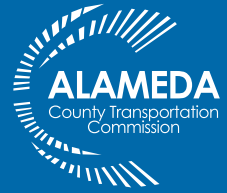
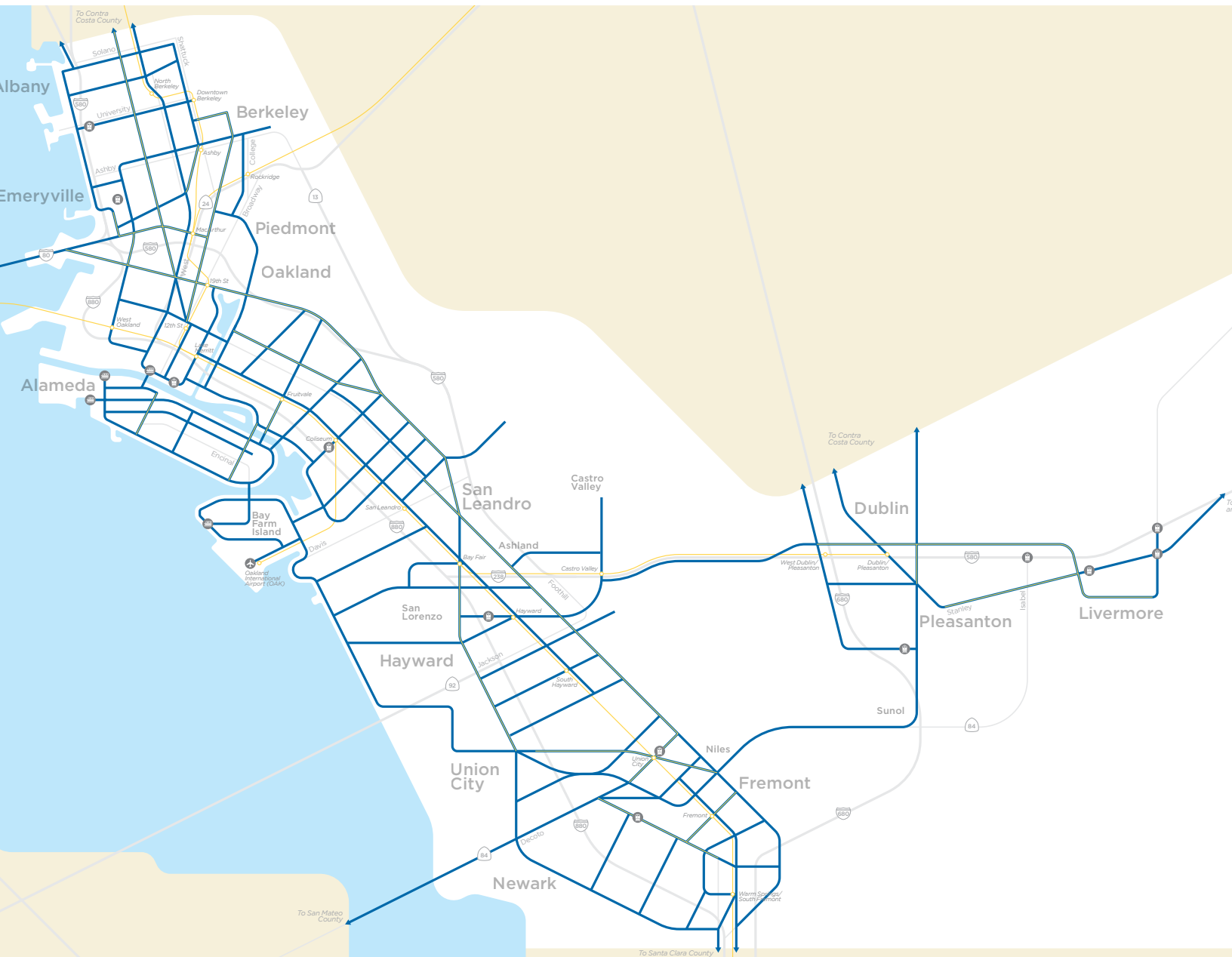


# ALAMEDA CTC COUNTYWIDE BIKEWAYS NETWORK



## Phasing and Implementation Strategies and Case Studies



May 2024



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## INTRODUCTION

This white paper offers a menu of implementation strategies to support the successful implementation of high-quality All Ages and Abilities (AAA) bikeways in Alameda County. It also contains a checklist of implementation considerations and a set of AAA bikeway implementation case studies. Together, these sections highlight locally tested construction methods and project implementation strategies ranging from in-house pilot projects to major grant-supported capital investment projects. This document is accompanied by the white paper "Phasing and Implementation Treatments and Materials Toolbox."

### Why is this white paper needed?

Alameda CTC is committed to supporting local agencies in their efforts to advance the implementation of high-quality bikeway networks, including AAA bikeways on the Alameda CTC Countywide Bikeways Network (2022). A wealth of bikeway design guidance available from state and national organizations documents bikeway design best practice. To make the guidance more accessible, Alameda CTC maintains an online bikeway design resource that summarizes and references key guidance from the National Association of City Transportation Officials (NACTO), the Federal Highway Administration (FHWA), and other agencies.

Even with these resources, there are guidance gaps in how to get there, including communication of tradeoffs with technical and community stakeholders, identification of phasing strategies, and planning for operations and maintenance considerations. Each poses challenges that can lead to long project timelines or possibly stalled implementation. This paper aims to provide additional guidance in these areas.

