-gap measure.
- Neighborhood Stabilization Voucher Program. Under this program, vouchers similar to Section 8 or Housing Choice Vouchers would be created using local dollars and targeted for neighborhoods or residents in the most need (i.e., at risk of displacement). Localities could provide the voucher to residents who are unable to pay their rent due to rising property values, residents currently residing in affordable housing projects and other vulnerable residents.

Equity Planning
Incorporating policies that place equity at the forefront can reduce the risk of displacement. Decision-makers should evaluate the potential impacts of investments on a case-by-case basis and proactively mitigate negative outcomes. This can be done as a result of the health impact assessment recommended under the zoning section.

- Incorporate practices that ensure responsible, equitable, and sustainable active transportation planning and development by evaluating the potential impacts and pro-actively mitigating the negative consequences, such as displacement of residents and businesses.
- Develop a set of guidelines to identify, adopt, and implement prevention and mitigation strategies for the negative impacts identified in the Health Impact Assessment (of Policy 10.1).
- Provide direct financial relief to vulnerable renters at risk of being displaced from their homes in gentrifying neighborhoods.
- Community Land Trusts (CLTs) are run by non-profit organizations or the locality that maintains land ownership to provide permanently affordable housing for communities in need.
- Conduct a Health Impact Assessment that evaluates the benefits and negative consequences (i.e., displacement potential) of the (A) cumulative Active Transportation Plan and (B) individual projects that connect to major employment hubs and high-quality transit, on a series of community-level indicators, including health, housing, employment.

Partnerships
Pursuing local partnerships surrounding the project area within local government and with employers and businesses can help gain support for the project and ease the planning process. Finding consistency in policies across local, state, and federal government can help ease the planning process and mitigate negative consequences of development. Project partners can also open doors to additional funding sources and future opportunities.

For example, partnering with major employers within a half mile of a transit project helps build project support and spread awareness.

- Collaborate with other departments (e.g., Community Development Agency, Planning) to explore intersectional policies to prevent and mitigate negative consequences of ATP development, such as strengthening inclusionary zoning within a radial proximity of major ATP projects, Just Cause Evictions Ordinance, etc.
- Develop regional strategies. Displacement pressures and the need for affordability span across jurisdiction borders. Federal grants, rules, and assistance can help localities collaborate regionally through data sharing, award preferences, best practice convenings, and affirmatively furthering fair housing.

- Actively pursue funding and partnerships to build affordable housing within half a mile of active transportation projects that connect to major employment hubs and high-quality transit.
- Empower the private sector via Private Preservation Investment Funds. Private preservation investment funds provide an outlet for private investors to support the acquisition and preservation of at-risk affordable housing—or housing vulnerable to redevelopment pressures which would result in the loss of affordable units. Private sector partners would reserve equity investments in an easily accessible fund to enable quick action when funds are needed to preserve affordable housing.
- Form Non-Profit Housing Collaborative that would function as non-profits come together to create partnerships and pool resources and expertise for advocacy, capacity building, and coordination purposes. Additionally, non-profits could co-develop properties and advocate for their tenants.

Funding Strategies

The following list of competitive grants and formula-based funding programs are recommended for consideration to address the financial needs of the projects identified in this Study. We recommend that agencies within Orange County continue to monitor the following sources to determine where projects may be eligible for opportunities to secure funding:

State of California Funding Sources

1. AHSC – Affordable Housing and Sustainable Communities
   https://sgc.ca.gov/programs/ahsc/
2. ATP – Active Transportation Program
   https://catc.ca.gov/programs/active-transportation-program
3. CleanCA – Clean California
   https://cleancalifornia.dot.ca.gov/
4. HSIP - Local Highway Safety Improvement Program
   https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/highway-safety-improvement-program
5. LPP – Local Partnership Program
   https://catc.ca.gov/programs/sb1/local-partnership-program
6. LSRP – Local Streets and Roads Program
   https://catc.ca.gov/programs/sb1/local-streets-roads-program
7. OTS – Office of Traffic Safety
   https://www.ots.ca.gov/grants/
8. PROTECT
   https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/protect#:~:text=The%20purpose%20of%20the%20PROTECT,natural%20disasters%2C%20and%20climate%20change.
9. RC:H2B – Reconnecting Communities: Highways to Boulevards
   https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/rc-h2b

