SAN PABLO BICYCLE AND PEDESTRIAN CORRIDOR STUDY

Adopted February 2022

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ACKNOWLEDGEMENTS

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Funding for this Bicycle and Pedestrian Corridor Study was generously provided by Caltrans through a Sustainable Communities Planning Grant.

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Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, concept drawings, cost opinions, and commentary contained herein are based on limited data and information and on existing conditions that are subject to change. Further analysis and engineering design are necessary prior to implementing any of the recommendations contained herein.

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EXECUTIVE SUMMARY

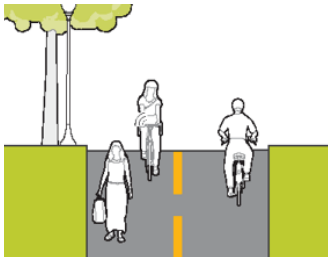
San Pablo is a thriving residential and business community in the East Bay with approximately 30,000 residents. The City of San Pablo (City) is actively planning for growth and is committed to enhancing resident health, safety, and quality of life. To achieve these goals, the City has led the development of this Report – the City of San Pablo Bicycle and Pedestrian Corridor Study (Corridor Study) – which strives to increase residents' access to comfortable and connected walking and bicycling infrastructure throughout the City.

This Report builds upon the recommendations and findings of previous planning efforts concerned with walking and bicycling (active transportation) in San Pablo, most notably the 2017 San Pablo Bicycle and Pedestrian Master Plan (BPMP). The 2017 BPMP recommended further study of eight (8) on-street corridors and two (2) off-street corridors throughout the City to determine their feasibility and to develop concept-level designs for the recommended bicycle facilities on these corridors. The ten (10) corridors studied as a part of this Corridor Study include:

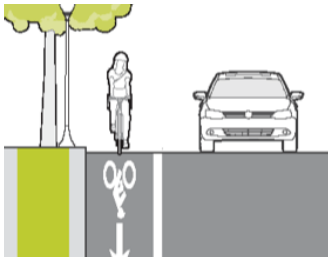
- **On-Street Corridors** (where the BPMP recommended Class II or IV bicycle lanes):
  1. San Pablo Avenue (Evans Avenue to Lowell Avenue) (i.e., "South")
  2. San Pablo Avenue (Road 20 to Rumrill Boulevard) (i.e., "North")
  3. Broadway Avenue (11th Street to San Pablo Avenue)
  4. El Portal Drive (San Pablo Avenue to Church Lane)
  5. Road 20 (San Pablo Avenue to El Portal Drive)[1]
  6. Church Lane (intersection with San Pablo Avenue)
  7. San Pablo Dam Road (Morrow Drive to Amador Street)
  8. Giant Road (Brookside Drive to Miner Avenue)
- **Off-Street Corridors** (where the BPMP recommended Class I shared-use paths)
  9. Wanlass Park/Rheem Creek Trail (Wanlass Park to 19th Street)
  10. Hillside/Princeton Plaza Trail (San Pablo Dam Road to Hillcrest Road)

This Corridor Study is the result of over a year of robust community engagement and detailed analysis of existing conditions. This foundational work, along with best-practice designs, informed the concept-level designs for active transportation facilities on the study corridors. Overall, these concept-level designs (Appendix D) work toward achieving the goals from the 2017 BPMP: health, safety, mobility, and livability. The designs and cost estimates provided in this Report, paired with the Report's implementation considerations, position San Pablo to quickly advance designs through final design and construction. The recommended concept designs are flexible and can be implemented on a near- or long-term basis, pending City staffing and budgetary resources. By using this Report as a blueprint, the City will be well-equipped to expand its active transportation network, thereby providing residents with comfortable, convenient, and healthy alternatives to driving.

BICYCLE FACILITY TYPES

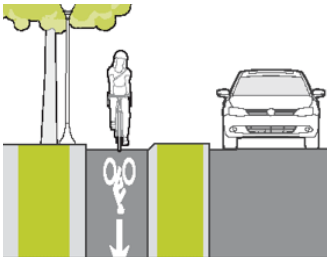


Class I Shared Use Paths



Class II Bicycle Lanes

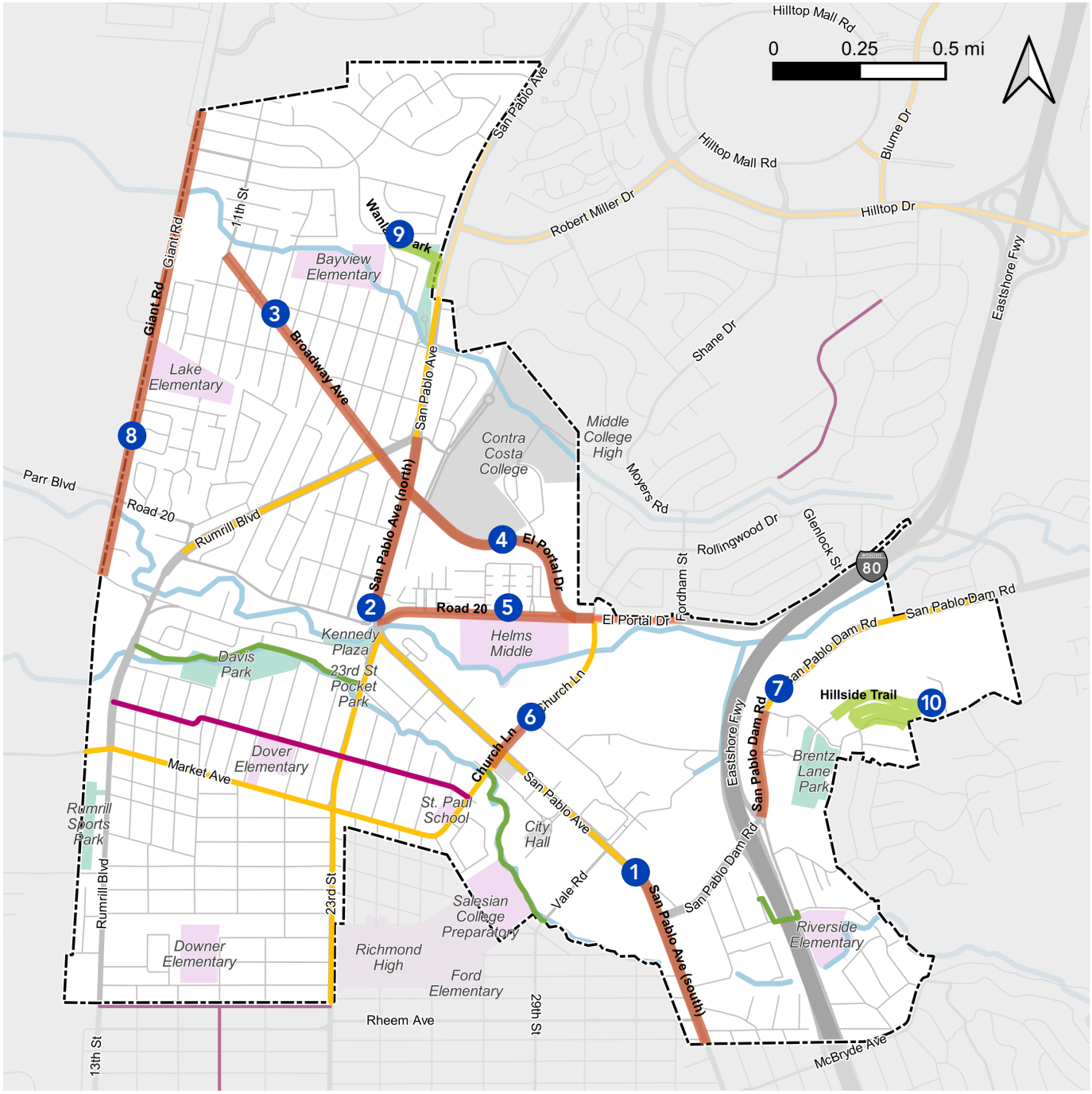
Class III Bicycle Routes



Class IV Separated Bicycle Lanes

1 Class I shared-use path also recommended on Road 20 in front of Helms Middle School.

Study Corridors



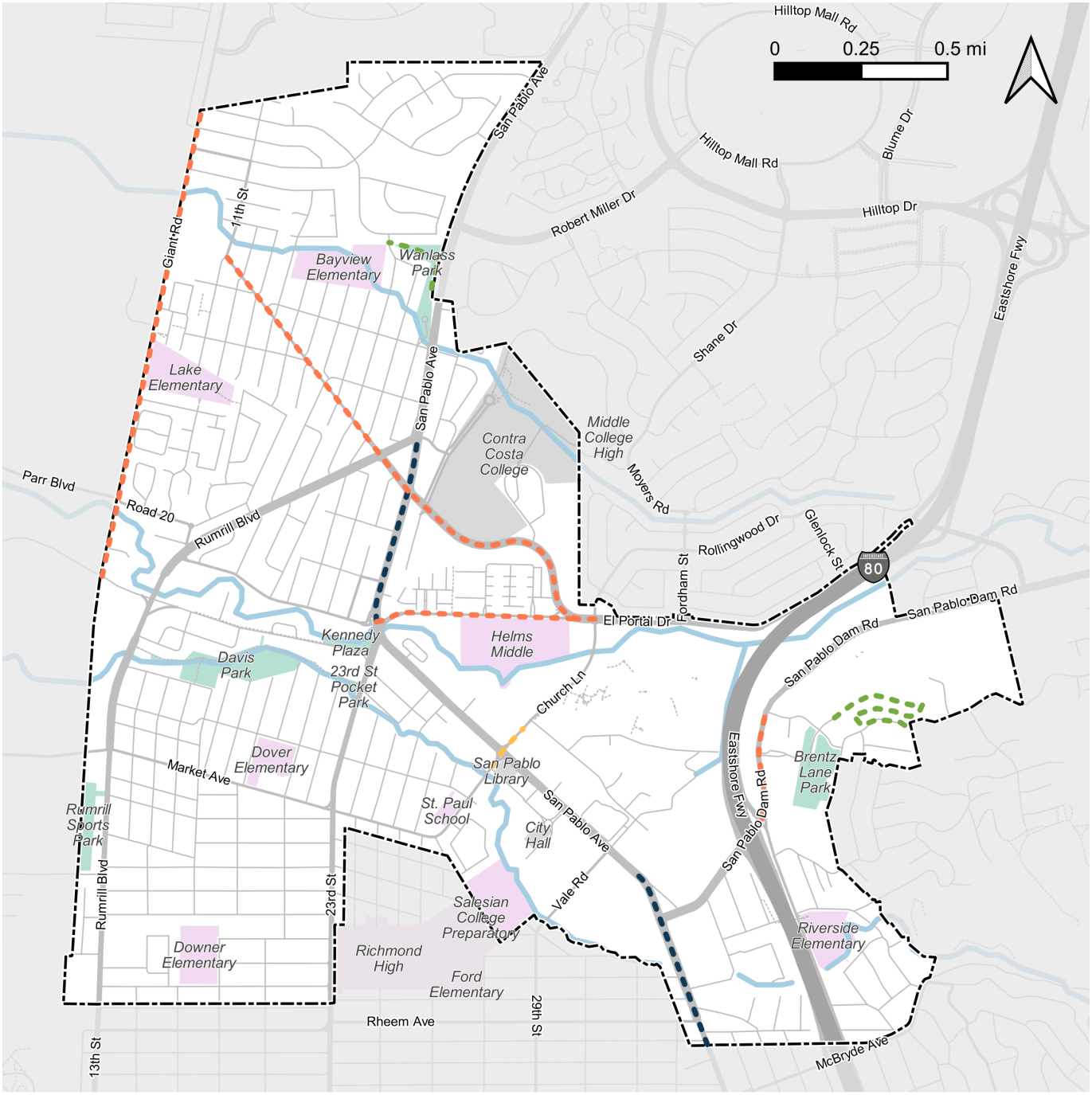
Project Corridors

- Corridor
- Shared-Use Path

Existing Bikeways

- Class I (Shared-Use Path)
- Class II (Bike Lane)
- Class III (Bike Boulevard/Sharrow)
- Class IV (Separated Bike Lane)

Corridor Study Recommendations

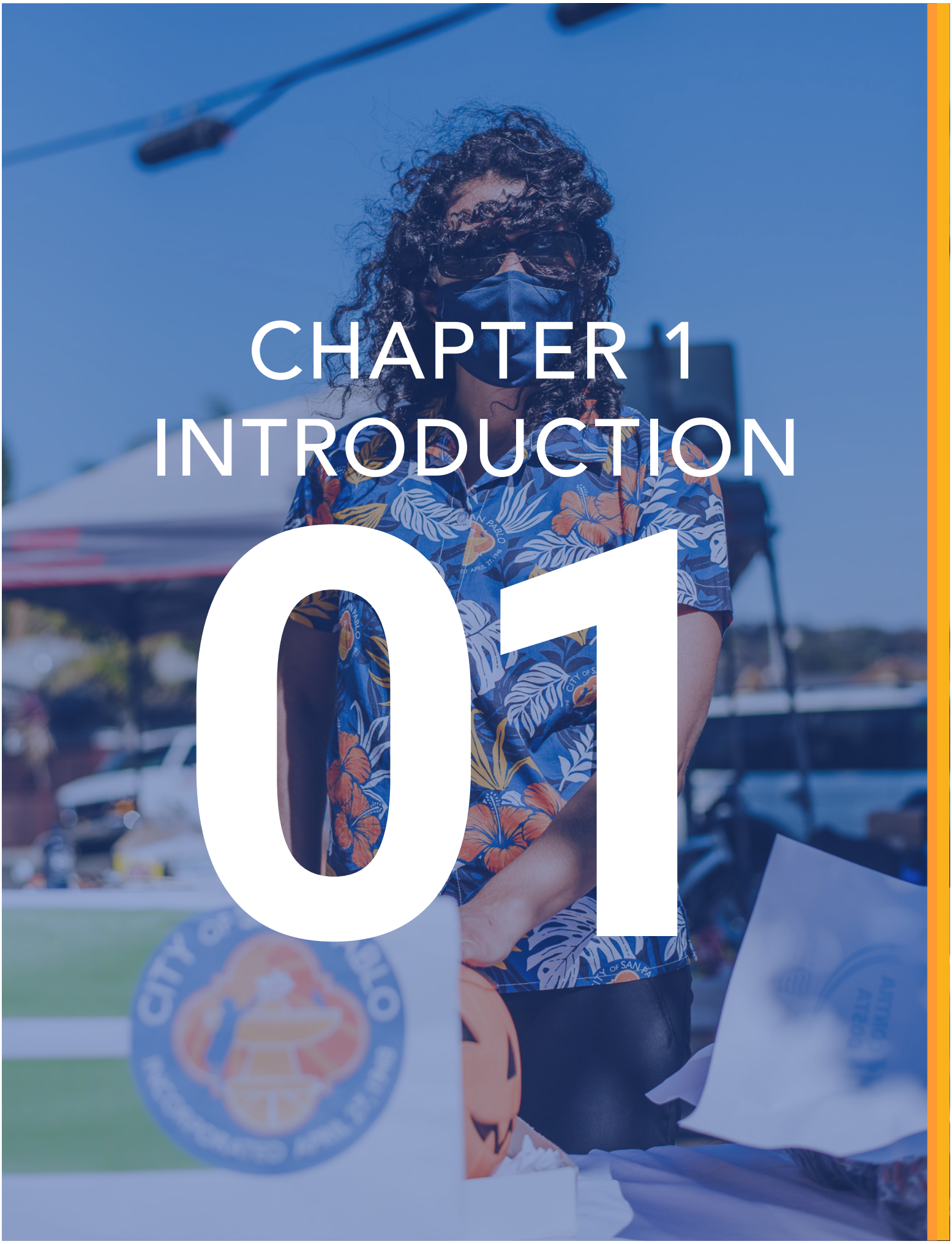


Project Corridor
Proposed Facilities

- Class I (Shared-Use Paths)
- Class II (Bike Lane)
- Class II (Buffered Bike Lane)
- Class IV (Separated Bike Lane)

Destinations

- City
- Parks
- Schools



CHAPTER 1
INTRODUCTION

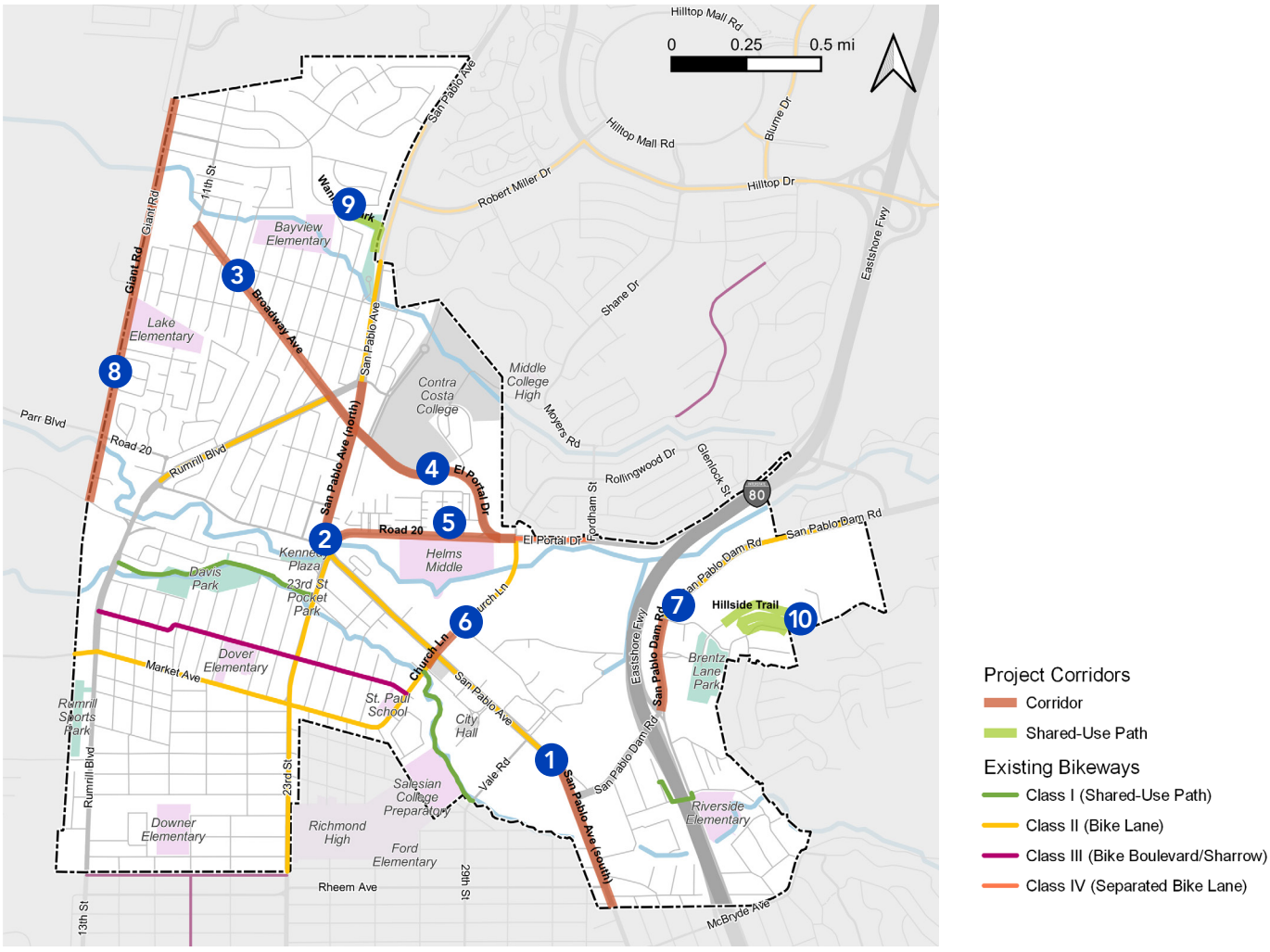
01

The City of San Pablo (City) *Bicycle and Pedestrian Corridor Study* (Corridor Study) assesses trade-offs, provides concept designs, and discusses implementation and feasibility considerations for the ten (10) corridors identified for future study in the 2017 San Pablo *Bicycle and Pedestrian Master Plan* (BPMP). The 2017 BPMP recommended eight (8) on-street corridors (for Class II or Class IV bicycle lanes) and two (2) off-street corridors (for Class I shared use paths) throughout the City for further study to develop informed concept-level designs for the recommended bicycle facilities on these corridors.

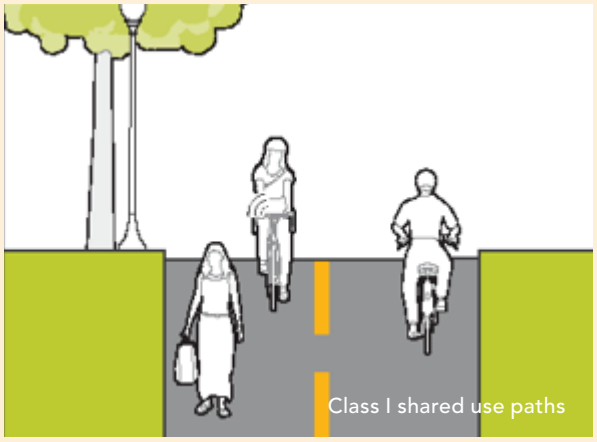
The ten (10) corridors studied as a part of this Corridor Study include:

1. San Pablo Avenue (South)
2. San Pablo Avenue (North)
3. Broadway Avenue
4. El Portal Drive
5. Road 20
6. Church Lane and San Pablo Avenue
7. San Pablo Dam Road
8. Giant Road
9. Wanlass Park/Rheem Creek Trail
10. Hillside/Princeton Plaza Trail

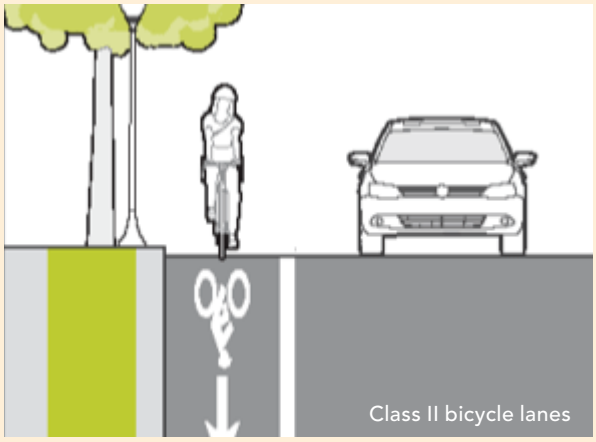
Study Corridors



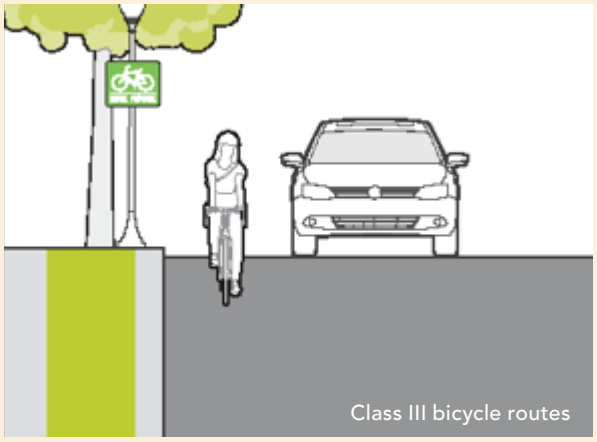
BICYCLE FACILITY TYPES



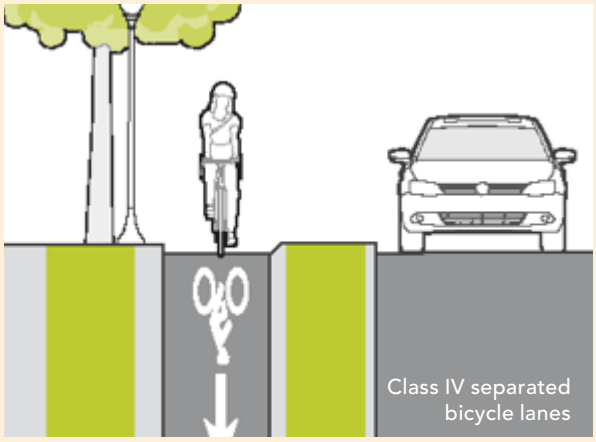
Class I shared use paths (often called "trails") are off-street, two-way paved facilities that provide robust separation from vehicles. Shared use paths are used by pedestrians, bicyclists, and other non-motorized users. Interactions with vehicles are limited to roadway crossings. Due to separation from vehicular traffic, these facilities provide a low-stress environment for bicyclists and other users.



Class II bicycle lanes provide an exclusive space for bicyclists to operate on the roadway. They are striped adjacent to vehicle lanes, delineated by a solid white line. Bicycle lanes may be painted green for increased visibility. Buffered bicycle lanes provide additional horizontal separation between motorists and bicyclists via a painted buffer.



Class III bicycle routes use signs to designate certain roadways as preferred bicycle roads, where bicyclists share the road with drivers. These are generally only comfortable for all bicyclists when they are on low-volume and low-speed streets. Some Class III bicycle lanes are called bicycle boulevards; these are typically located on neighborhood streets and have traffic calming enhancements like speed cushions or chicanes to encourage slower driving speeds.



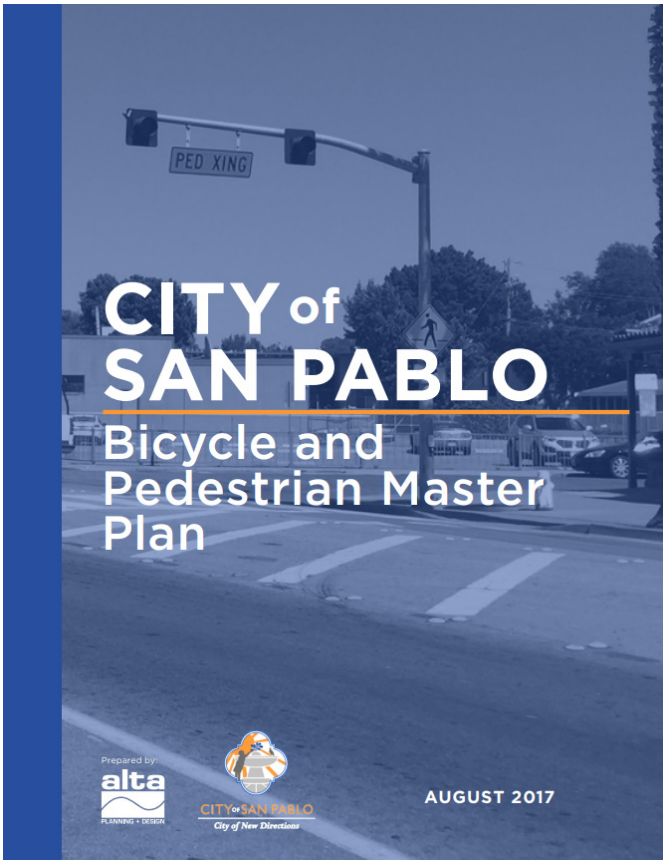
Class IV separated bicycle lanes are dedicated on-street bicycle facilities that provide more robust physical separation between bicyclists and vehicles than Class II facilities. Separated bicycle lanes always include vertical separation, like raised concrete curbs, planters, posts, or parked vehicles, as well as horizontal separation, like a striped buffer or landscaped area.

Previous and Ongoing Planning Efforts

Previous and ongoing City planning efforts have informed the development of the designs presented in this Corridor Study. The plans governing active transportation infrastructure recommendations along the ten (10) study corridors are the:

- City of San Pablo *Bicycle and Pedestrian Master Plan* (2017)
- West Contra Costa Transportation Advisory Committee (WCCTAC) *I-80 High-Capacity Transit Study* (2017)
- City of San Pablo *Complete Streets Safety Assessment* (2019)
- City of San Pablo *Green Infrastructure Plan* (2019)
- City of San Pablo *Systemic Safety Analysis Report* (2019)
- *Highway Safety Improvement Project (HSIP) on Church Lane and El Portal Drive* (2021)
- *Safe Routes to School Master Plan* (ongoing)
- WCCTAC/CCTA *San Pablo Avenue Corridor Project* (ongoing)
- WCCTAC/CCTA *San Pablo Avenue Multimodal Corridor Study* (ongoing)

City of San Pablo Bicycle and Pedestrian Master Plan (2017)

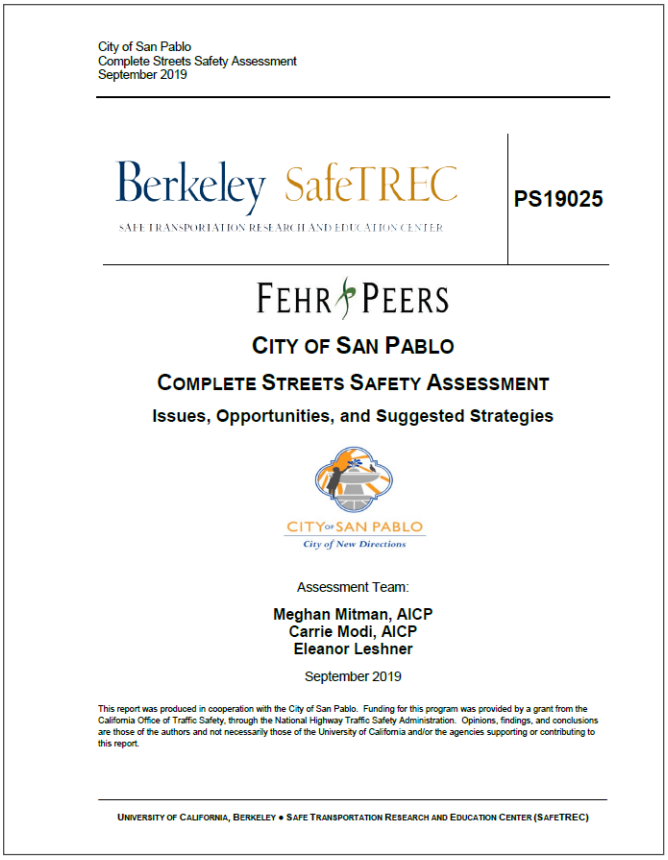


In 2017, the City developed a BPMP through extensive community engagement and detailed analysis about the bicycle and pedestrian opportunities in the area. The goals of the BPMP are to improve the health, safety, mobility, and livability in the City through walking and bicycling. The BPMP recommends bicycle and pedestrian infrastructure improvements throughout the City, in addition to identifying ten (10) corridors for future study, which are the focus of this Corridor Study.

WCCTAC I-80 High-Capacity Transit Study (2017)

In May 2017, WCCTAC completed its *West County High-Capacity Transit Study*. The Study evaluated public transportation options and identified funding opportunities to expand high-capacity transit service and access for the more than 250,000 residents of West County. In addition to analyzing the origins and destinations of people who live or work in West County, the Study examined how to encourage transit use and improve service in underserved communities. The Study's final proposal identified five (5) projects to improve the quality and effectiveness of high-capacity transit in West County, expand alternatives to driving on congested streets and highways, and improve regional air quality. One of the projects identified was Bus Rapid Transit (BRT) on San Pablo Avenue. The San Pablo Avenue BRT configuration proposed by the Study would operate on San Pablo Avenue between Robert Miller Drive and downtown Oakland, including through the City of San Pablo. The BRT would require converting one (1) existing vehicle lane in each direction to transit-only use. The recommendations of this Study have continued to be analyzed as part of the *San Pablo Avenue Corridor Project*.

City of San Pablo Complete Streets Safety Assessment (2019)


City of San Pablo
Complete Streets Safety Assessment
September 2019

Berkeley SafeTREC
SAFE TRANSPORTATION RESEARCH AND EDUCATION CENTER

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FEHR & PEERS

CITY OF SAN PABLO

COMPLETE STREETS SAFETY ASSESSMENT

Issues, Opportunities, and Suggested Strategies

CITY OF SAN PABLO
City of New Directions

Assessment Team:

Meghan Mitman, AICP
Carrie Modi, AICP
Eleanor Leshner

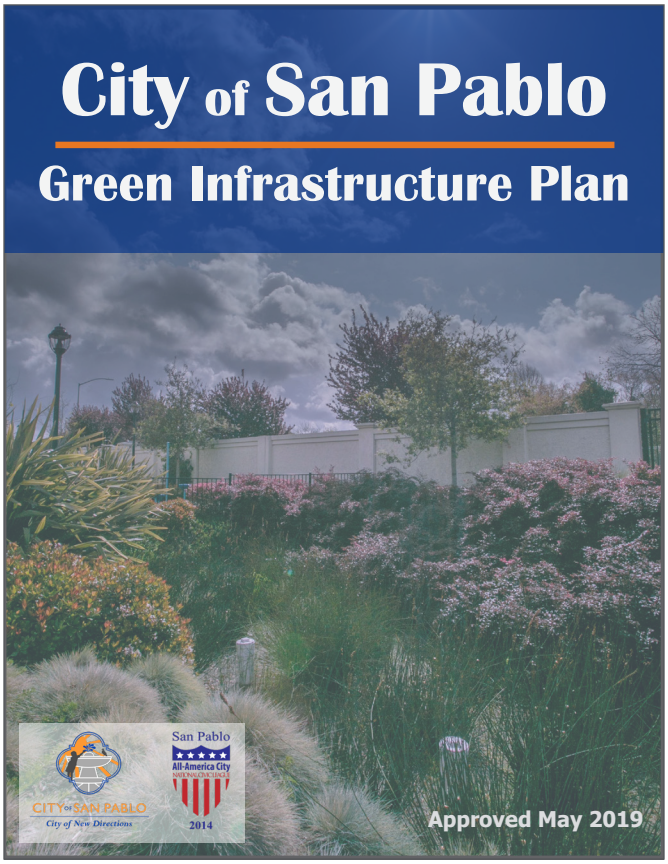
September 2019

This report was produced in cooperation with the City of San Pablo. Funding for this program was provided by a grant from the California Office of Traffic Safety, through the National Highway Traffic Safety Administration. Opinions, findings, and conclusions are those of the authors and not necessarily those of the University of California and/or the agencies supporting or contributing to this report.

UNIVERSITY OF CALIFORNIA, BERKELEY • SAFE TRANSPORTATION RESEARCH AND EDUCATION CENTER (SAFETREC)

In 2019, the City conducted a *Complete Streets Safety Assessment* (CSSA) study with the Safe Transportation Research and Education Center at University of California, Berkeley. The objectives of the CSSA are to improve pedestrian and bicycle safety and to enhance walkability and accessibility for all pedestrians and bicyclists in San Pablo. The resulting CSSA Report contains infrastructure recommendations based on walking audits at five (5) focus areas, which are considered in the relevant designs in this Corridor Study.

City of San Pablo Green Infrastructure Plan (2019)

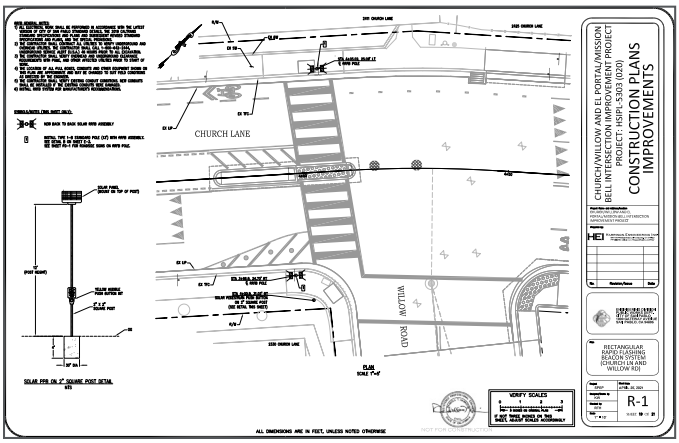


In 2019, the City prepared a *Green Infrastructure Plan* in adherence with the San Francisco Bay Regional Water Quality Control Board's Municipal Regional Stormwater Permit (MRP). The Green Infrastructure Plan presents a comprehensive program of stormwater control measures and actions designed to limit contributions of urban runoff pollutants to the San Francisco Bay watershed. Resulting infrastructure recommendations are considered in relevant designs in this Corridor Study.

City of San Pablo Systemic Safety Analysis Report (2019)

In 2019, the City prepared a *Systemic Safety Analysis Report* (SSAR) that describes the City's roadway network, crash trends and patterns, priority corridors, potential countermeasures, and benefit-cost ratios of viable project scopes. The purpose of the SSAR is to recommend infrastructure countermeasures to address identified safety issues. The identified infrastructure projects are considered in the relevant designs in this Corridor Study.

Church/Willow and El Portal/Mission Bell Intersection Improvement Project (Ongoing)

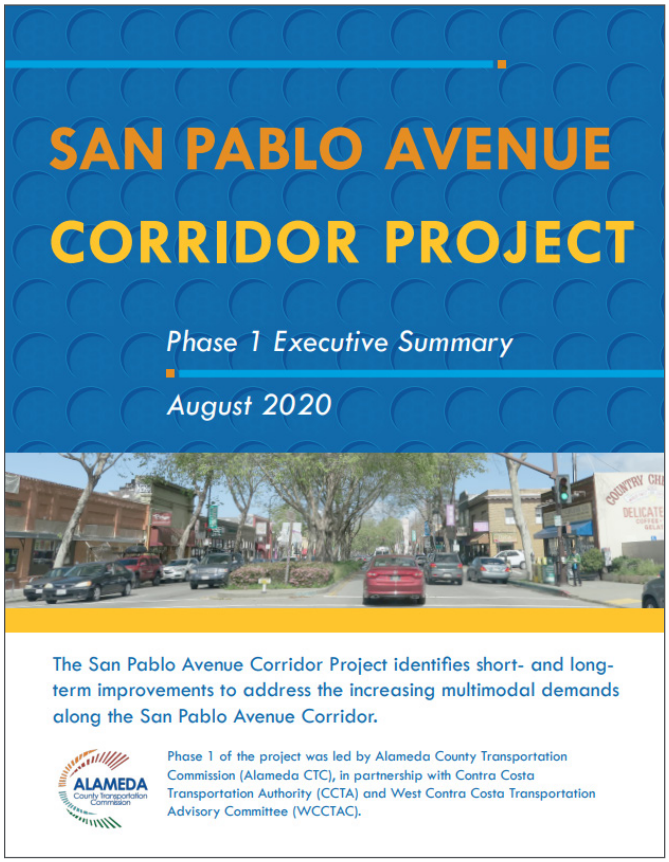


From the SSAR Project, the intersection of Church Lane/ Willow Road and the intersection of El Portal Drive / Mission Bell Road were identified as experiencing a high frequency of pedestrian and bicycle crashes resulting in injury. The City has since acquired funding from the Highway Safety Improvement Program (HSIP) to design and construct pedestrian crossing enhancements and other intersection improvements at these two intersections. In addition, the project will close part of the bicycle network gap on Church Lane identified in the BPMP via the implementation of a Class II bicycle lane in the westbound direction and a Class III bicycle route in the eastbound direction in the proximity of Willow Road. The *Church Lane/Willow Road and El Portal Drive/Mission Bell Road Intersection Improvement Project* is planned for construction in 2022.

Safe Routes to School Master Plan (Ongoing)

The 2017 *San Pablo Bicycle and Pedestrian Master Plan* (BPMP) recommended that the City of San Pablo establish a Safe Routes to School program. The purpose of the *Safe Routes to School Master Plan* was to identify ways to make walking and bicycling safer, more comfortable, and more enjoyable for students, families, and school staff in San Pablo. During the SR2S Plan process, the Project Team evaluated safety and accessibility conditions around ten (10) schools in San Pablo and made engineering, education, encouragement, and engagement recommendations. This evaluation was centered around virtual and in-person walk audits that allowed students, families, teachers, and principals to document their experiences walking and bicycling to school. The Project Team also implemented an on-the-ground pilot of two engineering recommendations. The San Pablo *Safe Routes to School Master Plan* was funded by Measure J sales tax and Contra Costa Transportation Authority (CCTA), and expected to be completed in March 2022.

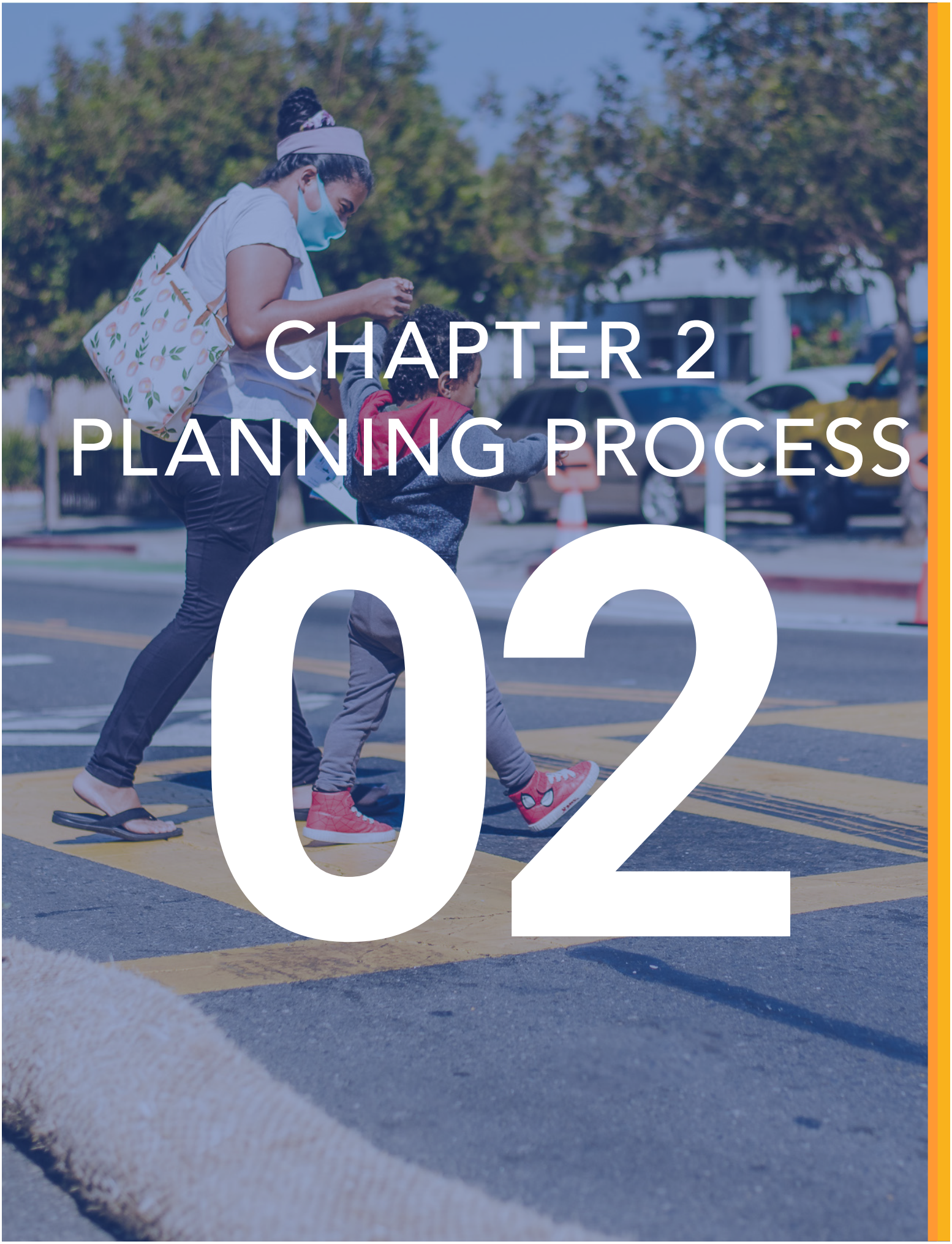
WCCTAC/CCTA San Pablo Avenue Multimodal Corridor Study (ongoing)



In 2017, the Alameda County Transportation Commission (Alameda CTC), the West Contra Costa County Transportation Advisory Committee (WCCTAC), and the Contra Costa Transportation Authority (CCTA) jointly began a comprehensive multimodal complete streets project along the 13.4-mile segment of San Pablo Avenue between Hilltop Mall in Richmond and downtown Oakland. The purpose of the Study is to improve multimodal mobility, efficiency, and safety in order to sustainably meet current and future transportation needs, support a strong local economy, and encourage growth along the corridor while maintaining local contexts.

Phase 1 of the Study—concluded in 2020—identified short- and long-term improvements to address the increasing multimodal demands along the San Pablo Avenue corridor. Phase 1 concluded by identifying that additional location-specific design development and evaluation are needed to advance concepts in Contra Costa County due to: (1) greater variability in geometric and operational characteristics of the corridor; (2) different mode splits and travel needs; and (3) varying attitudes toward preferred improvements.

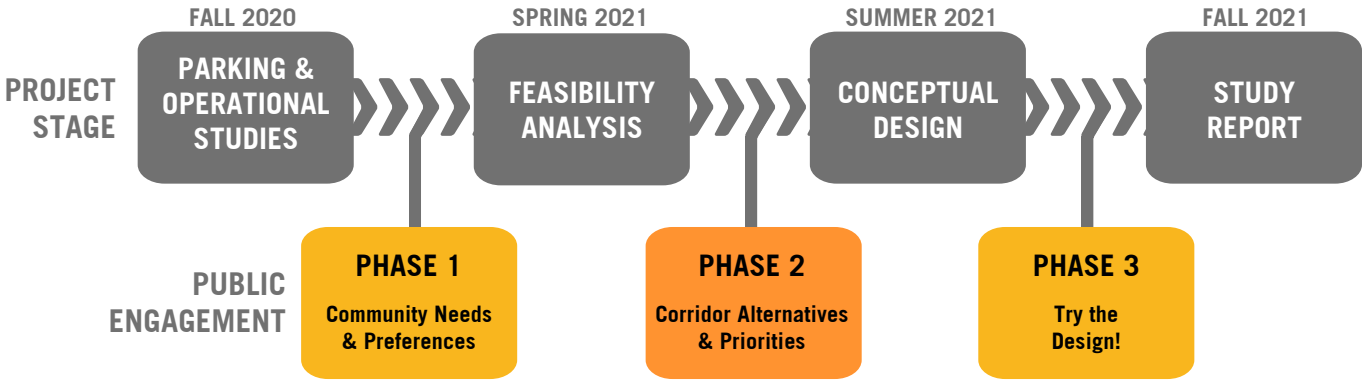
Phase 2 of the Study began in 2021 and is focused on identifying feasible and jurisdiction-supported improvement alternatives for San Pablo Avenue in Contra Costa County. Alternatives include dedicated transit lanes, protected bicycle lanes, and additional pedestrian and multimodal safety improvements. The magnitude of the improvements being considered may ultimately require full reconstruction of the roadway in order to most efficiently use the roadway space. Phase 2 of the Study in Contra Costa County is anticipated to conclude in 2022. Upon completion of Phase 2, the WCCTAC Board and local cities may have enough information to provide further direction on the desired long-term configuration of the roadway and next steps for the Study. As of 2021, there is no defined project and no funding for implementation has been secured.



CHAPTER 2
PLANNING PROCESS

02

This Project included two parallel initiatives that led to context-based concept recommendations that were informed by detailed analysis and public engagement. The following flow chart represents how the Project Team, comprised of City and consultant staff, executed these key project efforts in close consultation with project stakeholders, San Pablo residents, and City staff.