## How to Use this Document

The document is organized into three parts:

### ✔ Considerations Checklist

Potential challenges and considerations for implementation of the Countywide Bikeways Network (CBN) are outlined in a checklist for practitioners, each with an accompanying icon. Where a checklist item is applicable to your project or jurisdiction, look for its icon in the case studies to learn more about projects with potentially similar challenges and considerations.

### 🔧 Implementation Strategies

The menu of implementation strategies also has a set of corresponding icons. Readers should look for these icons in the project stories to learn more about how peer agencies used these strategies to advance successful projects.

### 📍 Case Studies

Six case studies are presented to demonstrate the various design considerations and the strategies adopted by jurisdictions to advance projects.



## Selecting All Ages & Abilities Bikeways

The Alameda CTC All Ages and Abilities Policy, approved in December 2022, sets the highest expectation for safety and comfort on the Countywide Bikeways Network to ensure people of all ages and physical abilities are safe and feel safe walking, biking, rolling, and riding transit. High-quality bikeways also encourage mode shift toward sustainable, active modes. Countywide Bikeways facilities are expected to incorporate All Ages and Abilities design principles defined in the [NACTO Contextual Guidance for Selecting All Ages and Abilities Bikeways](#) and shown in Table 1. This guidance recommends bikeway facility types appropriate for people of all ages and abilities based on contextual factors such as vehicle speeds, volumes, number of lanes, and curb uses.

Table 1: Contextual Guidance for Selecting All Ages & Abilities Bikeways

Contextual Guidance for Selecting All Ages & Abilities Bikeways				
Roadway Context				All Ages & Abilities Bicycle Facility
Target Motor Vehicle Speed*	Target Max. Motor Vehicle Volume (ADT)	Motor Vehicle Lanes	Key Operational Considerations	
Any		Any	Any of the following: high curbside activity, frequent buses, motor vehicle congestion, or turning conflicts†	Protected Bicycle Lane
< 10 mph	Less relevant	No centerline, or single lane one-way	Pedestrians share the roadway	Shared Street
≤ 20 mph	≤ 1,000 – 2,000		< 50 motor vehicles per hour in the peak direction at peak hour	Bicycle Boulevard
≤ 25 mph	≤ 500 – 1,500	Single lane each direction, or single lane one-way	Low curbside activity, or low congestion pressure	Conventional or Buffered Bicycle Lane, or Protected Bicycle Lane
	≤ 1,500 – 3,000			Buffered or Protected Bicycle Lane
	≤ 3,000 – 6,000			Protected Bicycle Lane
	Greater than 6,000			Protected Bicycle Lane
Greater than 26 mph†	≤ 6,000	Single lane each direction	Low curbside activity, or low congestion pressure	Protected Bicycle Lane, or Reduce Speed
		Multiple lanes per direction		Protected Bicycle Lane, or Reduce to Single Lane & Reduce Speed
	Greater than 6,000	Any	Any	Protected Bicycle Lane, or Bicycle Path
High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts	Any	Any	High pedestrian volume	Bike Path with Separate Walkway or Protected Bicycle Lane
			Low pedestrian volume	Shared-Use Path or Protected Bicycle Lane

\* While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.

† Setting 25 mph as a motor vehicle speed threshold for providing protected bikeways is consistent with many cities' traffic safety and Vision Zero policies. However, some cities use a 30 mph posted speed as a threshold for protected bikeways, consistent with providing Level of Traffic Stress level 2 (LTS 2) that can effectively reduce stress and accommodate more types of riders.<sup>18</sup>

‡ Operational factors that lead to bikeway conflicts are reasons to provide protected bike lanes regardless of motor vehicle speed and volume.

Source: [NACTO Designing for All Ages & Abilities, 2017](#)

## CONSIDERATIONS CHECKLIST

With the ideal AAA facility identified based on the roadway context and NACTO Guidance, engineers and planners develop a typical cross-section, identify related project elements, and address related safety and engineering factors. From there, designers should pro-actively consider what complexities may arise in bikeway design, implementation, and operation. These considerations do not apply in all cases, but can have a significant impact on cost, project timeline, and implementation strategy.



### Parking/Curb Management

- Is there existing parking, and what is the parking demand?
- Are there land uses along the corridor that result in high activity curb uses, such as school, passenger, and/or commercial loading? Are they adequately addressed today?
- What parking changes are needed with the project for safety?
- Are there driveways and/or loading docks on the corridor? If yes, what is the design vehicle for these access points?



### Multimodal Intersection Interactions and Access

- Are there high turning conflicts at intersections? If yes, is there existing signal infrastructure to separate users in time?
- Where do bikeways intersect along the project and how will people biking transition between them? How will people biking turn onto other side streets?
- What pedestrian safety needs and access could be part of the intersection designs?



### Fire Department and Emergency Access

- What curb-to-curb clear width is required for fire access in the project area?
- Are there tall buildings along the project that may have additional requirements for aerial ladder access?
- What types of materials does your fire department consider mountable or accessible, and which not?



### ADA Access

- Is there existing or de facto ADA parking and/or loading, and how will the design affect it?
- What PROWAG standards apply to the project?
- Are ramps needed for mid-block parking?
- Are there pedestrian accessibility upgrades (ramps, sidewalk width, accessible signals, etc.) that should be part of the project?
- What are the ADA needs at intersections? Bus stops?