10. RMRA – Road Maintenance and Rehabilitation Account (RMRA) and Highway Users Tax Account (HUTA)
    https://www.sco.ca.gov/aud_road_maintenance_sb1.html
11. SCCP – Solutions for Congested Corridors Program
    https://catc.ca.gov/programs/sb1/solutions-for-congested-corridors-program
12. SHOPP - State Highway Operation and Protection Program
    https://catc.ca.gov/programs/state-highway-operation-and-protection-program
13. STIP – State Transportation improvement Plan
    https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/state-transportation-improvement-program
14. STP – Sustainable Transportation Planning
    a. Sustainable Communities Grant
    b. Climate Adaptation Planning Grants
    c. Strategic Partnership Grants

    https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/regional-and-community-planning/sustainable-transportation-planning-grants

Federal Funding Sources

15. CMAQ – Congestion Mitigation and Air Quality Improvement Program
    https://ww2.arb.ca.gov/resources/documents/congestion-mitigation-and-air-quality-improvement-cmaq-program
16. RAISE - Rebuilding American Infrastructure with Sustainability and Equity
    https://www.transportation.gov/RAISEgrants
17. SS4A – Safe Streets and Roads for All
    https://www.transportation.gov/grants/SS4A
18. STBG – Surface Transportation Block Grant
    https://www.fhwa.dot.gov/specialfunding/stp/

Table 59 Funding Sources Description/Purpose, and Considerations

Source	Description/Purpose	Considerations
Affordable Housing and Sustainable Communities (AHSC) Program	Funded by Cap-and-Trade revenue, the AHSC program makes it easier for Californians to drive less by engaging in active transportation, such as walking, biking, and using transit.	Qualifying projects are associated with an affordable housing project.
Active Transportation Program (ATP)	The Active Transportation Program was created by Senate Bill 99 to encourage increased use of active modes of transportation, such as walking and biking.	Partial toward projects benefitting disadvantaged communities.
Clean California (CleanCA)	Clean California provides funds to clean and beautify public spaces in underserved communities.	Partial toward projects benefitting disadvantaged communities.
Highway Safety Improvement Program (HSIP)	California's Local HSIP focuses on infrastructure projects with nationally recognized crash reduction factors (CRFs).	Projects scored based on benefit cost ratio using crash history.

Source	Description/Purpose	Considerations
Local Partnership Program (LPP)	Provide funding to counties, cities, districts, and regional transportation agencies in which voters have approved fees or taxes dedicated solely to transportation improvements or that have imposed fees dedicated solely to transportation improvements	Funds are distributed through a 40% statewide competitive component and a 60% formulaic component.
Local Streets and Roads Program (LSRP)	SB 1 dedicated approximately $1.5 billion per year in new formula revenues apportioned by the State Controller (Controller) to cities and counties for basic road maintenance, rehabilitation, and critical safety projects on the local streets and roads system.	Projects must be adopted by a board or council, then submitted to the California Transportation Commission to be considered for funding.
Office of Traffic Safety (OTS) Grant Program	The goal of the annual program is to prevent severe injury and death resulting from motor vehicle crashes so that all roadway users arrive at their destination safely.	Funding is focused on projects centered around enforcement and/or education.
PROTECT	Help local agencies improve the resiliency of their on-system transportation infrastructure. Specifically, the program provides federal funding to projects to help communities address vulnerabilities due to weather, natural disasters, and climate change.	Funding may be applied to improve resilience of surface transportation infrastructure from the impacts of changing conditions.
Reconnecting Communities: Highways to Boulevards (RC:H2B)	To plan for and fund the conversion of key underutilized highways in the State into multi-modal corridors to reconnect communities divided by transportation infrastructure.	Partial toward projects associated with an affordable housing project.
Road Maintenance and Rehabilitation Account (RMRA) and Highway Users Tax Account (HUTA)	The RMRA deposits various funds to support the Road Maintenance and Rehabilitation Program (RMRP), which is applied to address deferred maintenance on the State Highway System and the local street and road system.	Apportioned by formula to eligible cities and counties pursuant to Streets and Highways Code section 2032(h)
Solutions for Congested Corridors Program (SCCP)	Provides funding to achieve a balanced set of transportation, environmental, and community access improvements to reduce congestion throughout the state.	Dedicated bicycle lanes on the state highway system are approved capacity-increasing projects.
State Highway Operation and Protection Program (SHOPP)	Funds capital improvements relative to the maintenance, safety, operation, and rehabilitation of the state highway system that do not add new capacity to the system.	Projects are programmed in four-year increments; the next round will begin fiscal year 2026-27.
State Transportation Improvement Plan (STIP)	The STIP is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the Transportation Investment Fund and other funding sources.	Local agencies will nominate projects for inclusion in the STIP via the Metropolitan Planning Organization (MPO) (SCAG).