Technical Analysis

The following sections present an overview of the analysis process conducted for each corridor. Chapters 3-12 discuss the analysis results for each corridor.

Data Collection

As a first step in the planning process, the Project Team gathered relevant background data on all Corridor Study segments to inform current conditions and potential recommendations and corridor designs. In some cases, the COVID-19 pandemic made it more difficult to collect reliable and realistic data. This is especially true for count data where it is meant to represent typical conditions (e.g., parking and traffic count data). To the extent possible, data was collected during times considered less impacted by COVID-19 (e.g., waiting until school was back in session before collecting parking and traffic count data). However, in situations where that was not possible, older pre-COVID-19 data was used to supplement and calibrate available data.

Parking & Operational Studies

The Project Team conducted parking and operational studies on Corridor Study segments, as appropriate. Parking counts were conducted to inform existing on- and off-street parking utilization in order to assess the overall feasibility of on-street parking removal on certain corridors. Weekday peak-hour turning movement and traffic counts were collected at key intersections to understand existing traffic conditions. In the subsequent feasibility analysis, these traffic counts were used to assess the feasibility of road diets and turn lane removal at intersections for certain design alternatives.

Feasibility Analysis

The Project Team conducted a feasibility analysis of recommended project alternatives. This analysis assessed the feasibility of recommended alternatives, considering existing pedestrian and bicycle facilities, potential conflicts with utilities, results of the parking and operational studies, traffic operations analysis, and other trade-offs and potential conflicts. The Project Team evaluated existing signal phasing and timing; traffic volumes at intersections and along Corridor Study segments; vehicle operations at peak

periods; and existing adjacent curb-use regulations (e.g., parking and loading zones), bus stop locations, turn restrictions, and curb-to-curb widths.

Conceptual Design

Taking into consideration the data and feasibility analyses, conceptual designs were developed for each corridor. Some corridors with one clear design solution resulted in a single conceptual design, while others resulted in multiple design alternatives. These design alternatives were evaluated and shared with community members to determine which would best meet the community's needs and fill gaps in the bicycle network.

Cost Estimates

Cost estimates were developed for the preferred conceptual design for each corridor, using Caltrans, District 4 unit costs (2019-2021). Full cost estimates of each corridor can be found in Appendix E. These costs may vary based on implementation timeline, buffer materials selected for bicycle lanes, and other factors.

Public Engagement

The Corridor Study was developed through a robust public engagement process. The Project Team collected community and stakeholder feedback through a wide range of online and in-person techniques. The goals of the engagement process were to:

- Partner with two (2) Community-Based Organizations (CBOs) that are embedded in the community and trusted to co-lead engagement efforts. The partnership included paying the CBOs for their hours worked.
- Inform the surrounding community about the Corridor Study, planning process, and opportunities for involvement.
- Identify and engage key stakeholders interested in, or potentially affected by, the recommended Corridor Study conceptual designs and recommendations.
- Solicit input on current bicycling and walking issues and opportunities along the corridors.
- Identify community needs and priorities for enhancing bicycling, transit access, and walking in specific segments along the corridors.
- Build momentum and support for the future implementation of all-ages-and-abilities bicycle corridors, as well as pedestrian- and transit-supportive investments.

Phases of Outreach

The public engagement process was divided into three (3) phases to collect community and stakeholder input at critical points during the Corridor Study. At each project milestone, we collected feedback to inform the next project phase. The graphic below illustrates the timeline and outcomes of each of the project phases.

PHASE	TIMELINE	OUTCOME
PHASE 1 **Community Needs & Preferences**	FALL 2020–SPRING 2021	The Project Team gained a deeper understanding of the multimodal challenges and opportunities along each corridor. Community input during this phase helped shape the specific recommendations made during Phase II.
PHASE 2 **Corridor Alternatives & Priorities**	SPRING 2021–SUMMER 2021	Community members and stakeholders reviewed draft cross-sections and conceptual designs for each corridor and weighed in with their preferences and priorities. This feedback helped the Project Team adjust designs, select preferred alternatives, and select a location for a temporary demonstration.
PHASE 3 **Try the Design!**	FALL 2021	Through a temporary demonstration along Broadway Avenue, the community was able to experience some of the recommended changes first-hand. The Project Team observed how the design worked on the ground, and refined the designs as needed.

Public Engagement Methods

At the start of the Corridor Study, the Project Team prepared a detailed Community Engagement Plan. The plan outlined a set of online and in-person outreach and engagement techniques for each of the three (3) project phases. A description of each technique is provided below.

Technical Advisory Committee

At the start of the Corridor Study, the Project Team convened a Technical Advisory Committee (TAC) to provide guidance at key project milestones. The TAC was a small group of highly informed and engaged stakeholders. The input and support from TAC members was critical to the success of the Corridor Study. A list of TAC members is provided on the Acknowledgements page of the plan document. The TAC met three (3) times during the project:

1. **September 22, 2020:** Before draft concept designs were developed. The TAC weighed in on corridor issues and opportunities, and provided input on the Community Engagement Plan;
2. **March 23, 2021:** In advance of the Community Workshop. The TAC reviewed proposed Workshop materials and supported Workshop planning and outreach; and
3. **August 30, 2021:** Prior to the temporary demonstration. The TAC provided feedback on the temporary demonstration materials and draft design and provided support for outreach and engagement.

Due to COVID-19, all three (3) TAC meetings were held online via Zoom. TAC members also provide support and guidance throughout the lifetime of the project: TAC members attended the Community Workshop, conducted outreach and publicity, tested the online survey and web-map, reviewed and provided feedback on the draft designs, and supported the implementation of the temporary demonstration.

Public Agency Meetings

In addition to TAC members, the Project Team met with various agency stakeholders to conduct detailed reviews of project designs of relevant corridors. The team presented designs to City Maintenance Division, the City Police Department, AC Transit, Caltrans, Contra Costa Health Services and City of Richmond staff, and adjusted designs according to the agencies' feedback.

Community-Based Organizations

To ensure that the community engagement process was equitable, effective, and wide-reaching, the Project Team worked with two (2) local Community-Based Organizations (CBO): Rich City Rides and Morada de Mujeres del Milenio. These CBO partners were identified through a selection process that placed emphasis on organizations that could serve as a liaison to reach key community members. Rich City Rides is non-profit bicycle advocacy organization based in Richmond, California. Morada de Mujeres del Milenio is a non-profit domestic violence advocacy organization for Latina women based in San Pablo. Involvement by both organizations was critical to the success of the project. CBO staff dedicated time and resources to:

- Spreading the word about the project through personal and professional networks
- Distributing outreach materials online and in-person
- Attending project events and providing feedback on draft conceptual designs
- Providing on-the-ground Spanish interpretation
- Facilitating conversations about the project with community members and stakeholders
- Conducting pop-up field surveys and a bicycle ride

Pop-Ups

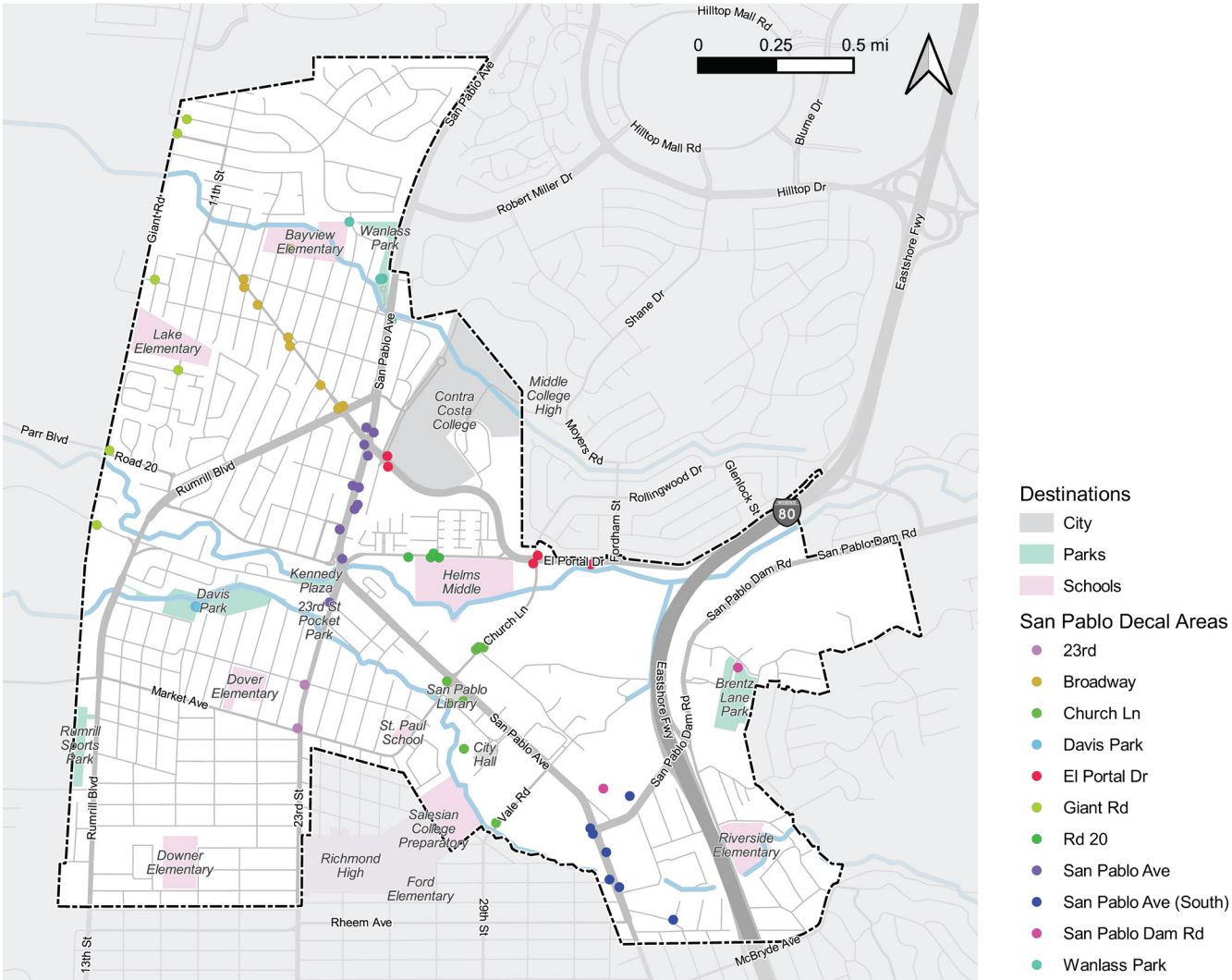
Community engagement best practice emphasizes the importance of meeting people where they are. To do this, pop-up events in the community have increasingly supplemented or replaced traditional open house events. Pop-up events bring project resources, materials, and activities to community members where they live and work. As part of the Corridor Study outreach and engagement, the Project Team implemented three (3) pop-up strategies:

Sidewalk Stickers

In response to COVID-19, the Project Team installed sidewalk stickers as a safe, socially-distanced outreach technique. In December 2020, the Project Team installed 62 bilingual stickers on sidewalks throughout the City, with a focus on the ten (10) project corridors and high-pedestrian traffic locations (e.g., bus stops). The stickers included a QR code and link to the project survey and web-map. The stickers were removed in after four (4) months to ensure that there was ample time for pedestrians to see the sidewalk stickers.

City of San Pablo staff installed bilingual sidewalks stickers along the study corridors to advertise the project survey.

Decal Locations



Bicycle Ride

On Saturday, April 10, 2021, the City worked with Rich City Rides to lead a bicycle ride for key bicycle advocacy stakeholders through six (6) of the project corridors. During the ride, stakeholders observed existing conditions and provided live feedback on draft conceptual designs. Feedback collected during the pop-up bicycle ride helped the Project Team refine the conceptual designs.

Rich City Rides led a pop-up bicycle ride for key project stakeholders

Field Surveys

On Saturday, May 29, 2021, the Project Team, and staff from Morada de Mujeres del Milenio conducted in-person field surveys. Surveys were conducted along key project corridors and at community spaces such as the San Pablo Public Library. The Project Team spoke with community members in both English and Spanish. Field surveys were an essential technique to close the digital divide and capture feedback from residents who are unlikely to fill out an online survey or web-map. While on-the-ground, the Project Team spoke with seniors, immigrants, people who do not read or write, and unhoused community members. Involvement by Spanish-speaking staff from Morada de Mujeres del Milenio was vital to reaching these groups.

Community Meetings

City staff met with a variety of stakeholders and community organizations throughout the lifetime of the Corridor Study. In the spirit of meeting people where they are, City staff attended existing and ongoing meetings to provide information about the project and ask for feedback. Staff conducted presentations to the San Pablo Youth Commission, San Pablo Rotary, San Pablo Safety Commission, Richmond Bicycle and Pedestrian Advisory Committee, Rich City Rides, Parkview Terrace Homeowners Association, San Pablo Planning Commission, and San Pablo City Council Public Safety Standing Committee. These community meetings served to keep key stakeholders in the loop and to secure their support for outreach efforts. Members of the Youth Commission and Safety Commission, in particular, were critical to the planning and implementation of the Temporary Demonstration.

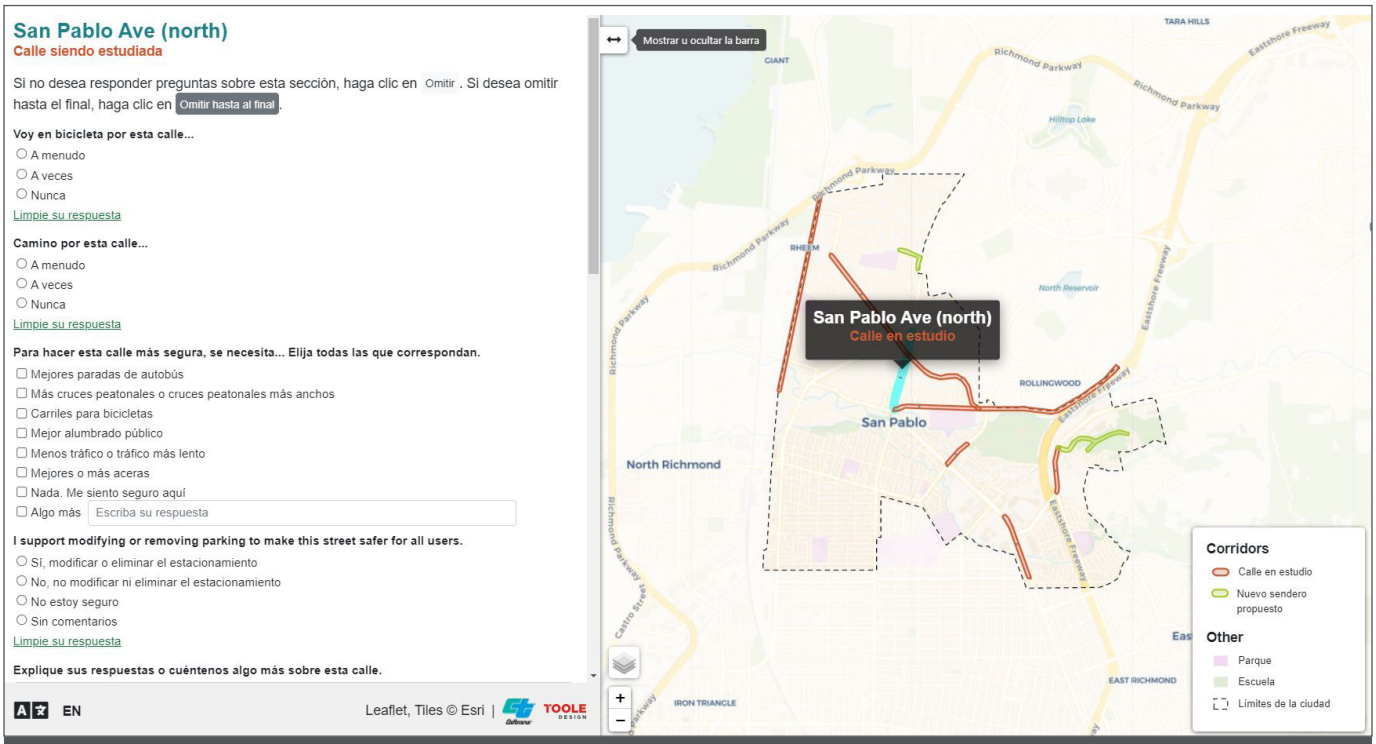
Community Workshop

On Wednesday, April 14, 2021, the City hosted a virtual Community Workshop via Zoom. The purpose of the workshop was to collect community and stakeholder feedback on the draft conceptual designs. To create an interactive environment, the workshop included live polling and discussions about each corridor. The workshop was provided in English, with simultaneous live Spanish interpretation and Spanish translation of all presentation text and poll questions. The workshop was also live-streamed to Facebook, where residents could post questions that were addressed live during the workshop. The workshop was recorded and posted on the Project website for those that could not attend.

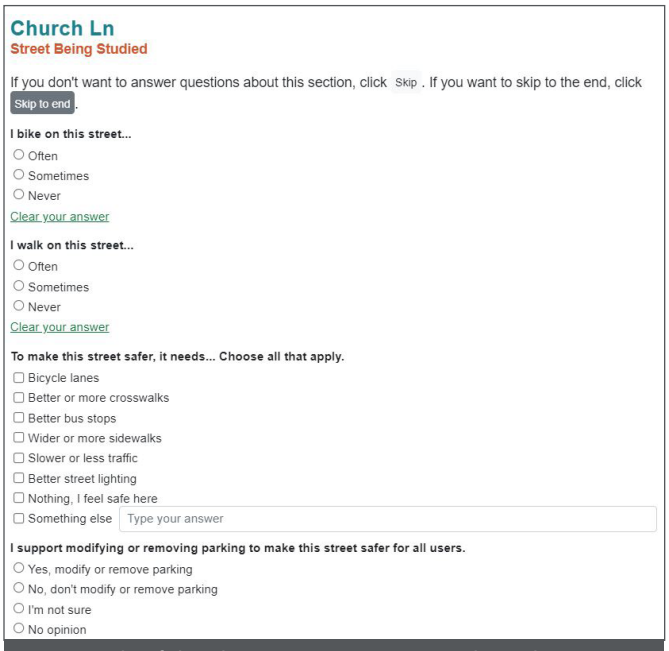
Community Survey and Web-Map

In response to the in-person engagement restrictions due to COVID-19, the Project Team developed a bilingual, interactive, digital survey and web-map as the central feedback mechanism for the Corridor Study. The survey walked users through each corridor, allowing users to easily respond to all of the questions or only those for the corridors they use most. During Phase 1 of the Project, survey questions focused on user experiences of each corridor and asked for feedback on issues and opportunities. During Phase 2, the survey was updated to include cross-section graphics of the conceptual designs, and asked users to select which conceptual design they preferred. Alongside each design, the Project Team provided information about the cost, level of safety improvement, and extent of changes to the street. This information helped users weigh the tradeoffs of each design and make an informed decision about their preferences.

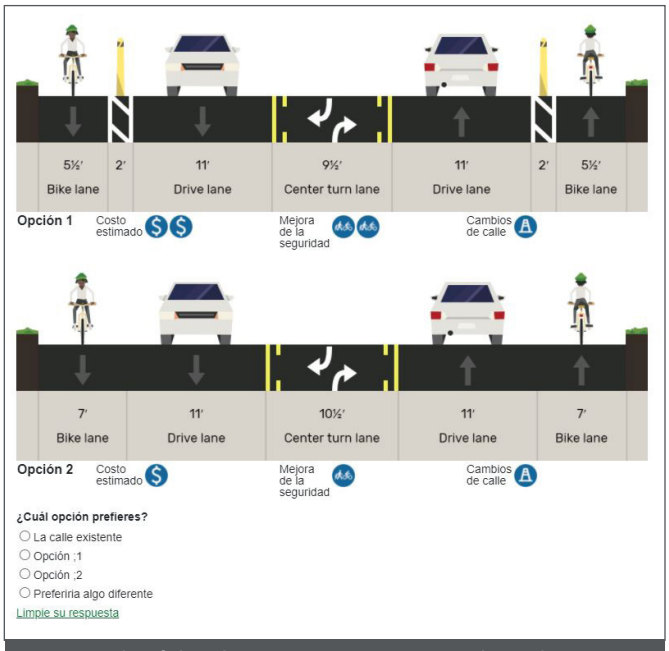
The survey was distributed via email, social media, local newsletters, direct mailers, doorhangers, sidewalk stickers, and the City's website. It was also advertised during community meetings and the community workshop. CBO partners and TAC members distributed the survey via their personal and professional networks. To address the digital divide, the Project Team conducted on-the-ground surveying using digital tablets, and distributed hard-copy surveys to the San Pablo Senior Center. The survey was open for six (6) months, from December 2020 through June 2021. Almost 250 people used the survey to provide over 800 comments on the study corridors. A list of the survey questions and a summary of survey responses is provided in Appendix C.



Community members and stakeholders provided feedback via a digital, bilingual, survey and web-map.



An example of the Phase I survey questions, shown here in English



An example of the Phase II survey questions, shown here in Spanish

Temporary Demonstration: Walk & Bike Broadway

Temporary Demonstrations are a powerful and relatively low-cost way to test how a conceptual design functions on-the-ground. They are also an innovative, interactive mechanism for collecting community feedback. During a demonstration project, elements of a design are installed using temporary materials. Community members try out the design elements and provide real-time feedback on their experience. Project Teams are able to make observations about user behaviors in order to inform and modify the project conceptual or final engineering design. Temporary demonstrations can be installed for a day, a week, a month, or even multiple months.

On Friday, September 24, 2021 the Project Team implemented the Walk & Bike Broadway temporary demonstration event as part of Phase 3: "Try the Design!" For one day—from 8:00 AM to 6:00PM—the Project Team installed a set of bicycle and pedestrian improvements along Broadway Avenue between 15th Street and Rivers Street. Improvements included:

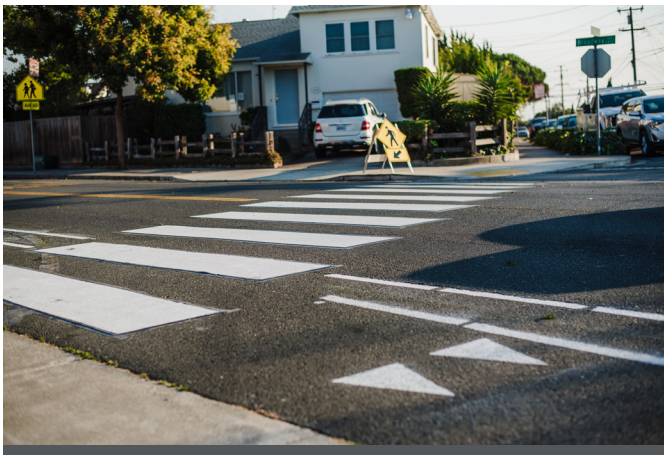
- **A bus boarding island** at the northbound bus stop at Broadway Avenue and Rivers Street
- **A two-way, separated and protected bicycle lane** along the north side of Broadway Avenue from 15th Street to Rivers Street
- **A crosswalk** on the southeast leg of the intersection at Broadway Avenue and 14th Street
- **A curb extension** at the southwest corner of the Broadway Avenue and 15th Street intersection

During the demonstration, the Project Team also temporarily closed one bus stop and the southern entrance to 14th Street from Broadway Avenue.

SEPARATED BICYCLE LANE

CURB EXTENSION

BUS BOARDING ISLAND



CROSSWALK

In advance of the temporary demonstration, the Project Team advertised the Walk & Bike Broadway event widely in English and Spanish. City staff distributed flyers to neighbors and knocked on doors of residents who live in the immediate demonstration area. Walk & Bike Broadway was also promoted via the City's social media; the City's website; direct emails to community groups, all previous survey respondents, the principals and Beacon Directors for neighboring elementary schools, and relevant local and regional agencies; the Richmond Standard; and through the personal and professional networks of the Corridor Study CBO partners and Technical Advisory Committee.

Throughout the Walk & Bike Broadway event, the Project Team conducted field surveys to gather feedback on the four (4) demonstration elements. In total, the Project Team collected almost 50 surveys from a wide variety of residents including youth, seniors, families, bicyclists, people walking, neighbors and more. Surveys were conducted in both English and Spanish. The Project Team also facilitated a scavenger hunt for children to get them engaged with the temporary demonstration. Community feedback was overwhelmingly positive. Residents appreciated both the event itself, as well as the recommended designs.

Publicity and Promotion

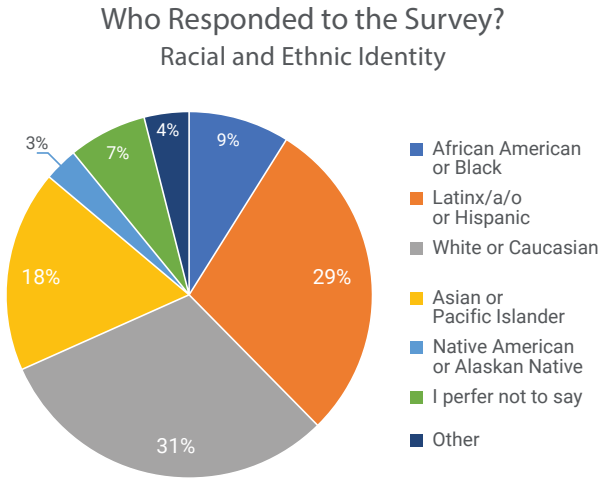
The Project Team used a wide range of online and in-person methods to publicize the Project, and to promote the survey, workshop, and Walk & Bike Broadway temporary demonstration event. All outreach materials were provided in English and Spanish. Images of the outreach materials are provided in in Appendix C. Key publicity and promotion methods included:

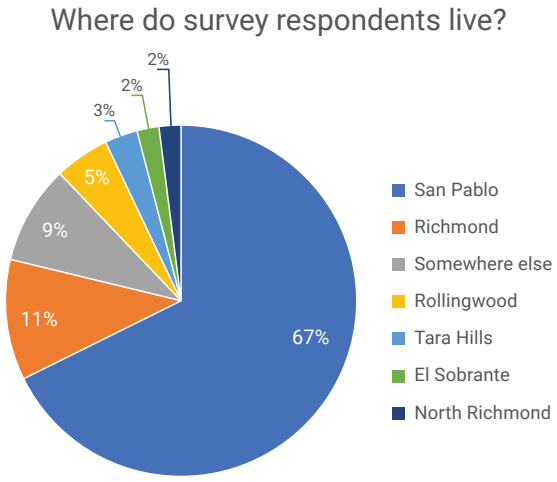
- The **City of San Pablo Website** was updated to include a project webpage. The project webpage was updated with key information throughout the lifetime of the Corridor Study, and included links to the online survey and a recording of the community workshop.
- Project information was distributed through **City of San Pablo social media**—including Facebook, Instagram, Twitter and Nextdoor—with a focus on regular, bilingual Facebook posts. The community workshop was also livestreamed via Facebook.
- **Email and Phone Outreach** was conducted to key stakeholders and community groups throughout the project. Invitations to the community workshop, online survey, and temporary demonstration were distributed to the Asian Pacific Environmental Network (APEN), RYSE Youth Center, First 5, Lao Family Community Development, San Pablo Economic Development Commission (EDC), Los Cenzontles Cultural Arts Academy, Community Housing Development Corporation (CHDC), Contra Costa County Board of Education, San Pablo Youth Commission, San Pablo Safety Commission, Richmond Bicycle and Pedestrian Advisory Committee, San Pablo Rotary, Bike East Bay, Beacon Directors, Contra Costa Health Services, AC Transit, West Contra Costa Unified School District, Caltrans, and all City staff. Members of the TAC, Rich City Rides, and Morada de Mujeres del Milenio also conducted outreach via email, phone, and text.
- **Newsletters**: With the support from key stakeholders and community partners, the Project Team publicized engagement opportunities in local newsletters, such as the El Portal neighborhood newsletter, the Bike East Bay newsletter, the San Pablo EDC newsletter, the City e-Newsletter and the City Manager's Weekly Report.
- **Postcards**: Over 4,000 postcards were mailed directly to community members in San Pablo, Richmond, and Contra Costa County. Postcards were customized for different geographic audiences, including those living and working along Giant Road, and those living outside of the City of San Pablo limits.
- **Doorhangers**: With support from Morada de Mujeres del Milenio, the Project Team distributed over 250 doorhangers to homes and individuals in San Pablo. Doorhangers focused on inviting residents to attend the community workshop and provide their input through the online survey and web-map.
- **Flyers**: During field surveying, the Project Team distributed over 100 hard-copy flyers with links to the Project website and survey. Flyers were also distributed to all residents living within ~500 feet of the temporary demonstration.

The Project Team used customized links and QR codes to collect information on which outreach methods were most effective. The resulting data showed that most community members were connected to the Project via email outreach, word of mouth, and through flyer distribution.

Public Engagement Findings

The outreach and engagement process reached a wide variety of San Pablo residents, visitors, and stakeholders. The Project Team collected feedback from youth, families, seniors, English and Spanish speakers, people who walk and bicycle, and people who primarily drive. As a result, the findings of the public input reflect the complexity of San Pablo's mobility needs. The following is a summary of the key takeaways that helped the Project Team shape the conceptual design alternatives for the Project corridors:





Safety While Walking

San Pablo is a geographically compact city that is mainly flat. Community input suggests that residents tend to walk slightly more than they bicycle. Roughly 60 percent of survey respondents reported walking along the project corridors, compared to 55 percent that reported bicycling. Certain corridors have higher (self-reported) rates of walking than others. Over 70 percent of survey respondents said that they walk on San Pablo Avenue (South), while only 34 percent said they walk on Giant Road.

San Pablo Ave. (S) Commercial Land Use	59%	73%
Broadway Ave. Residential Land Use	49%	54%
Giant Road Industrial Land Use	47%	34%

These trends are likely the combined result of land use patterns and perceptions of safety. San Pablo Avenue is one of the busiest commercial streets in San Pablo, with many retail stores, services, employment centers, and transit stops. These destinations likely generate more foot traffic than corridors such as Giant Road. However, Giant Road also received the most community input about high driver speeds; residents hold the perception that it is not safe to walk or bicycle along Giant Road. San Pablo Dam Road received similar input regarding traffic speeds and safety. This likely contributes to low walking rates along Giant Road and San Pablo Dam Road.

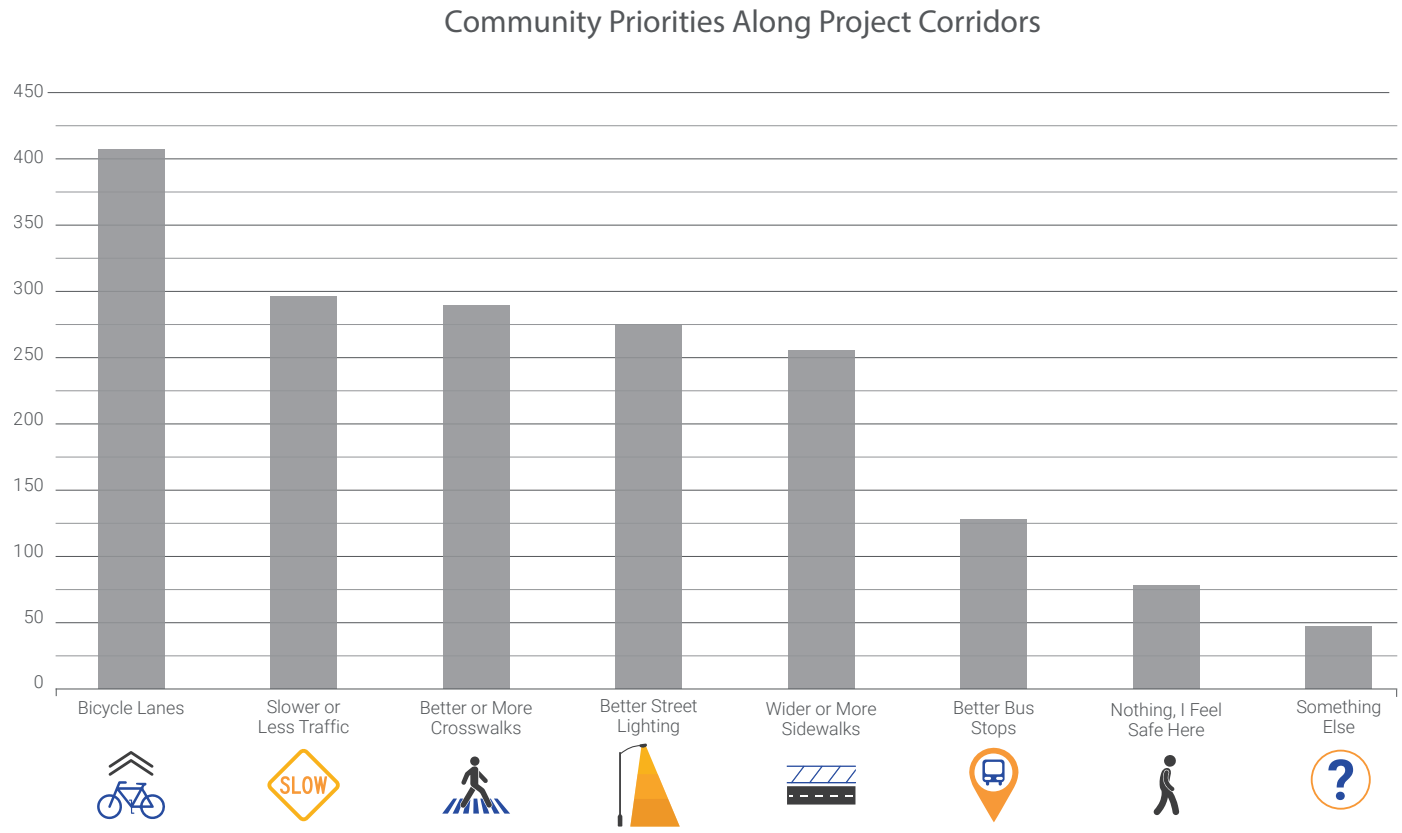
Community feedback suggests that many residents are satisfied with the current level of sidewalk connectivity and with sidewalk widths, but that there is a need for improved crossing opportunities for pedestrians. The Project Team heard consistent feedback that drivers speed along the Project corridors, and often do not yield to pedestrians. Many community members are concerned by high speeds and traffic safety, and would like to see improvements such as new and upgraded crosswalks, improved street lighting, and overall traffic calming. This message was consistent across all corridors.

A Safe, Cohesive Bicycle Network

During public engagement, residents and stakeholders indicated the need for a safe, cohesive bicycle network throughout the City. Survey responses consistently ranked bicycle lanes as the highest priority, across all corridors. Survey respondents also emphasized that beyond individual bicycle lanes, safe and cohesive connections between the corridors is also a priority. Attendees of the Walk & Bike Broadway temporary demonstration echoed this idea: they expressed excitement about the prospect of a bicycle lane on Broadway Avenue, and requested that it be constructed as a seamless bicycle connection along the length of Broadway Avenue, connecting to destinations on either end. For those community members that currently bicycle, driver speeds and behavior were cited as a major concern.

Multimodal Transportation Needs

In San Pablo, multigenerational or multifamily households are common[1]. Due to land use and employment patterns, most people in San Pablo rely on cars to commute to work or school. As a result, many households have multiple cars. During the community engagement process, residents talked about the competing mobility needs that they face. On the one hand, residents would like to see parking at local business and services, and efficient driving routes to work and school. On the other hand, residents have concerns about driver behavior and speeds, traffic safety, and mobility for those that do not drive. This is of particular concern to those households that do not have access to a vehicle for daily transportation. According to the San Pablo Bicycle and Pedestrian Master Plan, roughly 14 percent of households in San Pablo don't have access to a vehicle, and rely on transit or other modes to get around.



Source: San Pablo Corridor Study Community Survey

1 In San Pablo, 8% of households include grandparents living with grandchildren, compared to the 4% national average. Fourteen percent of San Pablo households include relatives other than those in the nuclear family (e.g., grandparents, cousins, aunts, uncles etc.). This is compared to the 7% national average. In addition to multigenerational households, San Pablo households tend to be larger than the national average. Over 40% of San Pablo households have four or more persons, compared to just 23% nationwide. (2019: ACS 4-Year Estimates)

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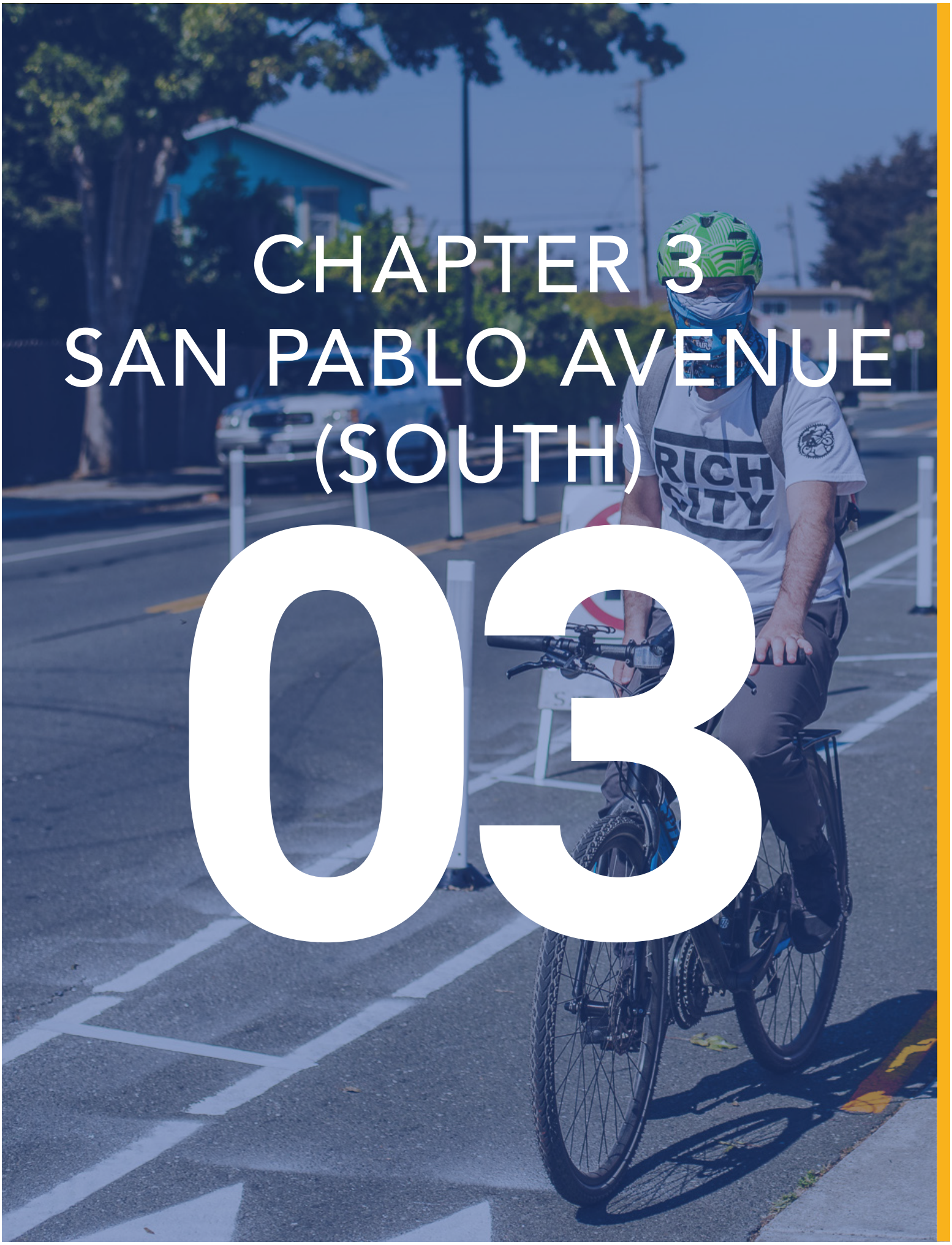


CHAPTER 3
SAN PABLO AVENUE (SOUTH)

03

Corridor Background

San Pablo Avenue is a principal arterial and mixed-use boulevard, serving as a regional thoroughfare through San Pablo. In San Pablo, the roadway has two (2) existing gaps in bicycle infrastructure; in this Corridor Project, they are referred to as "San Pablo Avenue (North)" and "San Pablo Avenue (South)." San Pablo Avenue (South) extends from the existing Class II bicycle lanes north of Evans Avenue to the southern City limits.

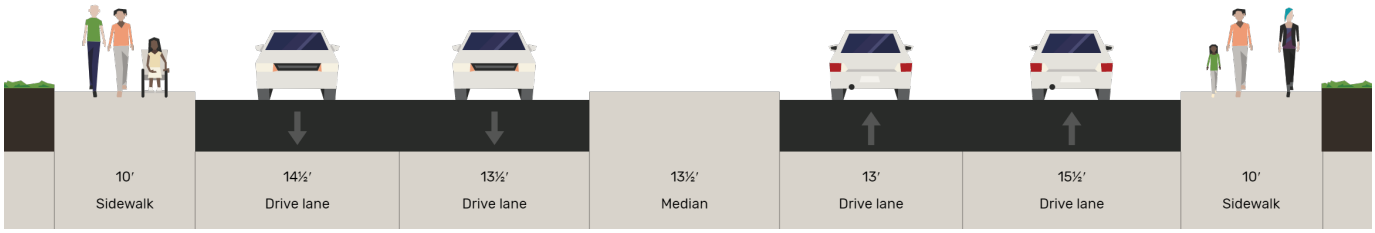
This Chapter focuses specifically on the segment of San Pablo Avenue between Lowell Avenue and Evans Avenue.

Typical Cross Section of San Pablo Avenue (South).

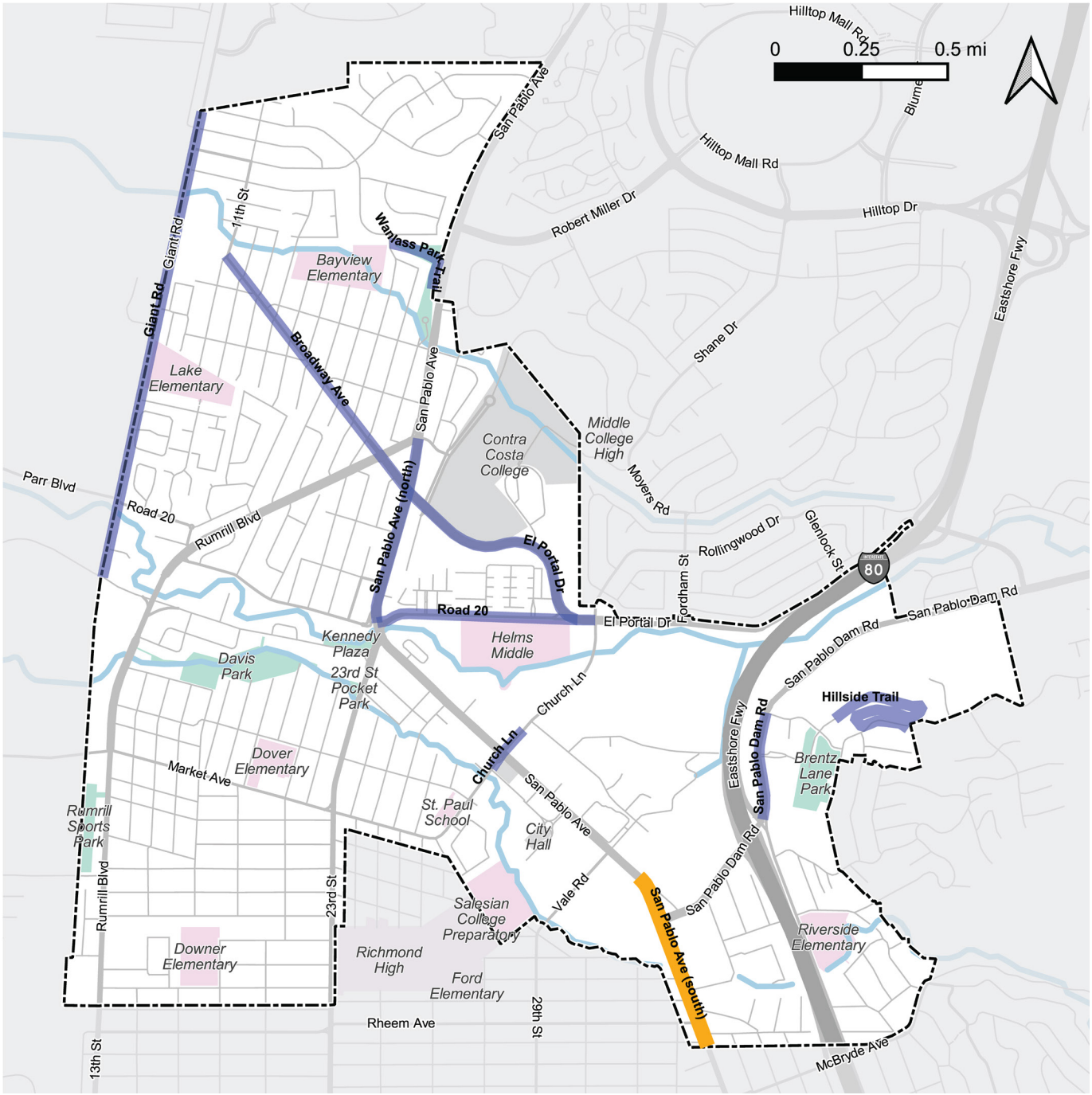
Existing Roadway Configuration

Within the Corridor Study limits, San Pablo Avenue (South) is a four-lane mixed use boulevard with a median or left-turn pockets in the center of the street, and sidewalks on both sides of the street. The southernmost limit of the study area has a center turn lane for the short segment south of Rheem Avenue to the City limits near Lowell Avenue. Figure 1 below represents a typical cross section of existing conditions on San Pablo Avenue (South).

Figure 1: San Pablo Avenue (South) – Existing Conditions Cross Section (Facing North)



Study Corridors



Project Corridors

- San Pablo Ave (South)
- Other Corridors

Connecting Active Transportation Facilities

No bicycle facilities currently exist along San Pablo Avenue (South) within the Corridor Study limits. There are dedicated bicycle lanes along San Pablo Avenue beginning at Evans Avenue and continuing north.

There are currently several AC Transit bus stops along San Pablo Avenue (South). As of 2021, the provided bus service is via Line 72, which provides five (5) buses per hour seven (7) days per week between Hilltop Mall in San Pablo and Jack London Square in Oakland. There are three (3) northbound stops and one (1) southbound stop along San Pablo Avenue (South). These stops would not be modified by the recommended improvements, though stop locations could be adjusted in coordination with AC Transit.