### Transit Coordination

- Is there bus activity on the corridor? Is it a major bus corridor?
- How will the stops tie in to the bikeway design?
- Should in-lane bus stops be provided, given speeds less than 35 mph?
- Where does the bus need to turn?
- Are there opportunities to enhance bus service and stop amenities?
- What is the capacity for bus service enhancements that require dedicated right-of-way?
- Are there opportunities to address bus operations issues?



### Community Engagement

- Has there been previous community engagement on the project, whether as part of a larger plan process or a specific design?
- Who are the key stakeholders that should be engaged (schools, business district, neighborhood groups, community-based organizations, etc.)?
- Is there a major tradeoff in the project design that may affect the political success of the project?
- Are decision-makers and community members already clear on Alameda CTC, local, and regional safety priority and active transportation policies, or is capacity building needed ahead of project approval?



### Civil Engineering Needs

- Are there significant civil engineering needs on the corridor, including drainage issues, pavement and sidewalk repair needs, etc.?
- What are potential utility coordination needs?
- Is there an opportunity or requirement for green infrastructure?



### Operations and Maintenance

- What resources for maintenance already exist in your city? What type of sweepers? Business district support?
- What is the city's in-house capacity for maintaining facilities?
- Is there trash collection on the corridor? Bins or dumpsters? How can they be accommodated?
- Are there typically large amounts of truck or other heavy vehicle traffic?
- What level of additional cost needs to be considered to remove/replace/reinstall existing or new bikeway separation devices?
- How much are additional striping and pavement resurfacing costs?

## IMPLEMENTATION STRATEGIES

Alameda County jurisdictions have used these strategies to build AAA bikeways.



### Pilot Project

A short-term, low cost project to test implementation of a design, which is always assumed to be removed or upgraded after a set period of time. A pilot project should be durable enough to test over multiple months, but low-cost enough to modify or adjust based on observations. The scope of the project should include plans for evaluation of the pilot as well as upgrading it if it is successful.



### Interim Bikeway Type

Where the preferred All Ages and Abilities facility may be very difficult to implement due to multiple challenges, a lower grade bikeway can in some cases provide an interim solution ahead of potential future upgrades. Interim bikeway types require evaluation to understand what upgrades, if any, would be needed later to achieve AAA.



### Interim Materials

Where major civil engineering work is out of scope for the current phase, interim or “quick-build” materials can support bikeway design as part of lower cost projects or together with paving and striping until additional funding is available. Material selection should consider life cycle costs, weighing frequent replacement of cheaper materials versus higher installation costs but minimized maintenance costs of more durable materials. While an upgrade or modification is possible and expected, the project is not treated as fully temporary like in a pilot.



### Proactive Coordination and Engagement

Proactive engagement with stakeholders—typically school districts, fire, transit agencies, community leaders, human services and social services programs, and/or businesses—helps understand local context and needs, build trust and get ahead of potential issues, and find co-beneficial design details. Work to engage harder-to-reach individuals.