Source	Description/Purpose	Considerations
STP Sustainable Communities Grants	To encourage local and regional planning that supports state goals, implements Regional Transportation Plan (RTP) Sustainable Communities Strategies (SCS), and to ultimately achieve the State's greenhouse gas (GHG) reduction targets.	Multimodal transportation and land use planning projects.
STP Climate Adaptation Planning Grants	Support local and regional identification of transportation-related climate vulnerabilities through the development of climate adaptation plans, as well as project-level adaptation planning to identify adaptation projects and strategies for transportation infrastructure.	Identification of transportation related climate vulnerabilities through the development of climate adaptation plans.
STP Strategic Partnership Grants	To identify and address statewide, interregional, or regional transportation deficiencies on the State highway system in partnership with Caltrans. A sub-category funds transit-focused planning projects that address multimodal transportation deficiencies.	Project must assist in achieving the Caltrans Mission and Grant Program Objectives
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	Funds transportation projects and programs which include cost-effective clean air strategies that contribute to the attainment or maintenance of National Ambient Air Quality Standards.	Project must quantify the expected emissions reductions resulting from implementation.
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	Invests in projects that enhance safety, environmental sustainability, quality of life, mobility and community connectivity, economic competitiveness and opportunity including tourism, state of good repair, partnership and collaboration, and innovation.	Partial toward projects benefitting disadvantaged communities.
Safe Streets and Roads for All (SS4A)	Supports the National Roadway Safety Strategy and the Department's goal of zero deaths and serious injuries on our nation's roadways.	Action Plan Grants and Implementation Grants fund planning and construction, respectively.
Surface Transportation Block Grant (STBG)	Provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects.	Projects must be identified in the Transportation Improvement Program (TIP) and be consistent with the Long-Range Statewide Transportation Plan and the Metropolitan/Regional Transportation Plan.

Implementation Roles & Responsibilities

OCTA will support local agencies to advance the implementation of the enhancement concepts along the regional bikeway network. Opportunities for early-action implementation include the *Initial Design*, as identified for the corridors in earlier sections of this Study. These include treatments that may be completed through capital maintenance roadway striping, such as implementing bikeway buffer zones, increasing bikeway facility width, implementing conflict zone striping, installing two-stage left turn boxes, and installing Class III sharrow markings with signage. In addition, local agencies have the opportunity to begin public outreach and data collection to support future grant pursuits to complete the construction of *Comprehensive Design*, as identified in earlier sections of this Study. An opportunity to support implementation provided by OCTA is the Complete Streets Program detailed below.

OCTA Bicycle Corridor Improvement Program

Local agencies in Orange County may apply for funding to implement bicycle enhancements under OCTA's 2019 Bicycle Corridor Improvement Program (BCIP). The BCIP is funded through the Federal Congestion Mitigation Air Quality Improvement Program (CMAQ) funds, which provides annual appropriations to Orange County for transportation-related projects reducing traffic congestion and improving air quality. OCTA's Capital Programming Guidelines sets aside ten percent of CMAQ funds for bicycle and pedestrian infrastructure projects via a competitive call for projects. Applications from local agencies are typically due annually in the Fall to OCTA for consideration. Projects are selected based on their capacity to achieve the following goals of the BCIP:

- Increase the number of biking and walking trips.
- Provide regional linkages to key destinations.
- Close bikeways corridor gaps.
- Promote mobility options by increasing safety.
- Implement projects with community support.
- Improve air quality across Orange County.

Additional information can be found online at https://www.octa.net/Projects-and-Programs/Plans-and-Studies/Funding-Programs/Call-for-Projects/BCIP-Call-For-Projects/.

OCTA Complete Streets Program

OCTA is planning to administer a federally funded call for projects, the OC Complete Streets Program, to support local agency led projects in Orange County that contribute to the creation of a complete transportation network for all modes of travel, consider benefits to all user types; and improve access for residents and visitors. The program is expected to provide up to $55 million available in federal fiscal years 2023-24 through 2025-26.

Conclusion

Through coordination with the community, public engagement, and focus meetings with local agency staff, this Study identified solutions for implementing bikeway gap closures, enhanced facilities, and alternative route alignments. Cost estimates developed in the former Feasibility Studies were updated to support pursuit of grant funding, as led by local agencies. The content provided in this Study can be utilized to position OCTA and other partner agencies to further evaluate concepts and secure funding for planning, environmental review, design, and construction.

Orange County Bike Connectors Gap Closure Feasibility Study

Prepared for
Orange County
Transportation Authority by:

MARK THOMAS