Previous Planning Efforts

The 2019 City of San Pablo *Complete Streets Safety Assessment* (CSSA) highlighted a set of recommendations for San Pablo Avenue stretching from San Pablo Dam Road to Rivers Street. Recommendations include:

- Upgrade to separated bicycle lanes
- Where parking is provided, consider feasibility of moving off-street
- Move bus stops to far side of intersection
- Consider removal of mid-block bus stops with no crosswalk or add crosswalk if demand is warranted
- Mark additional enhanced crosswalks where demand is warranted

In addition to the corridor recommendations, the CSSA identified spot improvements for the Evans Avenue intersection:

- Install dashed green bicycle lane approaches and conflict zones
- Consider removing Evans Avenue truck route designation
- Remove slip lane
- Realign Evans Avenue to square up intersection approach

The 2019 City of San Pablo *Systemic Safety Analysis Report* (SSAR) provided further spot improvements at the intersection with San Pablo Dam Road. The SSAR recommends:

- Remove the channelized right-turn lanes
- Adjust clearance timings
- Stripe tracking through the intersection

Design Alternatives

Three (3) design alternatives were considered on San Pablo Avenue (South). Alternative 1 (Figure 2) narrows both the existing raised median and the driving lanes to provide Class IV separated bicycle lanes. This design provides the most desirable on-street bicycle facility feasible, although it requires a greater cost and construction impact due to the median modifications that would be required in much of the corridor. Additional reduction of the median width is not feasible as that would impact the ability to provide left-turn movements at intersections and driveways.

Alternative 2 (Figure 3) would further narrow driving lanes to below 11 feet in order to maintain the existing median. This may result in challenges for larger vehicles to utilize the roadway, but would allow for a quicker and much cheaper implementation by not modifying the median.

Alternative 3 (Figure 4) would place the bicyclists at sidewalk level in a shared-use facility with pedestrians instead of within the roadway. The existing median can be maintained, although curbs would need to be modified on both sides of the roadway in order to widen the existing sidewalk, provide landscaping, and include the shared-used path. Although landscaping is recommended as a buffer to increase greenery, aesthetics, and shade, it is not required; a wider shared-use facility could be implemented instead.

Alternative 3 would provide a bicycle and pedestrian facility better separated from traffic, but would introduce conflicts between people walking and bicycling. It would also likely require a number of driveway modifications associated with the revised curb location.

Figure 2: San Pablo Avenue (South) – Alternative 1 General Cross Section (Facing North)

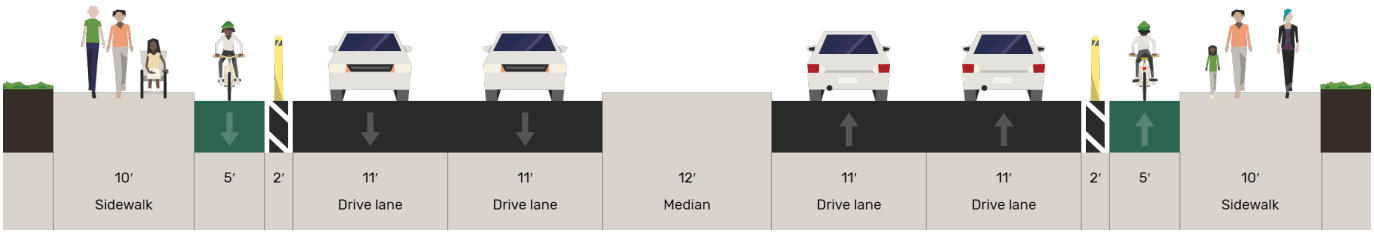


Figure 3: San Pablo Avenue (South) – Alternative 2 General Cross Section (Facing North)

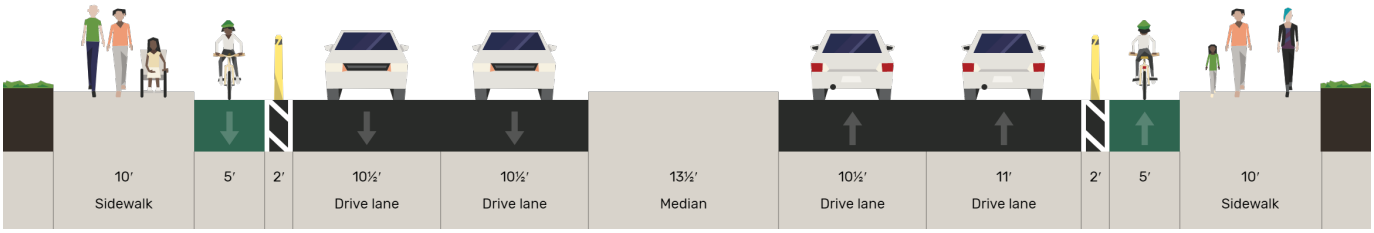
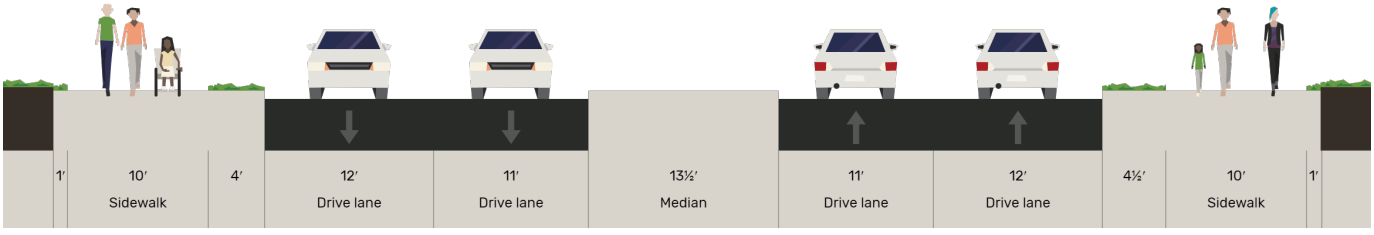


Figure 4: San Pablo Avenue (South) – Alternative 3 General Cross Section (Facing North)



Community Priorities

Community feedback suggests that San Pablo Avenue (South) is one of the corridors with the highest level of existing bicycle and pedestrian activity. Of those who completed the online survey and interactive web-map, almost 60 percent indicated that they travel the corridor by bicycle, and 73 percent said they walk along San Pablo Avenue. Survey respondents and workshop attendees indicated that their top priorities are bicycle lanes and improved crossing opportunities. When selecting between conceptual designs, residents and stakeholders largely preferred the concepts that included the separated and protected Class IV bicycle lanes (Alternatives 1 and 2, with a strong preference for Alternative 1).

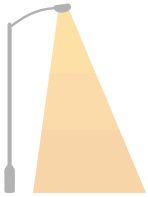
59%

73%

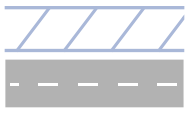
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

A very small amount of on-street parking is provided for this segment of San Pablo Avenue, between Tulare Avenue and Rheem Avenue on the west side of the street. Given the very limited amount of parking currently provided, a parking analysis was not conducted. No modifications to intersection geometrics are proposed; thus, a traffic analysis was not conducted for existing conditions.

Intersection Considerations

Intersection modifications within this segment would be very limited, as the only major intersection is at San Pablo Dam Road. That intersection has pedestrian islands in the southeast and northeast corners of the intersection. Removal of these islands may improve comfort for those walking and bicycling, but would require significant intersection reconstruction to relocate signal equipment and modify curbs. Right-turn volumes in this location are very high and thus removal of the right-turn lane to further enhance bicycle facilities is not likely feasible.

Both the Rheem Avenue intersection and the South San Pablo Avenue shopping center signalized driveway, located south of San Pablo Dam Road, are three-legged T-intersections that currently only have one crosswalk across San Pablo Avenue. In order to better facilitate bicycle and pedestrian crossings of San Pablo Avenue, the addition of the missing crosswalks (north leg at Rheem Avenue, south leg at the shopping center) is proposed. This will introduce a new vehicle-pedestrian conflict that currently does not exist for left-turn movements from the side-streets. Additional signal infrastructure (such as pedestrian push buttons and signal heads), American Disabilities Act (ADA) upgrades, and additional signage to warn drivers of the new conflict is recommended at these locations.

Median Modifications

This segment of San Pablo Avenue is particularly narrow and thus presents challenges to provide a comfortable bicycle facility while sufficiently accommodating other roadway users. It has the additional challenge of a poor pavement and concrete gutter pan surface that would present a safety hazard for bicyclists. Therefore, unlike the San Pablo Avenue (North) segment, more significant roadway reconstruction is recommended for this segment. This would include narrowing or removing the median in several locations to provide an extra one (1) to four (4) feet for improved bicycle facilities, while maintaining minimum lane widths for larger vehicles. Median modifications may incur additional costs associated with roadway reconstruction, grading, landscaping modifications, and utility impacts. However, since the median modifications would typically only affect a small portion of the median, the magnitude of impact may be limited. Additional survey and utility investigation is needed to confirm the feasibility of the median modifications. Complete median removal is not proposed in order to avoid modifying existing turn restrictions at crossing streets and driveways.

Bus Stops

There are several AC Transit bus stops along this section of San Pablo Avenue to accommodate Lines 72 and 72R, as well as other local routes. Line 72R provides service approximately five (5) times per hour and thus this is one of the higher frequency transit lines in Contra Costa County. The roadway width does not allow for separated bus and bicycle areas at the bus stops. Therefore, each bus stop would be configured as a shared space between buses and bicyclists.

Implementation Timeline

The San Pablo Avenue (South) project will require significant median modifications and roadway rehabilitation to improve the pavement surface and the concrete gutter pan. Therefore, the project cost for implementation and expected construction duration will be greater than the quick-build type improvements recommended for some other corridors, as a greater level of engineering design will be needed.

Conceptual Design

Design Overview

The preferred design for San Pablo Avenue (South) includes median modifications to accommodate separated and protected bicycle lanes (i.e., Class IV) in both directions (Alternative 1). It is anticipated that the roadway will need to be significantly rehabilitated in order to create a less hazardous surface for bicyclists. Minor intersection improvements are included to better facilitate bicycle and pedestrian crossings of San Pablo Avenue. See Appendix D for the full concept design plans.

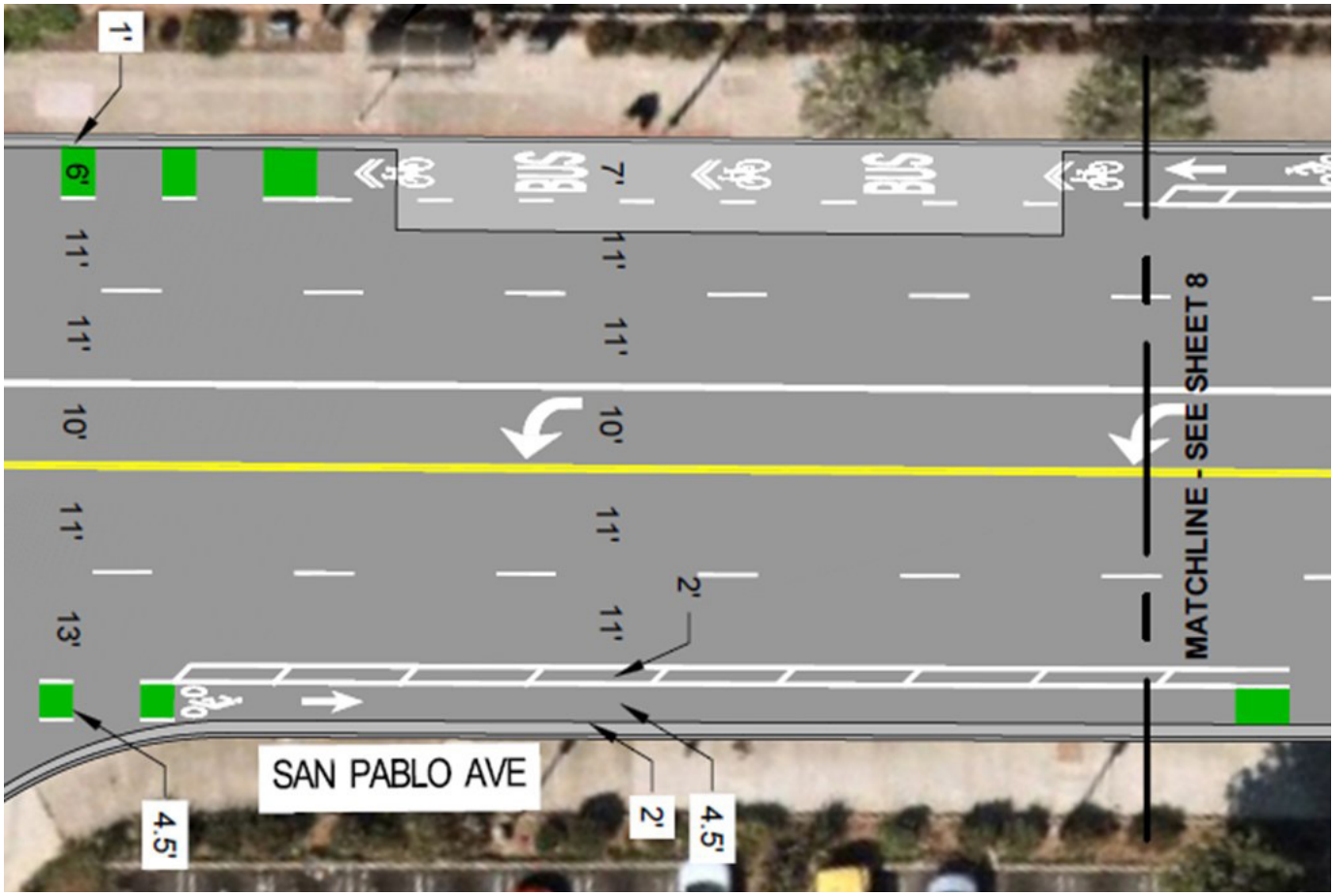
Benefits of the design include the following:

- A continuous bicycle connection through this portion of the City
- Class IV separated bicycle lanes provide a high-quality facility for bicyclists
- Reduction of vehicle lane widths may calm traffic and improve corridor safety

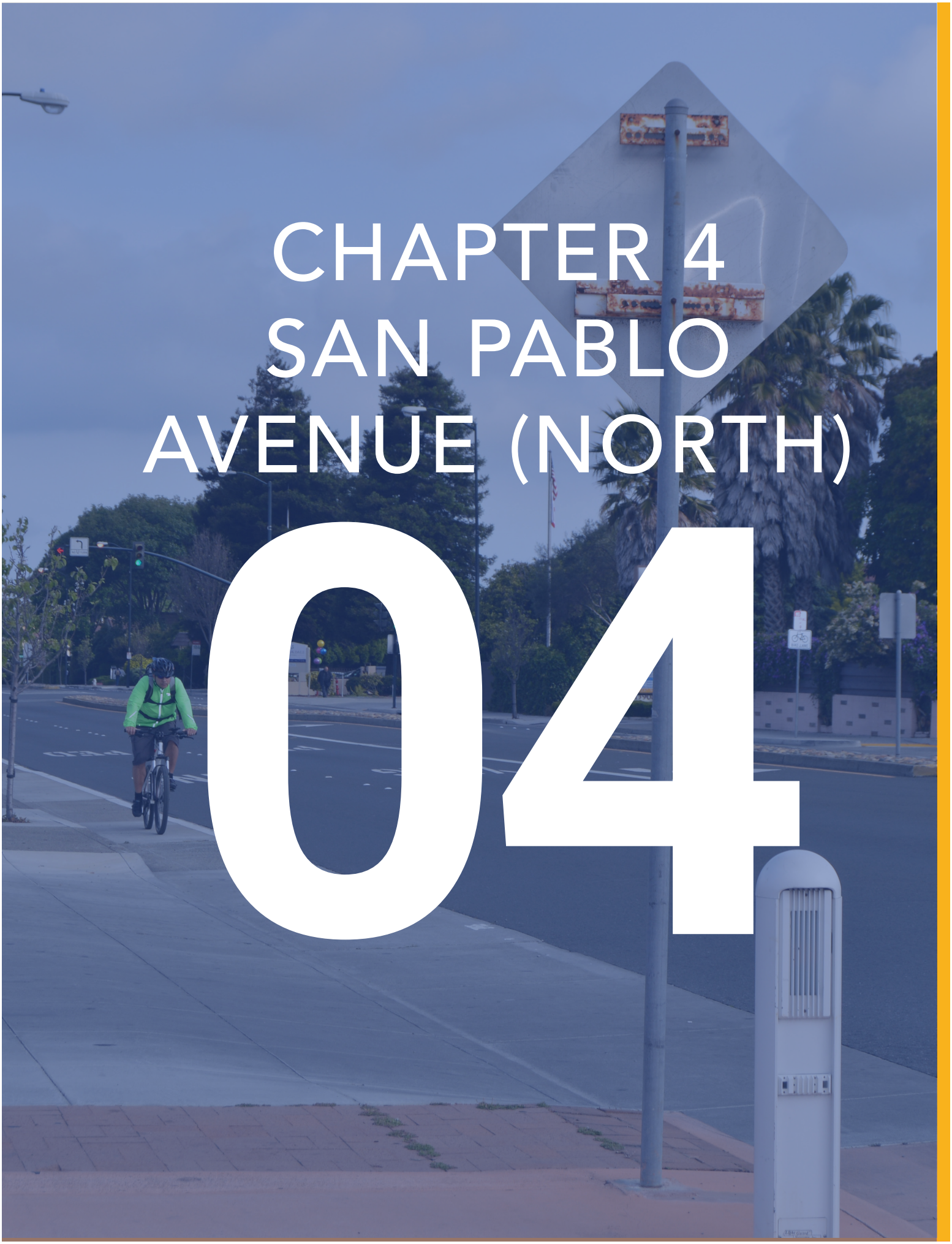
Cost Estimate

Per Caltrans unit costs[1], the estimated construction cost for the recommended design of San Pablo Avenue (South) is approximately $1,610,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, limits of the separated bicycle lane striping and barriers on San Pablo Avenue, and other factors.

Figure 5: San Pablo Avenue South – Typical Segment with Separated Bicycle Lane (bottom) and Shared Bus/Bicycle Space at Bus Stop (top)



1 Caltrans Contract Cost Database, District 4, 2019-2021 costs



CHAPTER 4
SAN PABLO AVENUE (NORTH)

04

Corridor Background

San Pablo Avenue is a mixed-use boulevard that transitions to a vehicle-centric arterial north of Rivers Street; it is classified as a principal arterial. In the City of San Pablo (City), the roadway has two (2) existing gaps in bicycle infrastructure; in this Project, they are referred to as "San Pablo Avenue (North)" and "San Pablo Avenue (South)". San Pablo Avenue (North) extends from the existing Class II bicycle lanes south of Road 20 to the existing Class II/IV bicycle lanes north of Rumrill Boulevard.

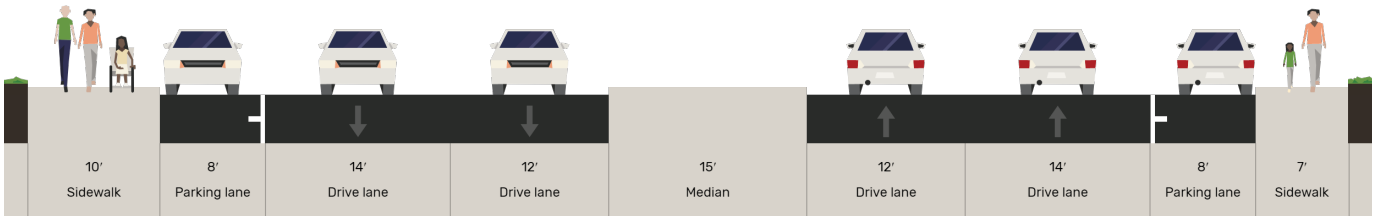
This proposed bicycle facility would also connect to the Rumrill Boulevard Complete Streets Project, which includes a Class IV separated and protected bicycle lane for the full extent of Rumrill Boulevard. **This Chapter focuses specifically on the segment of San Pablo Avenue between 23rd Street/Road 20 and Rumrill Boulevard.**

Typical Cross Section of San Pablo Avenue (North).

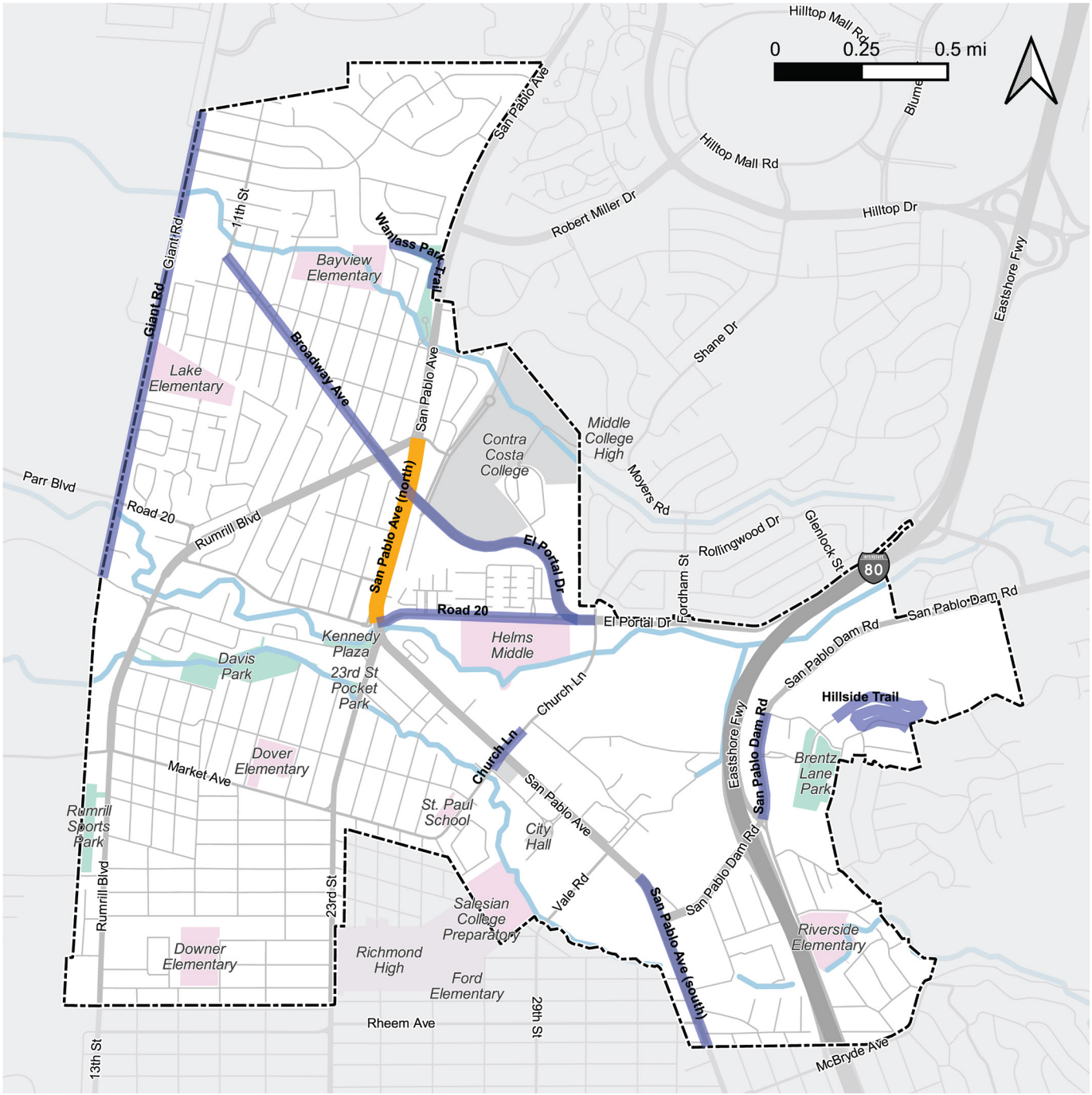
Existing Roadway Configuration

Within the Corridor Study limits, San Pablo Avenue (North) is a four-lane mixed-use boulevard with median or left-turn pockets in the center of the street, and parking lanes and sidewalks on both sides of the street. Figure 6 represents a typical cross section on San Pablo Avenue (North). Three (3) different existing cross-sections for this segment of San Pablo Avenue were identified, with similar characteristics.

Figure 6: San Pablo Avenue (North) – Existing Conditions Cross Section (Facing North)



Study Corridors



Project Corridors

- San Pablo Ave (North)
- Other Corridors

Connecting Active Transportation Facilities

No bicycle lanes currently exist on San Pablo Avenue (North), between 23rd Street and Rumrill Boulevard. There are Class II bicycle lanes along San Pablo Avenue north of Rumrill Boulevard—up to La Puerta Road, installed as part of the San Pablo Avenue Complete Streets Project in 2019—and south of 23rd Street—until Evans Avenue, installed in the late 1970s/ early 1980s. The recommended Class IV bicycle lanes along San Pablo Avenue would close the gap to provide a continuous bicycle lane on San Pablo Avenue between Evans Avenue to La Puerta Road, a distance of approximately two (2) miles.

The ongoing *Rumrill Boulevard Complete Streets Project* will add Class IV (separated and protected) bicycle lanes along the entire length of Rumrill Boulevard, from San Pablo Avenue to Costa Avenue. The addition of bicycle lanes on San Pablo Avenue would connect to this project on Rumrill Boulevard, scheduled for completion in 2023.

There are currently several AC Transit bus stops along San Pablo Avenue (North). As of 2021, the provided bus service is via Line 72, which provides five (5) buses per hour seven (7) days per week between Hilltop Mall in San Pablo and Jack London Square in Oakland. There are two (2) northbound stops and two (2) southbound stops along San Pablo Avenue (South). These stops would not be impacted or removed by the recommended designs.

Previous Planning Efforts

The 2019 City of San Pablo *Complete Streets Safety Assessment* (CSSA) highlighted a set of recommendations for San Pablo Avenue stretching from San Pablo Dam Road to Rivers Street. Recommendations include:

- Upgrade to separated bicycle lanes
- Where parking is provided, consider feasibility of moving off-street
- Move bus stops to far side of intersection
- Consider removal of mid-block bus stops with no crosswalk or add crosswalk if demand is warranted
- Mark additional enhanced crosswalks where demand is warranted

In addition, the CSSA identified spot improvements for the intersection at 23rd Street / Road 20:

- Add leading pedestrian interval
- Reduce curb radius
- Consider making Road 20 right-turn in and right-turn out only
- Install bulb-out on the Northeast corner
- Redesign the intersection to realign the two (2) approaches and install two (2) coordinated signals

The 2019 City of San Pablo *Systemic Safety Analysis Report* (SSAR) identified further spot improvements at the intersections with Purisima Street, Laurie Lane, and Stone Street. At all three (3) intersections, the SSAR recommends:

- Install striped advanced yield lines
- Install Rectangular Rapid-Flashing Beacon

In 2017, the City started the design for the *Rumrill Boulevard Complete Streets Project*. Rumrill Boulevard is currently impacted by connectivity gaps and lacks appropriate pedestrian and bicycle facilities, especially given the average speeds traveled by motorists on this corridor. Recommendations include:

- Class IV (separated and protected) bicycle lanes
- Safety improvements including flashing beacons at crosswalks, improved lighting, ADA ramps and median islands crosswalks
- Enhanced pedestrian facilities such as sidewalks, new trees, benches, and trash enclosures
- Improved storm drain infrastructure
- Road improvements such as asphalt repair
- Minor striping and signage improvements at the Rumrill Boulevard approach to San Pablo Avenue, including bicycle lane markings.

Design Alternatives

Three (3) design alternatives are considered on San Pablo Avenue (North). Alternative 1 (Figure 7) removes the parking lane in both directions, reduces the driving lane width and introduces a separated bicycle lane with vertical delineators. Since this design does not alter the median and maintains two (2) driving lanes, it has the benefit of a relatively easy implementation process. Additionally, bicyclists would have a more comfortable experience given the wide bicycle lanes and buffer from the driving lane.

Figure 7 depicts the typical mid-block configuration for Alternative 1. However, in constrained areas, such as the approach to the Road 20/23rd Street intersection, the configuration presented in Alternative 1 requires additional space trade-offs as depicted in Figure 8 and Figure 9.

Alternative 1.1 (Figure 8) eliminates a turn lane in order to maintain a bicycle lane with buffer and vertical separation in the southbound direction. If the median is not modified, both the vehicle and bicycle lanes would need to get narrower in the northbound direction. Alternative 1.2 (Figure 9) modifies the median and preserves the southbound right-turn lane, but at the expense of precluding various levels of bicycle lane buffer and vertical separation in both directions.

Figure 7: San Pablo Avenue (North) – Alternative 1 General Cross Section (Facing North)

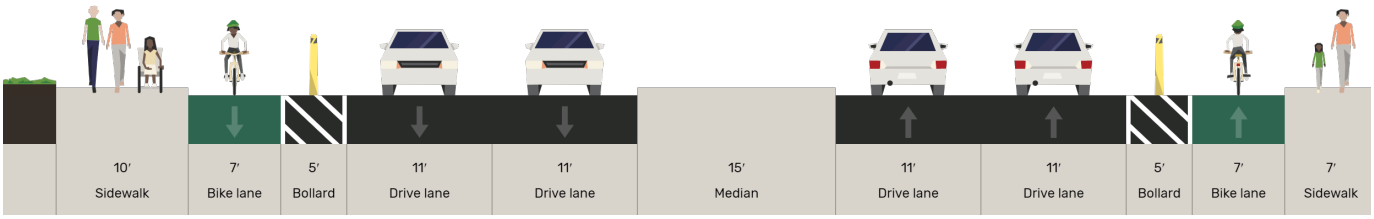


Figure 8: San Pablo Avenue (North) – Alternative 1.1 Approach to 23rd Street Intersection (Facing North)

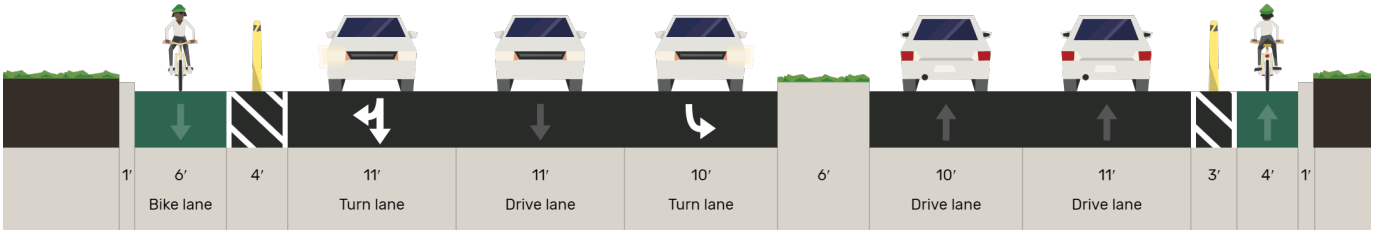
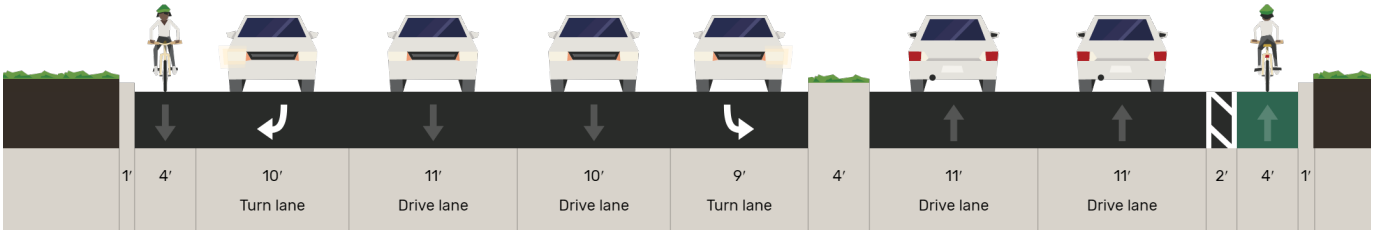


Figure 9: San Pablo Avenue (North) – Alternative 1.2 Approach to 23rd Street Intersection (Facing North)



Alternative 2 (Figure 10) would reduce the median width and reduce the driving lane width in order to maintain the parking lane and introduce a separated bicycle lane with vertical delineators. This avoids the parking impacts of Alternative 1 but would require much greater cost and provide a somewhat less optimal experience for bicyclists compared to Alternative 1. The options at the approach to the 23rd Street intersection would be similar to Alternative 1.

Alternative 3 (Figure 11) preserves the driving lanes and parking lane on one side of the street by providing a shared-use path on one or both sides of San Pablo Avenue. Instead of being placed in the roadway, bicyclists would be directed to use the shared-use paths on either side of the roadway. The existing sidewalks would be widened to provide a minimum 10-foot shared-use path width with additional landscape separation from the roadway. Although landscaping is recommended as a buffer to increase greenery, aesthetics, and shade, it is not required; a wider shared-use facility could be implemented instead. This configuration can potentially avoid median modification (high cost), but it would require relocating the curbs on one or both sides of the roadway (medium cost). Additional modifications would be necessary at the Road 20 / 23rd Street intersection to maintain the shared-use paths through the intersection area.

Alternative 4 (Figure 12) aims to preserve existing on-street parking while also accommodating bicyclists along San Pablo Avenue. In order to preserve parking, narrower bicycle lanes and a painted buffer (with no vertical separation) would be provided. Driving lane widths would be narrowed. Parking would be removed in locations with narrower cross-sections, as well as near driveways and intersections for improved visibility.

Figure 10: San Pablo Avenue (North) – Alternative 2 General Cross Section (Facing North)

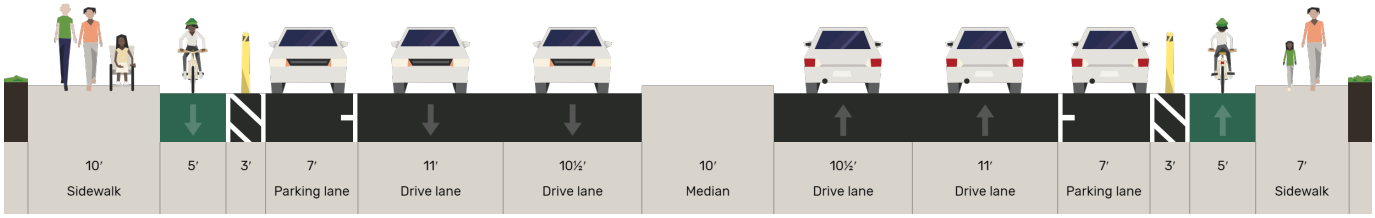


Figure 11: San Pablo Avenue (North) – Alternative 3 General Cross Section (Facing North)

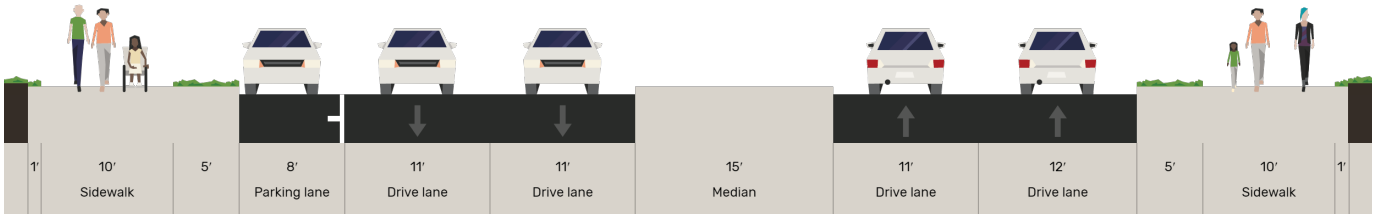
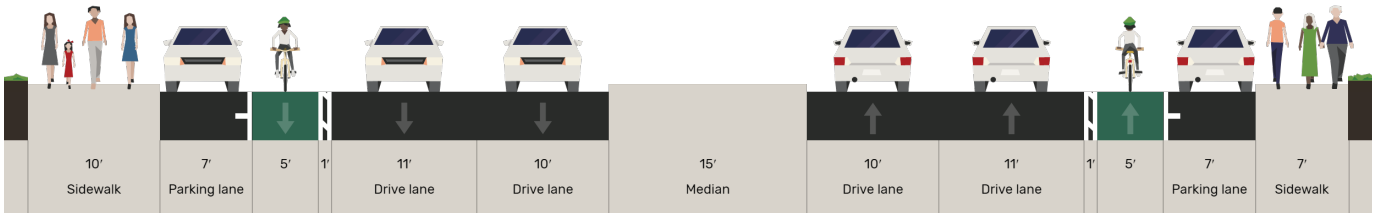


Figure 12: San Pablo Avenue (North) – Alternative 4 General Cross Section (Facing North)



Community Priorities

During the engagement process, community members and stakeholders were asked to share how they use the northern stretch of San Pablo Avenue, and what improvements they would like to see. According to the online survey and interactive web-map, 56 percent participants indicated that they travel the corridor by bicycle and almost 70 percent by foot. In response to a question about what would make San Pablo Avenue (North) safer, most participants said bicycle lanes; followed by slower traffic, better lighting, and improved crosswalks. Of all the corridors, San Pablo Avenue (North and South) generated the most interest in improved transit stops. The community engagement process also generated support for and excitement about the design alternatives that included separated bicycle lanes. With this in mind, the Project Team focused on a conceptual design that provided Class IV bicycle facilities where possible (i.e., some areas with painted buffers and post delineators), while understanding that there are space constraints that may only support Class II bicycle facilities.

"Making San Pablo Avenue bicycle-safe should be a priority in every community from Oakland to Hercules. It will bring so much more safe mobility to the area, as opposed to the complicated patchwork of paths barely available now. It will be a huge boon to the businesses along that route, as well."

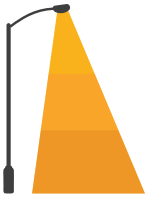
56%

69%

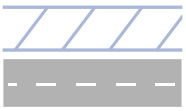
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Parking Analysis

A parking study on San Pablo Avenue—between Rivers Street and Road 20—was conducted as part of the WCCTAC San Pablo Avenue Corridor Project in 2017. It analyzed parking supply and the average utilization of parking along San Pablo Avenue during the peak AM (6:00–9:00 AM), PM (4:00–7:00 PM), and weekend periods (Saturday 1:00–3:00 PM). These are broken into segments (Table 1 and Table 2). The parking study is included in Appendix A.

Parking utilization is generally low in both the AM and PM weekday periods and is higher in some segments on the weekend. Parking utilization data was not collected on nearby side-streets to assess the feasibility of relocating parking to those streets. Further analysis and coordination with businesses may be required prior to project implementation. While most businesses along this stretch of San Pablo Avenue have off-street parking that can accommodate employees and customers as well as loading needs, that may not be the case for all properties. Additional outreach and coordination may be necessary to develop strategies for accommodating loading and access needs for businesses.

Traffic Analysis

A traffic operations analysis was conducted on San Pablo Avenue to document existing conditions through level of service (LOS)[1], delay (measured in seconds), and volume-to-capacity ratio[2]. This analysis was completed at corridor intersections where concept alternatives

Table 1: **San Pablo Avenue (North)** – Parking Occupancy – East Side

Segment	Supply	AM Occupancy	AM Utilization	PM Occupancy	PM Utilization	Weekend Occupancy	Weekend Utilization
Road 20 to Purisima St	0	0	NA	0	NA	0	NA
Purisima St to Laurie Ln	14	0	0%	0	0%	0	0%
Laurie Ln to El Portal Dr	15	6	40%	7	47%	13	83%
El Portal Dr to College Ln	18	0	0%	0	0%	1	6%

Source: Kimley-Horn and Associates, Inc. for ACTC, WCCTAC, and CCTA

Table 2: **San Pablo Avenue (North)** – Parking Occupancy – West Side

Segment	Supply	AM Occupancy	AM Utilization	PM Occupancy	PM Utilization	Weekend Occupancy	Weekend Utilization
Rumrill Blvd to Broadway Ave	9	0	0%	1	11%	1	11%
Broadway Ave to Stone St	13	3	19%	9	56%	13	81%
Stone St to Lovegrove St	8	1	13%	2	25%	1	13%
Lovegrove St to Road 20	13	1	8%	8	62%	12	92%

Source: Kimley-Horn and Associates, Inc. for ACTC, WCCTAC, and CCTA

1 LOS describes traffic conditions—the amount of traffic congestion—at an intersection or on a roadway. LOS ranges from A to F, with A indicating a condition of little or no congestion and F indicating a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. For intersections, LOS is based on the average delay experienced by all traffic using the intersection during the busiest (peak) 15-minute period. LOS A through D are generally considered acceptable.

2 Volume-to-capacity ratio (v/c) represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c approaches 1.0, traffic becomes unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.

include geometric and/or traffic signal modifications (e.g., removing a travel lane, modifying lane geometry, changing signal timing). Existing conditions traffic analysis results serve as a comparative baseline for recommended intersection modifications.

Table 3 and Table 4 below summarize the movement, approach, and overall LOS and delay for the relevant intersections on San Pablo Avenue (North): San Pablo Avenue & Broadway Avenue/El Portal Drive and San Pablo Avenue & 23rd Street & Road 20. No movements were found to have untenable levels of delay or congestion at these two intersections. The full Reports are included in Appendix B.

Table 3: **San Pablo Ave & Broadway Ave / El Portal Dr** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
San Pablo Ave & Broadway Ave / El Portal Dr	Eastbound	Left	C (28.8)	0.11	C (34.3)	0.11
		Through	D (44.4)	0.86	D (43.4)	0.74
		Right	-	-	-	-
		Approach	D (43.9)		D (43.1)	
	Westbound	Left	E (58.0)	0.72	D (49.1)	0.54
		Through	C (21.3)	0.30	C (26.0)	0.28
		Right	B (19.3)	0.08	C (24.4)	0.11
		Approach	C (27.4)		C (29.2)	
	Northbound	Left	E (60.8)	0.70	E (63.9)	0.72
		Through	D (41.6)	0.37	C (25.1)	0.62
		Right	B (19.2)	0.12	B (12.7)	0.07
		Approach	D (42.2)		C (31.0)	
	Southbound	Left	F (88.6)	0.90	E (67.1)	0.68
		Through	C (22.8)	0.71	C (20.2)	0.39
		Right	C (22.5)	0.01	C (20.1)	0.01
		Approach	D (37.9)		C (30.2)	

Table 4: **San Pablo Ave & 23rd St & Rd 20** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
San Pablo Ave & 23rd St & Rd 20	Eastbound	Left	C (25.3)	0.29	D (42.7)	0.69
		Through	C (25.3)	0.29	D (42.1)	0.68
		Right	B (18.1)	0.04	C (24.1)	0.08
		Approach	C (23.9)		D (39.9)	
	Westbound	Left	-	-	-	-
		Through	D (35.8)	0.38	D (47.0)	0.49
		Right	C (33.2)	0.02	D (42.7)	0.03
		Approach	D (35.2)		D (45.8)	
	Northbound	Left	D (36.9)	0.38	D (47.4)	0.52
		Through	C (21.7)	0.18	D (35.4)	0.58
		Right	-	-	-	-
		Approach	C (25.3)		D (37.2)	
	Southbound	Left	D (43.3)	0.48	D (51.7)	0.44
		Through	C (27.0)	0.34	D (36.4)	0.35
		Right	B (11.1)	0.15	B (17.7)	0.24
		Approach	C (20.5)		C (27.6)	

Intersection Considerations

The corridor includes several intersections with pedestrian "pork-chop" islands that allow for higher-speed right-turn movements through the right-turn only slip lanes. While pedestrian islands allow for a shorter pedestrian clearance phase, they also require pedestrians to cross higher-speed vehicle turning movements and they restrict the space available for the provision of bicycle lanes on San Pablo Avenue. Removal of the pedestrian islands would require significant intersection modifications, including relocation of signal poles, reconstruction of curbs, reconfiguration of drainage, and other potential utility conflicts. Therefore, no pedestrian island removal is currently proposed; however, these modifications should be considered in the future, as funding allows, to improve bicycle facility comfort and pedestrian safety. Opportunities for protected intersections to further improve safety for people walking and biking should be further explored at that time.

The City is about to embark on a multi-year project to improve the 23rd Street & Road 20 intersection with San Pablo Avenue, including reconstruction of the San Pablo Avenue bridge over San Pablo Creek. This bridge reconstruction project will also analyze alternative intersection configurations, which may significantly change how motorists, bicyclists, and pedestrians travel through the area. Therefore, while a design concept was identified for this intersection as part of this project, alternatives will be further developed and analyzed as part of the bridge reconstruction project.

Further analysis and coordination with local businesses is recommended to evaluate the opportunity to eliminate the existing pork-chop and right-turn lane on southbound San Pablo Avenue approaching Broadway Avenue. The volume of motorists making this specific right turn are very low due to the roadway network in the area (i.e., more than 95% of vehicles turn right on Rumrill Boulevard instead of Broadwaey Avenue during the AM and PM peak hours today).

As noted earlier, the Rumrill Boulevard Complete Street Project will provide protected bicycle lanes on Rumrill Boulevard. In order to enhance the connectivity between those bicycle lanes and lanes proposed on San Pablo Avenue, two-stage bicycle turn boxes are recommended in the southeast and northeast quadrants of the Rumrill Boulevard / College Lane intersection with San Pablo Avenue. These two-stage turn boxes will require "No Turn On Red" restrictions for their adjacent right-turn movements in order to not introduce a conflict between motorists turning right and bicyclists waiting for a green light. Two-stage turn boxes are neither proposed at the northwest corner of the intersection, because bicycle lanes are not provided on College Lane, nor the southwest corner of the intersection, due to the lack of space as a result of the pork-chop island.

Bus Stops

There are several AC Transit bus stops along this section of San Pablo Avenue that primarily accommodate Lines 72 and 72R, as well as other local routes. Line 72R provides service approximately five (5) times per hour and thus this is one of the higher frequency transit corridors in Contra Costa County. The roadway width does not allow for separated bus and bicycle lanes at the bus stops. Therefore, each bus stop would be configured as a shared space between buses and bicyclists, as is currently the design for the existing Class II bicycle lanes in San Pablo. Minor bus stop relocation is suggested south of Broadway Avenue to avoid an existing bus stop conflict with a driveway.

Implementation Timeline

San Pablo Avenue (North) is intended to be a quick-build project with a short-term implementation timeline. The improvements are entirely within the public right-of-way. The improvements consist entirely of signage, marking, and vertical delineator improvements throughout the corridor. Additional outreach to businesses will be necessary to discuss the proposed parking removal.

Conceptual Design

Design Overview

The recommended design for San Pablo Avenue (North) includes a separated bicycle lane in both directions, which would be made possible through parking removal (Alternative 1). This alternative balances a high-quality bicycle configuration while avoiding the significant cost of median modification. Minor intersection improvements are included in order to accommodate the separated bicycle lane. See Appendix D for the concept design plans.

Benefits of the design include:

- A continuous bicycle connection through this portion of the City;
- Class IV separated bicycle lanes provide a high-quality facility for bicyclists; and
- Narrowed vehicle lane widths may calm traffic and improve corridor safety.