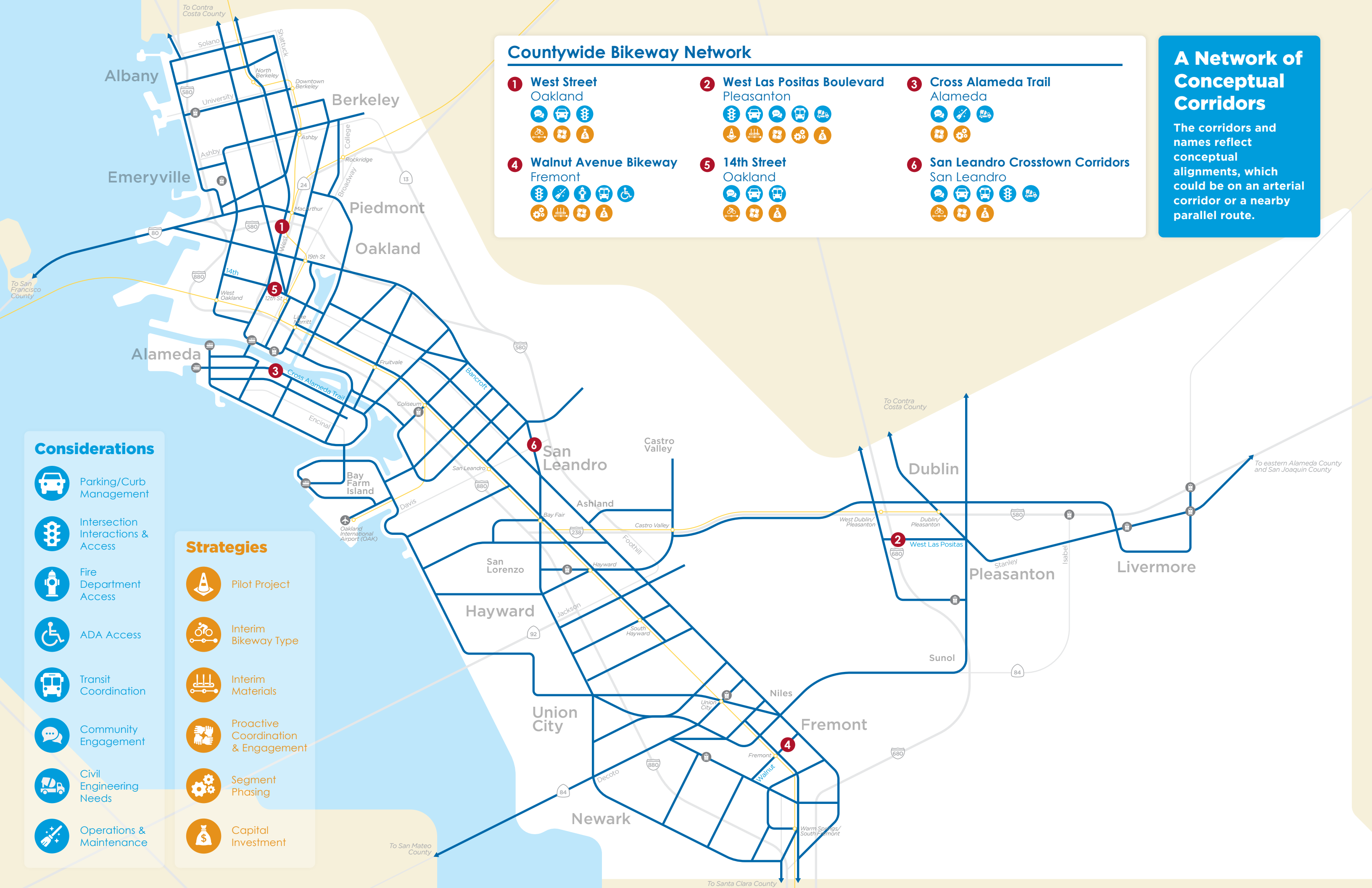
### Segment Phasing

On longer corridors, segmentation supports opportunities for implementation through developer coordination, paving, grants, or other opportunities. In some cases, segment phasing can take advantage of developer construction on single block faces.



### Capital Investment

In some cases, project complexity or needs related to ADA upgrades, signal work, or streetscape improvements necessitate significant capital investment. Practitioners should work toward supplemental funding sources such as grants, developer coordination, and coordination with city capital investment planning to fund projects.



## Countywide Bikeway Network

- 1 West Street**  
 Oakland
- 2 West Las Positas Boulevard**  
 Pleasanton
- 3 Cross Alameda Trail**  
 Alameda
- 4 Walnut Avenue Bikeway**  
 Fremont
- 5 14th Street**  
 Oakland
- 6 San Leandro Crosstown Corridors**  
 San Leandro

**A Network of Conceptual Corridors**  
 The corridors and names reflect conceptual alignments, which could be on an arterial corridor or a nearby parallel route.

### Considerations

- Parking/Curb Management
- Intersection Interactions & Access
- Fire Department Access
- ADA Access
- Transit Coordination
- Community Engagement
- Civil Engineering Needs
- Operations & Maintenance

### Strategies

- Pilot Project
- Interim Bikeway Type
- Interim Materials
- Proactive Coordination & Engagement
- Segment Phasing
- Capital Investment

To eastern Alameda County and San Joaquin County

To Contra Costa County

To Contra Costa County

To San Francisco County

To San Mateo County

To Santa Clara County

# WEST STREET ROAD DIET



Leveraging repaving to advance safer design and All Ages and Abilities bikeways

## Project Overview

West Street is a collector roadway running north-south that connects West Oakland and North Oakland. The corridor is parallel to two major arterials—Market Street and Martin Luther King, Jr. Way—and has served as a bikeway corridor since 1997 when the City of Oakland first installed bike lanes from MacArthur Boulevard to West Grand Avenue (extended north to 52nd St in 2007).

With routine paving coming up for the segment from 52nd Street to West Grand Avenue, the project team developed a design that includes traffic-calming, pedestrian safety enhancements, upgraded buffered bicycle lanes, and protected intersections for connectivity with the bikeway network.

*Pedestrian Safety Island at West Street & 33rd Street*



## Design Considerations

- Existing bike lanes
- 25 MPH school zone
- 2 lane road
- 3,650 Average Daily Traffic
- 30 MPH speed limit
- 8 KSI crash history (2012-2021)

Prior to project implementation, West Street had two travel lanes, bike lanes, and a two-way center turn lane. While the existing bike lanes served an important function for connectivity, feedback from the community and City data collection indicated that speeding was a barrier to achieving an All Ages and Abilities bikeway.

### COMMUNITY ENGAGEMENT Community Engagement

While traffic volumes on West Street are very low, community advocates have long voiced concerns about speeding and stop sign running on the corridor. Because speeding and pedestrian safety were the central issues for the community, it was important for the City to develop a responsive solution focused on multimodal safety while also paying attention to the bikeway type and quality.

### PARKING/CURB MANAGEMENT Parking and Driveways

West Street is a residential street with a significant number of driveways and relatively high parking demand. When evaluating a potential separated bikeway, there was concern that design details and potential parking removal at driveways would require a longer project timeline for additional outreach and design.

### MULTIMODAL INTERSECTION INTERACTIONS AND ACCESS Intersection Needs

Many intersections along West Street had non-ADA compliant curb ramps and unmarked crosswalks. West Street intersections also connect bikeway corridors going east-west, including Grand Avenue, 27th Street, MacArthur Boulevard, 42nd Street, and the 52nd Street connection to the Genoa Street bikeway. These intersections needed supportive infrastructure for bike network connectivity along with multimodal safety improvements and pedestrian enhancements.

## Design Strategies

With high speeds, the design team needed to either provide a separated bikeway or significantly lower speeds in order to meet NACTO All Ages and Abilities guidance. **Close coordination and engagement** with community members helped the design team understand that the two-way center turn lane provided excessive space for speeding and unsafe passing.

As a result, the team elected to remove the two-way center turn lane, install bikeway buffers, median refuge islands, and also incorporate additional traffic calming elements through a series of raised intersections and speed cushions. The additional measures were selected to fit into the scope and budget of the existing paving project, and located to address conditions identified through outreach.