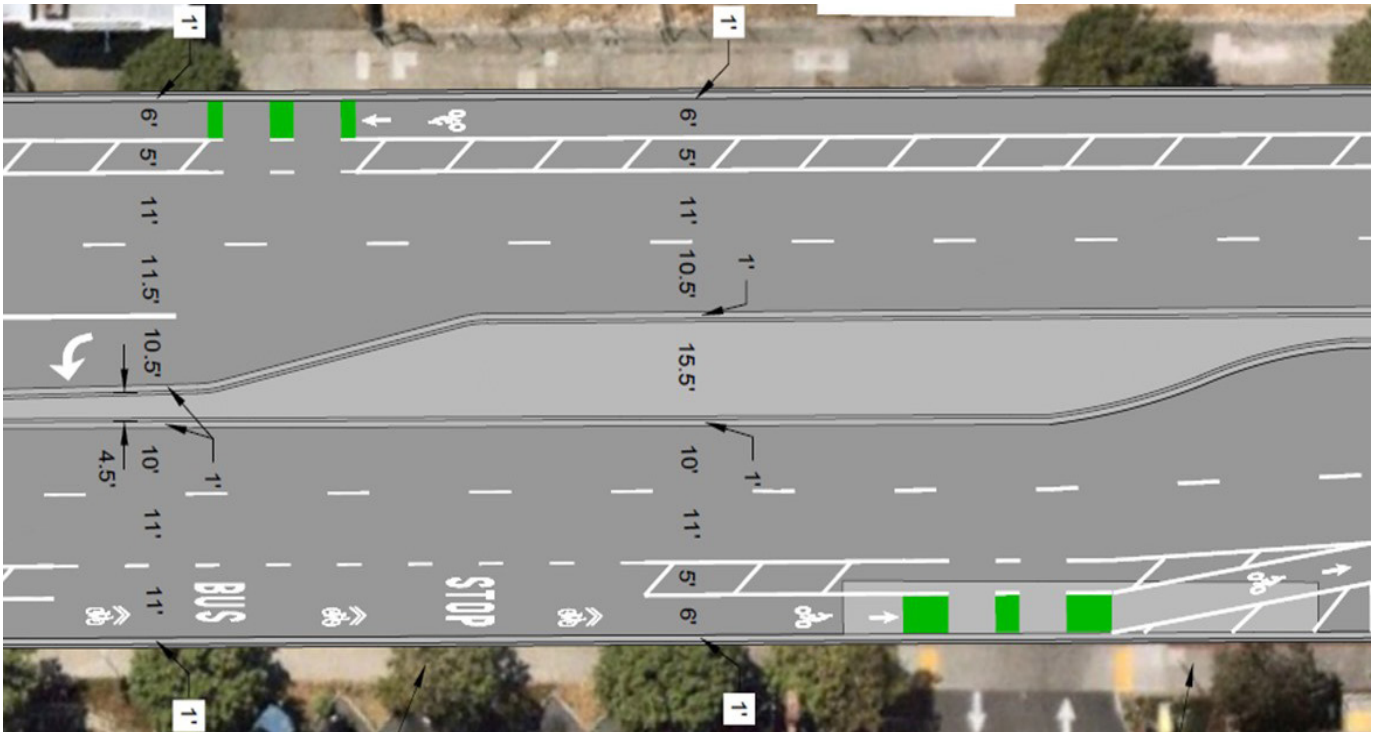
Traffic Analysis

No modifications to the existing lane configurations were made at key segment intersections; therefore, no alternatives traffic analysis was completed. The preferred San Pablo Avenue (North) alternative includes removal of the southbound right-turn slip lane on San Pablo Avenue; results of that analysis are provided in Chapter 5: Broadway Avenue. The preferred San Pablo Avenue (North) concept plan is considered to be more of a quick-build project than the Broadway Avenue corridor; therefore, the potential impacts to this longer-term design change is documented in the Broadway Avenue section.

Cost Estimate

Per Caltrans unit costs[3], the estimated construction cost for the recommended design of San Pablo Avenue (North) is approximately $490,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, limits of the separated bicycle lane striping and barriers on San Pablo Avenue, and other factors.

Figure 13: San Pablo Avenue (North) – Typical Segment with Shared Bus/Bicycle Space at Bus Stop (bottom) and Separated Bicycle Lane (top)



3 Caltrans Contract Cost Database, District 4, 2019-2021 costs

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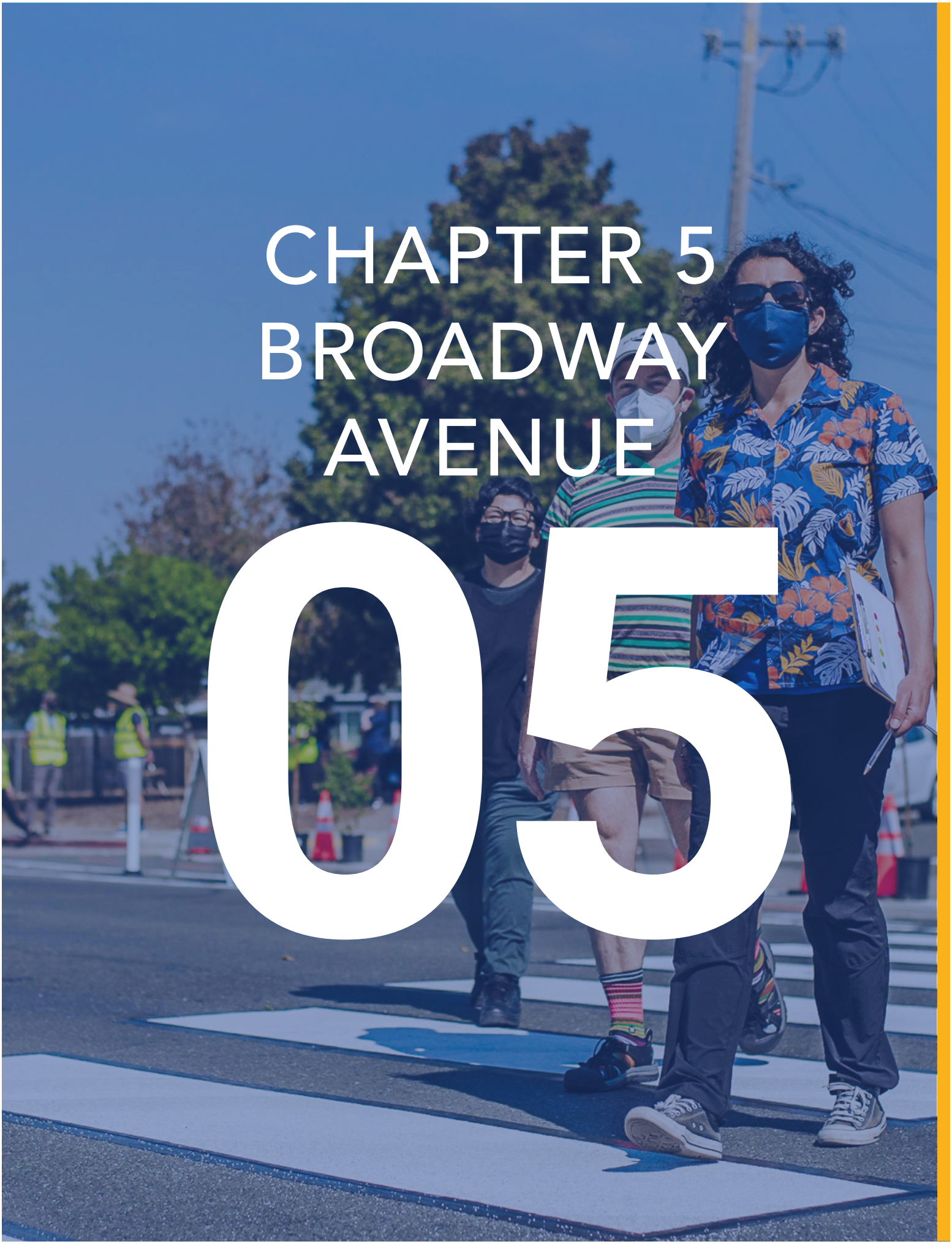


CHAPTER 5
BROADWAY AVENUE
05

Corridor Background

Broadway Avenue is a neighborhood avenue (11th Street to Rumrill Boulevard) and urban arterial (Rumrill Boulevard to San Pablo Avenue) that connects San Pablo's northern residential neighborhood with the City's commercial district; it is classified as a major collector. Broadway Avenue turns into El Portal Drive east of the intersection of San Pablo Avenue. Broadway Avenue does not provide direct access to any schools; however, it is located within ¼-mile of Bayview Elementary School and ½-mile of Lake Elementary School.

The City's Bicycle and Pedestrian Master Plan (BPMP, 2017) identified Broadway Avenue as a potential candidate corridor for Class II bicycle lanes between 11th Street and San Pablo Avenue to provide better bicycling connectivity throughout the City. The bicycle lanes on Broadway Avenue would connect to the Class IV separated bicycle lanes planned along Rumrill Boulevard as a part of the Rumrill Boulevard Complete Streets Project, and would potentially connect to other bicycle facilities proposed along El Portal Drive (Chapter 6) and San Pablo Avenue (Chapter 4).

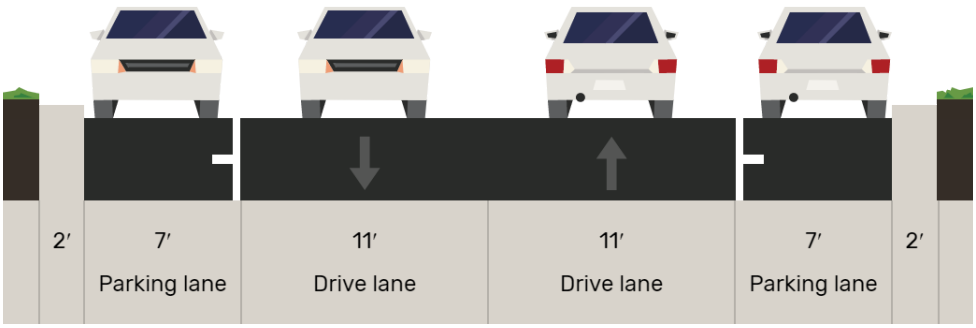
Typical Cross Section of Broadway Avenue.

This Chapter focuses on the entirety of Broadway Avenue, from 11th Street to San Pablo Avenue.

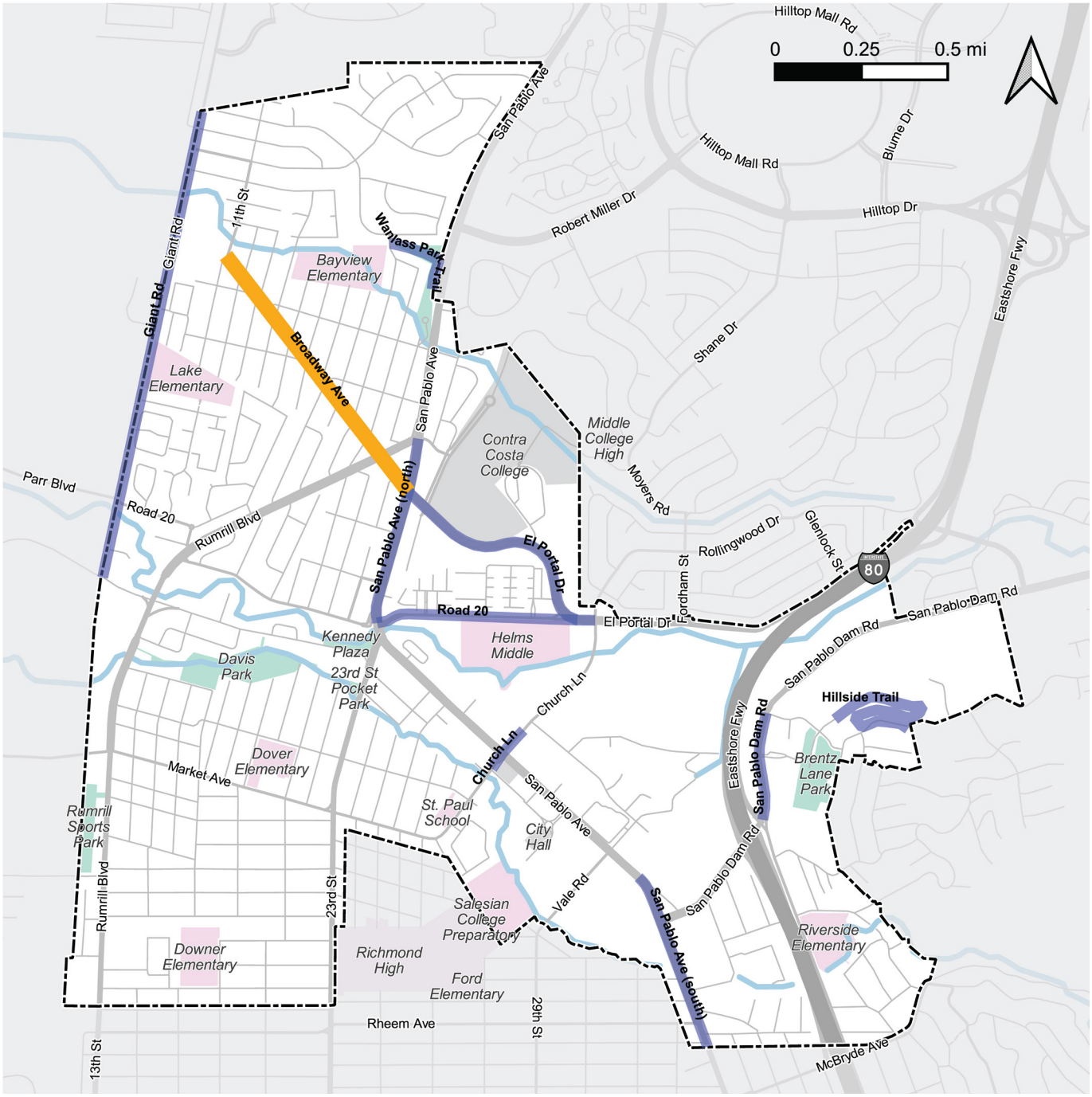
Existing Roadway Configuration

Broadway Avenue is a northwest/southeast two-lane street with on-street parking on both sides of the street. The roadway curb-to-curb width is 40 feet within a 60-foot right-of way (10-foot sidewalks on either side) for a majority of the corridor (Figure 14). There are wider segments from Rivers Street to 14th Street and Rumrill Boulevard to San Pablo Avenue. There is no center median for the length of the corridor, other than the segment from 20th Street to San Pablo Avenue.

Figure 14: Broadway Avenue – Existing Conditions Cross Section (Facing East)



Study Corridors



City

Parks

Schools

Connecting Active Transportation Facilities

Broadway Avenue connects to the short segment of existing southbound Class II bicycle lane on Rumrill Boulevard. There is also a short northbound Class II bicycle lane on Rumrill Boulevard that ends one block south of the Broadway/Rumrill intersection. The Rumrill Boulevard Complete Streets Project will upgrade the existing bicycle facilities on Rumrill Boulevard to Class IV separated bicycle lanes, close existing bicycle facility gaps on Rumrill Boulevard, and extend bicycle facilities north to San Pablo Avenue where Rumrill Avenue ends. There are no other existing bicycle facilities adjacent to Broadway Avenue, although Class IV separated bicycle lanes are recommended along El Portal Drive and San Pablo Avenue in this Corridor Study.

There are sidewalks on both sides of Broadway Avenue and all cross streets for the length of the corridor. There are marked crosswalks across all cross streets for the length of the corridor, plus marked crosswalks across Broadway Avenue at the following locations:

- 11th Street (southeast leg of intersection)
- 12th Street (northwest and southeast legs of intersection)
- Rivers Street (northwest leg of intersection)
- 15th Street (northwest and southeast legs of intersection)
- 16th Street/Lake Street (southeast leg of intersection)
- 17th Street/Lake Street (northwest and southeast legs of intersection)
- 19th Street (southeast leg of intersection)
- 20th Street (northwest and southeast legs of intersection)
- Rumrill Boulevard (northwest and southeast legs of intersection)
- San Pablo Avenue (northwest and southeast legs of intersection)

The crosswalks across the northwest leg of Broadway Avenue at 15th Street and the southeast leg of Broadway Avenue at 16th Street and Lake Street are raised.

There are currently several AC Transit bus stops along Broadway Avenue. As of 2021, the provided bus services are: Line 71 hourly service seven (7) days a week between the Richmond Parkway Transit Center and El Cerrito Plaza BART station; Line 376 twice-hourly evening and night service seven (7) days a week between El Cerrito del Norte BART station and Pinole Vista; and Line 672 school service Monday to Friday to Juan Crespi Middle School. There are five (5) northwest-bound stops and four (4) southeast-bound stops along Broadway Avenue.

Previous Planning Efforts

The 2019 City of San Pablo *Systemic Safety Analysis Report* (SSAR) identifies both short- and long-term recommendations for Broadway Avenue. In the short term, the SSAR recommends:

- implementing speed feedback signage,
- removing parking at intersections to create clear lines of sight (i.e., daylighting),
- installing rectangular rapid flashing beacons (RRFBs) to increase crosswalk visibility,
- striping advance yield lines in advance of select crosswalks across Broadway Avenue, and
- implementing signal timing adjustments (e.g., Leading Pedestrian Intervals, flashing yellow arrows, protected-permissive phasing) at signalized intersections.

In the long term, the SSAR recommends:

- installing pedestrian-scale lighting along the corridor,
- upgrading signal infrastructure at signalized intersections, and
- removing the slip lanes at the intersections with Rumrill Boulevard and San Pablo Avenue.

Design Alternatives

Two (2) design alternatives were considered for Broadway Avenue. Alternative 1 (Figure 15) would reconfigure Broadway Avenue to include a Class II bicycle lane in each direction by removing one (1) lane of on-street parking and reducing the width of the remaining parking lane, as was recommended in the BPMP. At bus stops, buses would pull into bicycle lanes to access the curb, resulting in bus/bicycle mixing zones.

Alternative 2 (Figure 16) would reconfigure Broadway Avenue to include a Class IV two-way separated bicycle lane on the northeast side of the street by removing one (1) lane of on-street parking and reducing the width of the remaining parking lane. At bus stops, the remaining parking lane is removed and vehicle lanes are shifted horizontally to expand the bicycle lane buffer into a bus boarding island, with the two-way separated bicycle lane running between the bus boarding island and the sidewalk.

Figure 15: Broadway Avenue – Alternative 1 Class II Bicycle Lane (Facing East)

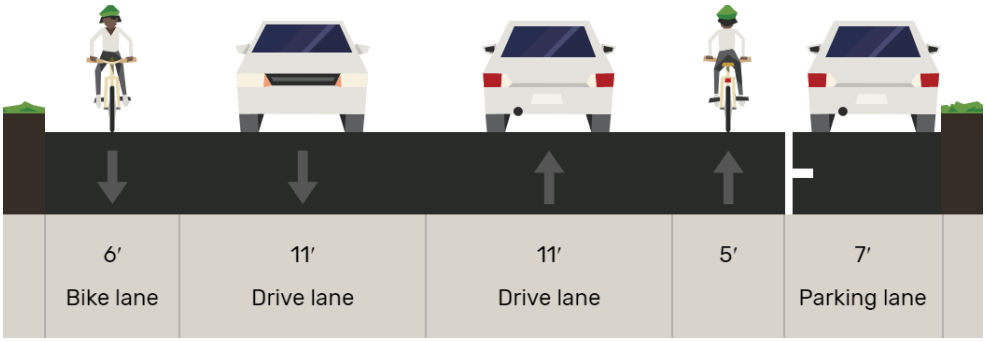
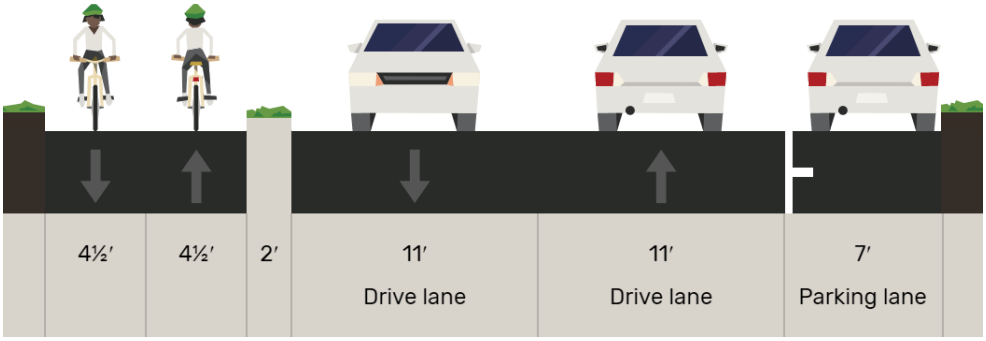


Figure 16: Broadway Avenue – Alternative 2 Class IV Two-Way Bicycle Lane (Facing East)



Community Priorities

During the engagement process, community members and stakeholders were asked to share how they use Broadway Avenue, and what improvements they would like to see along the corridor. Of those who filled out the online survey and interactive web-map, roughly 50 percent indicated that they walk or bicycle along Broadway Avenue. In response to a question about what would make Broadway safer, most respondents said bicycle lanes, followed by improved crosswalks. Community members and stakeholder had mixed preferences about removing parking. Many residences along or near Broadway Avenue are home to large or multigenerational families, with two (2) or more vehicles. For this reason, community members shared concerns about removing parking.

The Project Team also collected information from the San Pablo Safe Routes to School (SR2S) Master Plan, a concurrent planning process that is focusing on infrastructure needs at ten (10) schools in and adjacent to the City. Bayview Elementary and Lake Elementary—two (2) of the schools in the SR2S plan—are both within a half mile of Broadway Avenue; therefore, feedback collected from Bayview and Lake students, parents, and staff informed the Broadway Avenue design concept. Community input from the SR2S Master Plan typically focused on the pedestrian environment along Broadway, particularly the need for safe crossing opportunities for children and families.

The Walk & Bike Broadway temporary demonstration event implemented on Broadway Avenue included recommendations from both the SR2S Master Plan and the Corridor Study. The event demonstrated how a full-scale two-way separated bicycle lane, bus boarding island, new crosswalk and curb extension would look and function on Broadway Avenue.

49%

54%

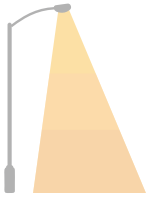
Community members that attended Walk & Bike Broadway expressed enthusiasm about the event itself, as well as the recommended designs. The Project Team conducted field surveys to understand how users felt about each of the temporary demonstration elements. Overwhelmingly, community members and stakeholders liked the design improvements, and said that they would be more likely to walk and bicycle if the improvements were made permanent. See Chapter 2 for additional details about the temporary demonstration.

Feedback collected during Walk & Bike Broadway helped the Project Team select Alternative 2 (Figure 16)—the two-way separated bicycle lane along Broadway Avenue—for the full conceptual design. This preferred alternative provides the level of protection from vehicles that community members requested throughout the engagement process.

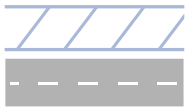
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Parking Analysis

Both design alternatives propose removing one (1) lane of on-street parking to accommodate bicycle facilities. A parking occupancy study was conducted in October 2020[1] to determine the extent to which existing on-street parking is used. Existing parking was inventoried and observed on a block-by-block basis for the length of the Broadway Avenue corridor. Parking on several cross streets (i.e., 12th Street, 15th Street, and 17th Street) was also inventoried and observed (Table 5). Parking occupancy was observed on a weekday morning (6AM-9AM), weekday evening (4PM – 7PM), and weekend midday (1PM – 3PM) to determine parking use at different times throughout a typical week.

The parking study found that corridor-wide on-street parking is occupied at 46% on average on weekday mornings and afternoons and 51% on weekend afternoons. Since the southern on-street parking lane of Broadway Avenue represents approximately 60% of the parking supply, it is feasible to remove the northern on-street parking lane and accommodate existing parking needs with both design Alternatives 1 and 2. See Appendix A for additional information on the parking occupancy study.

Table 5: **Parking Occupancy on Broadway Avenue and Select Cross Streets**

Street	Segment	Side of Street	Supply	AM Occupancy	AM Utilization	PM Occupancy	PM Utilization	Weekend Occupancy	Weekend Utilization
Broadway Ave	11th St to San Pablo Ave	North	55	34	62%	31	56%	33	60%
		South	78	29	37%	37	47%	37	47%
12th St	500' south of Broadway to 500' north of Broadway	West	39	21	54%	21	54%	19	49%
		East	38	13	34%	16	42%	19	50%
15th St	500' south of Broadway to 500' north of Broadway	West	29	20	69%	18	62%	21	72%
		East	27	21	78%	20	74%	23	85%
17th St	500' south of Broadway to 500' north of Broadway	West	32	16	50%	20	63%	16	50%
		East	24	13	54%	13	54%	12	50%

Source: National Data & Surveying Services (October 2020)

1 October 2020 was during the COVID-19 pandemic; therefore, this parking study could be considered a conservative estimate, with more people working from home during weekdays than "normal" conditions.

Traffic Analysis

Based on in-person vehicle volume and speed observations, it was determined that Class II bicycle lanes would not provide a sufficient level of protection or comfort for a majority of potential bicyclists along Broadway Avenue (e.g., children riding to school). Since Alternative I (Class II bicycle lanes) and Alternative II (Class IV two-way bicycle lane) had the same level of impact to parking, but very different levels of bicyclist safety and comfort, Alternative I was not advanced to a conceptual design.

A traffic operations analysis was conducted on Broadway Avenue to document existing conditions through level of service (LOS)[2], delay (measured in seconds), and volume-to-capacity ratio[3].

This analysis was completed at corridor intersections where concept alternatives include geometric and/or traffic signal modifications (e.g., removing a travel lane, modifying lane geometry, changing signal timing). Existing conditions traffic analysis results serve as a comparative baseline for recommended intersection modifications.

Table 6 and Table 7 summarize the movement, approach, and overall LOS and delay for these two (2) intersections: Broadway Avenue & Rumrill Boulevard and Broadway Avenue/El Portal Drive & San Pablo Avenue. The full Reports can be found in Appendix B.

Table 6: **Broadway Avenue & Rumrill Boulevard** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
Broadway Avenue & Rumrill Boulevard	Eastbound	Left	C (28.6)	0.03	C (29.1)	0.07
		Through	D (35.8)	0.65	C (32.6)	0.52
		Right	-	-	-	-
		Approach	D (35.5)	-	C (32.2)	-
	Westbound	Left	B (15.6)	0.19	C (22.8)	0.32
		Through	B (15.5)	0.18	C (25.1)	0.46
		Right	-	-	-	-
		Approach	B (15.5)	-	C (24.2)	-
	Northbound	Left	D (49.0)	0.46	D (41.3)	0.30
		Through	D (36.1)	0.50	C (30.3)	0.68
		Right	A (8.0)	0.13	A (7.2)	0.22
		Approach	C (24.3)	-	C (23.7)	-
	Southbound	Left	D (48.5)	0.41	D (44.7)	0.33
		Through	D (36.7)	0.54	C (27.2)	0.32
		Right	B (18.7)	0.01	B (13.5)	0.02
		Approach	D (36.6)	-	C (26.7)	-

2 LOS describes traffic conditions—the amount of traffic congestion—at an intersection or on a roadway. LOS ranges from A to F, with A indicating a condition of little or no congestion and F indicating a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. For intersections, LOS is based on the average delay experienced by all traffic using the intersection during the busiest (peak) 15-minute period. LOS A through D are generally considered acceptable.

3 Volume-to-capacity ratio (v/c) represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c approaches 1.0, traffic becomes unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.

Table 7: **Broadway Avenue/El Portal Drive & San Pablo Avenue** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
Broadway Avenue & San Pablo Avenue	Eastbound	Left	C (28.8)	0.11	C (34.3)	0.11
		Through	D (44.4)	0.86	D (43.4)	0.74
		Right	-	-	-	-
		Approach	D (43.9)		D (43.1)	
	Westbound	Left	E (58.0)	0.72	D (49.1)	0.54
		Through	C (21.3)	0.30	C (26.0)	0.28
		Right	B (19.3)	0.08	C (24.4)	0.11
		Approach	C (27.4)		C (29.2)	
	Northbound	Left	E (60.8)	0.70	E (63.9)	0.72
		Through	D (41.6)	0.37	C (25.1)	0.62
		Right	B (19.2)	0.12	B (12.7)	0.07
		Approach	D (42.2)		C (31.0)	
	Southbound	Left	F (88.6)	0.90	E (67.1)	0.68
		Through	C (22.8)	0.71	C (20.2)	0.39
		Right	C (22.5)	0.01	C (20.1)	0.01
		Approach	D (37.9)		C (30.2)	

Intersection Considerations

Broadway Avenue experiences vehicle traffic ranging from passenger vehicles, trucks—predominantly smaller single-unit trucks and delivery trucks—and AC Transit buses. The Class IV two-way separated bicycle lane design alternative (Figure 17) was designed using "AutoTURN" models to accommodate all relevant vehicle turning movements. A single-unit rear axle truck[4] was used to model right-turn movements to and from all side streets, including the intersections with Rumrill Boulevard and San Pablo Avenue where existing slip lanes are recommended to be removed. The transit bus[5] was used to model turning movements at bus stops and relevant intersections, and a passenger vehicle[6] was used to model turning movements in and out of driveways.

Implementation Timeline

The Class IV bicycle lane in Alternative 2 can be implemented in the short-term, except for infrastructure reconstruction of the curb line, drainage and traffic signals. For a short-term implementation, elements such as the bicycle lane buffer, corner curb extensions, and bus boarding islands can be constructed using lower cost materials such as flexible delineators, parking stops, thermoplastic paint, and modular rubber platforms. Signal timing adjustments can also be implemented in the short-term. If desired, the project can be implemented with lower cost materials in the short term, with permanent infrastructure upgrades in the long term. Long-term modifications may require a phased implementation to minimize disruption to the corridor as modifications are constructed.

4 AutoTURN SU-30 design vehicle

5 AutoTURN CITY-BUS design vehicle

6 AutoTURN PASSENGER CAR design vehicle

Conceptual Design

Design Overview

The preferred concept for Broadway Avenue is a Class IV two-way bicycle lane design (Alternative 2). This concept would remove an on-street parking lane to accommodate the two-way bicycle facility (Figure 17). This concept would accommodate bus service with bus boarding islands adjacent to the two-way bicycle lane at bus stops (Figure 18), and ties in with planned Class IV facilities on Rumrill Boulevard as well as the proposed bicycle facilities on San Pablo Avenue and El Portal Drive. See Appendix D for the full concept design plans.

Benefits of the design include:

- Protected two-way bicycle lane provides a safer and more comfortable connection between neighborhood residences and schools and other local destinations;
- Improved crosswalks to provide better pedestrian connectivity and safety;
- Traffic calming elements—such as corner curb extensions and narrowed vehicle lane widths—may lower vehicle speeds on the corridor; and
- More efficient bus service through in-lane stops and optimized stop spacing.

Figure 17: Broadway Avenue – Typical Bus Stop Configuration with Bus Boarding Island in Front of Two-Way Separated Bicycle Lane

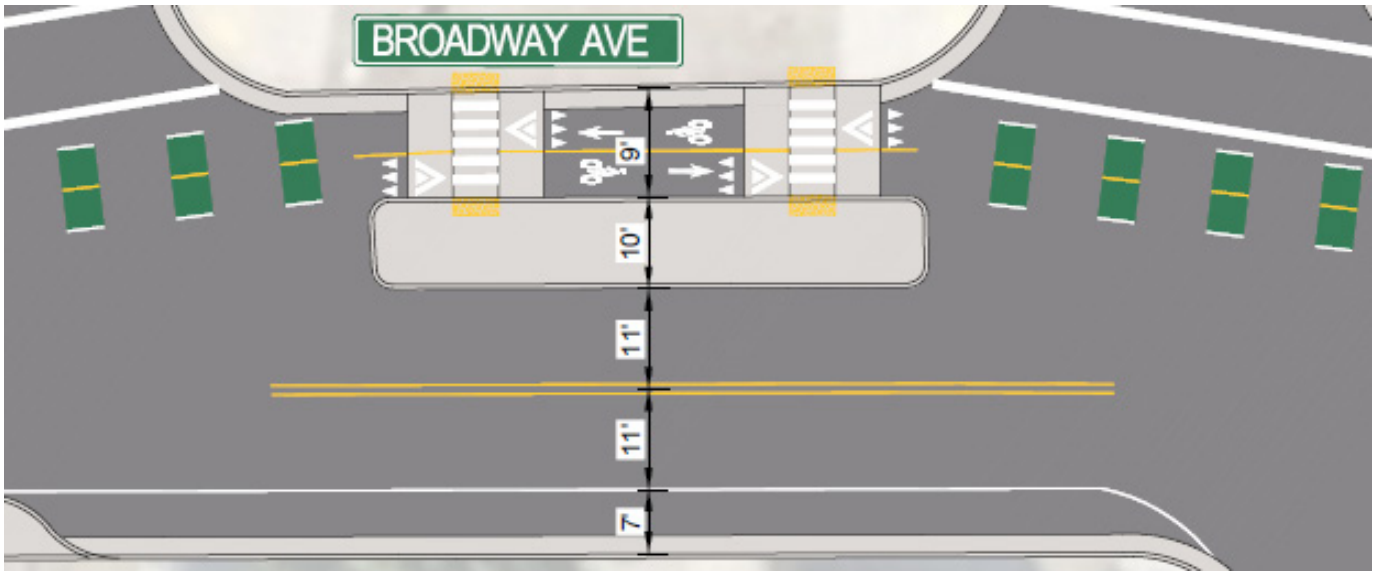
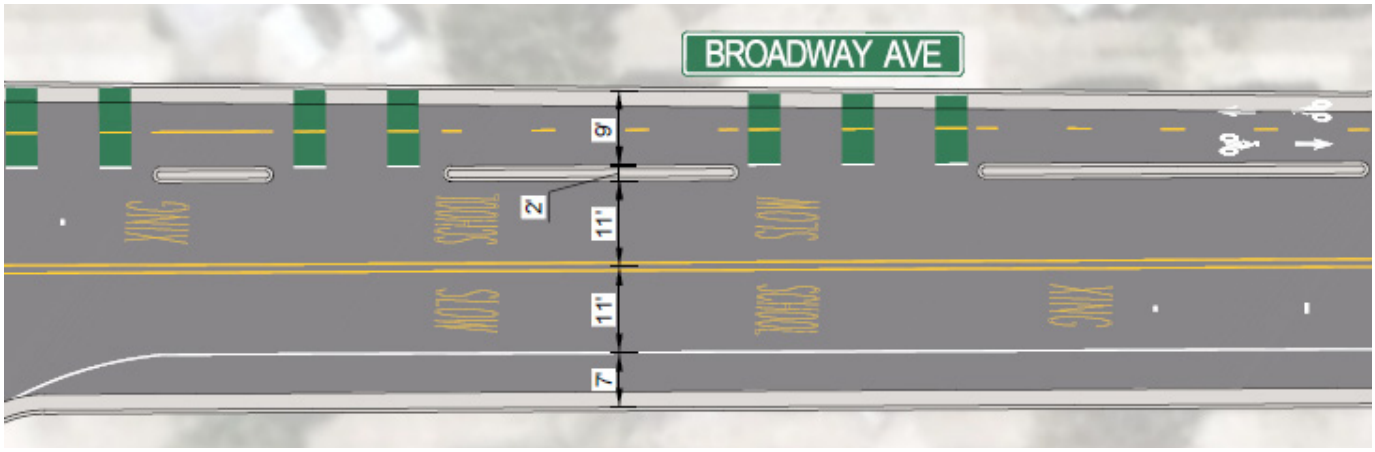


Figure 18: Broadway Avenue – Typical Segment with Two-Way Separated Bicycle Lane



Traffic Analysis

The preferred Class IV two-way bicycle lane design (Alternative 2) may require some modifications at the two (2) signalized intersections: Broadway Avenue & Rumrill Boulevard and Broadway Avenue/El Portal Drive & San Pablo Avenue.

At Broadway Avenue & Rumrill Boulevard, this Corridor Study recommends some signal phasing changes to limit conflicts between the Broadway Avenue two-way bicycle lane and the bicycle and traffic movements on Rumrill Boulevard (incorporating the road diet and Class IV bicycle lane design of the ongoing Rumrill Boulevard Complete Streets Project). Recommended changes include prohibiting "right-turns on red" from westbound Broadway Avenue to northbound Rumrill Boulevard and from southbound Rumrill Boulevard to westbound Broadway Avenue.

At Broadway Avenue/El Portal Drive & San Pablo Avenue, this Corridor Study recommends eliminating the right-turn slip lane from southbound San Pablo Avenue to westbound Broadway Avenue, and converting the outside drive lane to a shared through/right-turn lane.

The right-turn volumes are low during the morning and evening peak hours (18 and 16, respectively[7]) and eliminating the slip lanes will result in slower vehicle turning speeds. AutoTURN vehicle turning models show that a single-unit rear axle truck can make this right turn if the pedestrian "pork-chop" island is modified to be smaller through a larger curb radius on the corner, while allowing the existing signal pole to remain in place. A more detailed evaluation will be required as part of final design to determine if conduit pullboxes need to be relocated.

Table 8 and Table 9 summarize the movement, approach, and overall LOS and delay for the signalized intersections of Broadway Avenue & Rumrill Boulevard and Broadway Avenue/El Portal Drive & San Pablo Avenue for Alternative 2. No notable traffic operations deficiencies were found. The northbound through drive lane movement at Broadway Avenue & Rumrill Boulevard is expected to be close to capacity during the evening peak hour, a likely outcome of the two-to-one lane reduction in the Rumrill Boulevard Complete Streets Project. The full Reports can be found in Appendix B.

Table 8: **Broadway Avenue & Rumrill Boulevard** – Traffic Operations Summary (Preferred Alternative Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
Broadway Avenue & Rumrill Boulevard	Eastbound	Left	D (49.7)	0.48	D (47.5)	0.42
		Through	C (21.4)	0.35	D (36.2)	0.51
		Right	-	-	-	-
		Approach	C (22.6)	-	D (37.5)	-
	Westbound	Left	B (10.7)	0.26	C (33.2)	0.69
		Through	B (12.9)	0.17	C (33.8)	0.67
		Right	-	-		-
		Approach	B (11.8)	-	C (33.6)	-
	Northbound	Left	C (21.1)	0.04	A (7.6)	0.05
		Through	D (40.3)	0.83	D (43.4)	0.99
		Right	-	-	-	-
		Approach	D (39.9)	-	D (42.4)	-
	Southbound	Left	C (23.4)	0.08	C (20.4)	0.13
		Through	C (27.4)	0.53	B (11.2)	0.32
		Right	-	-	-	-
		Approach	C (27.2)	-	B (11.6)	-

7 City of San Pablo (2020)

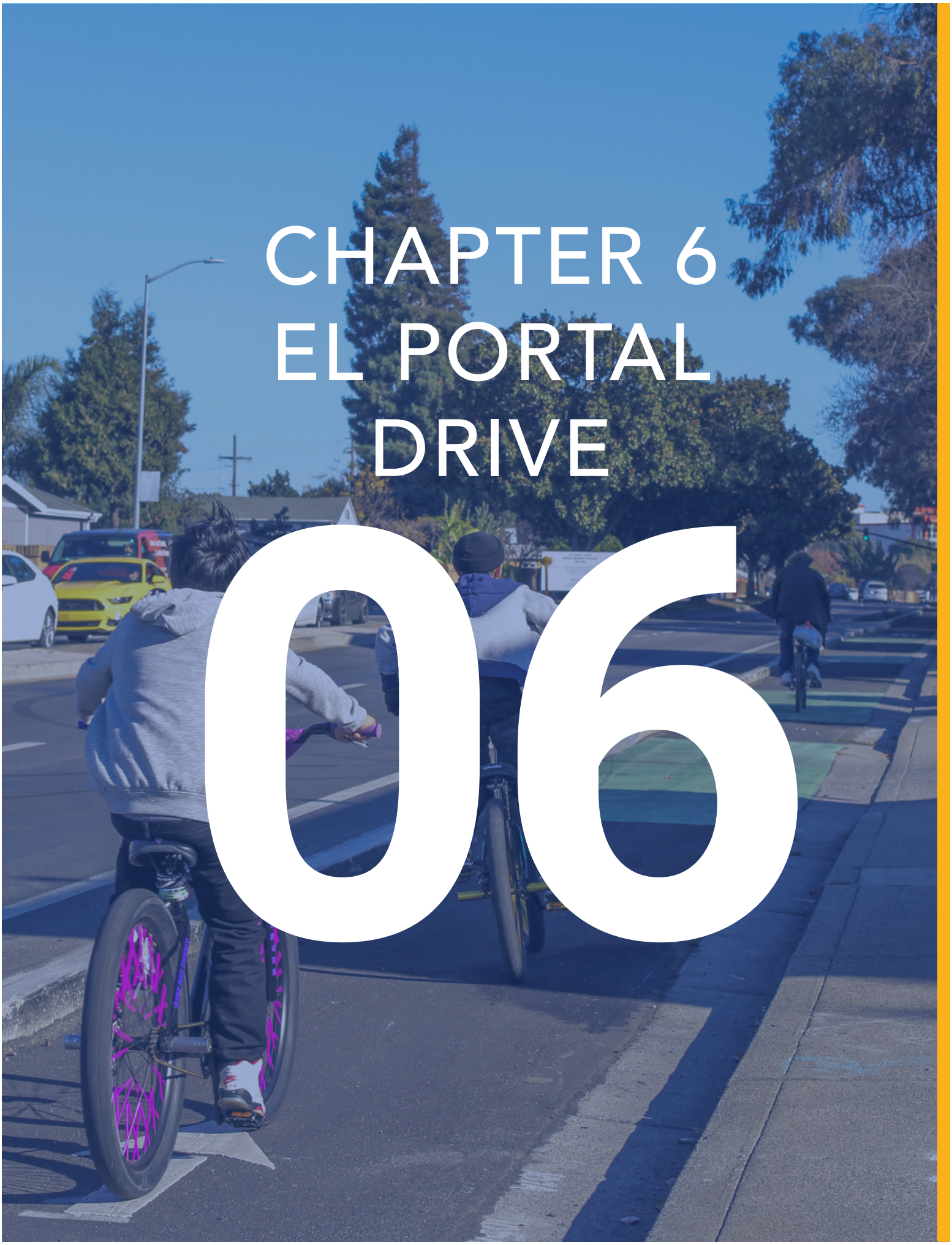
Table 9: **Broadway Avenue/El Portal Drive & San Pablo Avenue** – Traffic Operations Summary
(Preferred Alternative Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
Broadway Avenue/El Portal Drive & San Pablo Avenue	Eastbound	Left	C (28.8)	0.11	C (34.3)	0.11
		Through	D (44.4)	0.86	D (43.4)	0.74
		Right	-	-	-	-
		Approach	D (43.9)	-	D (43.1)	-
	Westbound	Left	E (58.0)	0.72	D (49.1)	0.54
		Through	C (24.9)	0.57	C (26.0)	0.28
		Right	B (19.6)	0.11	C (24.4)	0.11
		Approach	C (29.8)	-	C (29.2)	-
	Northbound	Left	E (60.8)	0.70	E (63.9)	0.72
		Through	D (41.6)	0.37	C (25.1)	0.62
		Right	B (19.2)	0.12	B (12.7)	0.07
		Approach	D (42.2)	-	C (31.0)	-
	Southbound	Left	F (88.6)	0.90	E (67.1)	0.68
		Through	C (23.2)	0.73	C (20.4)	0.41
		Right	-	-	-	-
		Approach	D (38.2)	-	C (30.3)	-

Cost Estimate

Per Caltrans unit costs[8], the estimated construction cost for the Broadway Avenue corridor improvements is approximately $3,730,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, and other factors.

8 Caltrans Contract Cost Database, District 4, 2019-2021 costs



CHAPTER 6
EL PORTAL DRIVE

06

Corridor Background

El Portal Drive is an east/west minor arterial street (San Pablo Avenue to the City limit west of I-80) that provides access to the College Center Shopping Center, Contra Costa College, I-80, and the unincorporated Rollingwood residential neighborhood. El Portal Drive also connects to Road 20 to provide access to Helms Middle School and the San Pablo Community Center.

The City's Bicycle and Pedestrian Master Plan (BPMP, 2017) identified El Portal Drive as a potential candidate for Class II bicycle lanes between San Pablo Avenue and Glenlock Street to provide better east/west bicycle connectivity across the City. The proposed bicycle lanes on El Portal Drive would connect to the existing Class II bicycle lanes on Church Lane, Class II/IV bicycle lanes on El Portal Drive between Church Lane and Fordham Street, and potential future Class IV bicycle lanes along Road 20, San Pablo Avenue, and Broadway Avenue.

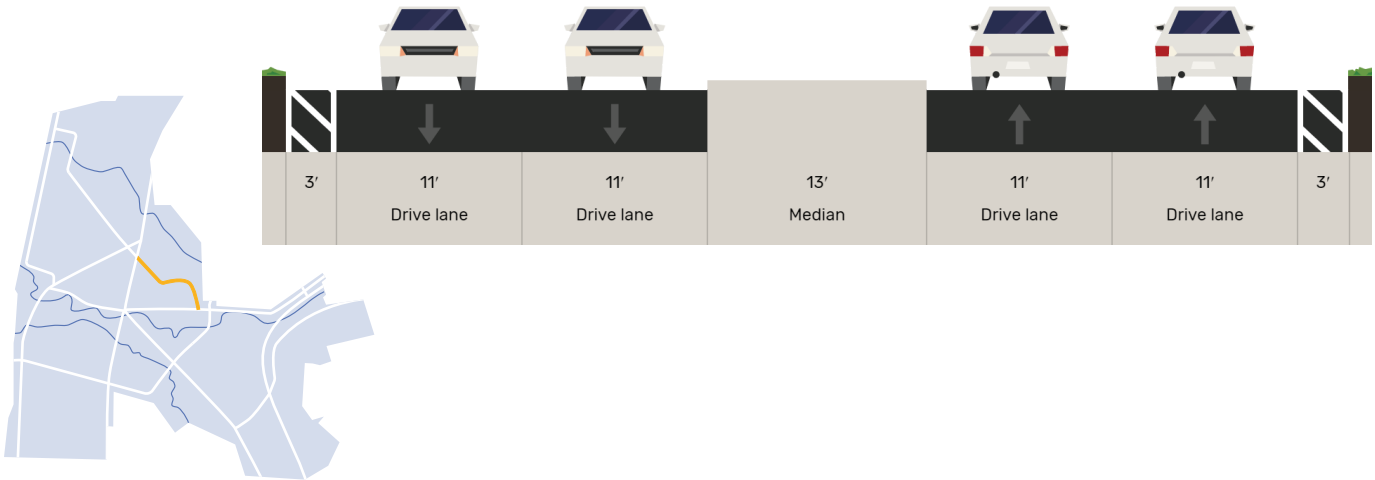
Typical Cross Section of El Portal Drive.

This chapter focuses on the segment of El Portal Drive from San Pablo Avenue to Church Lane, where the existing eastbound Class IV and westbound Class II bicycle facilities are already located. However, additional bicycle facility changes may be needed east of Church Lane to better align with the recommended design.

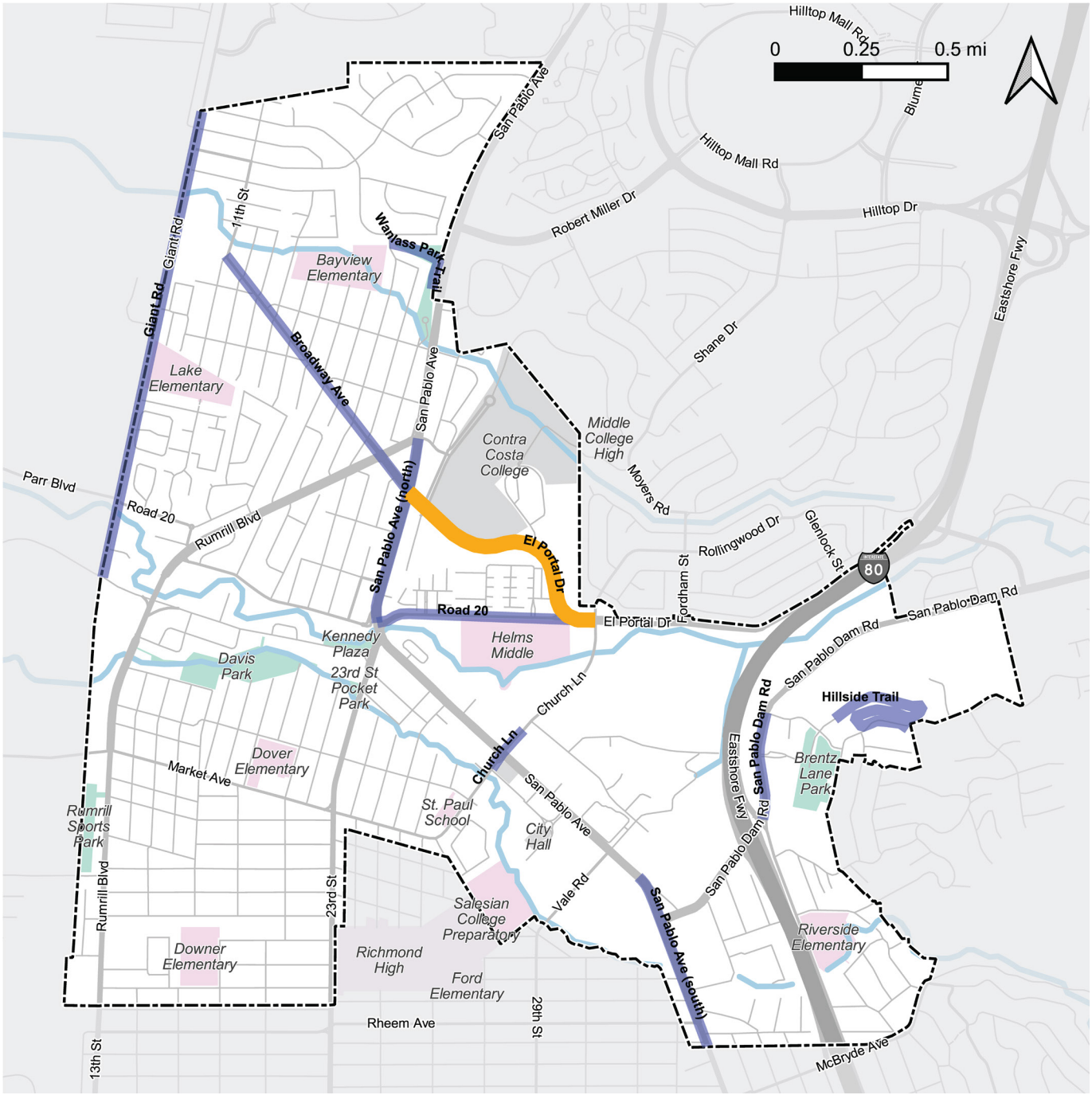
Existing Roadway Configuration

El Portal Drive is a four-lane street with a center landscaped median and limited access to adjacent properties. There is no on-street parking on El Portal Drive between San Pablo Avenue and Church Lane, but there are three-foot shoulders in each direction. For a majority of the corridor, the roadway curb-to-curb width is 63 feet, and the available right-of-way is 76 feet. The curb-to-curb width from the sidewalk to the center median is 25 feet in each direction (Figure 19). There are wider segments of El Portal Drive, including between San Pablo Avenue and Mission Bell Drive, and between Road 20 and Church Lane.

Figure 19: El Portal Drive – Existing Conditions Cross Section (Facing East)



Study Corridors



Project Corridors

- El Portal Dr
- Other Corridors

Connecting Active Transportation Facilities

El Portal Drive connects to the existing southbound Class II bicycle lane on Church Lane. There is also a northbound Class II bicycle lane on Church Lane, although it terminates south of the Church Lane & El Portal Drive intersection. In 2020, a Class IV bicycle lane—with a bioretention facility as the buffer—was installed along eastbound El Portal Drive from Church Lane to Fordham Street as part of the El Portal Drive Urban Greening Project. A westbound El Portal Drive Class II bicycle lane from Fordham Street to Church Lane was also installed through this Project. Class IV separated bicycle lanes are proposed along Road 20, San Pablo Avenue, and Broadway Avenue through this Corridor Study.

There are sidewalks on both sides of El Portal Drive, and all cross streets, between San Pablo Avenue and Church Lane. There are marked crosswalks across all cross streets for the length of the corridor, plus marked crosswalks across El Portal Drive at the following locations:

- San Pablo Avenue (northwest and southeast legs of intersection)
- Mission Bell Drive (northwest and southeast legs of intersection, although the Church/Willow and El Portal/Mission Bell Intersection Improvement Project plans to remove the northwest crosswalk and add a rectangular rapid flashing beacon or RRFB on the southeast crosswalk)
- Midblock location adjacent to the Contra Costa College Knox Performing Arts Center (200 feet west of Castro Road) with an RRFB
- Road 20 (southeast leg of intersection)
- Church Lane (west and east legs of intersection)

There are currently multiple AC Transit bus stops along El Portal Drive. As of 2021, the provided bus services are: Line 72 twice-hourly service seven (7) days a week between the Hilltop Mall and Jack London Square; Line 74 twice-hourly service seven (7) days a week between Marina Bay and the intersection of Castro Ranch Road and San Pablo Dam Road; Line 669 school service Monday to Friday to Juan Crespi Middle School; and Line 676 school service Monday to Friday to De Anza High School and Contra Costa College. There are two (2) northwest-bound stops and two (2) southeast-bound stops along El Portal Drive between San Pablo Avenue and Church Lane.

Class IV bicycle lane with bioretention buffer on El Portal Drive.

Previous Planning Efforts

The 2019 City of San Pablo Complete Streets Safety Assessment (CSSA) contains both short- and long-term recommendations for El Portal Drive. In the short term, the CSSA recommends pedestrian signal adjustments at the El Portal Drive/Broadway & San Pablo Avenue intersection and El Portal Drive & Road 20 intersection. In the long term, the CSSA recommends:

- a road diet to install separated bicycle lanes on El Portal Drive,
- removing the slip lanes at the El Portal Drive/ Broadway & San Pablo Avenue intersection,
- reconstructing medians and constructing corner curb extensions at the El Portal Drive & Mission Bell Drive intersection to reduce pedestrian crossing distances and exposure to vehicles,
- removing the midblock crossing west of Castro Road and signalizing the Castro Road intersection or converting it into a roundabout, and
- removing the slip lane at the El Portal Drive & Road 20 intersection or converting the intersection into a roundabout.

The 2019 *Systemic Safety Analysis Report* (SSAR) contains both short- and long-term recommendations for El Portal Drive. Short-term recommendations include:

- enhancing existing marked crosswalks at Mission Bell Drive to become high visibility crossings (e.g., installing a RRFB and advance yield lines) and
- implementing signal timing adjustments at the intersections with San Pablo Avenue and Church Lane.

Long-term SSAR recommendations include:

- removing the slip lanes at the San Pablo Avenue and Road 20 intersections,
- installing pedestrian-scale lighting along the corridor, and
- installing new signal infrastructure at the intersection with Church Lane.

Finally, the 2019 Green Infrastructure Plan recommended completion of the El Portal Drive Urban Greening Project (including a bioswale-protected Class IV bicycle facility on El Portal Drive) between Church Lane and Fordham Street, which was completed in 2020.

Design Alternatives

Two (2) design alternatives were considered for El Portal Drive. Alternative 1 (Figure 20) would reconfigure El Portal Drive to include Class IV bicycle lanes in each direction by removing one (1) vehicle lane and the shoulder in each direction. Depending on the space available at bus stops, buses would either pull into the bicycle lane to access the curb, resulting in bus/bicycle mixing zones, or would pull up to bus boarding islands with the bicycle lane running between the bus boarding island and the sidewalk, thus avoiding bus/bicycle conflicts.

Alternative 2 (Figure 21) would remove one (1) northwest-bound vehicle lane and the northeast shoulder to install a Class IV two-way bicycle lane on the northeast side of the street. At bus stops, the bicycle lane buffer is expanded into a bus boarding island with the two-way separated bicycle lane running between the bus boarding island and the sidewalk.

Figure 20: El Portal Drive – Alternative 1 Class IV One-Way Bicycle Lanes (Facing East)

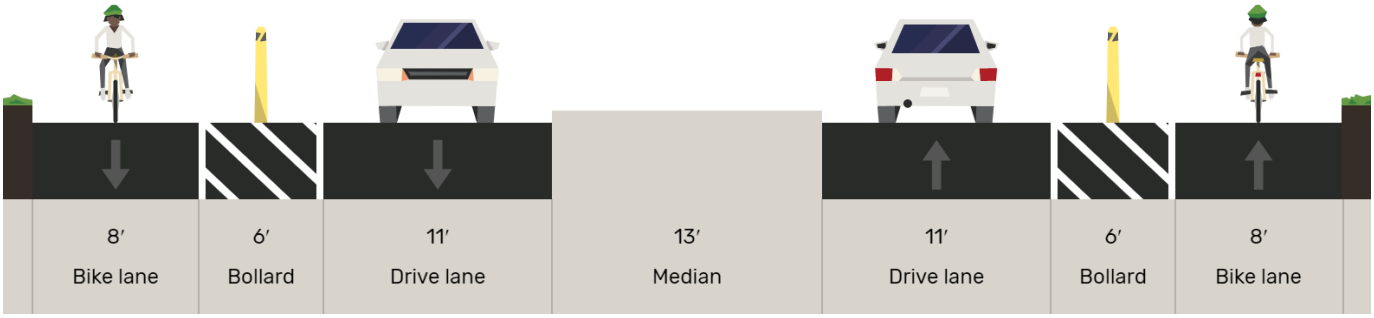
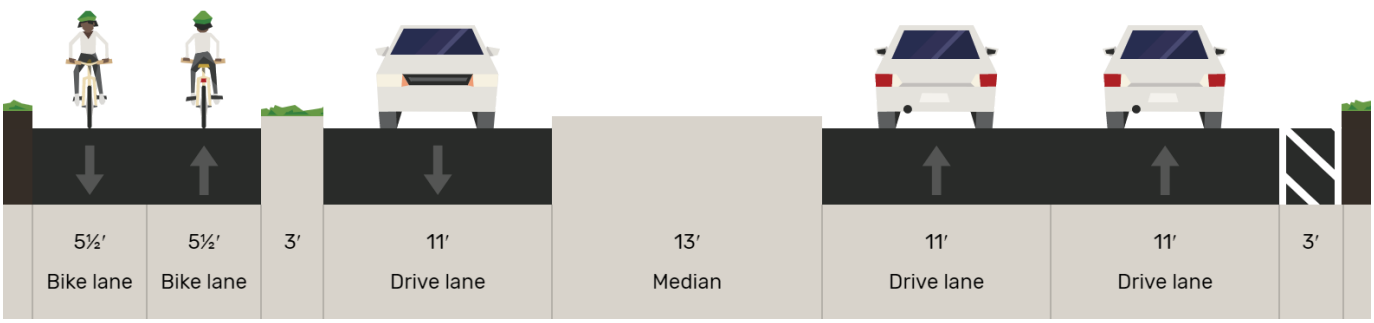


Figure 21: El Portal Drive – Alternative 2 Class IV Two-Way Bicycle Lane (Facing East)



Community Priorities

During the engagement process, community members and stakeholders were asked to share how they use El Portal Drive, and what improvements they would like to see along the corridor. Survey respondents described El Portal as a major thoroughfare carrying cars through San Pablo and toward I-80. Input collected during the survey and workshop focused overwhelmingly on driver behavior: community members perceive high speeds and reckless driving, especially at blind curves and intersections. Of those who filled out the online survey and interactive web-map, 55 percent indicated that they bicycle along El Portal Drive. Sixty-four percent of respondents reported that they walk along El Portal Drive sometimes or often. In response to a question about what would make El Portal Drive safer, most respondents said bicycle lanes, followed by improved crossing opportunities and slower traffic. In response to community feedback, the Project Team focused on design alternatives that are known to slow traffic and provide safe passage for bicyclists (i.e., Class IV bicycle lanes).

"This street is BUSY! I feel very unsafe due to fast moving traffic, poor sight lines and what generally feels like very impatient drivers."

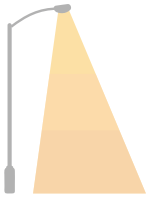
55%

64%

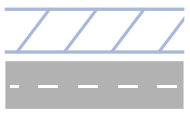
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Traffic Analysis

A traffic operations analysis was conducted on El Portal Drive to document existing conditions through level of service (LOS)[1], delay (measured in seconds), and volume-to-capacity ratio[2]. This analysis was completed at corridor intersections where concept alternatives include geometric and/or traffic signal modifications (e.g., removing a travel lane, modifying lane geometry, changing signal timing). Existing conditions traffic analysis results serve as a comparative baseline for recommended intersection modifications.

Traffic counts on El Portal Drive include pre-COVID-19 pandemic counts at Church Lane (October 2018) and counts in June 2021 before public schools were back in session and when Contra Costa College classes were being conducted virtually. Additionally, traffic counts on Road 20 were conducted in October 2021 after Helms Middle School had reopened for in-person learning and the Community Center reopened for in-person events. All counts were calibrated to reflect pre-COVID-19 conditions.

Table 10, Table 11, Table 12, and Table 13 summarize the movement, approach, and overall LOS and delay for the relevant intersections on El Portal Drive respectively: San Pablo Avenue, Mission Bell Drive, Road 20, and Church Lane/Rollingwood Drive. The full Reports can be found in Appendix B.

Table 10: **El Portal Drive/Broadway Avenue & San Pablo Avenue** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive/Broadway Avenue & San Pablo Avenue	Eastbound	Left	C (28.8)	0.11	C (34.3)	0.11
		Through	D (44.4)	0.86	D (43.4)	0.74
		Right	-	-	-	-
		Approach	D (43.9)	-	D (43.1)	-
	Westbound	Left	E (58.0)	0.72	D (49.1)	0.54
		Through	C (21.3)	0.30	C (26.0)	0.28
		Right	B (19.3)	0.08	C (24.4)	0.11
		Approach	C (27.4)	-	C (29.2)	-
	Northbound	Left	E (60.8)	0.70	E (63.9)	0.72
		Through	D (41.6)	0.37	C (25.1)	0.62
		Right	B (19.2)	0.12	B (12.7)	0.07
		Approach	D (42.2)	-	C (31.0)	-
	Southbound	Left	F (88.6)	0.90	E (67.1)	0.68
		Through	C (22.8)	0.71	C (20.2)	0.39
		Right	C (22.5)	0.01	C (20.1)	0.01
		Approach	D (37.9)		C (30.2)	

1 LOS describes traffic conditions—the amount of traffic congestion—at an intersection or on a roadway. LOS ranges from A to F, with A indicating a condition of little or no congestion and F indicating a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. For intersections, LOS is based on the average delay experienced by all traffic using the intersection during the busiest (peak) 15-minute period. LOS A through D are generally considered acceptable.

2 Volume-to-capacity ratio (v/c) represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c approaches 1.0, traffic becomes unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.

Table 11: **El Portal Drive & Mission Bell Drive** – Traffic Operations Summary (Existing Conditions – Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Mission Bell Drive	Eastbound	Left/Through	A (1.3)	0.02	A (1.0)	0.02
		Through/Right	A (0.0)	0.13	A (0.0)	0.17
		Approach	A (1.3)	-	A (0.4)	-
	Westbound	Left	A (8.2)	0.03	A (8.5)	0.02
		Through	A (0.0)	0.09	A (0.0)	0.15
		Through/Right	A (0.0)	0.06	A (0.0)	0.10
		Approach	A (0.08)	-	A (0.5)	-
	Northbound	Right	A (9.7)	0.05	B (10.1)	0.07
	Southbound	Left	C (15.5)	0.11	C (21.6)	0.22
		Through/Right	B (13.1)	0.07	C (15.2)	0.10
		Approach	B (14.5)	-	C (19.1)	-

Table 12: **El Portal Drive & Road 20** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Road 20	Eastbound (Road 20)	Left	C (21.5)	0.29	C (25.8)	0.51
	Westbound (Driveway)	Right	C (20.0)	0.0	C (20.9)	0.0
	Northbound (El Portal Drive)	Left	B (13.8)	0.28	B (11.3)	0.28
		Through	B (16.2)	0.58	B (13.8)	0.50
		Approach	B (15.7)	-	B (13.5)	-
	Southbound (El Portal Drive)	Through	B (15.5)	0.53	B (15.0)	0.60
		Right	B (12.0)	0.08	B (10.5)	0.04
		Approach	B (15.0)	-	B (14.7)	-

Table 13: **El Portal Drive & Church Lane/Rollingwood Drive** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Church Lane/Rollingwood Drive	Eastbound	Left	E (64.8)	0.67	D (51.3)	0.65
		Through	F (92.3)	1.00	D (39.0)	0.70
		Right	D (47.4)	0.21	C (30.6)	0.13
		Approach	E (74.4)	-	D (38.8)	-
	Westbound	Left	F (105.0)	1.02	D (50.0)	0.79
		Through	D (43.8)	0.67	C (26.3)	0.48
		Right	-	-	-	-
		Approach	E (65.7)	-	C (34.2)	-
	Northbound	Left	D (50.8)	0.50	D (41.5)	0.44
		Through	D (53.1)	0.58	D (46.6)	0.64
		Right	D (48.0)	0.20	D (39.0)	0.20
		Approach	D (49.9)	-	D (41.9)	-
	Southbound	Left	-	-	-	-
		Through	F (94.8)	1.02	D (48.8)	0.67
		Right	C (25.7)	0.10	D (38.8)	0.07
		Approach	E (74.1)	-	D (45.3)	-

Intersection Considerations

El Portal Drive experiences vehicle traffic ranging from passenger vehicles, trucks—predominantly smaller panel trucks and delivery trucks—and AC Transit buses. The one-way and two-way Class IV bicycle lane alternatives were designed using "AutoTURN" models to accommodate all relevant vehicle turning movements. A single-unit rear axle truck[3] was used to model right-turn movements to and from all side streets and commercial driveways. The transit bus[4] was used to model bus turning movements at bus stops and relevant intersections, in particular for the Mission Bell intersection where buses turn left and right onto El Portal Drive. A passenger vehicle[5] was used to model turning movements in and out of driveways.

Implementation Timeline

El Portal Drive Alternatives 1 and 2 can both be implemented in the short-term or long-term, depending on materials used and extent of intersection treatments desired. For a short-term implementation, elements such as the bicycle lane buffer, corner curb extensions, and bus boarding islands can be constructed using lower cost materials such as flexible delineators, parking stops, thermoplastic paint, and modular rubber platforms. Signal timing adjustments can also be implemented in the short-term. Curb line and drainage reconstruction (e.g., as may be required if modifying the intersection at Road 20), as well as signal hardware and infrastructure modifications at signalized intersections are typically long-term investments. For this reason, the project can be implemented with lower cost materials in the short term, with permanent infrastructure upgrades in the long term. Long-term modifications may require a phased implementation to minimize disruption to the corridor as modifications are constructed.

3 AutoTURN SU-30 design vehicle

4 AutoTURN CITY-BUS design vehicle

5 AutoTURN PASSENGER CAR design vehicle

Conceptual Design

Two (2) concept designs were developed for El Portal Drive: Alternative 1, with one-way Class IV bicycle lanes on each side of the road; and Alternative 2, with a two-way Class IV bicycle lane on the northeast side of the road.

Alternative 1: One-Way Bicycle Lanes

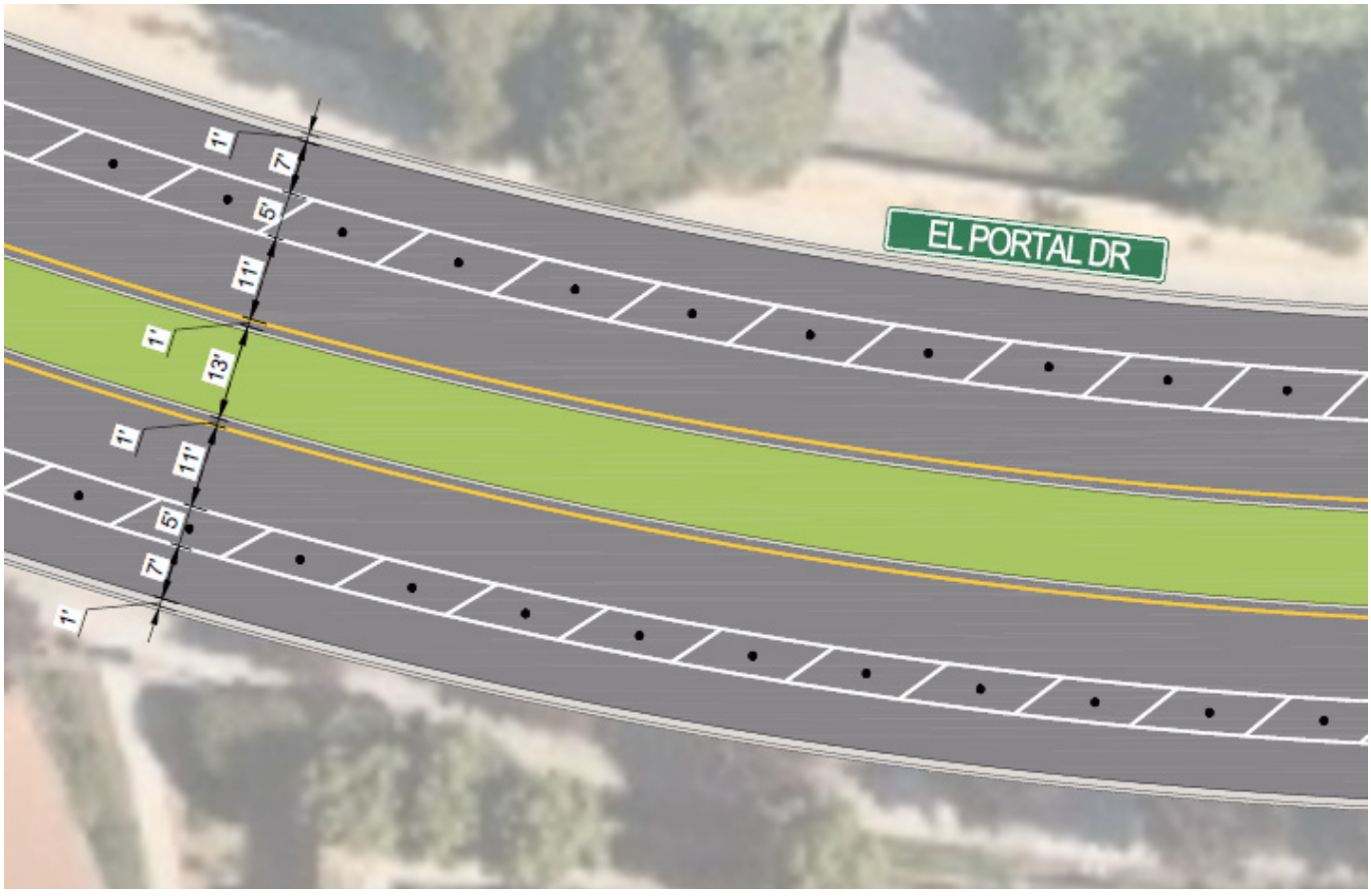
Design Overview

Alternative 1 (one-way Class IV bicycle lanes) removes one (1) vehicle lane and shoulder in each direction and narrows the remaining vehicle lane to accommodate the bicycle facilities (Figure 22). Alternative 1 accommodates bus service with bus/bicycle mixing zones or bus boarding islands adjacent to the one-way bicycle lanes, depending on the space available at bus stops (Figure 23, Figure 24). This configuration directly connects to existing Class II facilities on Church Lane as well as existing Class II and Class IV facilities on El Portal Drive east of Church Lane. Proposed Class IV bicycle facilities on San Pablo Avenue, Broadway Avenue, and Road 20 would also connect to this design, although the transition from a two-way bicycle lane on Broadway Avenue to this El Portal Drive Alternative 1 would be less seamless for bicyclists. See Appendix D for the full concept design plans.

Benefits of the design include:

- Protected bicycle lanes in each direction provide a safer and more comfortable connection to retail, schools, and other local destinations;
- Improved crosswalks to provide better pedestrian connectivity and safety; and
- Narrowed vehicle lanes may lower vehicle speeds along the corridor.

Figure 22: El Portal Drive – Alternative 1: Typical Segment with One-Way Class IV Bicycle Lanes



Traffic Analysis

The following summary tables reflect expected changes in traffic operations of Alternative 1. Modeled changes include removal of one (1) vehicle lane in each direction and removal of the right-turn slip lane from Road 20 to El Portal Drive. Currently, only left turns from Road 20 to El Portal Drive are permitted at this signalized intersection, while right turns are made through the slip lane. Removal of the right-turn slip lane would shift the right turns to the signalized intersection, which would require modifying the "pork-chop" island (e.g., rebuilding the curb and gutter, replacing curb ramps, potentially relocating utilities and traffic signal infrastructure) to accommodate a larger radius at Road 20 & El Portal Drive. These details are shown in the full concept in Appendix D.

In addition to removing one (1) vehicle lane in each direction on El Portal Drive, it is recommended to remove the split phase signal arrangement at Church Lane/Rollingwood Drive (i.e., when the northbound and southbound phases operate independently of one another). This will simplify phasing and improve efficiency of the intersection. Additionally, it is recommended to remove the eastbound right-turn lane from El Portal Drive to Church Lane which will be accommodated by a shared through/right-turn lane. Results of these changes are reflected in the summary tables and in more detail in the Synchro Reports in Appendix B.

Figure 24: El Portal Drive – Alternative 1: Bus Boarding Island in Front of One-Way Class IV Bicycle Lane

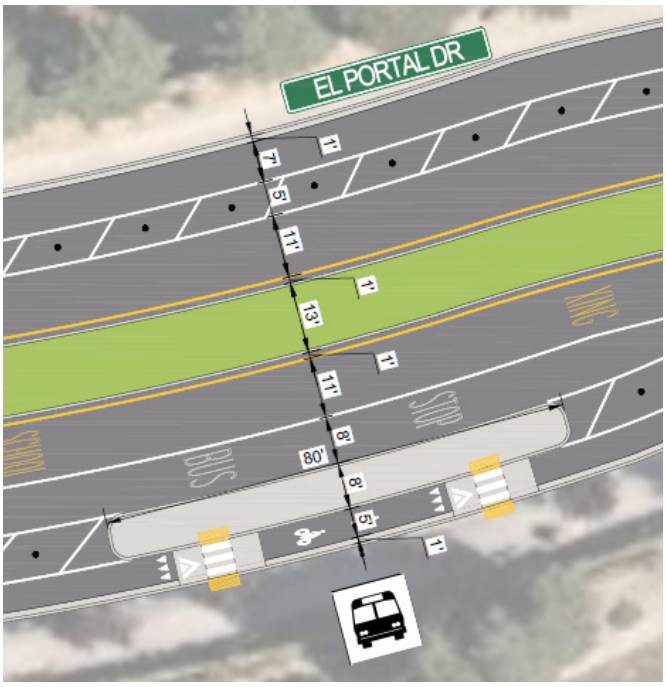
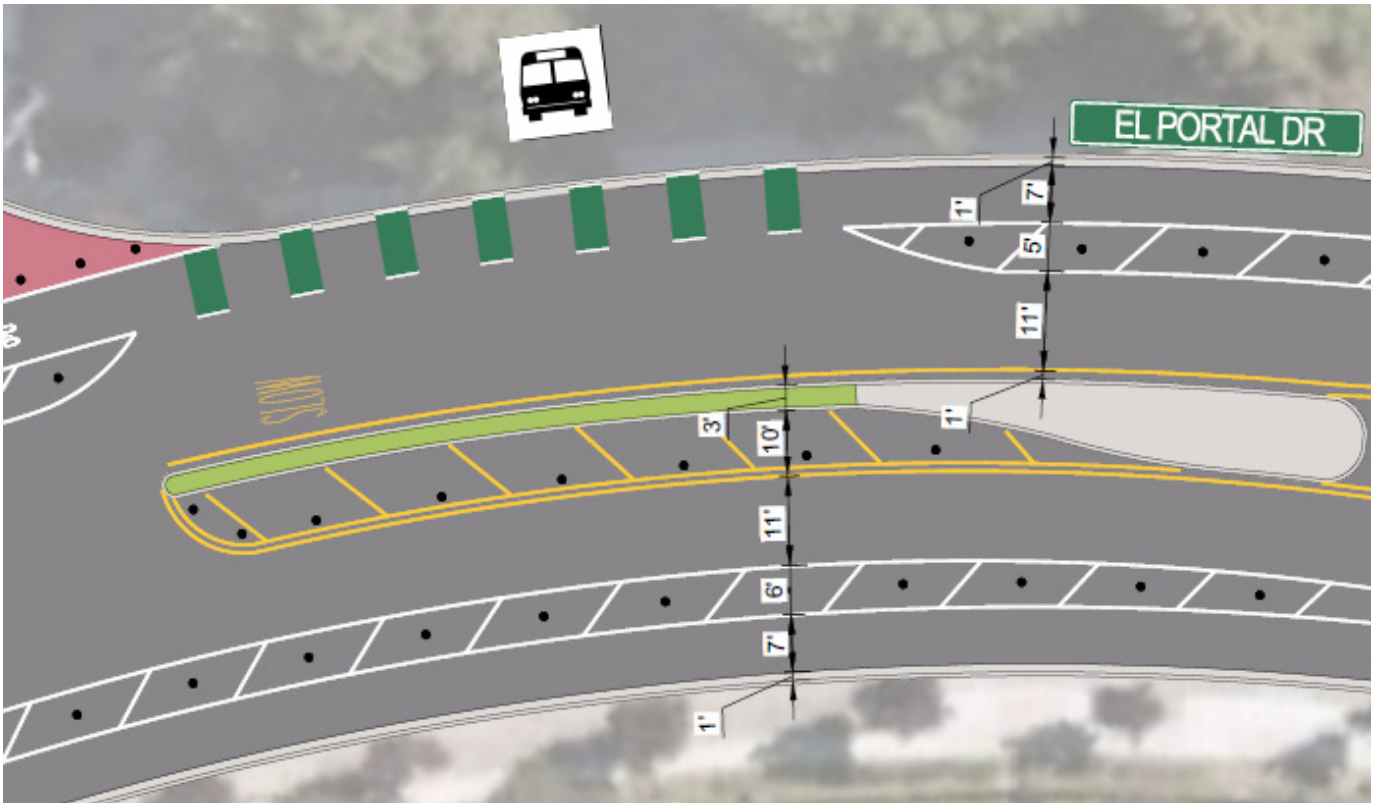


Figure 23: El Portal Drive – Alternative 1: Typical Bus Stop Configurations with Bus/Bicycle Mixing Zone



Under these modeled conditions for Alternative 1, there were no instances where vehicle lane capacity is exceeded, with the exception of the eastbound through movement at San Pablo Avenue where volume-to-capacity exceeds 1.0. This is a result of removing one (1) vehicle through lane, and converting a current vehicle through lane to a right-turn lane, to accommodate the Class IV bicycle lane. The eastbound through movement at San Pablo Avenue has relatively high volumes during the morning peak periods that are easily accommodated today with two (2) through lanes, but reducing to a single lane will likely result in vehicles queuing through the adjacent Rumrill Boulevard intersection to the west.

Table 14: **El Portal Drive/Broadway Avenue & San Pablo Avenue** – Traffic Operations Summary (One-Way Bicycle Lanes)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive/Broadway Avenue & San Pablo Avenue	Eastbound	L	C (22.7)	0.08	C (30.1)	0.09
		T	E (75.2)	1.02	D (52.4)	0.87
		R	C (22.8)	0.10	C (30.1)	0.10
		Approach	E (64.8)	-	D (46.0)	-
	Westbound	L	F (100.2)	0.91	D (53.7)	0.62
		T	B (17.0)	0.26	C (23.1)	0.25
		R	B (15.5)	0.08	C (21.8)	0.11
		Approach	C (31.5)	-	C (27.5)	-
	Northbound	L	E (71.9)	0.79	E (66.8)	0.77
		T	D (46.9)	0.44	C (28.6)	0.67
		R	C (34.9)	0.11	B (16.2)	0.07
		Approach	D (50.7)	-	C (34.4)	-
	Southbound	L	F (107.6)	0.97	E (70.9)	0.70
		T	C (30.6)	0.86	C (21.2)	0.44
		R	-	-	-	-
		Approach	D (48.3)	-	C (31.8)	-

Table 15: **El Portal Drive & Mission Bell Drive** – Traffic Operations Summary (One-Way Bicycle Lanes – Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Mission Bell Drive	Eastbound	L	A (7.9)	0.02	A (8.3)	0.02
		T/R	A (0.0)	0.22	A (0.0)	0.30
		Approach	A (0.5)	-	A (0.3)	-
	Westbound	L	A (8.2)	0.03	A (8.5)	0.02
		T/R	A (0.0)	0.15	A (0.0)	0.25
		Approach	A (0.08)	-	A (0.5)	-
	Northbound	R	A (10.5)	0.06	B (10.8)	0.07
	Southbound	L	C (17.7)	0.13	C (27.6)	0.28
		T/R	B (13.3)	0.07	C (16.2)	0.11
		Approach	C (15.8)	-	C (23.2)	-

Table 16: **El Portal Drive & Road 20** – Traffic Operations Summary (One-Way Bicycle Lanes)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Road 20	Eastbound (Road 20)	L	C (20.0)	0.20	B (19.9)	0.22
		R	B (19.8)	0.16	B (19.5)	0.13
		Approach	B (19.9)	-	B (19.6)	-
	Westbound (Driveway)	R	B (19.0)	0.0	B (18.8)	0.0
	Northbound (El Portal Drive)	L	D (40.5)	0.79	C (26.2)	0.55
		T	A (5.4)	0.52	A (4.6)	0.46
		Approach	B (12.3)	-	A (9.4)	-
	Southbound (El Portal Drive)	T	B (13.4)	0.66	C (23.3)	0.87
		R	A (7.0)	0.07	A (8.1)	0.04
		Approach	B (12.5)	-	C (23.3)	-

Table 17: **El Portal Drive & Church Lane/Rollingwood Drive** – Traffic Operations Summary (One-Way Bicycle Lanes)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Church Lane/Rollingwood Drive	Eastbound	L	C (27.9)	0.39	C (22.7)	0.47
		T	D (43.9)	0.79	D (35.9)	0.75
		R	-	-	-	-
		Approach	D (42.2)	-	C (34.2)	-
	Westbound	L	D (52.0)	0.89	D (37.1)	0.82
		T	C (33.6)	0.76	C (33.8)	0.78
		R	B (19.2)	0.01	B (18.6)	0.02
		Approach	D (39.8)	-	C (34.5)	-
	Northbound	L	C (28.0)	0.56	C (24.5)	0.42
		T	C (25.7)	0.23	C (29.7)	0.36
		R	C (29.1)	0.20	C (33.2)	0.20
		Approach	C (28.0)	-	C (30.3)	-
	Southbound	L	C (26.3)	0.03	C (30.2)	0.08
		T	D (43.6)	0.79	D (40.7)	0.64
		R	-	-	-	-
		Approach	D (43.1)	-	D (39.9)	-

Alternative 2: Two-Way Bicycle Lane

Design Overview

Alternative 2 (two-way Class IV bicycle lane) removes one (1) vehicle lane and shoulder in the northwest-bound direction and narrows the remaining northwest-bound vehicle lane to accommodate the bicycle facility (Figure 25). Alternative 2 accommodates bus service with bus boarding islands adjacent to the two-way bicycle lane (Figure 26). This configuration connects to existing Class II facilities on Church Lane as well as existing Class II and Class IV facilities on El Portal Drive east of Church Lane. Proposed Class IV bicycle facilities on San Pablo Avenue, Broadway Avenue, and Road 20 would also connect to this design, including a seamless transition from the proposed two-way bicycle lane on Broadway Avenue to this proposed Alternative 2. See Appendix D for the full concept design plans.

Benefits of the design include:

- Protected bicycle lanes in each direction provide a safer and more comfortable connection to retail, schools, and other local destinations;
- Improved crosswalks to provide better pedestrian connectivity and safety;
- Narrowed northwest-bound vehicle lane may lower vehicle speeds in this direction; and
- Minimal changes to the southeast-bound side of the roadway.

Figure 25: El Portal Drive – Alternative 2: Typical Segment with Two-Way Class IV Bicycle Lane

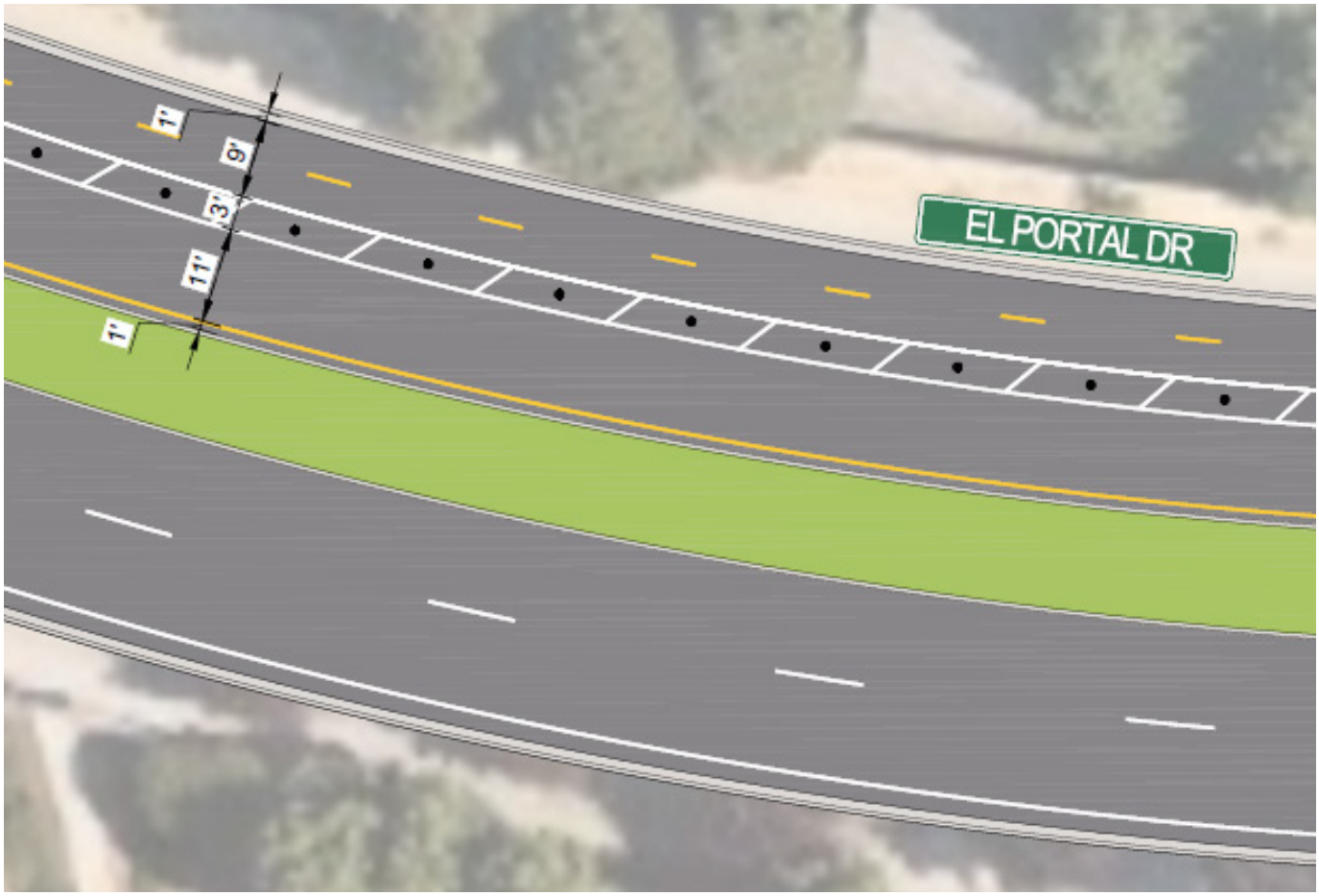
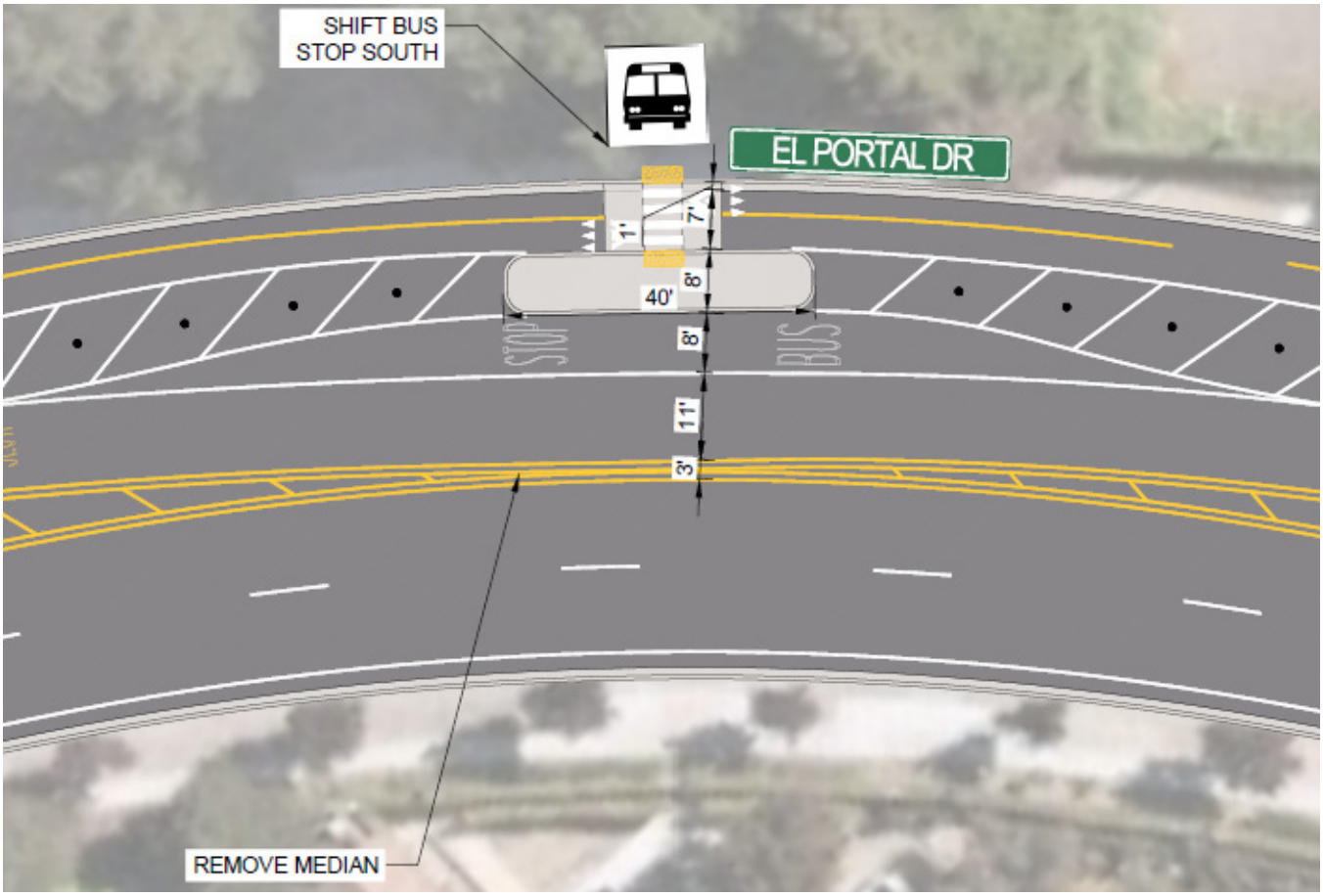


Figure 26: El Portal Drive – Alternative 2: Typical Bus Stop Configuration with Bus Boarding Island in Front of Two-Way Class IV Bicycle Lane



Traffic Analysis

The following traffic operations summary tables reflect expected changes in traffic operations of Alternative 2. Modeled changes include removal of one northwest-bound vehicle lane and removal of the right-turn slip lane from Road 20 to El Portal Drive. Currently, only left turns from Road 20 to El Portal Drive are permitted at this signalized intersection, while right turns are made through the slip lane. Removal of the right-turn slip lane would shift the right turns to the signalized intersection, which would require modifying the "pork-chop" island (e.g., rebuilding the curb and gutter, replacing curb ramps, potentially relocating utilities and traffic signal infrastructure) to accommodate a larger radius at Road 20 & El Portal Drive. These details are shown in the full concept in Appendix D.

In addition to removing one (1) vehicle lane in each direction on El Portal Drive, it is recommended to remove the split phase signal arrangement at Church Lane/Rollingwood Drive (i.e., when the northbound and southbound phases operate independently of one another). This will simplify phasing and improve efficiency of the intersection. Additionally, it is recommended to remove the eastbound right-turn lane from El Portal Drive to Church Lane which will be accommodated by a shared through/right-turn lane. Results of these changes are reflected in the summary tables and in more detail in Appendix B.

Under these modeled conditions for Alternative 2, there were no instances where vehicle lane capacity is exceeded. The impacts to eastbound through capacity at the San Pablo Avenue intersection that were described in Alternative 1 is not an issue under Alternative 2 as the removal of an eastbound through lane is no longer needed, primarily because Alternative 2 includes bike lanes only on the north side of El Portal Drive.