Instead of a longer project schedule for a separated bikeway, the team has pursued an All Ages and Abilities buffered bike lane with traffic calming given concerns about speeding, parking, the existing low traffic volumes, and scope of the resurfacing project.

Along with speed calming, two protected intersections were installed at 27th Street and West MacArthur Boulevard to fully separate bicyclists and enable easy connections with intersecting bikeways. This **capital investment** at key intersections with paving will support bicycle turn movements and help prepare the network for future All Ages and Abilities bikeway upgrades on intersecting corridors.

Before/after evaluation was done to monitor speed reductions: 85th percentile speeds dropped by six MPH 12 months after installation. Ongoing speed, volume, and safety evaluation will be critical in understanding whether the buffered bike lane with traffic calming will be sufficient, or if additional traffic calming or separated bikeway upgrades would be necessary to meet All Ages and Abilities guidelines.

*Protected Intersection at West St & W MacArthur Blvd*




## Timeline

- 1997 Initial Bike Lanes**  
West St (from W Grand Ave to W MacArthur Blvd) received the City's second bike lanes as part of a 4-3 lane road diet.
- 2007 Bike Lanes Extended**  
West St bike lanes were extended north to 52nd St.
- 2016 Prioritized in the Capital Improvement Program**  
Due to poor pavement conditions, the segment from West St to W MacArthur Blvd is prioritized for paving and bikeway improvements.
- 2017 - 19 Plan Updates Completed**  
OakDOT is formed and Oakland completes updates to its Pedestrian Plan and Bicycle Plan. West St up to 52nd St was included in the 2019 Paving Plan.
- 2020 - 21 Studies and Outreach**  
City staff completes the Feasibility Study and engage with residents and stakeholders along West Street.
- 2021 - 22 Construction**  
The resurfacing project is completed in 2022.

# Project Features




### Buffered Bicycle Lanes

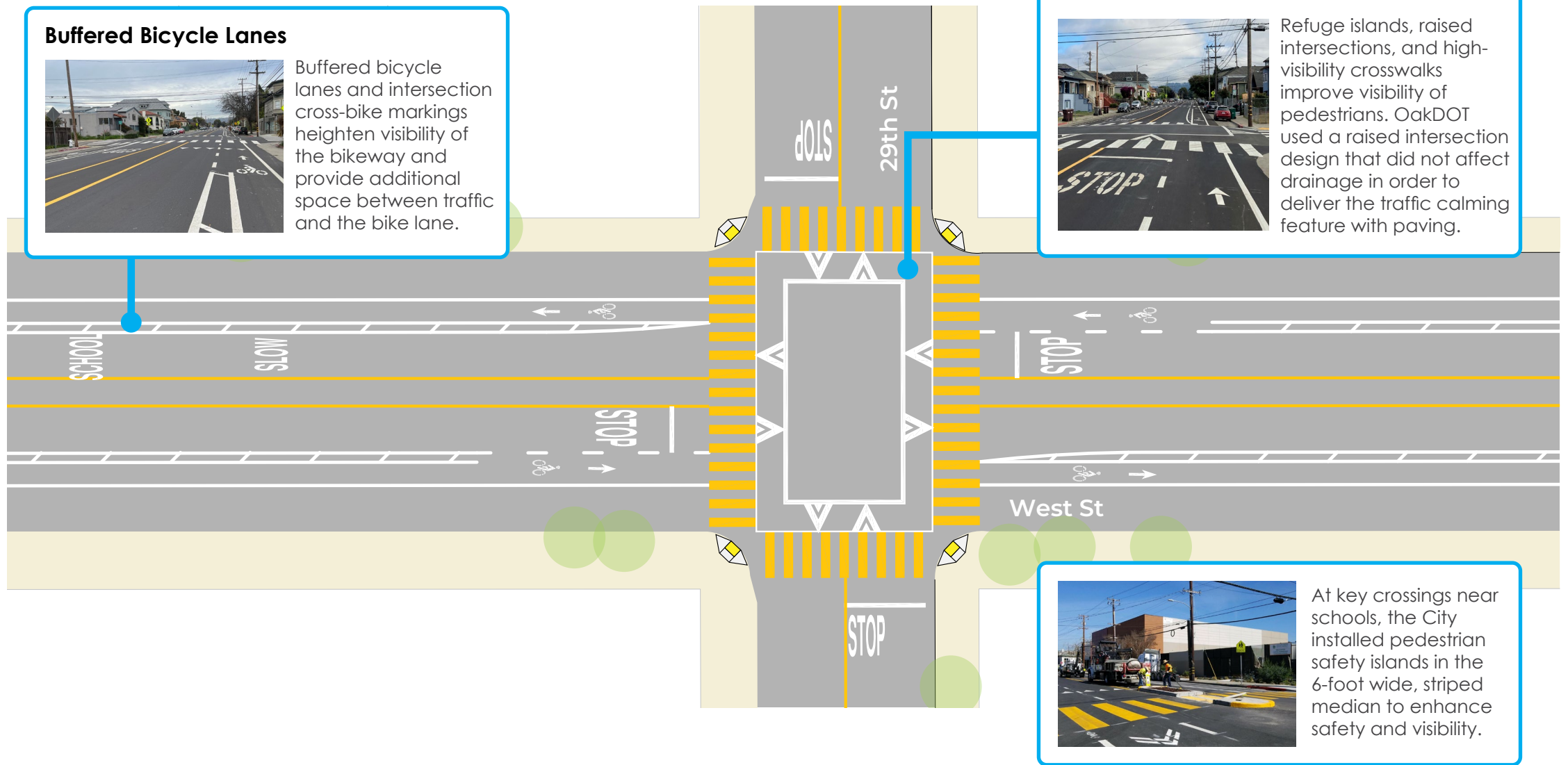
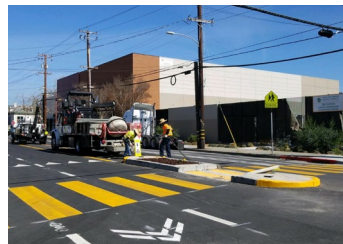