Table 18: **El Portal Drive/Broadway Avenue & San Pablo Avenue** – Traffic Operations Summary (Two-Way Bicycle Lane)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive/Broadway Avenue & San Pablo Avenue	Eastbound	L	C (28.8)	0.11	C (34.3)	0.11
		T	D (44.4)	0.86	D (43.4)	0.74
		R	-	-	-	-
		Approach	D (43.9)	-	D (43.1)	-
	Westbound	L	E (58.0)	0.72	D (49.1)	0.54
		T	C (24.9)	0.57	C (26.0)	0.28
		R	B (19.6)	0.11	C (24.4)	0.11
		Approach	C (29.8)	-	C (29.2)	-
	Northbound	L	E (60.8)	0.70	E (63.9)	0.72
		T	D (41.6)	0.37	C (25.1)	0.62
		R	B (19.2))	0.12	B (12.7)	0.07
		Approach	D (42.2)	-	C (31.0)	-
	Southbound	L	F (88.6)	0.90	E (67.1)	0.68
		T	C (23.2)	0.73	C (20.4)	0.41
		R	-	-	-	-
		Approach	D (38.2)	-	C (30.3)	-

Table 19: **El Portal Drive & Mission Bell Drive** – Traffic Operations Summary (Two-Way Bicycle Lane – Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Mission Bell Drive	Eastbound	L/T	A (1.3)	0.02	A (1.0)	0.02
		T/R	A (0.0)	0.13	A (0.0)	0.17
		Approach	A (0.6)	-	A (0.4)	-
	Westbound	L	A (8.2)	0.03	A (8.5)	0.02
		T/R	A (0.0)	0.15	A (0.0)	0.25
		Approach	A (0.08)	-	A (0.5)	-
	Northbound	R	A (9.7)	0.05	B (10.8)	0.07
	Southbound	L	C (15.5)	0.11	C (21.6)	0.22
		T/R	B (13.6)	0.07	C (16.4)	0.11
		Approach	B (14.7)	-	C (19.6)	-

Table 20: **El Portal Drive & Road 20** – Traffic Operations Summary (Two-Way Bicycle Lane)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Road 20	Eastbound (Road 20)	L	B (19.6)	0.20	B (19.9)	0.22
		R	B (19.4)	0.16	B (19.5)	0.13
		Approach	B (19.5)	-	B (19.6)	-
	Westbound (Driveway)	R	B (18.7)	0.0	B (18.8)	0.0
	Northbound (El Portal Drive)	L	B (15.3)	0.30	B (14.9)	0.31
		T	A (3.4)	0.28	A (3.0)	0.24
		Approach	A (5.7)	-	A (5.6)	-
	Southbound (El Portal Drive)	T	B (17.3)	0.56	B (18.4)	0.66
		R	B (13.2)	0.08	B (12.5)	0.04
		Approach	B (16.7)	-	B (17.9)	-

Table 21: **El Portal Drive & Church Lane/Rollingwood Drive** – Traffic Operations Summary (Two-Way Bicycle Lane)

Intersection	Direction	Movement	AM		PM	
			LOS (Delay)	V/C	LOS (Delay)	V/C
El Portal Drive & Church Lane/Rollingwood Drive	Eastbound	L	C (32.2)	0.49	C (22.6)	0.47
		T	D (53.3)	0.87	D (35.8)	0.75
		R	-	-	-	-
		Approach	D (51.1)	-	C (34.1)	-
	Westbound	L	E (73.6)	0.96	D (36.8)	0.82
		T	D (39.5)	0.80	C (33.6)	0.78
		R	C (21.9)	0.01	B (18.5)	0.02
		Approach	D (51.3)	-	C (34.3)	-
	Northbound	L	C (25.8)	0.44	C (24.5)	0.42
		T	C (25.7)	0.22	C (29.7)	0.36
		R	C (26.1)	0.20	C (33.2)	0.20
		Approach	C (25.9)	-	C (30.4)	-
	Southbound	L	C (29.4)	0.03	C (30.2)	0.08
		T	E (56.8)	0.88	D (40.5)	0.64
		R	-	-	-	-
		Approach	E (56.1)	-	D (39.7)	-

Cost Estimate

Per Caltrans unit costs[6], the estimated construction cost for the El Portal Drive corridor one-way separated bike lane design is approximately $2,410,000, including planning, design, construction management, and contingency. The estimated cost for the two-way bicycle lane design is approximately $2,420,000. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, and other factors.

6 Caltrans Contract Cost Database, District 4, 2019-2021 costs

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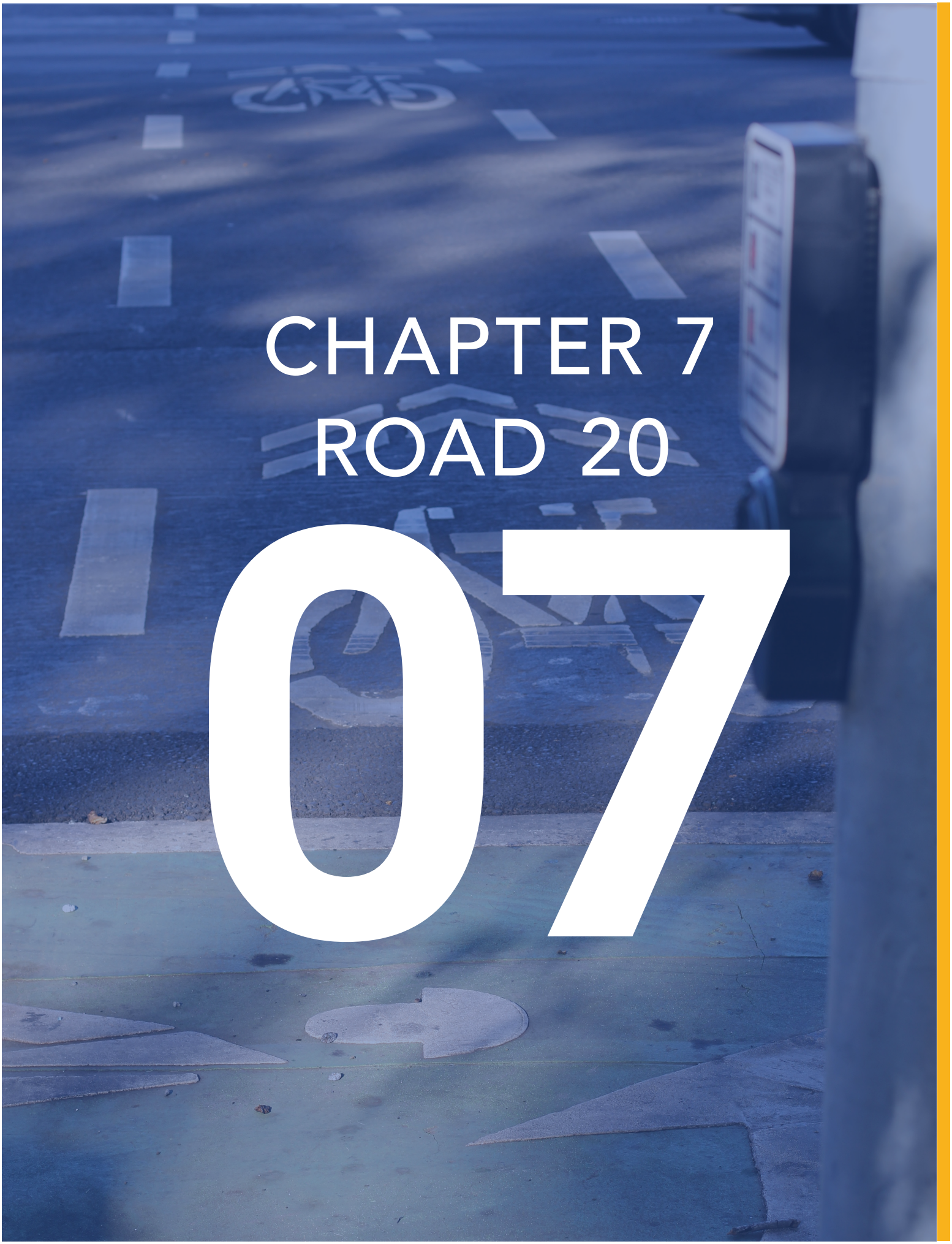


CHAPTER 7
ROAD 20
07

Corridor Background

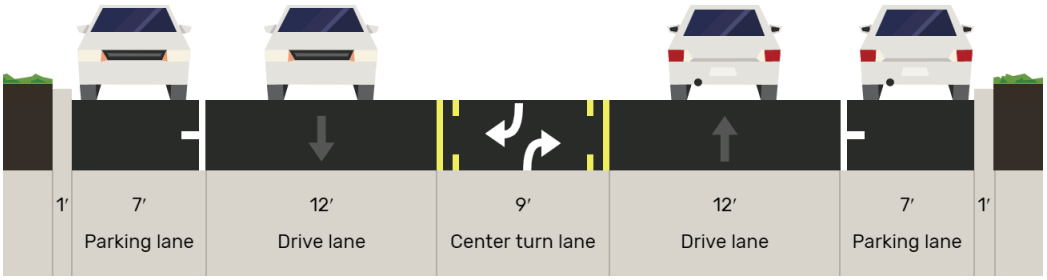
Road 20 is an east/west avenue that connects San Pablo Avenue and 23rd Street to El Portal Drive. Road 20 also provides direct access to Helms Middle School and the San Pablo Community Center, as well as multiple multi-family housing sites. The City's *Bicycle and Pedestrian Master Plan* (BPMP, 2017) identified Road 20 as a potential candidate for a Class I shared-use path on the south side of the roadway, from San Pablo Avenue to El Portal Drive, created by widening the existing sidewalk and relocating utilities. This Corridor Study instead recommends a Class IV bicycle facility on Road 20 that would connect to the existing and proposed Class IV bicycle lanes on San Pablo Avenue, existing Class II bicycle lanes on 23rd Street, and proposed Class IV bicycle facilities on El Portal Drive.

Like the BPMP, this chapter focuses on the segment of Road 20 between San Pablo Avenue and El Portal Drive.

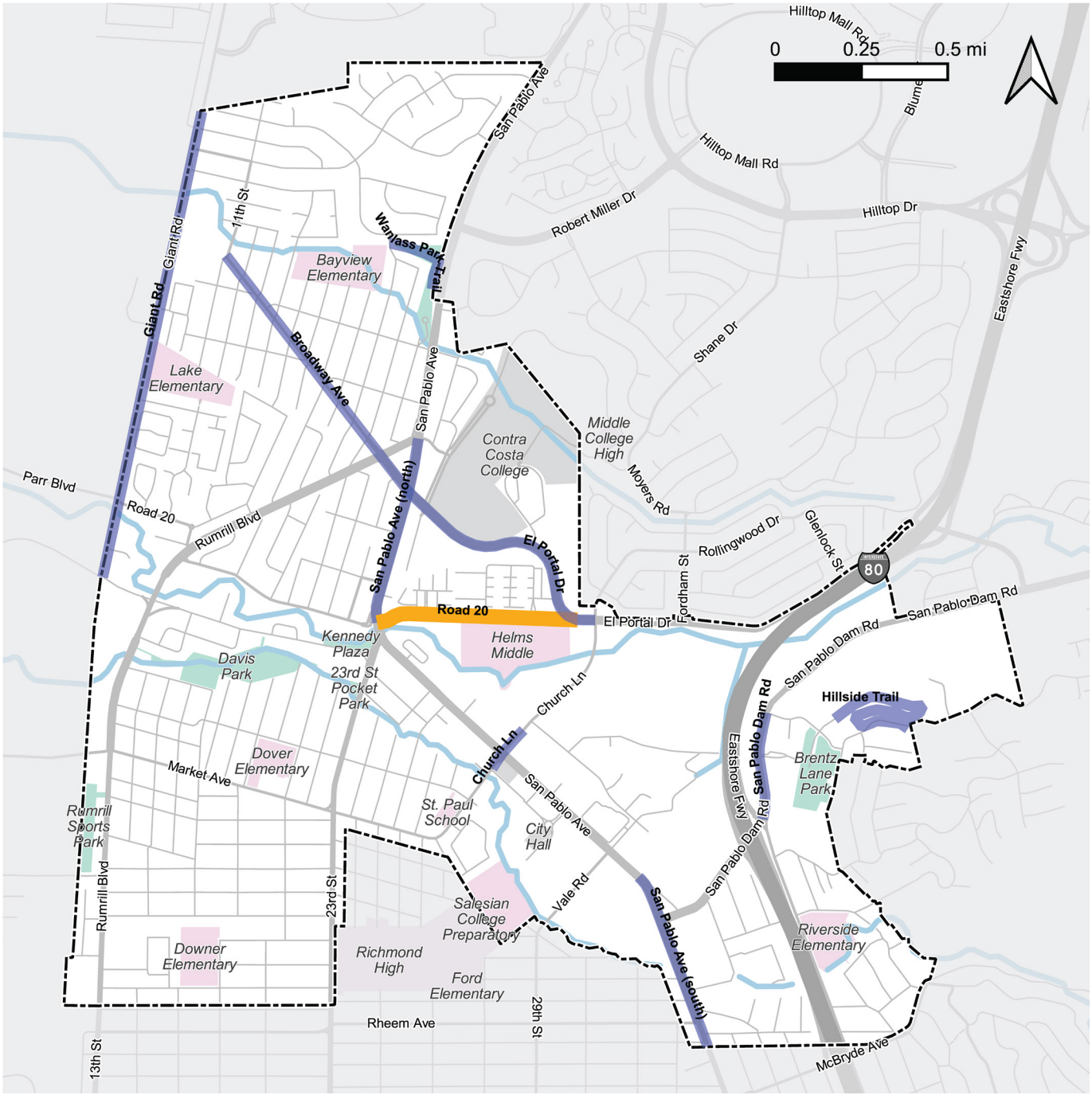
Existing Roadway Configuration

Road 20, between San Pablo Avenue and El Portal Drive, is an east-west minor arterial with one (1) vehicle lane in each direction and a center turn lane. Road 20 has on-street parking and loading zones (i.e., in front of Helms Middle School) on both sides of the street. The roadway curb-to-curb width ranges from 49 to 53 feet within a 65-foot right-of way (Figure 27). There is no center median for the length of the corridor, other than the 230-foot segment on the approach to San Pablo Avenue.

Figure 27: Road 20 – Existing Conditions Cross Section (Facing East)



Study Corridors



Connecting Active Transportation Facilities

Road 20 connects to the existing Class II bicycle lanes on 23rd Street and San Pablo Avenue (south of 23rd Street), and is a short distance from the existing Class II bicycle lanes on Church Lane, and Class II/IV bicycle lanes on El Portal Drive, east of Church Lane. Bicycle facilities on Road 20 would connect to the proposed Class IV bicycle lanes on El Portal Drive and San Pablo Avenue (north of 23rd Street). There are sidewalks on both sides of Road 20 and all cross streets for the length of the corridor. There are marked crosswalks across all cross streets for the length of the corridor, plus marked crosswalks across Road 20 at the following locations:

- San Pablo Avenue (east leg of signalized intersection)
- Abella Circle (West) (west and east legs of signalized intersection)
- Abella Circle (East) (west and east legs of unsignalized intersection)
- El Portal Drive (west leg of signalized intersection and across slip lane)

There are currently multiple AC Transit bus stops along Road 20. As of 2021, the provided bus service is Line 76 twice-hourly service seven (7) days a week between the Richmond Parkway Transit Center and El Cerrito del Norte BART station. There are two (2) westbound stops and two (2) eastbound stops along Road 20 between San Pablo Avenue and El Portal Drive.

Design Alternatives

Two (2) design alternatives were considered for Road 20. Alternative 1 (Figure 28) would reconfigure Road 20 to include one-way Class IV separated bicycle lanes on each side of the street by removing one (1) lane of on-street parking and the center turn lane. At bus stops, buses would pull into bicycle lanes to access the curb, resulting in bus/bicycle mixing zones.

Alternative 2 (Figure 29) would reconfigure Road 20 to include a two-way Class IV bicycle lane on the south side of the street by removing the center turn lane and narrowing the vehicle lanes. At bus stops, a parking lane is removed and the vehicle lanes are shifted horizontally to expand the bicycle lane buffer into a bus boarding island with the two-way bicycle lane running between the bus boarding island and the sidewalk.

Figure 28: Road 20 – Alternative 1 Cross Section (Facing East)

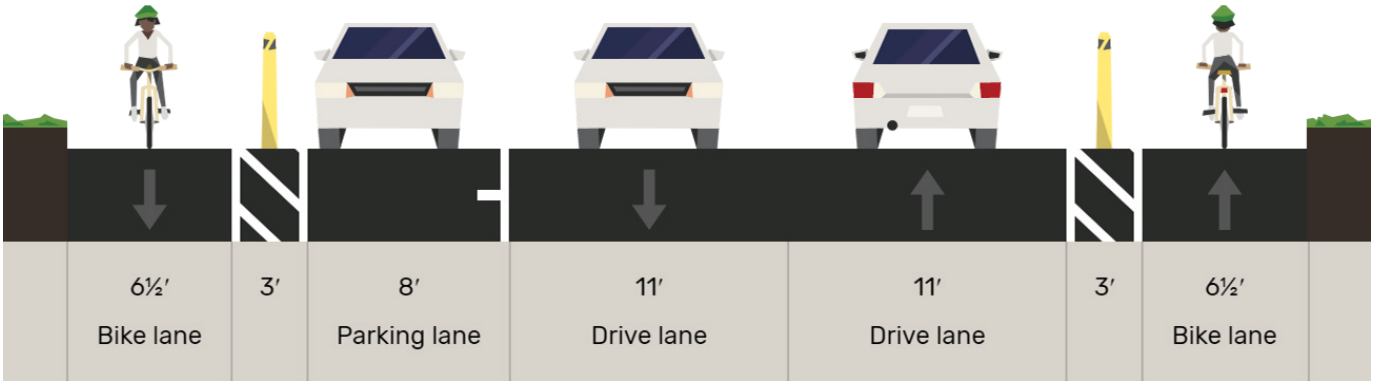
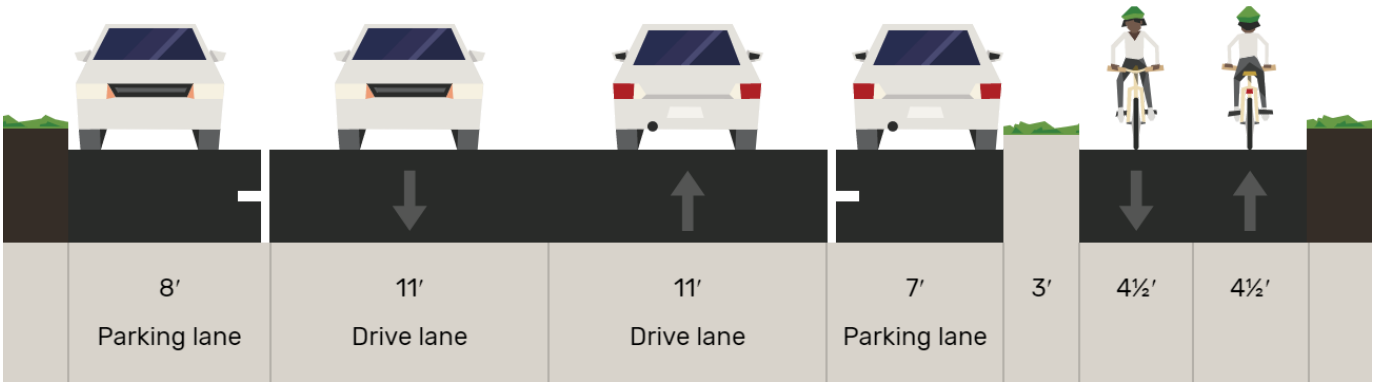


Figure 29: Road 20 – Alternative 2 Cross Section (Facing East)



Community Priorities

During the engagement process, community members and stakeholders were asked to share how they use Road 20, and what improvements they would like to see along the corridor. Of those who filled out the online survey and interactive web-map, roughly 47 percent indicated that they bicycle along Road 20. Fifty-six percent of respondents reported that they walk on Road 20 sometimes or often. In response to a question about what would make Road 20 safer, most respondents said bicycle lanes, followed by slower traffic, and additional or improved crosswalks. Many residents indicated the need for safe walking and bicycling connections to Helms Middle School and the San Pablo Community Center. At the same time, community members expressed concern about removing parking to install bicycle lanes or other traffic-calming infrastructure.

The Project Team also collected information from the San Pablo *Safe Routes to School Master Plan*, since Helms Middle School is a focus school located on Road 20. The SR2S Project Team received an overwhelming response from staff, students, and parents at Helms Middle School. Collectively, the school community indicated preferences for slower traffic and safer crossing opportunities along Road 20.

Given the complexity of travel behaviors along Road 20, and competing priorities for different users, the Project Team analyzed two (2) design alternatives. Both alternatives consider community feedback alongside data analysis to evaluate alternatives that maintain or modify parking on the street.

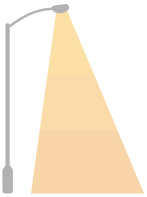
47%

56%

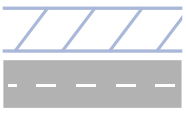
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Parking Analysis

Alternative 1 (one-way bicycle lanes) would require removing on-street parking on one side of the street to accommodate the proposed bicycle facilities.

A parking occupancy study was conducted in October 2021 to determine the extent to which existing on-street parking is used. Existing parking was inventoried and observed on a block-by-block basis for Road 20, between San Pablo Avenue and El Portal Drive. Parking occupancy was observed on a weekday morning (6AM-9AM), weekday evening (4PM-7PM), and weekend midday (1PM-3PM) to determine parking use at different times throughout a typical week (**Table 22**).

The parking study found that corridor-wide on-street parking is occupied at 56% on average on weekday mornings, 46% on average on weekday afternoons, and 56% on average on weekend afternoons. In addition, there is off-street parking available in the parking lot adjacent to the San Pablo Community Center when no events are taking place, as well as off-street school parking outside of school hours. See Appendix A for additional information on the parking occupancy study.

Results of this parking analysis indicated that limited parking removal or adjustments would be feasible. However, given the high occupancy rates in the areas closest to the school, it is not recommended to remove one (1) full lane of parking. Consequently, Alternative 1, which required removal of one (1) parking lane, was removed from consideration in the analysis phase of the project and was not advanced to a full conceptual design.

Traffic Analysis

A traffic operations analysis was conducted on Road 20 to document existing conditions through level of service (LOS)[1], delay, and volume-to-capacity ratio[2]. This analysis was completed at corridor intersections where concept alternatives include geometric and/or traffic signal modifications (e.g., removing a travel lane, modifying lane geometry, changing signal timing).

Table 22: **Road 20** – Parking Occupancy

Segment		Supply	AM Occupancy	AM Utilization	PM Occupancy	PM Utilization	Weekend Occupancy	Weekend Utilization
San Pablo Ave to Paseo Way	North	10	8	80%	4	40%	3	33%
	South	10	0	0%	0	0%	3	30%
Paseo Way to Abella Cir W	North	26	19	73%	15	58%	17	71%
	South	18	11	61%	16	89%	19	94%
Abella Cir W to Abella Cir E	North	18	12	71%	10	50%	13	67%
	South	20	11	54%	7	39%	11	41%
Abella Cir E to El Portal Dr	North	0	0	N/A	0	N/A	0	N/A
	South	0	0	N/A	0	N/A	0	N/A

Source: National Data & Surveying Service (October 2021)

1 LOS describes traffic conditions—the amount of traffic congestion—at an intersection or on a roadway. LOS ranges from A to F, with A indicating a condition of little or no congestion and F indicating a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. For intersections, LOS is based on the average delay experienced by all traffic using the intersection during the busiest (peak) 15-minute period. LOS A through D are generally considered acceptable.

2 Volume-to-capacity ratio (v/c) represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c approaches 1.0, traffic becomes unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.

Existing conditions traffic analysis results serve as a comparative baseline for recommended intersection modifications.

Traffic counts on Road 20 include counts in June 2021 (at El Portal Drive & Road 20) while learning at Helms Middle School was being conducted virtually, and counts in October 2021 (at the remaining three (3) intersections on Road 20) after Helms Middle School had reopened for in-person learning and the Community Center reopened for in-person activities. All counts were calibrated to reflect pre-COVID-19 conditions.

Table 23, Table 24, Table 25, and Table 26 summarize the movement, approach, and overall LOS and delay for the relevant intersections on Road 20 respectively: Paseo Way, Abella Circle (West), Abella Circle (East), and El Portal Drive. The full Reports can be found in Appendix B.

Table 23: **Road 20 & Paseo Way** – Traffic Operations Summary (Existing Conditions - Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
Road 20 & Paseo Way	Eastbound	L	A (8.0)	0.01	A (8.3)	0.01
		T	A (0.0)	0.23	A (0.0)	0.18
		Approach	A (0.4)	-	A (0.4)	-
	Westbound	T/R	A (0.0)	0.19	A (0.0)	0.26
	Southbound	L/R	B (10.8)	0.05	B (11.3)	0.05

Table 24: **Road 20 & Abella Circle (West)** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
Road 20 & Abella Circle West	Eastbound	L	C (20.5)	0.37	C (21.3)	0.38
		T	A (1.9)	0.27	A (1.7)	0.27
		Approach	A (2.6)	-	A (2.5)	-
	Westbound	T/R	A (3.9)	0.30	A (3.9)	0.36
	Southbound	L/R	B (18.0)	0.33	B (18.6)	0.24

Table 25: **Road 20 & Abella Circle (East)** – Traffic Operations Summary (Existing Conditions - Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
Road 20 & Abella Circle East	Eastbound	L	A (8.0)	0.02	A (8.1)	0.04
		T	B (10.5)	0.36	B (11.6)	0.43
		Approach	B (10.4)	-	B (11.4)	-
	Westbound	T/R	B (11.4)	0.39	B (11.6)	0.41
	Northbound	L/R	B (10.4)	0.30	B (10.6)	0.31
	Southbound	L/R	A (9.4)	0.11	A (9.2)	0.07

Table 26: **Road 20 & El Portal Drive** – Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
El Portal Drive & Road 20	Eastbound (Road 20)	L	C (21.5)	0.29	C (25.8)	0.51
	Westbound (Driveway)	R	C (20.0)	0.0	C (20.9)	0.0
	Northbound (El Portal Drive)	L	B (13.8)	0.28	B (11.3)	0.28
		T	B (16.2)	0.58	B (13.8)	0.50
		Approach	B (15.7)	-	B (13.5)	-
	Southbound (El Portal Drive)	T	B (15.5)	0.53	B (15.0)	0.60
		R	B (12.0)	0.08	B (10.5)	0.04
		Approach	B (15.0)	-	B (14.7)	-

Intersection Considerations

Road 20 experiences vehicle traffic ranging from passenger vehicles, trucks—predominantly smaller panel trucks and delivery trucks—and AC Transit buses. The two-way Class IV bicycle lane was designed using "AutoTURN" models to accommodate all relevant vehicle turning movements. A single-unit rear axle truck[1] was used to model right-turn movements to and from all side streets. The transit bus[2] was used to model bus turning movements at bus stops and relevant intersections, and a passenger vehicle[3] was used to model turning movements in and out of driveways.

Implementation Timeline

The two-way Class IV bicycle lane (Alternative 2) can be implemented in the short-term or long-term, depending on materials used and the scale of intersection modifications. For a short-term implementation, elements such as the bicycle lane buffer and bus boarding islands can be constructed of lower cost materials such as flexible delineators, parking stops, thermoplastic paint, and modular rubber platforms. Signal timing adjustments can also be implemented in the short-term. Curb line and drainage reconstruction (e.g., removal of the slip lane at El Portal Drive) as well as signal hardware and infrastructure modifications at signalized intersections are typically long-term investments. For this reason, the project can be installed with lower cost materials in the short term, with permanent infrastructure upgrades over time. Long-term modifications may require a phased implementation to minimize disruption to the corridor as modifications are constructed.

1 AutoTURN SU-30 design vehicle

2 AutoTURN CITY-BUS design vehicle

3 AutoTURN PASSENGER CAR design vehicle

Conceptual Design

Design Overview

The two-way Class IV bicycle lane design on Road 20 removes the center turn lane and narrows the vehicle lanes to accommodate the two-way bicycle facility (**Figure 30**). This alternative accommodates bus service with bus boarding islands adjacent to the two-way bicycle lanes at bus stops (**Figure 31**). This configuration connects to the proposed Class IV facilities on San Pablo Avenue and El Portal Drive, though the intersection treatments need to be carefully designed to connect these facilities. See Appendix D for the full concept design plans.

Benefits of the design include:

- Protected two-way bicycle lane along Road 20 provides a safer and more comfortable connection to Helms Middle School, the San Pablo Community Center, housing and other local destinations;
- Narrowed vehicle lanes may lower vehicle speeds on the corridor; and
- Improved bus service efficiency through in-lane bus stops.

Figure 30: Road 20 – Typical Segment with Two-Way Bicycle Lane

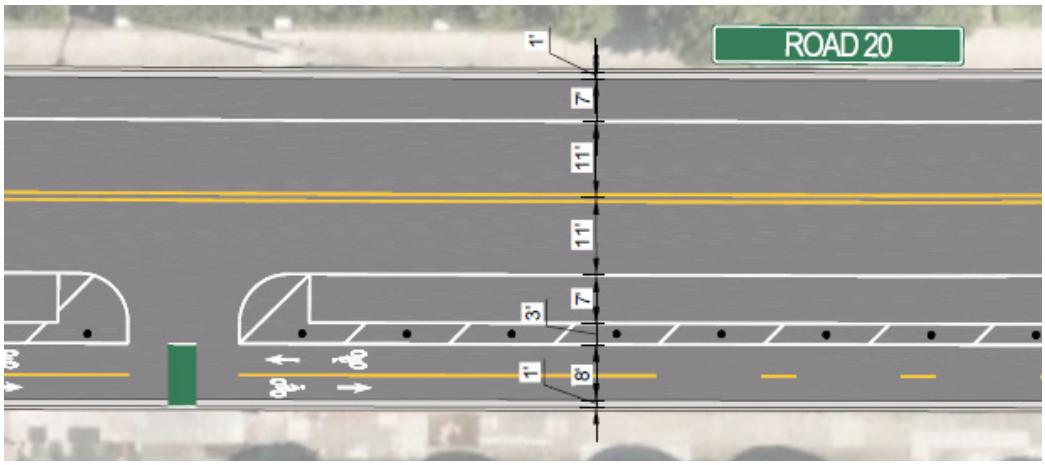
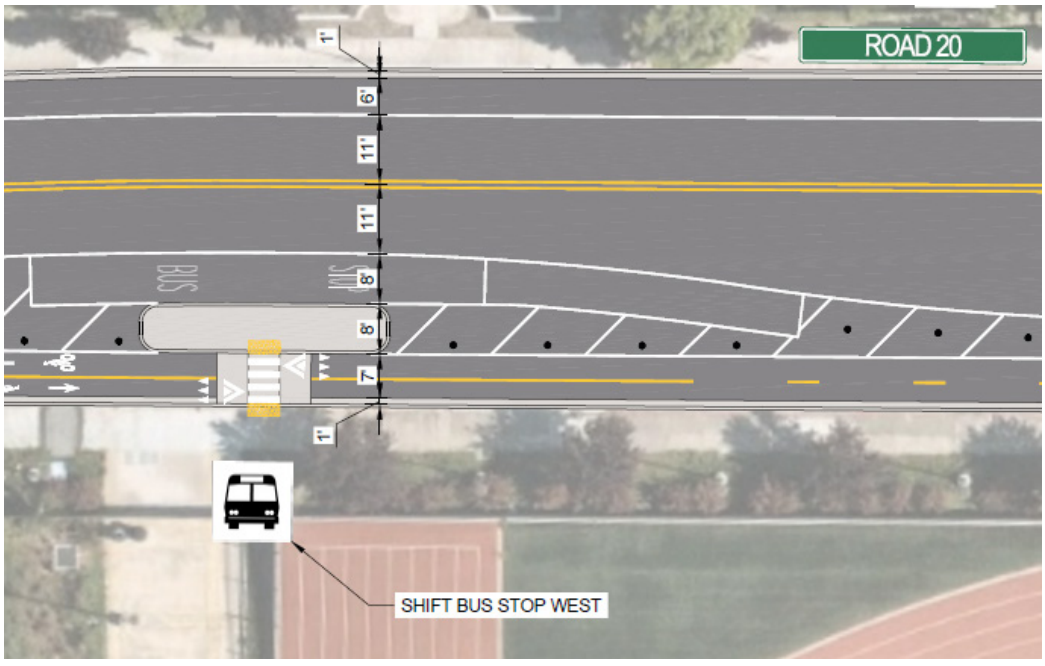


Figure 31: Road 20 – Typical Bus Stop Configuration with Bus Boarding Island in Front of Two-Way Bicycle Lane



Traffic Analysis

The following summary tables reflect expected changes in traffic operations with a two-way bicycle lane configuration on the south side of Road 20. Modeled changes include removal of the left-turn lanes at the unsignalized intersections of Road 20 & Paseo Way and Road 20 & Abella Circle (East). The capacity of the other signalized intersections on Road 20 were not modified. No significant capacity or delay impacts were found under these recommended conditions for any Road 20 intersections. The traffic operations results are summarized in Table 27 and Table 28.

The key operational issues along Road 20 are related to school pick-up and drop-off at Helms Middle School, sports field facility rentals, and other Community Center events and not specifically vehicle lane capacity. These high-traffic volume events are not well defined through traditional traffic analysis such as this. Further discussions with school and City staff are required to better assess recommendations specific to these conditions.

Table 27: **Road 20 & Paseo Way** – Traffic Operations Summary (Two-Way Separate Bike Lane - Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
Road 20 & Paseo Way	Eastbound	L/T	A (0.5)	0.01	A (0.5)	0.01
	Westbound	T/R	A (0.0)	0.19	A (0.0)	0.26
	Southbound	L/R	B (12.1)	0.07	B (12.5)	0.06

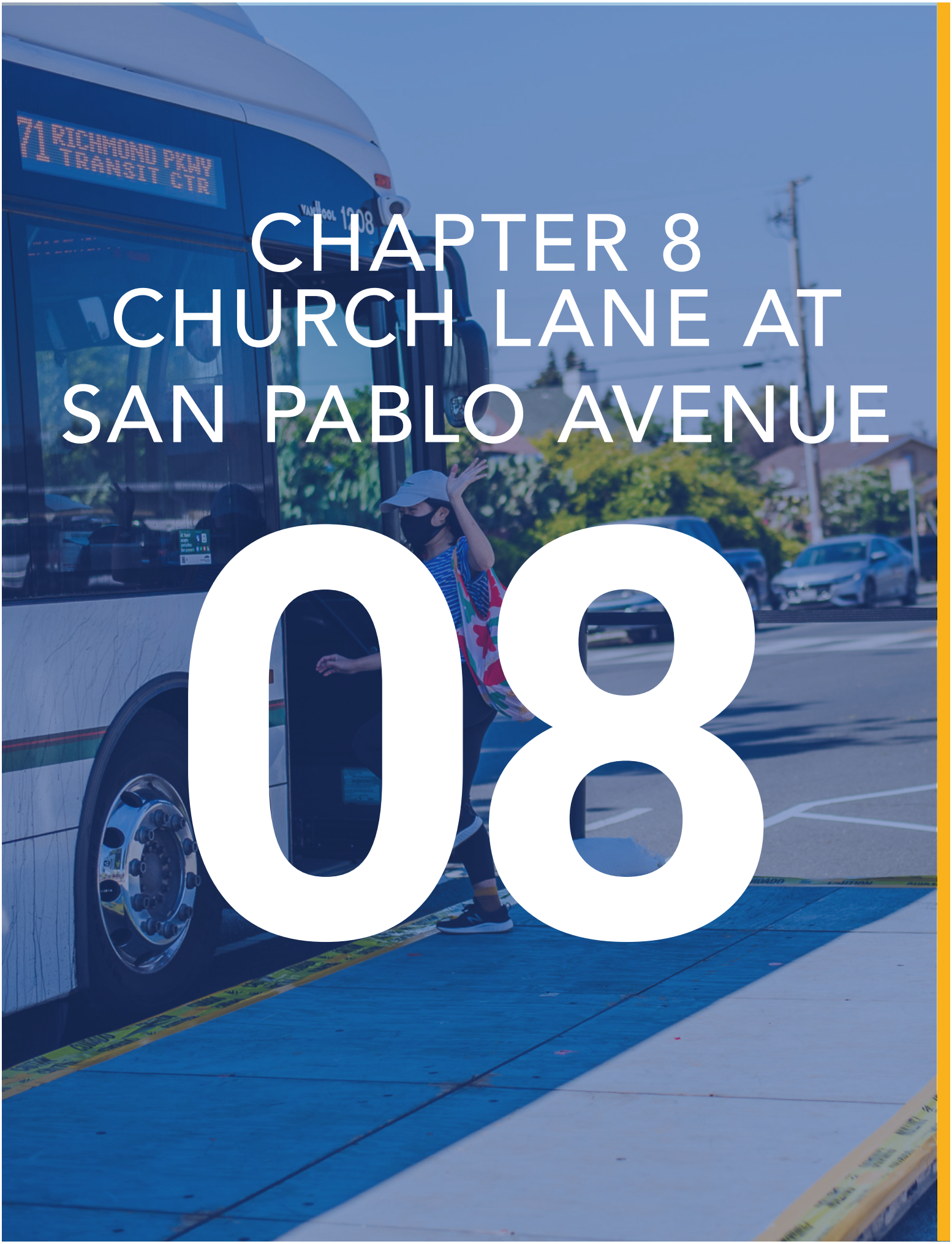
Table 28: **Road 20 & Abella Circle (East)** – Traffic Operations Summary (Two-Way Separated Bike Lane - Unsignalized)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
Road 20 & Abella Circle East	Eastbound	L/T	B (10.6)	0.33	B (11.8)	0.42
	Westbound	T/R	B (11.0)	0.38	B (11.2)	0.42
	Northbound	L/R	B (10.3)	0.30	B (10.6)	0.31
	Southbound	L/R	A (9.4)	0.11	A (9.2)	0.07

Cost Estimate

Per Caltrans unit costs[1],the estimated construction cost for the recommended design of Road 20 is approximately $1,520,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, and other factors.

1 Caltrans Contract Cost Database, District 4, 2019-2021 costs



CHAPTER 8
CHURCH LANE AT SAN PABLO AVENUE

08

Corridor Background

Church Lane is an east/west minor urban arterial that connects El Portal Drive with Market Avenue. The City's *Bicycle and Pedestrian Master Plan* (BPMP, 2017) identified a bicycle lane gap on Church Lane, from 400 feet north of Willow Road to San Pablo Avenue, that would otherwise connect Class II bicycle lanes further north on Church Lane to Class II bicycle lanes on San Pablo Avenue and Class II bicycle lanes further south on Church Lane.

Planned to be constructed in 2022, the Church Lane/ Willow Road and El Portal Drive/Mission Bell Road Intersection Improvement Project will close most of the 400-foot bicycle network gap on Church Lane, north of Willow Road, and will improve the intersection at Willow Road for pedestrians and bicyclists.

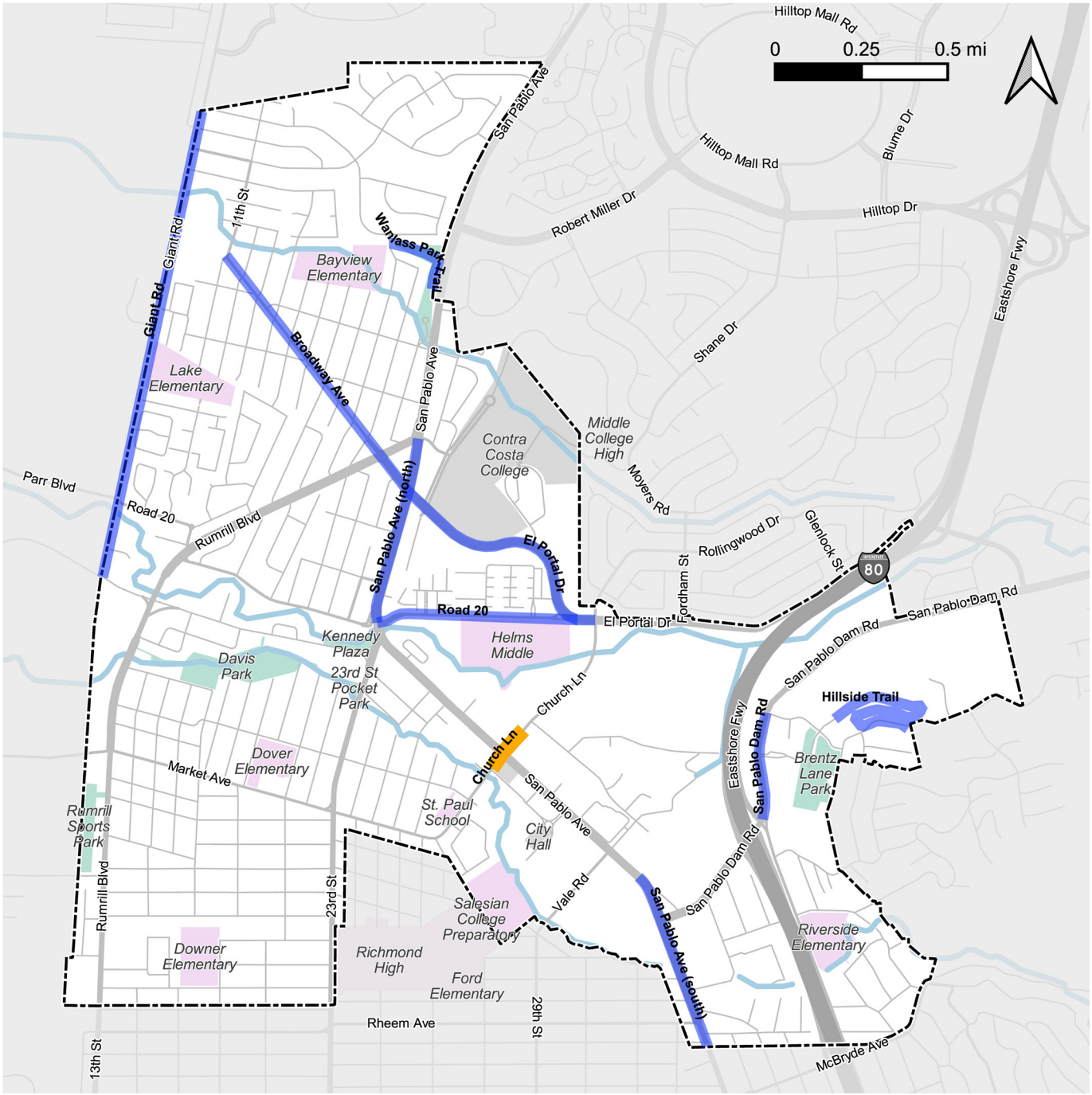
This chapter focuses on the intersection of Church Lane and San Pablo Avenue.

Aerial view of Church Lane at San Pablo Avenue intersection

Existing Intersection Configuration

Church Lane has one (1) vehicle through lane and one (1) vehicle receiving lane, a left-turn lane, and a right-turn slip lane in each direction. San Pablo Avenue has a median in the center of the street, two (2) vehicle through lanes, and two (2) vehicle receiving lanes, and left-turn pockets in each direction. Southbound San Pablo Avenue has a right-turn slip lane onto westbound Church Lane. Northbound San Pablo Avenue is the only approach of the intersection without a right-turn slip lane; right-turning vehicles turn from the curbside vehicle through lane.

Study Corridors



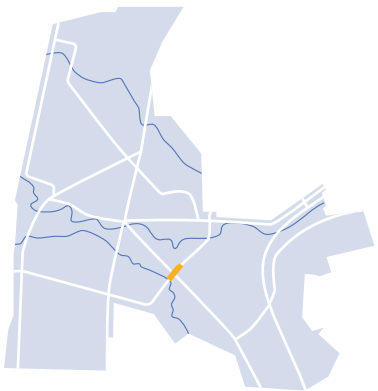
Project Corridors

- Church Lane
- Other Corridors

Connecting Active Transportation Facilities

The intersection of Church Lane at San Pablo Avenue connects to Class II bicycle lanes on San Pablo Avenue, in both directions, and Class II bicycle lanes on Church Lane, in both directions. There is a gap in the existing Class II bicycle lanes on Church Lane that will mostly be closed by the *Church/Willow and El Portal/Mission Bell Intersection Improvement Project*. Bicycle lanes currently continue close to the intersection but not through it, meaning that this major intersection does not have dedicated space for bicyclists to navigate through the intersection. There are sidewalks on all legs of the intersection and crosswalks across all intersection legs, including across the three (3) slip lanes.

There are three (3) AC Transit bus stops at the intersection of Church Lane and San Pablo Avenue: a Route 76 far-side stop on westbound Church Lane, a Route 76/669 far-side stop on eastbound Church Lane, and a Route 72 near-side stop on northbound San Pablo Avenue. These stops are served by Route 76, which provides twice-hourly service seven (7) days a week; Route 669, which provides once-daily service on school days (Monday through Friday except holidays); and Route 72, which provides five (5) buses per hour seven (7) days a week.



Previous Planning Efforts

The 2019 City of San Pablo Complete Streets Safety Assessment (CSSA) contains both short-term and long-term recommendations for the intersection of Church Lane at San Pablo Avenue. In the short term, the SSAR recommends:

- implementing a Leading Pedestrian Interval and "No Turn On Red" restrictions for right turns,
- adding median refuge islands on San Pablo Avenue, and
- extending the pork chop island on the northbound approach.

In the long term, the SSAR recommends:

- narrowing the intersection,
- removing the pork chop islands or installing raised crosswalks across the slip lanes at intersections,
- straightening crosswalks, and
- installing directional curb ramps.

The 2019 City of San Pablo *Systemic Safety Analysis Report* (SSAR) recommends:

- removing the channelized right turn lanes,
- adding Leading Pedestrian Intervals, and
- narrowing/delineating vehicle lanes

Design Alternatives

One (1) design alternative was considered for the intersection of Church Lane at San Pablo Avenue. This alternative recommends closing the three (3) existing right-turn slip lanes to vehicle access, but maintaining them for bicycle access. The design recommends providing vertical separation (e.g., delineators) to turn the existing Class II bicycle lanes into Class IV bicycle lanes on San Pablo Avenue in addition to the eastbound approach lane of Church Lane. In addition to connecting to and improving existing active transportation facilities, this design provides continuity to the adjacent intersection improvement project on Church Lane and Willow Road.

Community Priorities

During the engagement process, community members and stakeholders were asked to share how they use Church Lane, and what improvements they would like to see along the corridor. Of those who filled out the online survey and interactive web-map, roughly 50 percent indicated that they bicycle along Church Lane. Sixty-five percent of respondents reported that they walk on Church Lane sometimes or often. In response to a question about what would make Church Lane safer, most respondents said bicycle lanes, followed by slower traffic and better street lighting. Community members and stakeholder had mixed preferences about removing parking to install bicycle lanes or other traffic calming infrastructure. While some believed that it would help slow traffic and improve safety, others noted that many residents and local business rely on the parking on Church Lane.

As part of the in-the-field outreach, the Project Team and staff from Morada de Mujeres Del Milenio conducted surveys along Church Lane. The Project Team conducted surveys in Spanish to understand how users experienced the pedestrian and bicycle environment. During field surveys, community members reported that they rely on Church Lane as a key pedestrian route. They also echoed online survey responses that described high vehicular speeds.

Community feedback emphasized the need to improve safety and address bicyclist needs by better separating space between motorists and bicyclists at intersections and by forcing slower right turns by motorists. Some of the community's pedestrian priorities are being addressed through the *Church/Willow and El Portal/Mission Bell Intersection Improvement Project*. The Corridor Study also recommends implementing Leading Pedestrian Intervals (LPI) at the Church Lane and San Pablo Avenue intersection to serve the many residents and visitors that travel through the intersection on foot.

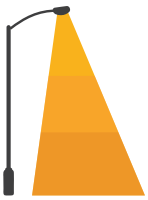
50%

65%

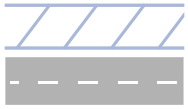
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Intersection Considerations

San Pablo Avenue experiences vehicle traffic ranging from passenger vehicles, trucks—predominantly smaller panel trucks and delivery trucks—and AC Transit buses. Church Lane experiences a similar mix of vehicle traffic, although San Pablo Avenue is identified as a truck route in the City of San Pablo *General Plan* and Church Lane is not. The design for the intersection of Church Lane was developed using "AutoTURN" models to accommodate all relevant vehicle turning movements. A single-unit rear axle truck[1] was used to model all turns through the intersection. A transit bus[2] was used to model the AC Transit Route 669 northbound right turn from San Pablo Avenue to Church Lane.