Buffered bicycle lanes and intersection cross-bike markings heighten visibility of the bikeway and provide additional space between traffic and the bike lane.

### Intersection Safety Infrastructure



Refuge islands, raised intersections, and high-visibility crosswalks improve visibility of pedestrians. OakDOT used a raised intersection design that did not affect drainage in order to deliver the traffic calming feature with paving.

At key crossings near schools, the City installed pedestrian safety islands in the 6-foot wide, striped median to enhance safety and visibility.

## Protected Intersections

Protected intersections at several high-traffic locations enhance bicycle and pedestrian safety and visibility.



## Traffic Calming Elements

Narrower travel lanes, speed cushions, and other intersection features slow down traffic on this corridor.



## Key Stakeholders

- West Street residents:**  
 In mid-2020, the City of Oakland sent area mailers to solicit feedback on the project proposals and identify additional opportunities or concerns, followed by virtual meetings with local neighborhood councils. Subsequently, in 2021, staff sent mailers to addresses fronting the proposed additional traffic calming elements, and attended follow-up neighborhood council meetings to solicit additional feedback.

## Contact Info

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# WEST LAS POSITAS BOULEVARD



Supporting users of All Ages and Abilities with a pilot project and project phasing

## Project Overview

West Las Positas Boulevard is a six-lane arterial corridor that runs east-west in Pleasanton across a freeway, connecting multiple neighborhoods, schools, and the Iron Horse Trail. The corridor was identified as the top priority project in the City's 2018 Bicycle & Pedestrian Master Plan.

The City of Pleasanton has advanced a pilot project to implement a road diet and separated bikeway along with crosswalk enhancements near a middle school. Next, City staff will continue to pursue funding to upgrade the bikeway to a permanent, All Ages & Abilities facility with new landscaping, concrete, and five protected intersections.

*City staff coordinated with Wheels Bus to confirm and test turn radii.*



## Design Considerations

- No existing bike facility
- 6 lane road
- 40 MPH speed limit
- 25 MPH school zone
- 6,000 to 16,000 Average Daily Traffic
- 12 KSI crash history (2012-2021)

The West Las Positas Boulevard corridor is three lanes in each direction, considerably overbuilt for the existing vehicle demand. The project will feature a road diet with separated bikeways, with additional important design considerations:

### MULTIMODAL INTERSECTION INTERACTIONS AND ACCESS Intersection Safety

There are five major intersections with high-speed right turns and slip lanes along the corridor. Because of the cost and complexity of converting right turn slip lanes to protected intersections, the City has made careful decisions about which project elements to include in the pilot project and which to implement with the full capital project.

### PARKING/CURB MANAGEMENT High Curb Demand

There is high curb demand for pick-up and drop-off next to Thomas Hart Middle School. The pilot project determined that the design of the 8-foot, floating parking lane next to a 12-foot travel lane was too narrow to effectively facilitate safe pick-up and drop-off. Many parents blocked the travel lane because they were not able to pull close enough to the bikeway.

### COMMUNITY ENGAGEMENT Middle School Rider Behavior

Early in the scoping process, the City debated whether a one-way or two-way bike facility would be most appropriate for the corridor. During the pilot project, middle school students became so comfortable with the one-way, quick-build separated bikeway that contraflow cycling became common.

### TRANSIT COORDINATION Wheels Bus Service

Wheels, the bus provider in East County, operates a mix of all-day, peak-hour, and supplementary school bus service every 40 minutes along the entirety of the corridor.

### CIVIL ENGINEERING NEEDS Roadway Reconstruction

Due to the settling native clay soil beneath the roadway, reconstruction of the roadway is necessary to stabilize its surface and fix uneven pavement sections.

## Design Strategies

**Proactive outreach and coordination** to local businesses, the school district, local transit agencies ensured active participation in designing the quick-build pilot program and evaluating its features. The **pilot project** allowed the City to observe student bicycling behavior, pick-up and drop-off needs, and transit needs while also building community support for a future update to a full raised bikeway.

Because of the unique needs for separation in time with major signal updates at busier intersections, the pilot also represents a **segment phasing** approach by strategically implementing the bikeway at lower conflict intersections first.

The full-build design incorporates a series of changes based on observations and community feedback received during the pilot.

Turning radii at all intersections will be tightened with a fully protected intersection design. These elements slow down turning traffic and reduce the severity of injury collisions with pedestrians in the crosswalk. Right-turn slip lanes will be closed or signalized to separate users in time.

A raised two-way bikeway near Thomas Hart Middle School is designed to accommodate the contraflow riding observed during the pilot. And finally, an additional 2 feet of buffer space has been added between the parking lane and the travel lane at the pick-up and drop-off curb next to Thomas Hart Middle School.

The final project will be coordinated with a major geotechnical rehabilitation of the roadway in 2025, which will require significant **capital investment**.

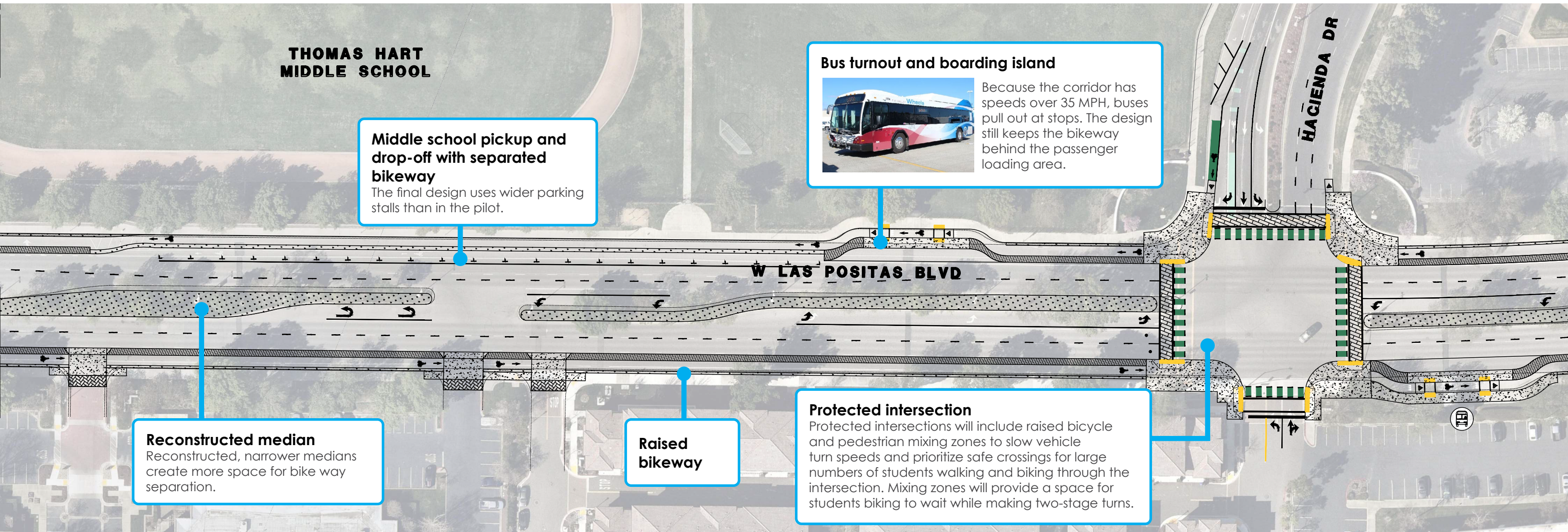


## Timeline

- 2016** **Bicycle and Pedestrian Master Plan Update**  
The updated Plan includes provisions to make the city more bike- and ped- friendly with an All Ages and Abilities Network.
- 2017 - 20** **Corridor Study and Concept Design**  
Following a corridor study, an initial concept design is developed for West Las Positas Boulevard.
- 2022** **Council Approval**  
The West Las Positas Boulevard Corridor Plan is approved by City Council.
- 2023** **Quick-Build Complete**  
Near-term improvements are implemented between Hopyard Road and Hacienda Drive.
- 2024 - 25** **Construction**  
Construction of the permanent, full-build project is expected to be completed in 2025.



# Project Features



**THOMAS HART MIDDLE SCHOOL**

**Middle school pickup and drop-off with separated bikeway**  
The final design uses wider parking stalls than in the pilot.

**Bus turnout and boarding island**  
Because the corridor has speeds over 35 MPH, buses pull out at stops. The design still keeps the bikeway behind the passenger loading area.



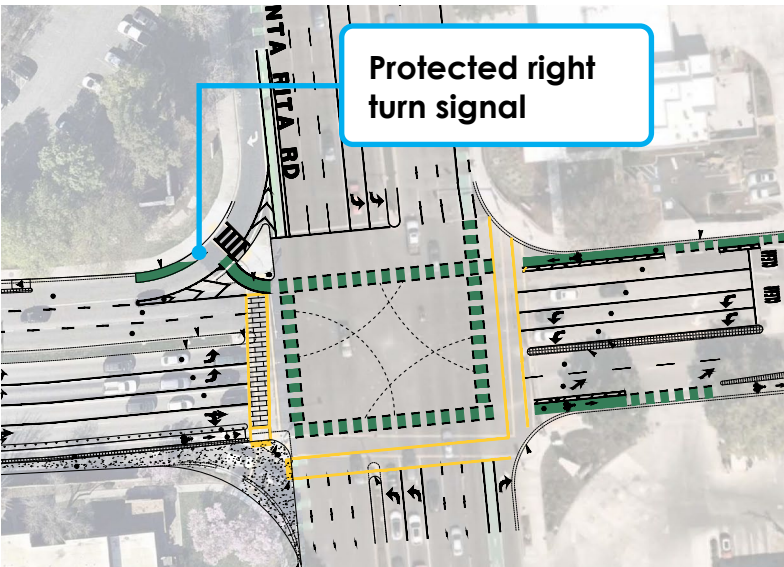
**Reconstructed median**  
Reconstructed, narrower medians create more space for bike way separation.