The existing right-turn slip lanes provide a path with a large turning radius for vehicles to make right turns throughout the intersection. The removal of these slip lanes reduces curb radii considerably, with the goal of creating a smaller intersection footprint and making travel safer for all modes. Although only San Pablo Avenue is classified as a truck route and Church Lane is not, an intermediate semitrailer[3] was run through all right turns at the intersection to assess the impacts of slip lane removal. These semitrailers can navigate the intersection through the recommended design, although this results in encroachment into adjacent approach lanes on all legs and opposing approach lanes on the receiving legs of Church Lane. As the design advances to the next stage, this could be remedied by setting back the left-turn stop bars on Church Lane and lengthening the turning pockets accordingly.

An existing conditions traffic operations analysis was not conducted at the intersection as a part of this Corridor Study, but based on the design alternatives, additional operations analysis may be required to determine impacts to larger right-turning vehicles. This is discussed further in the Conceptual Design section below.

Implementation Timeline

The design alternative for the intersection of Church Lane at San Pablo Avenue can be implemented in the short term since all modifications can be implemented via pavement markings, signage, and vertical separation (e.g., flex posts, planters, or precast curbs). The design maintains all existing signal infrastructure, curb lines, crosswalk configuration and curb ramp locations.

1 AutoTURN SU-30 design vehicle

2 AutoTURN CITY-BUS design vehicle

3 AutoTURN WB-50 design vehicle

Conceptual Design

Design Overview

The design for the Church Lane at San Pablo Avenue intersection closes the existing right-turn slip lanes to vehicle access, while maintaining them for bicycle access. The design recommends installing vertical separation elements to turn existing Class II bicycle lanes into Class IV bicycle lanes on San Pablo Avenue and the eastbound approach lane of Church Lane; however, this improvement can be implemented independently of the slip lane closures. See Appendix D for the concept design plan.

Benefits of the design include:

- Slip lane closures will lower the vehicle turning speeds at the intersection
- Protected bicycle lanes provide a safer and more comfortable space for bicyclists
- Designated bicycle space in the intersection and fewer conflict points between vehicles and bicyclists, and vehicles and pedestrians will improve safety

Figure 32: Church Lane at San Pablo Avenue – Closed Right-Turn Slip Lanes

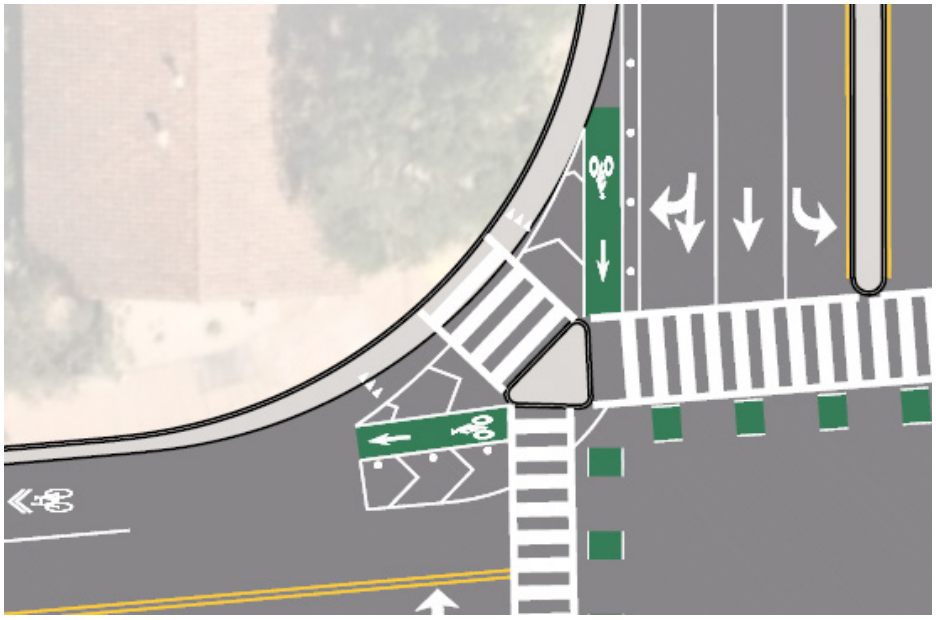
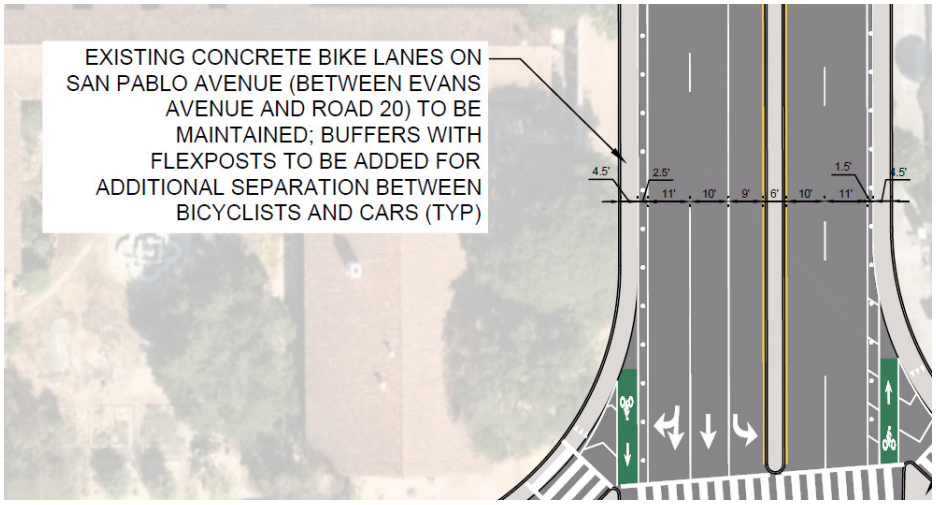


Figure 33: Church Lane at San Pablo Avenue – Bicycle Lanes on San Pablo Avenue

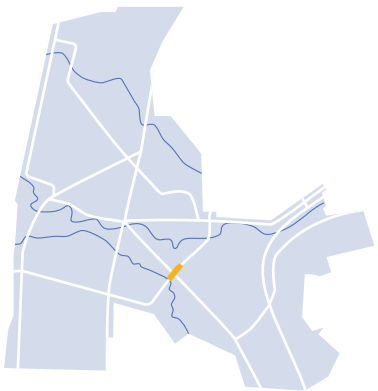


Traffic Analysis

In order to implement this concept design, the following changes to the existing vehicle lane configuration will need to be evaluated as part of final project design:

- On westbound Church Lane, removing the right-turn slip lane will remove about 50 feet of vehicle storage. The vehicle approach lanes will change from one (1) left-turn, one (1) through, and one (1) right-turn slip lane to one (1) left-turn lane and one (1) shared through/right lane.
- On eastbound Church Lane, removing the right-turn slip lane will remove about 40 feet of vehicle storage. However, the vehicle approach lane configuration will remain the same, via the addition of a right-turn lane to the left of the "pork-chop" island. Loop detectors may need to be moved to implement the design, due to a lateral shift in approach lane configuration.
- On southbound San Pablo Avenue, removing the right-turn slip lane will remove about 50 feet of vehicle storage. The vehicle approach lanes will change from one (1) left-turn, two (2) through, and one (1) right-turn slip lane to one (1) left-turn, one (1) through, and one (1) shared through/right lane.

The existing right-turn slip lanes at the intersection are to the right of the existing bicycle lanes, whereas the design alternative requires that right-turning vehicles cross over the bicycle lanes at the intersection, versus in advance of it. It is preferred to move this conflict point to the intersection, rather than in advance of the intersection, since vehicles are forced to slow down to a greater extent because of the smaller turning radius and there is improved visibility of the bicyclists. On westbound Church Lane and southbound San Pablo Avenue, peak hour right-turn volumes are low enough that this design can be implemented without any signal timing changes.



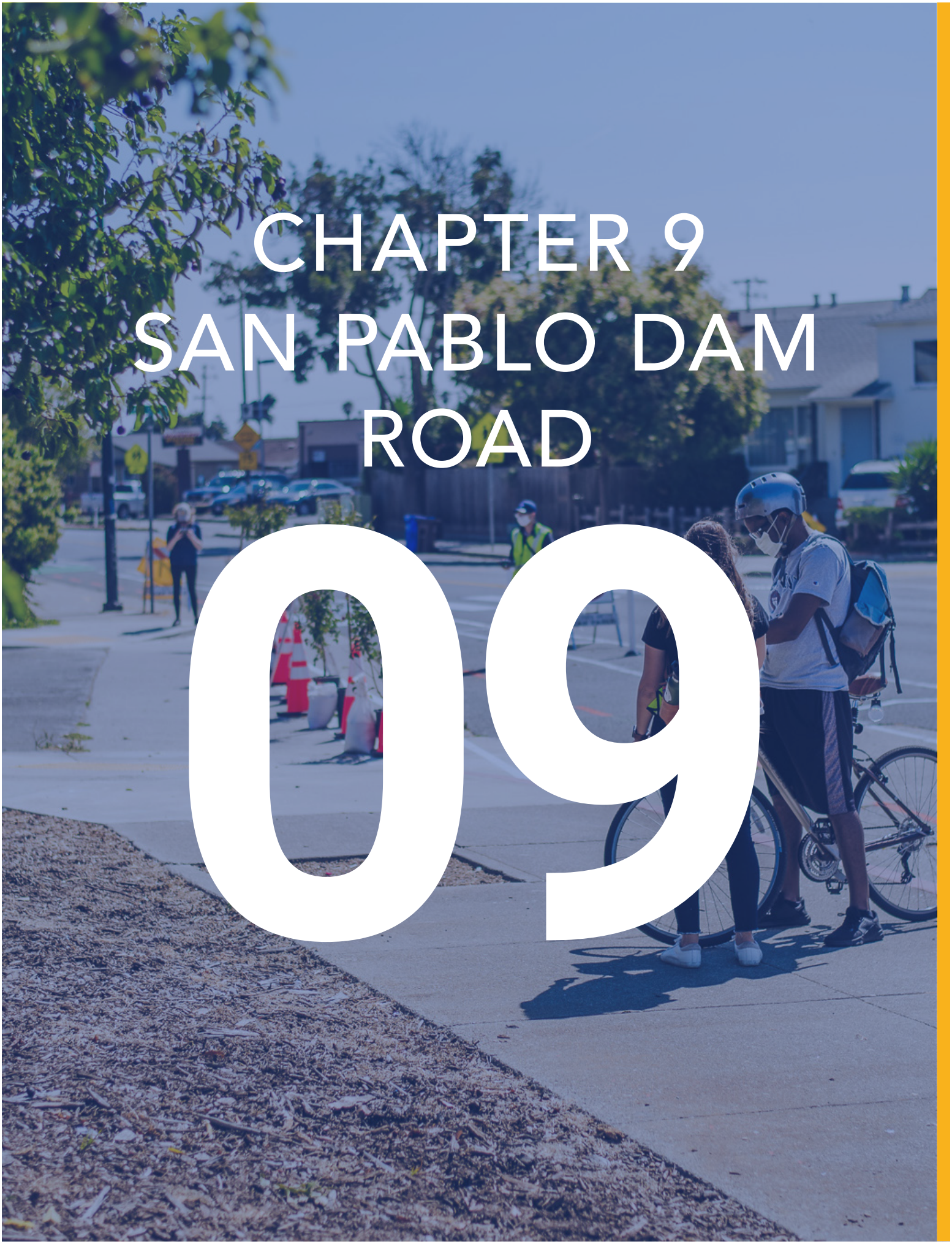
Due to the eastbound right-turning volumes from Church Lane onto San Pablo Avenue (271 vehicles during the morning peak hour and 235 vehicles during the afternoon peak hour, based on November 2016 traffic counts), it is recommended to phase separate eastbound right turning vehicles (turning from a dedicated lane on this approach) from through bicyclists. This can be done by installing a bicycle signal and right-turn-on-red prohibition (i.e., a right-turn arrow signal). The general "rule of thumb" for separating right-turning vehicles from through bicyclists in time and space is 150 right-turning vehicles per hour which is met in this scenario.

Leading Pedestrian Intervals are also recommended on all legs of the intersection to improve pedestrian safety.

Cost Estimate

Per Caltrans unit costs[4], the estimated construction cost for the recommended design of Church Lane at San Pablo Avenue is approximately $210,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, and other factors.

4 Caltrans Contract Cost Database, District 4, 2019-2021 costs



CHAPTER 9
SAN PABLO DAM ROAD

09

Corridor Background

San Pablo Dam Road is an east/west arterial that connects San Pablo Avenue to I-80, in addition to providing a regional connection to State Route 24 (in Orinda). The City's *Bicycle and Pedestrian Master Plan* (BPMP, 2017) identified a bicycle lane gap on San Pablo Dam Road that would connect existing Class II bicycle lanes on San Pablo Dam Road to a proposed Class III bicycle route on Amador Street.

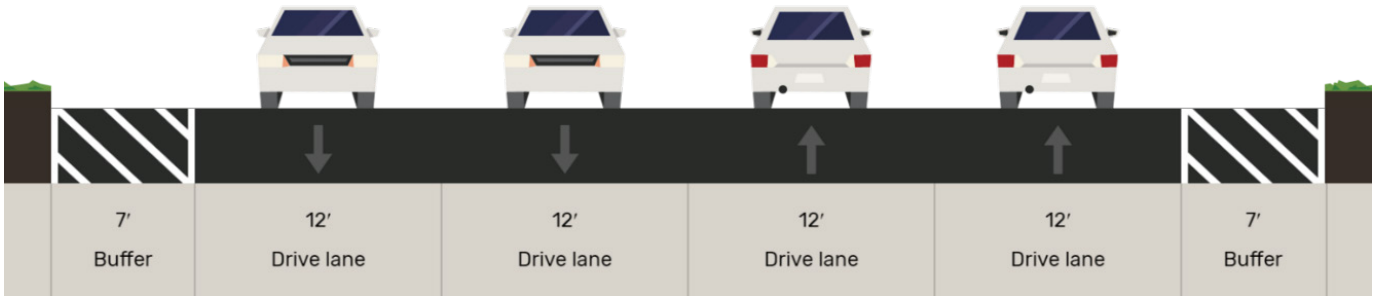
The Contra Costa Transportation Authority (CCTA), in collaboration with Caltrans, have planned long-term improvements at the I-80 and San Pablo Dam Road interchange that are part of the Measure J Expenditure Plan approved in 2004 by Contra Costa County voters. Phase 1 of the project—which included a reconstructed bicycle and pedestrian freeway overcrossing, expanded shoulders, and improved sidewalks by Riverside Elementary School, in addition to a new interchange at El Portal Drive—was completed in 2017. Phase 2—which includes reconfiguring interchanges at San Pablo Dam Road, McBryde Avenue and Amador Street as well as improved bicycle and pedestrian access—has preliminary designs, but is not yet fully funded for design or construction. As of 2021, there is no confirmed construction timeline for Phase 2 of the San Pablo Dam Road interchange improvements. Nevertheless, all concept design recommendations are presented with this long-term project in mind.

As identified in the BPMP, this chapter focuses on San Pablo Dam Road between Amador Street/I-80 and Morrow Drive. The westernmost 750 feet of the study limits, starting from I-80, is within Caltrans right-of-way; east of this point, the roadway is owned and operated by the City of San Pablo.

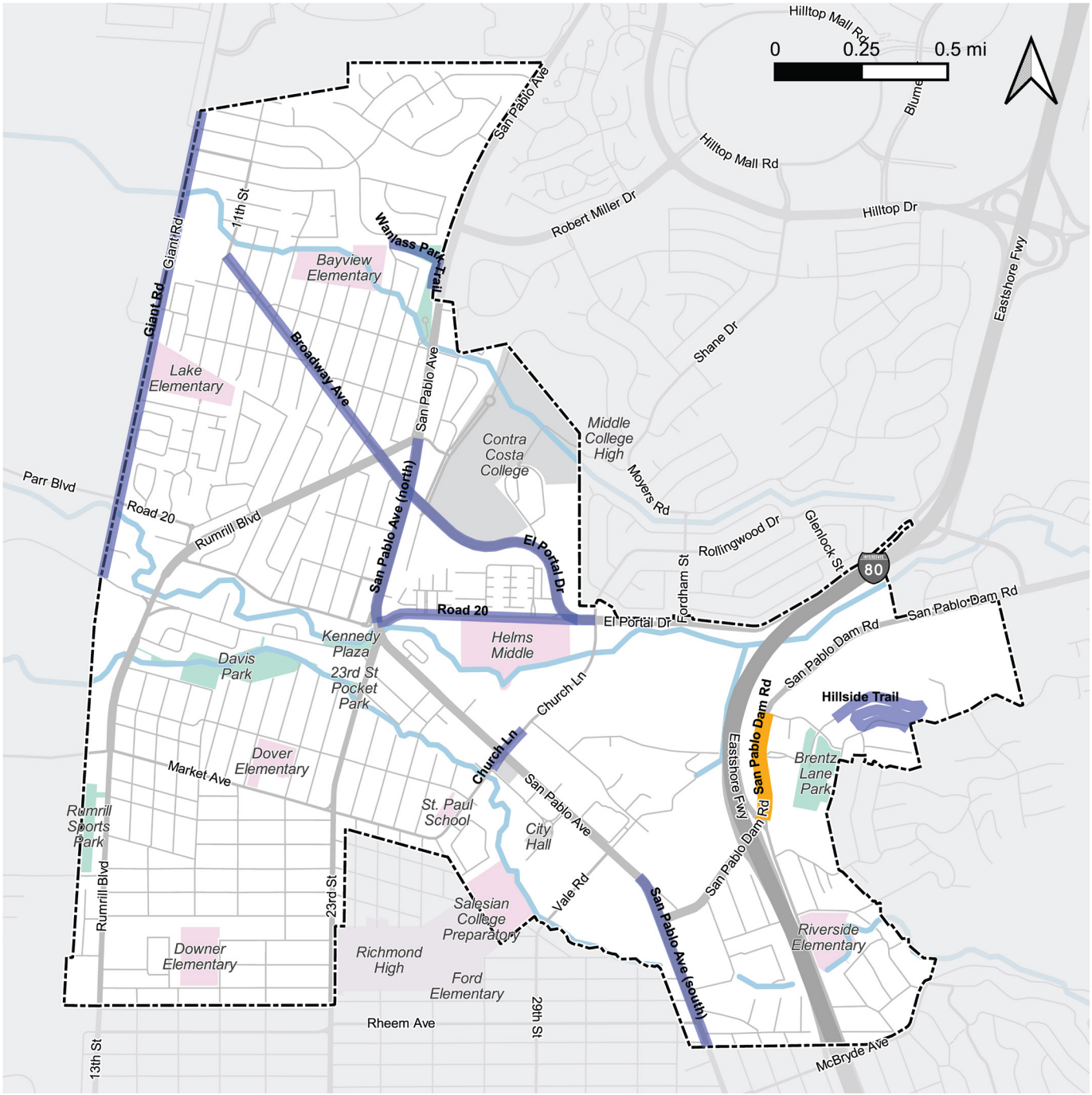
Existing Roadway Configuration

San Pablo Dam Road has two (2) vehicle lanes in each direction and a paved shoulder of varying width on both sides of the street (Figure 34). San Pablo Dam Road does not have a curb or sidewalk on the west end of the study segment by Amador Street/I-80. Curbs begin on the north side of the roadway 650 feet east of Amador Street and on the south side of the roadway 750 feet east of Amador Street. The paved width of the roadway ranges from 50 feet to 62 feet, depending on the width of the paved shoulder.

Figure 34: San Pablo Dam Road – Existing Conditions Cross Section (Facing East)



Study Corridors



Project Corridors

- San Pablo Dam Rd
- Other Corridors

Connecting Active Transportation Facilities

There are existing Class II standard bicycle lanes on San Pablo Dam Road east of the Princeton Plaza shopping center and a proposed Class III bicycle route on Amador Street. Additionally, there is a Class I bicycle and pedestrian bridge that crosses over I-80 to connect Amador Street to Humboldt Avenue. Given the existing conditions at the San Pablo Dam Road and I-80 interchange, this dedicated Class I bridge is the preferred location for bicyclists to cross I-80.

The only sidewalk on San Pablo Dam Road, between Amador Street and Morrow Drive, extends the 340 feet west of Morrow Drive. There are sidewalks on both sides of Morrow Drive, on the east side of Amador Street—ending approximately 100 feet before the intersection of Amador Street and San Pablo Dam Road—and on both sides of San Pablo Dam Road, west of Amador Street. There are gaps in the accessible pedestrian network at the intersection of San Pablo Dam Road & Amador Street & I-80, west of the study limits, due to sidewalk gaps, unmarked crosswalks, and missing curb ramps.

Although AC Transit Route 70 runs along this segment of San Pablo Dam Road, there are no bus stops on San Pablo Dam Road between Amador Street and Morrow Drive. The closest Route 70 bus stops are just east of the study area at Princeton Plaza.

Previous Planning Efforts

The 2019 *City of San Pablo Complete Streets Safety Assessment* (CSSA) contains long-term recommendations for San Pablo Dam Road from I-80 to the Princeton Plaza shopping center. Recommendations include:

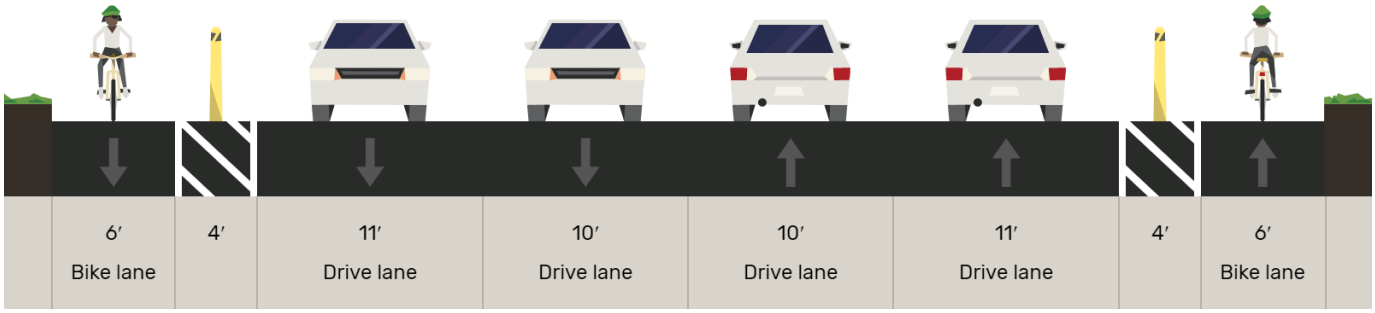
- closing the sidewalk gaps on both sides of the street,
- installing pedestrian-scale lighting, and
- installing buffered or separated bicycle lanes.

Similarly, the BPMP recommends closing the sidewalk gaps on San Pablo Dam Road.

Design Alternatives

Due to high roadway speeds and space constraints, only one (1) design alternative was considered for this segment of San Pablo Dam Road. The recommended design narrows vehicle lanes in order to create one-way Class IV bicycle lanes on the existing paved shoulders on both sides of the street (Figure 35). The design closes the sidewalk gap on the southeast side of the street, from Amador Road (100 feet south of San Pablo Dam Road) to the existing sidewalk (that begins 330 feet south of Morrow Drive).

Figure 35: San Pablo Dam Road – Class IV Bicycle Lane Cross Section (Facing East)



Community Priorities

Approximately 58 percent of community members that completed the survey reported that they walk or bicycle on San Pablo Dam Road. Survey respondents tended to describe fast-moving traffic along San Pablo Dam Road that make walking and bicycling feel unsafe. In response to a question about what would make San Pablo Dam Road safer, most respondents said bicycle lanes and slower speeds or less traffic. There was also interest in street lighting, and improved sidewalks. For other residents, San Pablo Dam Road was not a major priority for walking or bicycling. Those residents described the street as a key route in and out of the City and indicated a preference for quick and convenient driving access.

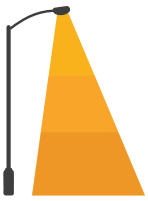
58%

58%

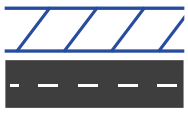
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Traffic Analysis

While the recommended design maintains the dedicated right-turn lane on eastbound San Pablo Dam Road at Morrow Drive, a traffic analysis should be part of the final design process to determine if this right-turn lane can be removed. Removal of this dedicated right-turn lane would allow the eastbound Class IV bicycle lane to be maintained up to the Morrow Drive intersection to eliminate conflicts between bicyclists and right-turning vehicles before the Morrow Drive intersection, thus making a safer and more comfortable facility for bicyclists.

Intersection Considerations

San Pablo Dam Road experiences vehicle traffic ranging from passenger vehicles, trucks—predominantly smaller panel trucks and delivery trucks—and AC Transit buses. The design of San Pablo Dam Road was developed using "AutoTURN" models to accommodate all relevant vehicle turning movements. An intermediate semitrailer was used to model turns through the intersection of San Pablo Dam Road and Amador Street. A passenger vehicle was used to model turning movements in and out of driveways along the corridor. The recommended design will not affect transit operations, given that there are no bus stops along the corridor, and AC Transit Route 70 continues straight on San Pablo Dam Road at both terminal intersections.

Implementation Timeline

The recommended design can be implemented in the short-term or long-term, depending on the materials used. Although shown as a concrete curb, the bicycle lane buffer could be constructed of lower cost materials such as flexible delineators, parking stops, thermoplastic paint, and modular rubber platforms. Curb line and drainage reconstruction (i.e., slip lane reconfiguration and new sidewalk along San Pablo Dam Road) are typically mid- or long-term investments. The slip lane reconfiguration could also be implemented in the short term with the use of paint and flex-posts, instead of a reconstructed curb line. A phased implementation (e.g., bicycle lane infrastructure, followed by new sidewalk, and eventually the long-term redesign of the intersection of San Pablo Dam Road and I-80 and Amador Street) may be the most realistic approach for this segment, given the coordination requirements with Caltrans for infrastructure installed on their right-of-way. These coordination requirements include using mountable curbs as vertical separation in the bikeway buffer at staging area entry and access points and otherwise adhering to the Caltrans Highway Design Manual (HDM) by maintaining 11-foot vehicle lanes. Coordination with Caltrans also confirmed the planned long-term intersection redesign of the intersection of San Pablo Dam Road and I-80 and Amador Street, which informed the decision to only recommend short-term improvements (i.e., not requiring new signal equipment or civil reconstruction) at this intersection.

Conceptual Design

Design Overview

The recommended alternative narrows vehicle lane widths in order to provide sufficient space for one-way Class IV bicycle lanes to be installed on each shoulder (Figure 36), with some short space-constrained segments of Class II bicycle lanes that are painted green for visibility (Figure 37). In City of San Pablo right-of-way, vehicle lanes are narrowed to as low as 10.5 feet; vehicle lanes are maintained at 11 feet within Caltrans right-of-way. See Appendix D for the full concept design plans.

Benefits of the design include:

- Protected one-way bicycle lanes provide a safer and more comfortable connection to neighborhood residences, shopping centers, and other local destinations;
- Sidewalk gap closures to improve pedestrian accessibility and safety; and
- Narrowed vehicle lanes may lower vehicle speeds on the corridor to increase safety for all users.

There are unpaved areas on the shoulder of San Pablo Dam Road that are used primarily for staging by Caltrans and City vehicles. In order to maintain access to these staging areas, the concrete curb separating the bicycle lane from the vehicle lanes transitions to a mountable median (Figure 38).

Figure 38: San Pablo Dam Road – Mountable Curbs at Staging Area

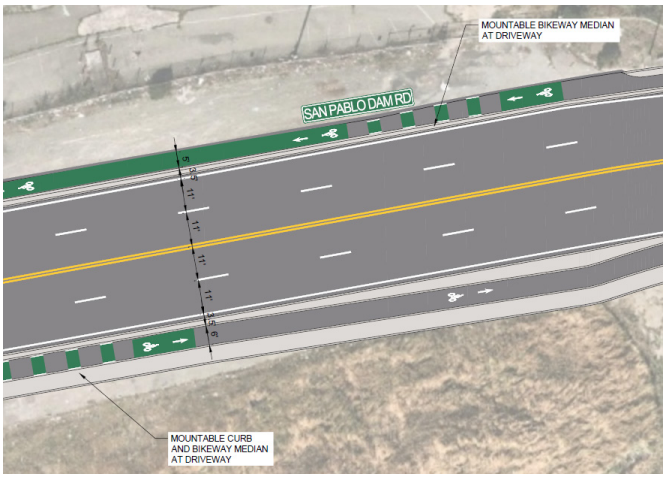


Figure 36: San Pablo Dam Road – Typical Segment with Separated Bicycle Lanes

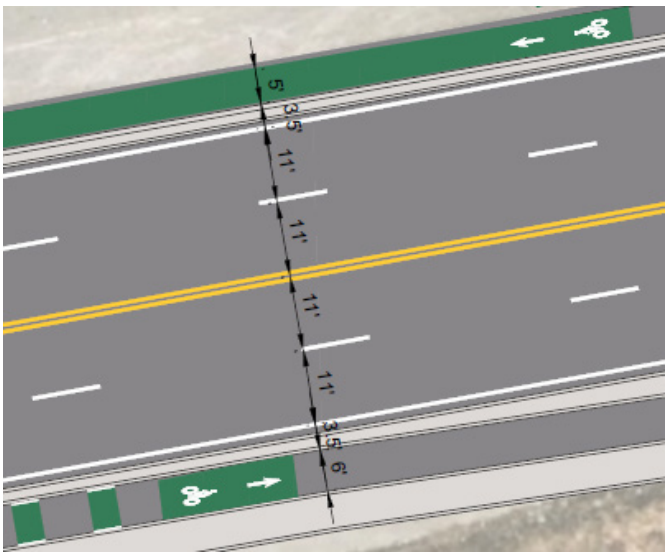


Figure 37: San Pablo Dam Road – Green Class II Bicycle Lanes

The recommended design also reconfigures the right-turn slip lane from Amador Street onto San Pablo Dam Road to provide increased safety for all users. The improvements include a squared intersection to slow turning vehicles and a marked bicycle lane to provide a dedicated space for bicyclists (Figure 39).

East of Morrow Drive, there is not enough roadway space to have even a Class II bicycle lane in each direction. Instead, a Class II bicycle lane is recommended in the uphill (westbound) direction, and a Class III sharrow lane is recommended in the downhill (eastbound) direction (Figure 40) in order to close the gap between the existing Class II bicycle facilities. This allows uphill-traveling bicyclists to have a dedicated lane while they are moving more slowly, while bicyclists traveling downhill will be able to move in the vehicle lane at much higher speeds.

Figure 40: San Pablo Dam Road – Westbound Class II Bicycle Lane and Eastbound Class III Sharrow on San Pablo Dam Road (East of Morrow Drive)

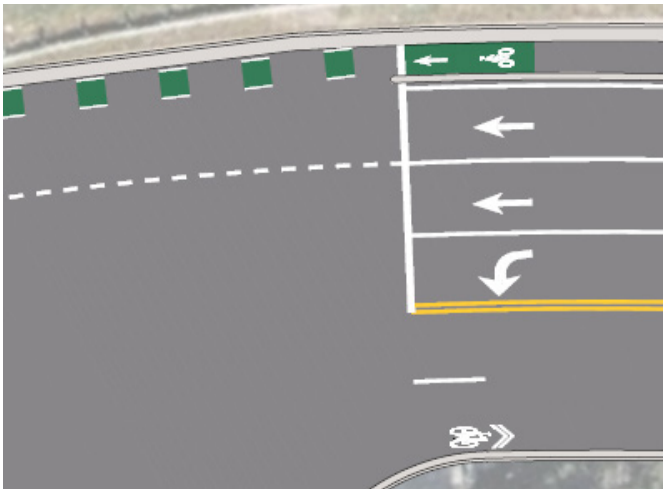
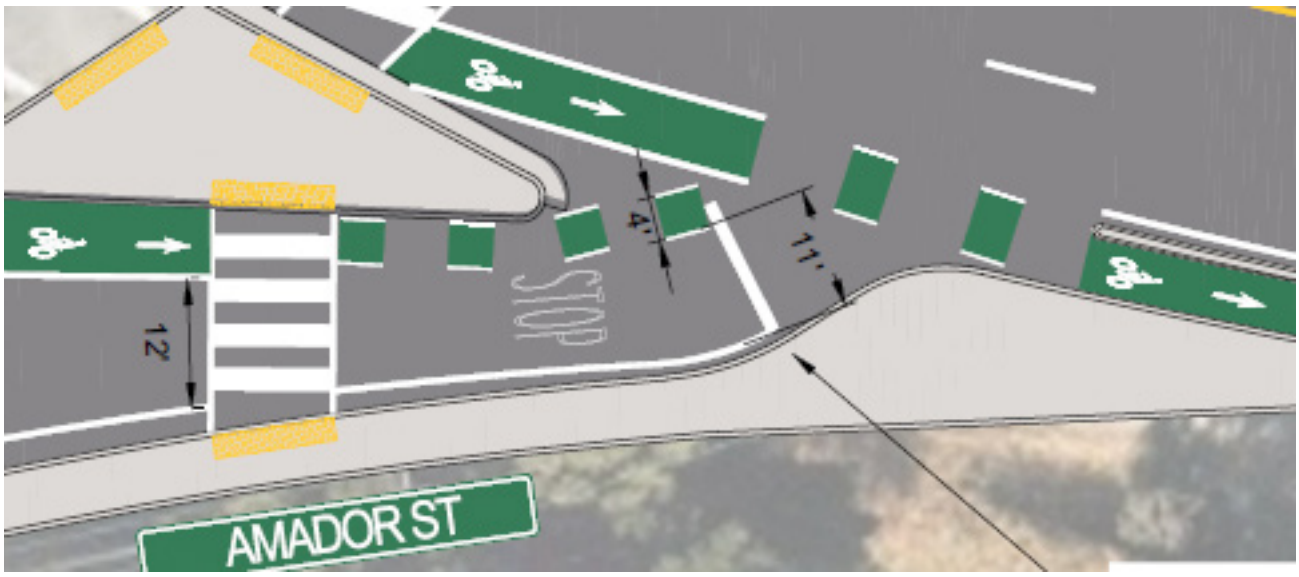


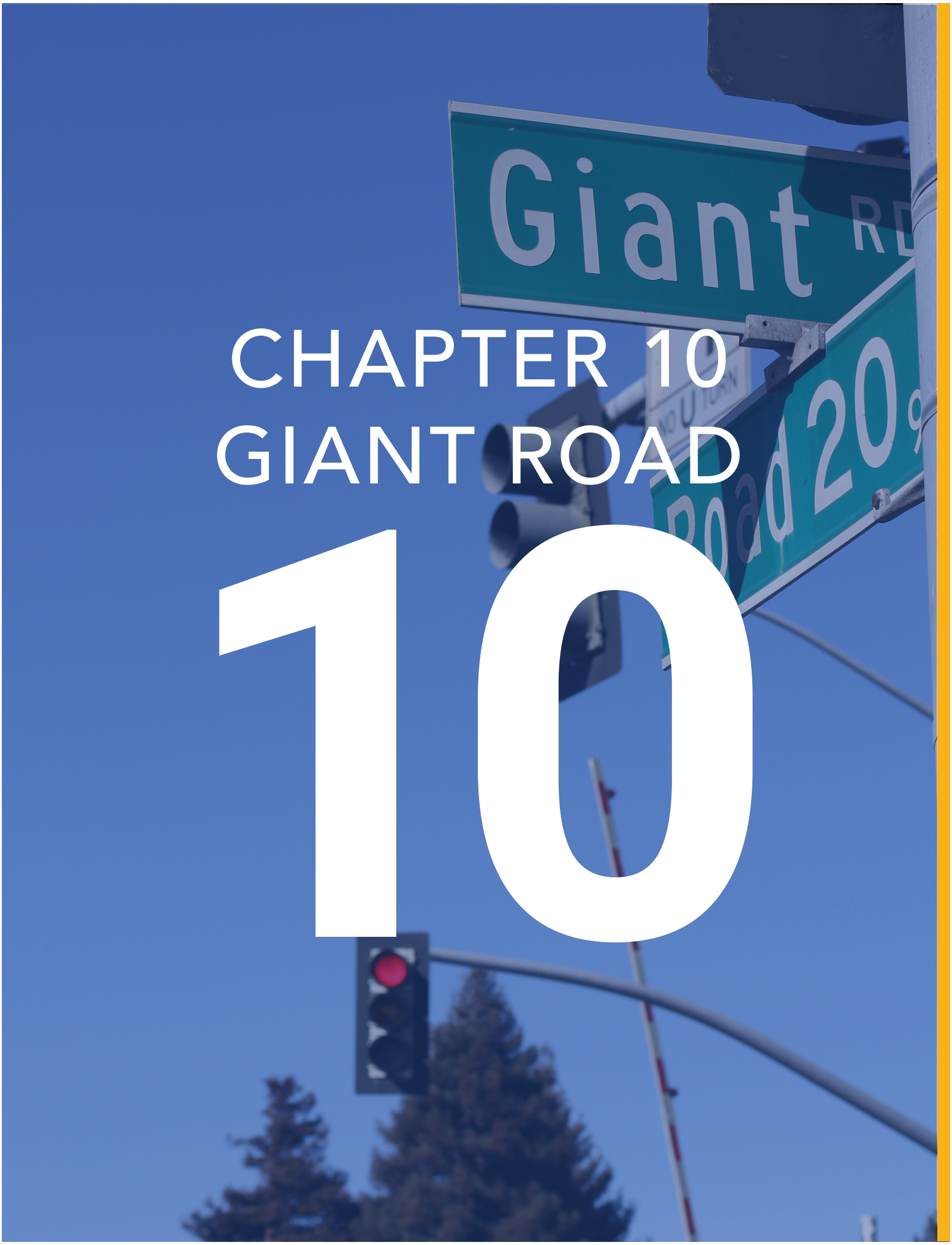
Figure 39: San Pablo Dam Road – Reconfigured Slip Lane at Amador Street and San Pablo Dam Road



Cost Estimate

Per Caltrans unit costs[1], the estimated construction cost for the recommended design of San Pablo Dam Road is approximately $1,860,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, and other factors.

1 Caltrans Contract Cost Database, District 4, 2019-2021 costs



CHAPTER 10
GIANT ROAD

10

Corridor Background

Giant Road is a north/south arterial that connects Brookside Drive and Miner Avenue. To the west of Giant Road are railroad tracks owned by Burlington Northern Santa Fe (BNSF). The City of San Pablo (City)'s *Bicycle and Pedestrian Master Plan* (BPMP, 2017) identified Giant Road as an opportunity to provide a regional connection. To the north of Giant Road is Point Pinole Regional Shoreline; to the south of Giant Road, via the *Rumrill Boulevard Complete Streets Project*, is the Richmond Bay Area Rapid Transit (BART) station. Giant Road has also been identified in the City's General Plan as needing safety improvements.

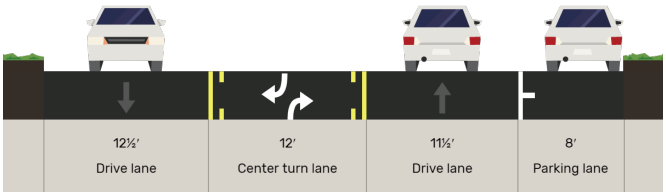
This chapter focuses on the full extent of Giant Road within the City of San Pablo, between Brookside Drive and Miner Avenue.

Existing Roadway Configuration

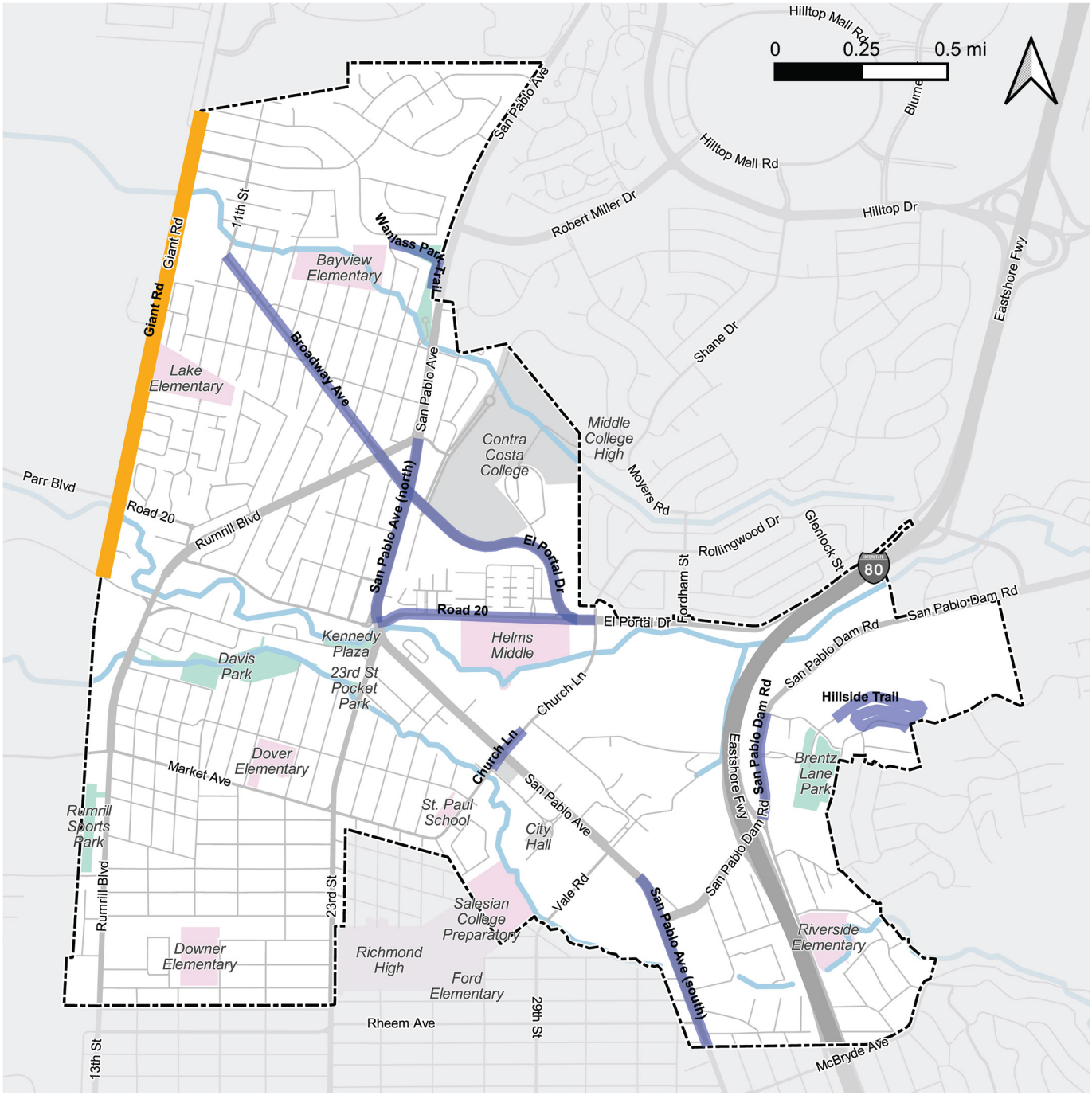
Giant Road has one (1) vehicle lane in each direction and a center turning lane north of the Road 20/Parr Boulevard intersection (Figure 41). Parking is generally permitted on the east side of the roadway, although vehicles also illegally park on BNSF Railroad right-of-way on the west side of Giant Road between Road 20/Parr Boulevard and Brookside Drive. Sidewalks are only provided on the east side of Giant Road, due to concerns about pedestrians walking on BNSF Railroad right-of-way. There are multiple different right-of-way widths along Giant Road, with Figure 41 illustrating the widest cross-section. There is one (1) signalized intersection at Giant Road and Road 20/Parr Boulevard.


Typical Cross Section of Giant Road.

Figure 41: Giant Road – Existing Cross Section



Study Corridors



Project Corridors

- Giant Rd
- Other Corridors

Connecting Active Transportation Facilities

No bicycle facilities or transit stops exist along Giant Road within City boundaries. This bicycle facility would provide a nearby connection to the ongoing *Rumrill Boulevard Complete Streets Project*, which will contribute to a north-south regional connection along the western edge of Contra Costa County.

Previous Planning Efforts

The *San Pablo General Plan 2030* (adopted 2011), identified Giant Road as a location for major transportation improvements to enhance safety on Giant Road, from Brookside Drive to Miner Avenue. No specific improvement projects were identified in the General Plan.

The *2019 Green Infrastructure Plan* recommended right-of-way improvements that include bioswales or other green infrastructure due to high flood risk in this region of the City. The *Green Infrastructure Plan* documented potential projects, including drainage improvements, bicycle and pedestrian upgrades, and traffic calming features.

Design Alternatives

As a result of the high vehicle speeds of the Giant Road corridor, and the limited number of railroad crossings on the western side of Giant Road, a two-way Class IV bicycle lane was the only recommended bicycle facility configuration. Three (3) design alternatives with the two-way Class IV bicycle lane were considered. Alternative 1 (Figure 42) removes the center turn lane to make room for a two-way Class IV bicycle lane. While Figure 42 depicts a typical cross section of Alternative 1, the configuration along Giant Road would vary based on the right-of-way width.

Alternative 2 (Figure 43) removes the center turn lane but preserves the parking lane by narrowing the vehicle lanes, bicycle lanes, and buffer width.

Alternative 3 (Figure 44) removes the parking lane, but preserves the center turn lane, and accommodates a two-way Class IV bicycle lane.

Figure 42: Giant Road – Alternative 1 General Cross Section (Facing North)

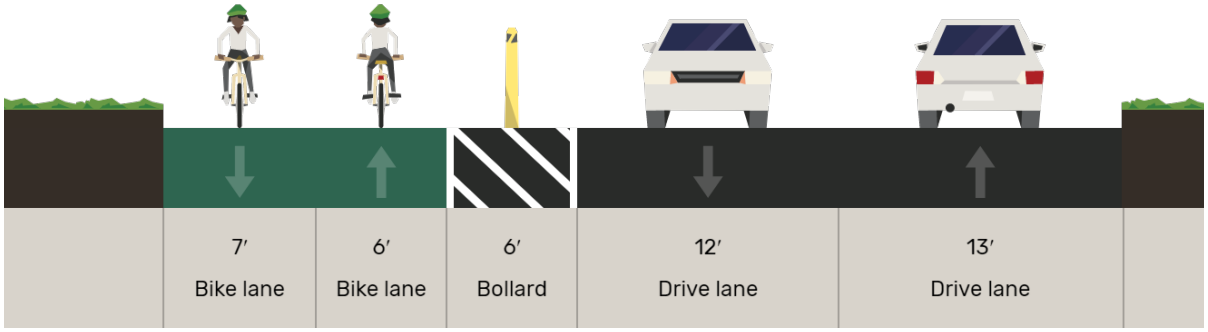


Figure 43: Giant Road – Alternative 2 General Cross Section (Facing North)

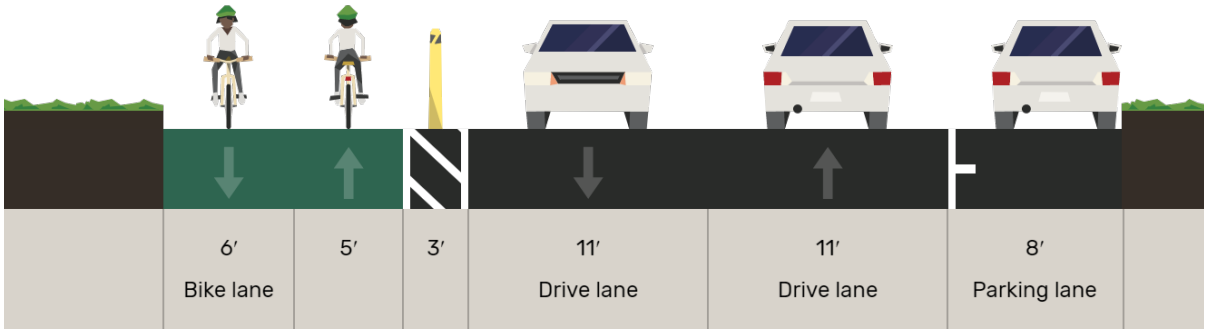
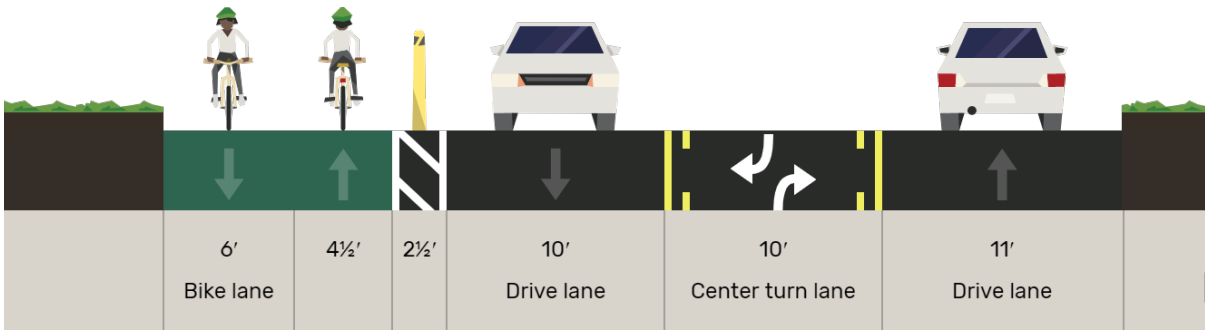


Figure 44: Giant Road – Alternative 3 General Cross Section (Facing North)



Community Priorities

Due to funding opportunities for Giant Road improvements, the Project Team conducted additional targeted outreach to residents, business owners, and stakeholders along Giant Road. The Project Team sent postcards to residents that live near Giant Road to promote the online survey and community workshop. City staff also worked with businesses, a housing association and multiunit property manager along Giant Road to identify any concerns related to the recommended bicycle lane and reduction in parking availability. These stakeholders were generally supportive, or indifferent, to the recommended project. The business entities were primarily concerned with truck routing and with maintaining as much parking as the project would allow.

Of those who responded to the survey, 47 percent reported that they bicycle along Giant Road, while only 34 percent said that they walk along Giant Road. These statistics reflect user perceptions that Giant Road is dangerous for bicyclists and pedestrians due to high vehicular speeds. Of all the corridors, Giant Road received the most community feedback about high speeds and reckless driver behavior. Survey respondents indicated that their priorities are bicycle lanes, slower traffic, and pedestrian amenities such as improved sidewalks and better lighting. Residents, including those that attended the community workshop, expressed excitement about the recommended conceptual design and support for the two-way Class IV bicycle lane along Giant Road. Community members also expressed support for removing parking to install the bicycle lane.

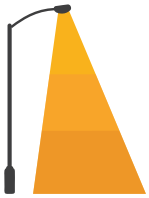
47%

34%

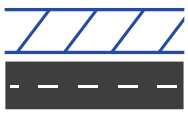
Bicycle Lanes

Slower Cars

Crosswalks



Lighting



Sidewalks

Bus Stops

Feasibility Considerations

Traffic Analysis

A traffic operations analysis was conducted at Giant Road & Parr Boulevard/Road 20, the one (1) signalized intersection on Giant Road, to document existing conditions through level of service (LOS)[1], delay (measured in seconds), and volume-to-capacity ratio[2]. This analysis was completed at corridor intersections where concept alternatives include geometric and/or traffic signal modifications (e.g., removing a travel lane, modifying lane geometry, changing signal timing). Existing conditions traffic analysis results serve as a comparative baseline for recommended intersection modifications.

Table 29 summarizes the movement, approach, and overall LOS and delay for the intersection of Giant Road & Road 20/Parr Boulevard. See Appendix B for full analysis results summary.

Table 29: **Giant Road & Road 20/Parr Boulevard -** Traffic Operations Summary (Existing Conditions)

Intersection	Direction	Movement	AM		PM	
			LOS (delay)	V/C	LOS (delay)	V/C
Giant Road & Parr Boulevard / Road 20	Eastbound	L	C (23.5)	0.29	B (17.7)	0.45
		T	C (23.1)	0.22	B (16.9)	0.35
		R	-	-	-	-
		Approach	C (23.1)		B (17.4)	
	Westbound	L	C (21.5)	0.02	C (21.3)	0.02
		T	C (24.0)	0.11	C (22.7)	0.26
		R	-	-	-	-
		Approach	C (23.9)		C (22.7)	
	Northbound	L	C (27.0)	0.52	C (34.4)	0.55
		T	A (4.9)	0.09	A (9.3)	0.28
		R	-	-	-	-
		Approach	B (11.1)		B (11.0)	
	Southbound	L	-	-	-	-
		T	A (8.7)	0.13	B (12.7)	0.23
		R	A (8.3)	0.05	B (11.7)	0.03
		Approach	A (8.5)		B (12.5)	

1 LOS describes traffic conditions—the amount of traffic congestion—at an intersection or on a roadway. LOS ranges from A to F, with A indicating a condition of little or no congestion and F indicating a condition with severe congestion, unstable traffic flow, and stop-and-go conditions. For intersections, LOS is based on the average delay experienced by all traffic using the intersection during the busiest (peak) 15-minute period. LOS A through D are generally considered acceptable.

2 Volume-to-capacity ratio (v/c) represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c approaches 1.0, traffic becomes unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.

Intersection Considerations

Giant Road has a limited number of intersections due to its location adjacent to the railroad tracks. The high volume intersections along the corridor include an unsignalized crossing at Brookside Drive and the signalized intersection at Road 20/Parr Boulevard.

At Brookside Drive, eastbound traffic on Brookside Drive does not have any stop control—in order to avoid vehicle queuing on the railroad tracks—while the westbound and southbound directions are stop-controlled. The bicycle facility is recommended to be stop-controlled with a defined queueing area for bicyclists waiting to turn that would maximize visibility, given the non-standard intersection configuration.

Road 20/Parr Boulevard is the main four-legged signalized intersection along the corridor. The key design challenges and considerations for this intersection include the offset alignment, the adjacent Giant Road bridge over San Pablo Creek, the signal preemption requirements with the BNSF Railroad crossing, and the split jurisdiction between the City of San Pablo and the City of Richmond. The City of San Pablo border roughly aligns with the western edge of the Giant Road right-of-way, and passes through the west side of the intersection; consequently, any intersection improvements will require coordination with the City of Richmond. A two-stage bicycle turn box and bicycle queuing area are recommended to facilitate bicycle turning movements from both directions of Giant Road to Road 20. After discussions with BNSF Railroad, the precise location of this turn-box and queuing area will need to be offset from the vehicle lane, in order to not interfere with the railroad track clearance requirements. Since Giant Road and Parr Boulevard are truck routes, a buffer and additional vertical separation is recommended to minimize truck intrusion into the two-way bicycle facility for right-turns from Parr Boulevard to Giant Road and from Giant Road to Parr Boulevard. Signal modifications will be needed at this location to provide a new signal head for northbound bicyclists. A "No Turn On Red" restriction is recommended for eastbound right-turns from Parr Boulevard to Giant Road in order to avoid a potential conflict with bicyclists traveling north/south through the intersection. However, all signal modifications and intersection changes will need to be approved by BNSF Railroad and the California Public Utilities Commission in order to ensure safety at the railroad crossing.

Many of the side-street intersections are "T" intersections that do not cross the railroad tracks; therefore, these intersections do not pose any conflicts with the two-way bicycle lane. At these minor street intersections, green markings and breaks in the vertical delineators are recommended to allow bicyclists to turn to and from the two-way bicycle lane. Where sufficient space is available, a bicycle queue box is provided to allow bicyclists to wait to make a turn and stay out of the flow of bicycle traffic.

Giant Road transitions to City of Richmond right-of-way north of the City of San Pablo limits, by Miner Avenue. In City of Richmond, there is currently only sufficient space for a Class III sharrow bicycle configuration; therefore, the two-way Class IV bicycle lane needs to transition to one-way bicycle facilities on each side of the road to align with this configuration. Since John Avenue is an uncontrolled 4-leg intersection, the Project Team recommends transitioning the two-way bicycle lane prior to this location to minimize potential safety conflicts. Thus, the northern terminus of the two-way bicycle lane is recommended at Stanton Avenue, at which location northbound bicyclists would cross Giant Road to connect to a one-way Class II bicycle lane on the east side of Giant Road. Additional crossing enhancements, e.g., a rectangular rapid flashing beacon, should be considered to improve the safety of bicyclists making this crossing.

Parking Analysis

The recommended design would preserve most of the parking on the east side of the street where it is currently provided, with a few exceptions. Parking removal is recommended on the east side of Giant Road for short segments near driveways or intersections, in order to provide improved visibility for vehicle and bicyclist turning movements from side-streets, and for a short distance north of Stanton Road and John Avenue in order to accommodate the one-way bicycle facilities.

The unpaved BNSF Railroad right-of-way area on the west side of Giant Road, south of Road 20, is illegally used for parking. Access to this area would be removed by the two-way bicycle lane design.

A parking occupancy study was conducted in October 2020 to determine the extent to which existing on-street parking is used. Existing parking was inventoried and observed on a block-by-block basis for Giant Road, between Brookside Drive and John Avenue. Parking occupancy was observed on a weekday morning (6AM-8AM), weekday evening (4PM-7PM), and weekend midday (1PM-2PM) to determine parking use at different times throughout a typical week (Table 30).

The parking study found that corridor-wide on-street parking is occupied at 20% on average on weekday mornings, 30% on average on weekday afternoons, and 39% on average on weekend afternoons. See Appendix A for additional information on the parking occupancy study. Results of this parking analysis indicated that limited parking removal or adjustments would be feasible.

Implementation Timeline

The Giant Road bicycle lane improvements are designed to be implemented on a relatively short-term timeline, although close coordination will be required with the BNSF Railroad and City of Richmond. The improvements primarily consist of signage, thermoplastic paint, and vertical separation throughout the corridor, in addition to the signal modifications required at Road 20/Parr Boulevard. There are no major impacts to local community access as a result of the targeted parking removal.

Table 30: **Giant Road** – Parking Occupancy

Segment	Side of Street	Supply	AM Occupancy	AM Utilization	PM Occupancy	PM Utilization	Weekend Occupancy	Weekend Utilization
Brookside Dr to Randy Ln	East	8	4	50%	5	63%	5	63%
Randy Ln to Road 20	East	9	0	0%	1	11%	0	0%
500' north of Lake St to Center St	East	52	7	13%	22	42%	34	65%
Palmer Ave to Stanton Ave	East	8	1	13%	1	13%	4	50%
Stanton Ave to John Ave	East	8	3	38%	2	25%	3	38%
Parr Blvd to Brookside Dr[3]	West	40	7	18%	3	8%	10	25%

Source: National Data & Surveying Service (October 2021)

3 This is the section (referred to above) of BNSF right of way that is illegally used for parking.

Conceptual Design

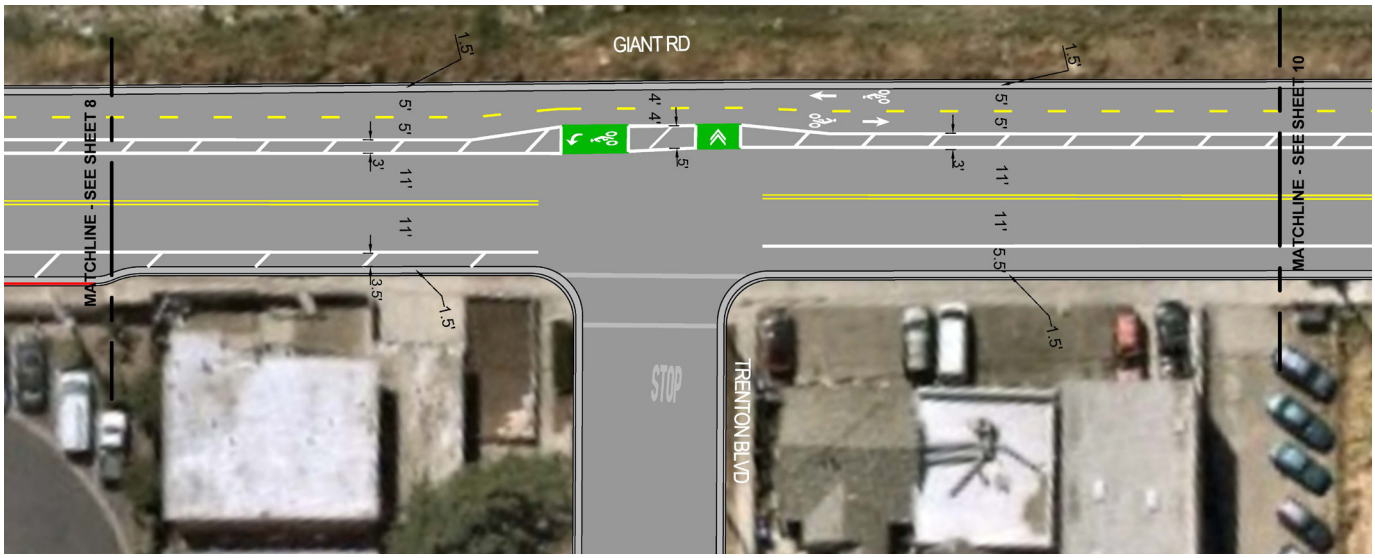
Design Overview

Alternative 2 was identified as the preferred alternative by City staff and the public, since it includes both the two-way Class IV bicycle lane and preserves sufficient parking to meet the demand on the corridor. See Appendix D for the concept design plans.

Benefits of the design include:

- Protected two-way bicycle lane provides a safer and more comfortable regional connection;
- Intersection treatments, at Road 20/Parr Boulevard as well as the minor side streets, minimize conflicts between motorists and bicyclists to provide a safer experience;
- Removal of the center turn lane may lower vehicle speeds and dangerous vehicle maneuvers, such as using the center turn lane as a passing lane; and
- Parking supply that meets the corridor-wide parking demand.

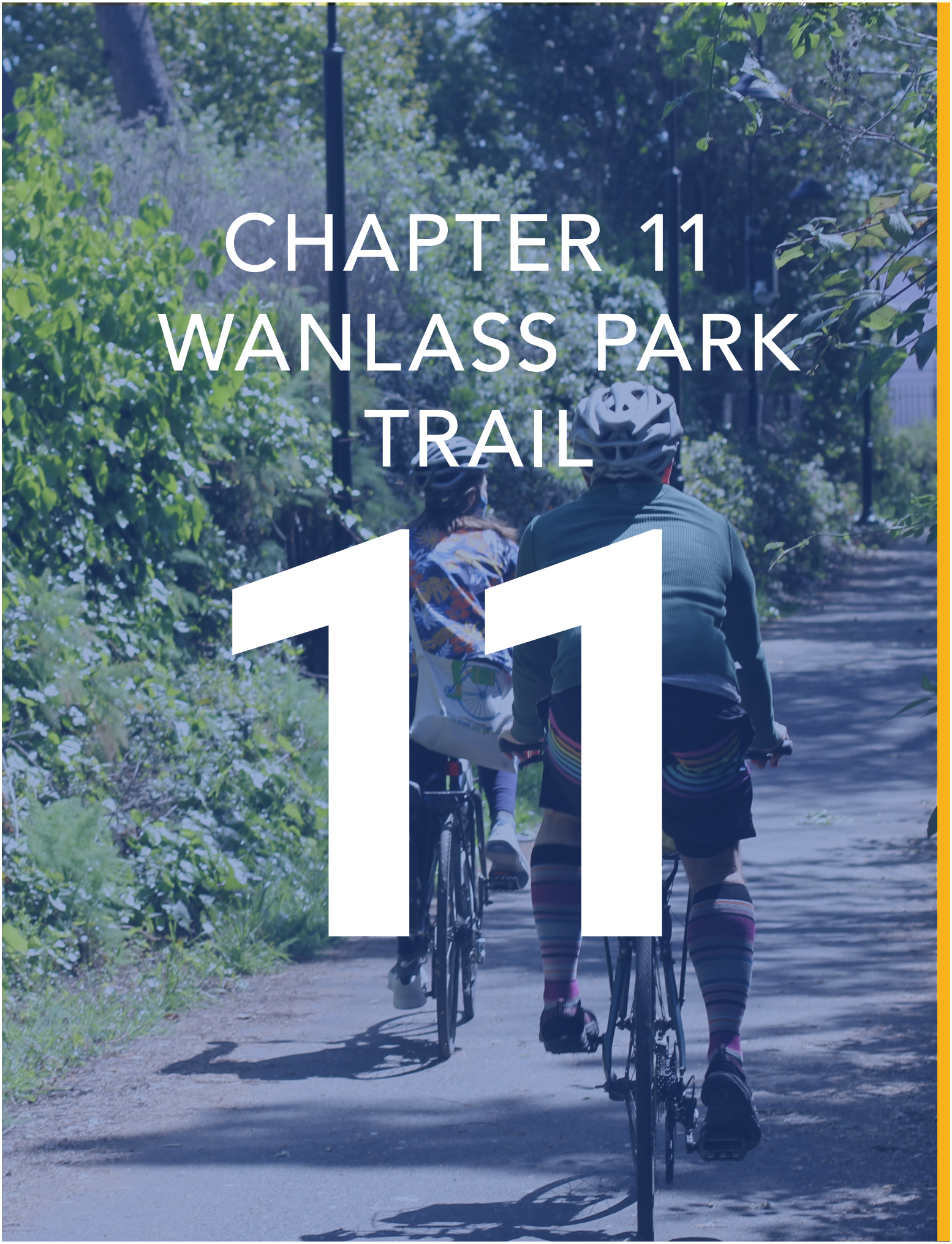
Figure 45: Giant Road - Typical Segment with Two-Way Separated Bicycle Lane



Cost Estimate

Per Caltrans unit costs[4], the estimated construction cost for the recommended design of Giant Road is approximately $700,000, including planning, design, construction management, and contingency. A full cost estimate can be found in Appendix E. This cost may vary based on implementation timeline, buffer material selected for the bicycle lane, and other factors.

4 Caltrans Contract Cost Database, District 4, 2019-2021 costs



CHAPTER 11
WANLASS PARK TRAIL

11

Corridor Background

The City's Bicycle and Pedestrian Master Plan (BPMP, 2017) recommended a Class I shared-use bicycle and pedestrian path that would connect Wanlass Park to 19th Street. A shared-use path or trail at this location would provide a direct connection between the lower half of Wanlass Park, through the demonstration urban forest in the upper half Wanlass Park[1], to the northern residential area of San Pablo. There is a long-term potential for an additional trail connection west to Bayview Elementary School through undeveloped West Contra Costa Unified School District hillside property and along a channelized portion of Rheem Creek that is under Contra Costa County Flood Control District jurisdiction. A trail connection could extend east across San Pablo Avenue to connect to Contra Costa College via Rheem Creek. This Wanlass Park trail would connect to existing Class II bicycle lanes on San Pablo Avenue, via Rivers Street.

Community Priorities

During the community engagement process, over 70 percent of survey and workshop respondents said they would walk on this trail, if constructed. Sixty-seven percent of respondents said that they would bicycle on this trail, if constructed. Qualitative feedback from the survey suggests that there is high-level support for this trail, and interest in more bicycle and pedestrian connections to Wanlass Park. Most community members would like to understand the details of the recommended design before weighing in. Depending on the final alignment and design, some residents had concerns about safety, lighting, privacy, and connectivity to other bicycle facilities.

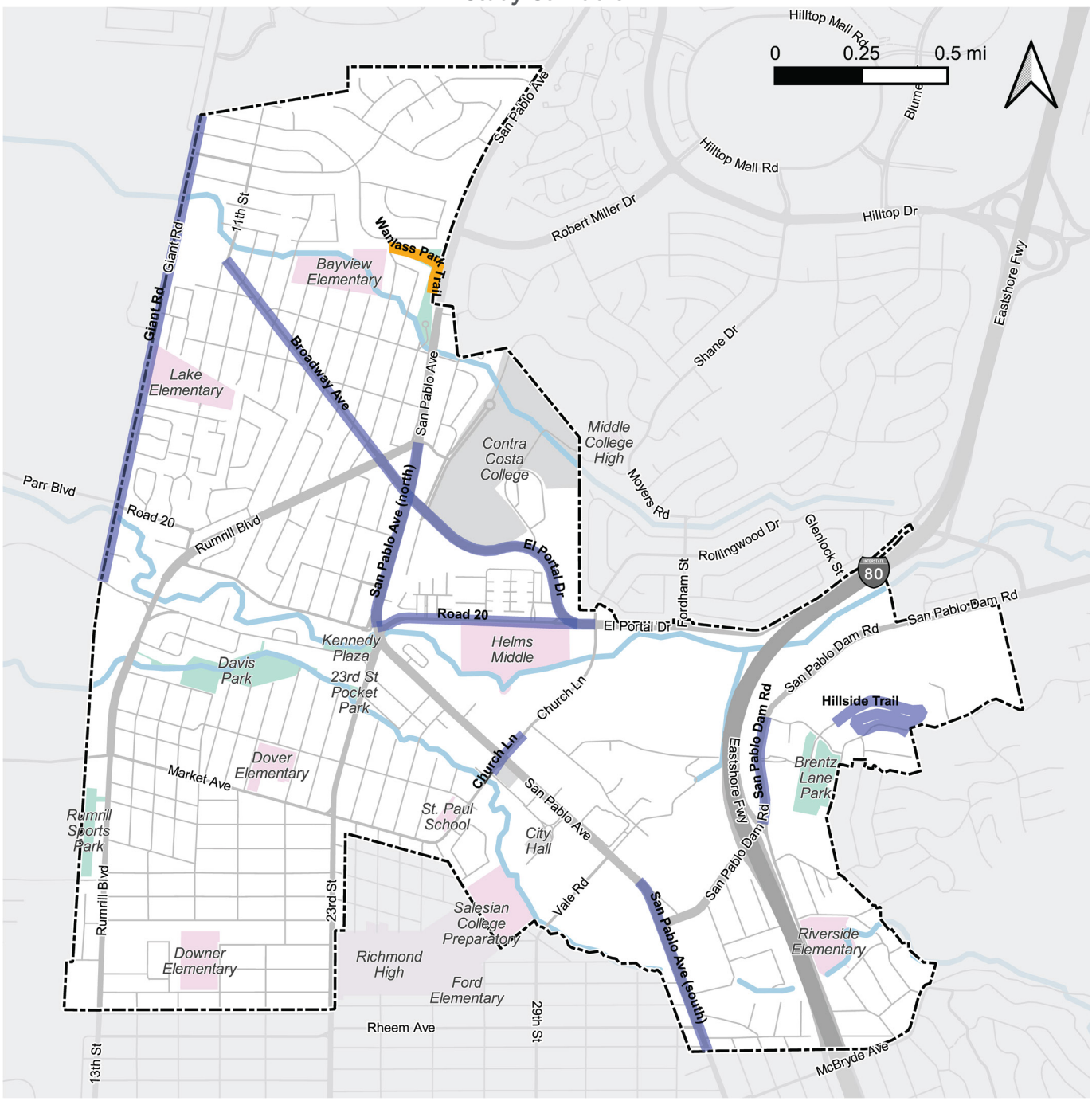
"My kids go to daycare nearby, and I know that they would use this path with their teachers."

67%

70%

1 The non-profit organization Earth Team planted this demonstration urban forest between 2015 and 2019 through a RELEAF grant. As of 2021, this section of Wanlass Park is closed to public access in order to allow the trees get established.

Study Corridors



Project Corridors

- Wanlass Park Trail
- Other Corridors

Feasibility Considerations

A trail connection between Wanlass Park and 19th Street would traverse steep topography and would likely require earthwork cut/fill and/or a switchback alignment to create a suitable grade for trail traffic. There are several additional constraints where the demonstration urban forest in the northern half of Wanlass Park intersects 19th Street—a utility box, telephone pole, and thick vegetation—which would need to be relocated or removed prior to trail implementation.

Wanlass Park Trail – Steep Grade in Demonstration Urban Forest in Wanlass Park

Cost Estimate

On average, the per-mile cost of trails varies widely, ranging from $1.2 million per mile to $3.4 million per mile. These costs vary based on geography, topography, trail amenities, right-of-way, and environmental mitigation. Trail costs can exceed this range when considering larger grading, structural, drainage, landscaping, utility adjustments, or green infrastructure design components. Per Caltrans unit costs, the estimated construction cost for the recommended design of Wanlass Park Trail is approximately $550,000 to $850,000, not including planning, design, construction management, and contingency.

Wanlass Park Trail – Utility and Vegetation Conflicts at Potential Wanlass Park Trail Connection to 19th Street

CHAPTER 12
HILLSIDE TRAIL

12

Corridor Background

The City's Bicycle and Pedestrian Master Plan (BPMP, 2017) recommended a Class I shared-use path connection through the City-owned open space south of the Princeton Plaza Shopping Center. A shared-use path or trail at this location would connect residences off Hillcrest Road to San Pablo Dam Road. If implemented, the Hillside Trail would connect just south of the Class II/Class IV bicycle lanes recommended along San Pablo Dam Road as a part of this Corridor Study. The recommended east/west trail would begin at San Pablo Dam Road, approximately 300 feet north of Morrow Drive, and continue through the City-owned open space to Hillcrest Road, between Bayo Vista Avenue and Parkview Terrace.

Community Priorities

Community survey and workshop results indicated that approximately 65 percent of respondents would bicycle on this trail, if constructed. Sixty-two percent of respondents said they would walk on the trail, if constructed. Overall, there was somewhat less community support for the Hillside Trail than the Wanlass Park Trail. Residents that were supportive of the trail said that this would be a good recreational amenity for neighbors, but would have limited use as a commute connection or for the general public. A number of respondents had concerns about the trail grade and suitability for bicycling.

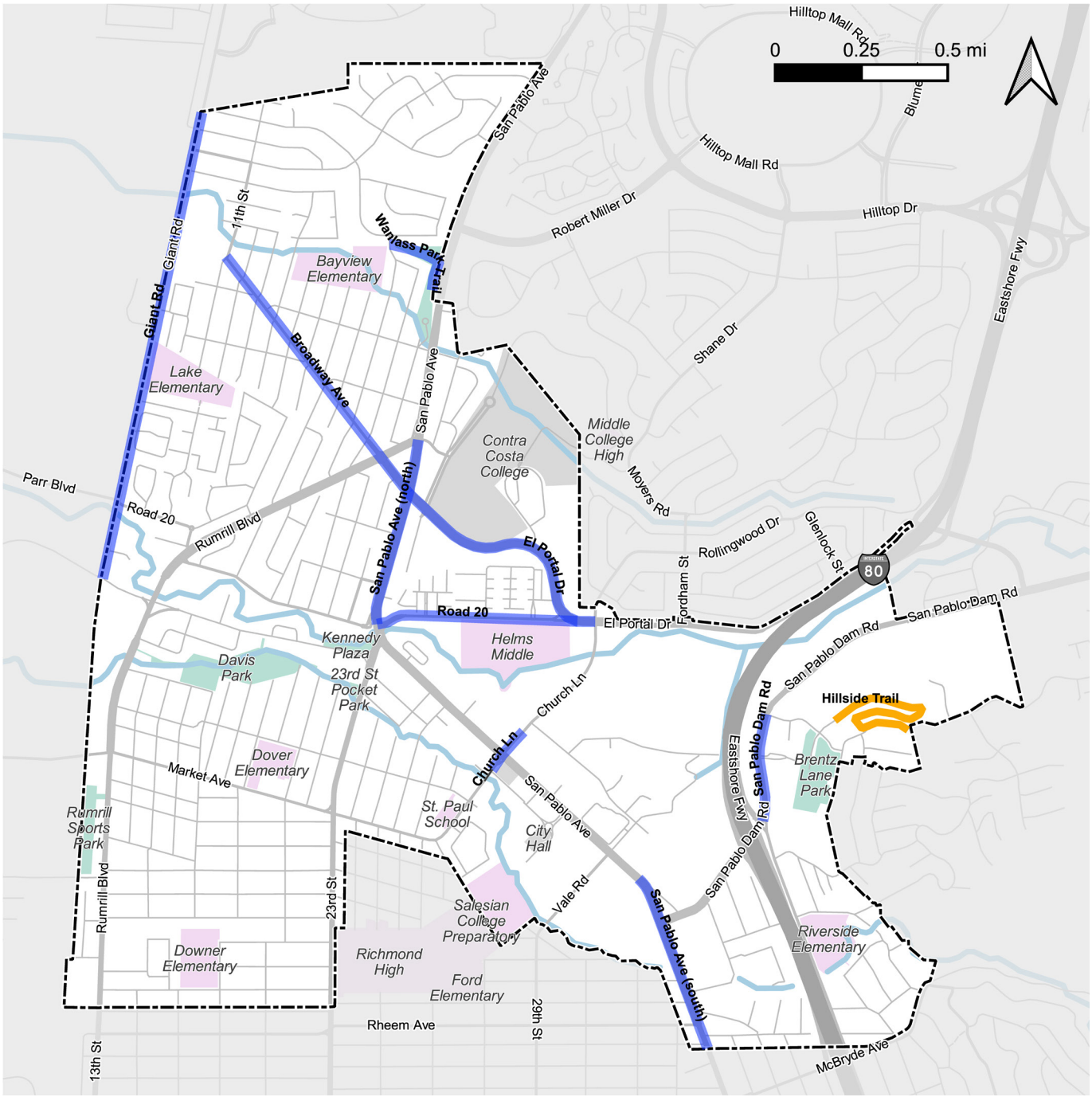
Residents of Parkview Terrace expressed a lack of interest in a direct connection to a potential trail, meaning that the trail alignment would likely connect San Pablo Dam Road to Hillcrest Road without additional spur trails to adjacent residential streets.

"I would use this path for recreation, but not for my commute."

"It looks like it may be too steep to bike, but might be useful for folks living along the path. It may be more effective to spend the money on better bike lanes along the rest of San Pablo Dam Road."

65%

62%



Project Corridors

- Hillside Trail
- Other Corridors

Feasibility Considerations

A trail connection between San Pablo Dam Road and Hillcrest Road would traverse steep topography and would require earthwork cut/fill and/or a switchback alignment to create a suitable grade for trail traffic. Additionally, there is thick vegetation where the undeveloped land intersects San Pablo Dam Road that would need to be removed prior to trail implementation.

Hillside Trail – Steep Grade on Undeveloped Land North of Hillcrest Road

Cost Estimate

On average, the per-mile cost of trails varies widely, ranging from $1.2 million per mile to $3.4 million per mile. These costs vary based on geography, topography, trail amenities, right-of-way, and environmental mitigation. Trail costs can exceed this range when considering larger grading, structural, drainage, landscaping, utility adjustments, or green infrastructure design components. Per Caltrans unit costs, the estimated construction cost for the recommended design of Hillside Trail is approximately $1,200,000 to $1,800,000, not including including planning, design, construction management, and contingency.

CHAPTER 13
NEXT STEPS

13

Implementation Considerations

Project implementation of recommended Corridor Study designs will require community support and continued political leadership, in addition to funding for permitting and approval, final design, construction and ongoing operations and maintenance. Each project will be subject to California Environmental Quality Act (CEQA), including review and noticing of the public as it progresses through the next stages of design.

Project Phasing

Pedestrian and bicycle improvement projects should be coordinated with other planned street projects, when feasible, to efficiently leverage staff and funding resources. The City has already successfully implemented projects using this approach, including recent pavement maintenance projects that have also installed Class II or Class III bicycle lanes, through the El Portal Drive Urban Greening Project (2020) that installed a bioswale-protected Class IV bicycle lane, and through the ongoing Giant Road Cycletrack and Pavement Maintenance Project. The active transportation recommendations from this Corridor Study can be implemented through:

- **street resurfacing** (e.g., roadways can be restriped to include dedicated bicycle facilities as a part of repaving or resurfacing);
- **safety improvements** (e.g., roadway modifications that improve safety—such as installing high-visibility crosswalks and corner curb extensions to reduce pedestrian exposure to motor vehicles—can be integrated into larger safety projects);
- **accessibility upgrades** (e.g., street improvements such as curb ramp (re)construction or installation of audible pedestrian pushbuttons can be implemented as a part of projects working to meet Americans with Disabilities Act requirements);
- **traffic calming** (e.g., traffic calming projects—such as neighborhood traffic circle installation—oftentimes use similar materials as for pedestrian and bicycle projects); and/or
- **private development** (e.g., improvements to the sidewalk or roadway fronting a proposed development can be incorporated into the conditions for approval).

Final Design Considerations

Design and installation of new active transportation facilities should consider existing street uses to ensure compatibility with existing operations. As part of the Corridor Study stakeholder engagement process, staff from City of San Pablo (City) Maintenance Division, Police Department and AC Transit all carefully reviewed the draft designs to identify and resolve any concerns regarding the designs. Additional engagement with these entities will be important to finalize the designs. This will require coordination with:

- the City Public Works Department to ensure easy access to storm drains, street trees, public trash cans, and utility access points, as well as compatibility with street sweeping activities;
- AC Transit to ensure efficient bus operations with minimal impacts;
- waste collection companies to ensure unimpeded trash and recycling pick-up; and
- the Contra Costa County Fire Protection District to ensure proposed vertical elements do not obstruct emergency motor vehicles or increase response times.

Separated bicycle lane clearances between the curb line and any vertical delineator are especially important to consider from a maintenance perspective. As of 2021, neither the City nor the City's contracted street sweeping company own a mini street sweeper, only a standard size street sweeper which requires a 10-foot clearance. If Class IV separated bicycle lanes are implemented in a short timeframe, either the City or the contracted street sweeping company would need to manually sweep the separated bicycle lane to keep it free of debris, or purchase a mini street sweeper.

Additionally, new active transportation facilities may need to incorporate green stormwater infrastructure (GSI) facilities if the roadway construction surpasses

defined regulatory thresholds.[1] GSI facilities can be incorporated into active transportation facility projects in ways that support both bicyclist and pedestrian safety (e.g., linear bioswales that serve as the barrier element for Class IV separated and protected bicycle lanes; bioswales that are incorporated in curb extensions to shorten the crossing distance for pedestrians). The City of San Pablo Green Infrastructure Plan (adopted 2019) provides additional guidance regarding the implementation of GSI facilities in San Pablo. Given the highly variable cost of GSI construction (e.g., based on the existing or new drainage patterns, the location of existing storm drain infrastructure, etc.), the cost estimates provided in this Report do not include any GSI elements. However, GSI elements should be included where feasible, as determined by available funding, infrastructure and space.

El Portal Drive bioswale

The cost of an active transportation project not only includes construction, but also the ongoing operations and maintenance of facilities. Operations and maintenance activities include restriping crosswalks and bicycle lane markings, sidewalk and curb ramp repair, shared-use path repair, repair/replacement of vertical separation elements, sign replacement, ongoing landscaping maintenance (e.g., GSI facilities, which can have extensive maintenance and inspection requirements), street light repair, and clearing trash and other debris.

1 See the most recent issuance of the Municipal Regional Stormwater Permit (MRP) from the San Francisco Bay Regional Water Quality Control Board for applicable stormwater requirements.

Funding Opportunities

Cities can fund bicycle and pedestrian projects in a variety of ways including funding from city, county, regional, state, federal, private, or non-profit sources. Historically, the City of San Pablo (City) has relied upon grant funding or planned street resurfacing projects to implement active transportation improvements. The Federal Highway Administration (FHWA), the California Department of Transportation (Caltrans), the California Transportation Commission (CTC), the California Office of Traffic Safety (OTS), the Metropolitan Transportation Commission (MTC), and the Contra Costa Transportation Authority (CCTA), among other agencies, offer a variety of active transportation funding sources that the City could use to fund and implement the designs recommended in this Corridor Study (Table 31).

The City may also consider establishing a dedicated funding source by increasing the proportion of capital improvement project (CIP) funds dedicated to active transportation projects.

Table 31: Summary of Potential Active Transportation Funding Sources

Active Transportation Funding Sources	ATP Projects Primary (P) or Accessory (A) Focus	Transit-Supportive and Access Improvements	Traffic Calming	Roundabouts	Pedestrian Crossing Enhancements	Complete Streets and Corridor Planning Studies	Simple Striping and Signage	Signal Modification / Improvement	Access Consolidation / Restriction	Pedestrian-Scale Illumination	Programs Implementation	Maintenance and Operations	Agency
Federal Programs													
Congestion Management & Air Quality (CMAQ)	P	X	X	X	X		X	X			X		FHWA
State Programs													
Active Transportation Program (ATP) Grant	P	X	X	X	X	X				X	X		Caltrans
Caltrans Transportation Planning Grant Program	P					X	X	X	X	X			Caltrans
Highways Safety Improvement (HSIP) Grant	P				X		X	X	X	X		X	Caltrans
State Transportation Improvement Program (STIP)	A	X		X			X	X	X	X			CTC
Office of Traffic Safety Grants	P										X		OTS
Regional Programs													
One Bay Area Grants (OBAG)	P	X	X	X	X	X					X	X	MTC
Transportation Development Act (TDA) Article 3	P	X	X	X	X	X	X	X		X	X		MTC
Measure J	P	X	X	X	X	X	X	X	X	X	X	X	CCTA

Implementation Timeline

Near-Term Projects

The City has identified the following projects for potential implementation in the near-term (0-5 years):

Giant Road

In 2020, the City was awarded funds from the One Bay Area Grant (OBAG) 2 Program to implement a pavement maintenance and repair project on Giant Road. During development of the Corridor Study, staff saw an opportunity to leverage the upcoming pavement maintenance work with the recommended two-way Class IV bicycle lane improvements. Staff successfully secured additional funding to support the bicycle lane implementation through the Metropolitan Transportation Commission's Safe and Seamless Mobility Quick Strike Program and through the regional Transportation Development Act 3 (TDA3) funding.

As of 2021, the City is coordinating with the City of Richmond, BNSF Railroad, and the California Public Utilities Commission to receive approval for the intersection design at Giant Road & Road 20/Parr Boulevard. Project final design is expected to be completed by end of 2022. Project construction is expected in 2023.

Broadway Avenue

As a result of the success and enthusiasm of the Walk & Bike Broadway temporary demonstration event in September 2021, the City will pursue Active Transportation Program (ATP) funds in the upcoming Cycle 6 in mid-2022 to finalize design and construct the recommended two-way Class IV bicycle lane on Broadway Avenue, as well as the continuation of these bicycle lane facilities onto El Portal Drive. If the City is awarded ATP Cycle 6 funding in 2023, project design is expected to begin in 2024 and project construction in 2026 or 2027.

El Portal Drive

The City plans to include the recommended two-way Class IV bicycle lane on El Portal Drive as part of the ATP Cycle 6 grant application in order to fund final design and construction of the bicycle facilities along the Broadway Avenue / El Portal Drive corridor. Since El Portal Drive is a continuation of Broadway Avenue, the continuation of this two-way Class IV bicycle lane would provide a safe and seamless connection for bicyclists traveling between residential neighborhoods near Broadway Avenue and local school and commercial destinations near El Portal Drive. If the City is awarded ATP Cycle 6 funding in 2023, project design is expected to begin in 2024 and project construction in 2026 or 2027.

The two-way Class IV bicycle lane design on El Portal Drive minimizes the changes to the roadway by only removing one vehicle lane in the westbound direction, which is the same configuration at the El Portal Drive & I-80 intersection and along the I-80 sound wall. During agency stakeholder review, this two-way Class IV bicycle lane configuration was favored by the San Pablo Police Department, Public Works' Engineering Division and Public Works' Maintenance Division.

Church Lane at San Pablo Avenue

A majority of the 400-foot bicycle lane gap on Church Lane that was originally identified in the San Pablo *Bicycle and Pedestrian Master Plan* will be closed as part of the "Church/Willow and El Portal/Mission Bell Intersection Improvement Project" funded by Highway System Improvement Plan (HSIP) funds. These improvements are expected to be constructed in 2022.

Following HSIP project construction, as well as expected future development at the old San Pablo City Hall location at the northwest corner of Church Lane and San Pablo Avenue, the City will determine if any additional adjustments are needed for this design.

This Church Lane at San Pablo Avenue project is a potential candidate for TDA3 funding, for example in TDA3 Fiscal Year 2023-2024.

Mid-Term Projects

The City has identified the following projects for potential implementation in the mid-term (5-10 years):

San Pablo Avenue (North)

As of 2021, the City has started design on a multi-year project to improve the intersection at San Pablo Avenue and 23rd Street and Road 20 and to reconstruct the bridge that is the foundation of this intersection. This bridge reconstruction and intersection improvement project will analyze different intersection configurations, which may significantly change how motorists, bicyclists, and pedestrians travel through the area. While this Corridor Study identified concepts around this intersection, the City will further refine the San Pablo Avenue (North) design during the bridge reconstruction and intersection improvement project.

If the City is successful with its ATP Cycle 6 funding application to construct the Broadway Avenue/ El Portal Drive two-way bicycle lanes, then the intersection design for San Pablo Avenue & Broadway Avenue/El Portal Drive (e.g., removal of slip lanes, turning lane configuration) will establish a basis for the future San Pablo Avenue (North) Project.

This San Pablo Avenue (North) project is a potential candidate for OBAG (e.g., Cycle 3 or 4) or Measure J funding.

Road 20

In order to streamline the design and minimize the cost of construction for the Road 20 project, the City wants to leverage the following efforts:

- As of 2021, the City has started design on a multi-year project to improve the intersection at San Pablo Avenue and 23rd Street and Road 20 and to reconstruct the bridge that is the foundation of this intersection. This bridge reconstruction and intersection improvement project will analyze different intersection configurations, which may significantly change how motorists, bicyclists, and pedestrians travel through the area. While this Corridor Study identified concepts around this intersection, the City will further refine the Road 20 design during the bridge reconstruction and intersection improvement project.
- If the City is successful with its ATP Cycle 6 funding application to construct the Broadway Avenue/ El Portal Drive two-way bicycle lanes, then the intersection design for Road 20 and El Portal Drive (e.g., removal of slip lane, turning lane configuration, pork-chop island reconfiguration) will establish a basis for the future Road 20 Project.
- There is a planned 4-story high-density residential building on the southwestern side of Road 20. The street reconfiguration in front of this building may require further adjustment based on the development's final design.

This Road 20 project is a potential candidate for Active Transportation Plan funding (e.g., Cycle 7 or 8), OBAG (e.g., Cycle 3 or 4) or Measure J funding.

Long-Term Projects

The City has identified the following projects for potential implementation in the long-term (10+ years):

San Pablo Avenue (South)

As a result of the substantial number of median modifications that would be required to implement safe bicycle and pedestrian facilities on San Pablo Avenue (South), this project has a longer time horizon.

Additional ongoing construction and planning efforts that may inform the final San Pablo Avenue (South) design include:

- As of 2021, the City is updating its General Plan and Housing Element. There are multiple focus areas for future housing development in San Pablo, including the area along San Pablo Avenue (South). If the land uses change along San Pablo Avenue (South), this may change the preferred configuration of the bicycle facilities.
- Building on its 2017 *I-80 High-Capacity Transit Study*, the West Contra Costa Transportation Authority Committee (WCCTAC) is working on a *San Pablo Avenue Multimodal Corridor Study* to evaluate potential transit, bicycle and pedestrian improvements along the full San Pablo Avenue corridor in Contra Costa County. Based on the outcomes of this planning effort, there may be additional transit supportive elements that will be incorporated into the San Pablo Avenue (South) configuration.

This San Pablo Avenue (South) project may be a good candidate for One Bay Area Grant (e.g., Cycle 4) or Measure J.

San Pablo Dam Road

The western part of this San Pablo Dam Road design falls under Caltrans right-of-way (i.e., at the I-80 interchange and to the east, where the hillside is Caltrans property). As a result, significant Caltrans coordination will be required to implement this San Pablo Dam Road project.

Additional ongoing construction and planning efforts that may inform the final San Pablo Avenue (South) design include:

- The Contra Costa Transportation Authority (CCTA), in collaboration with Caltrans, have planned long-term improvements at the I-80 and San Pablo Dam Road interchange. Phase 1 of these improvements—reconfiguration of the El Portal Drive interchange and the I-80 pedestrian overcrossing by Riverside Elementary School—was completed in 2017. However, Phase 2 of these improvements—including reconfiguring the interchanges at San Pablo Dam Road and Amador Street—has not been fully funded for design or construction. As of 2021, there is no confirmed construction timeline for Phase 2 of the San Pablo Dam Road interchange improvements. Nevertheless, all concept design recommendations are presented with this long-term project in mind.
- As of 2020, Contra Costa County has conducted an initial feasibility study regarding bicycle and pedestrian improvement to San Pablo Dam Road. Additional developments from Contra Costa County may inform the preferred configuration of bicycle improvements on San Pablo Dam Road.

This San Pablo Dam Road project is a potential candidate for One Bay Area Grant (e.g., Cycle 4) or Measure J.

Wanlass Park Trail

The Public Works Department's primary focus in the development of active transportation facilities will focus on areas that have the greatest potential for safety improvements and potential for transportation mode shift, in support of the City's *Climate Action Plan*. Based on the community outreach efforts conducted through this Corridor Study, the primary intended use of this potential Wanlass Park Trail appears to be recreational.

Additionally, the non-profit organization Earth Team planted a demonstration urban forest in Wanlass Park between 2015 and 2019. The ideal design of any bicycle and/or pedestrian facilities in Wanlass Park will be configured around the matured growth of these trees.

This Wanlass Park Trail may be a good candidate for Active Transportation Plan funding (e.g., Cycle 8 or 9) in order to fund the technical geotechnical design work and final construction.

Hillside Trail

The Public Works Department's primary focus in the development of active transportation facilities will focus on areas that have the greatest potential for safety improvements and potential for transportation mode shift, in support of the City's *Climate Action Plan*. Based on the community outreach efforts conducted through this Corridor Study, the primary intended use of this Hillside Trail appears to be recreational. Additionally, there is a lower level of interest in the Hillside Trail, as compared to the Wanlass Park Trail.

This Hillside Trail may be a good candidate for Active Transportation Plan funding (e.g., Cycle 8 or 9) in order to fund the technical geotechnical design work and final construction.

San Pablo Bicycle and Pedestrian Corridor Study