**Raised bikeway**

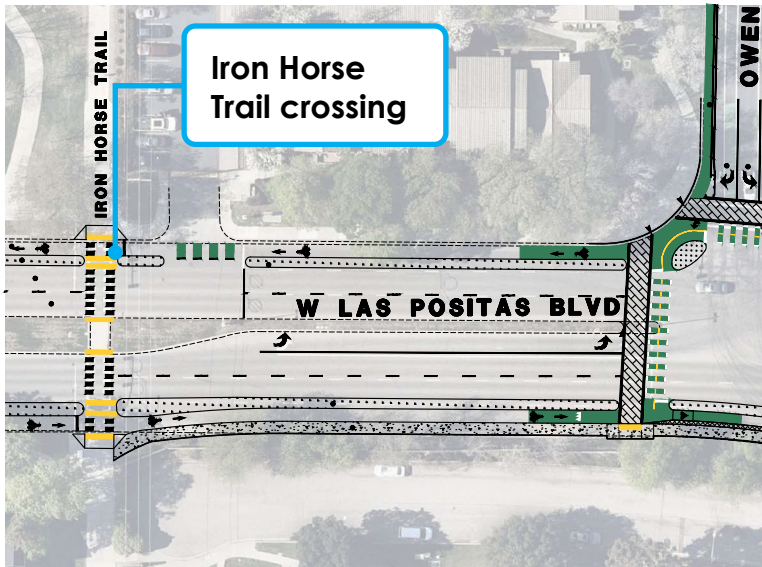
**Protected intersection**  
Protected intersections will include raised bicycle and pedestrian mixing zones to slow vehicle turn speeds and prioritize safe crossings for large numbers of students walking and biking through the intersection. Mixing zones will provide a space for students biking to wait while making two-stage turns.

**W LAS POSITAS BLVD**

**HACIENDA DR**



**Protected right turn signal**



**Iron Horse Trail crossing**

**W LAS POSITAS BLVD**

## Key Stakeholders

- Pleasanton Unified School District (PUSD)
- Livermore Amador Valley Transit Authority (LAVTA) or "Wheels"
- Local businesses

## Contact Info

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# WALNUT AVENUE BIKEWAY



Delivering a robust, multimodal connection between BART and Downtown

## Project Overview

Walnut Avenue is a major corridor that connects shopping and employment in Central Fremont with the Fremont BART station and Mission Boulevard (State Route 238). Efforts to reimagine the roadway began with the Downtown Community Plan in 2018 to develop a new vision for the Downtown District.

The City of Fremont has phased implementation of bikeway types and segments, with one segment of raised separated bikeways and protected intersections complete from Paseo Padre Boulevard and Mission Boulevard. Walnut Avenue represents a significant investment in implementation of Fremont's Vision Zero policy and All Ages and Abilities bikeway network.

Raised bikeway along Walnut Avenue



## Design Considerations

- Existing bike lanes
- 25 MPH school zone
- 4 lane road
- 9,215 Average Daily Traffic
- 35 MPH speed limit
- 8 KSI crash history (2012-2021)

Walnut Avenue has two lanes in each direction and a raised median with left-turn pockets at each intersection. Prior to project implementation, the roadway had existing bicycle lanes and very wide travel lanes with no on-street parking. Narrowed travel lanes mitigated the need for larger tradeoffs of roadway space. There were several other design considerations and challenges during development:

### MULTIMODAL INTERSECTION INTERACTIONS AND ACCESS Intersection Needs

Because of the high cost and complexity of re-building the "pork chop" islands, safety and comfort upgrades were not possible in the initial quick-build phase of the project.

### OPERATIONS AND MAINTENANCE Maintenance and Life Cycle Cost

Because of the 35 MPH speed limit on the corridor, durability and maintenance were a key consideration in the design process. Fremont staff carefully considered tradeoffs between bikeway materials and design to balance construction costs with maintenance and life cycle cost considerations.

### FIRE DEPARTMENT ACCESS Fremont Fire Department

Throughout the planning process, the City worked closely with the Fremont Fire Department to tailor the design to meet fire response needs, especially near developments with setbacks or tall buildings requiring aerial fire access.

### TRANSIT COORDINATION AC Transit Coordination

AC Transit operates several all-day bus routes on Walnut Avenue that provide access to the Fremont BART station. Enhanced floating bus boarding islands were incorporated in the project design.

### ADA ACCESS ADA Access

Walnut Avenue is near the California School for the Blind and School for the Deaf. As part of the design process, City staff engaged with staff and students to understand needs and challenges for people with disabilities, especially when considering a raised bikeway.

## Design Strategies

The Walnut Avenue corridor has used both **segment phasing** and **interim materials** as implementation strategies. In 2016, the City narrowed travel lanes to provide a buffer for the existing bike lanes. Then, the team experimented with temporary vertical buffers using multiple products including Zicla Zebras and flexible posts. This interim project has informed product selection for the quick-build bikeway network throughout Fremont, including on the southern segment of Walnut Avenue that is slated for upgrade to a raised facility as a next phase.

**Proactive coordination and engagement** with the School for the Blind and the School for the Deaf was a core component of the design process. The City organized field meetings with students from both schools to assess navigability and accessibility, particularly of intersections and conflict points. Staff continue to maintain these relationships and refine design practices based on user feedback.

The full-build bicycle facilities were originally designed to be at street level with median curb separation, but **coordination** with the Fremont Fire Department regarding the requirement for a 26-foot curb-to-curb clearance prompted the City to instead select a raised bikeway. The raised design allowed the City to add a 4-foot striped buffer in the roadway to provide sufficient clear width.

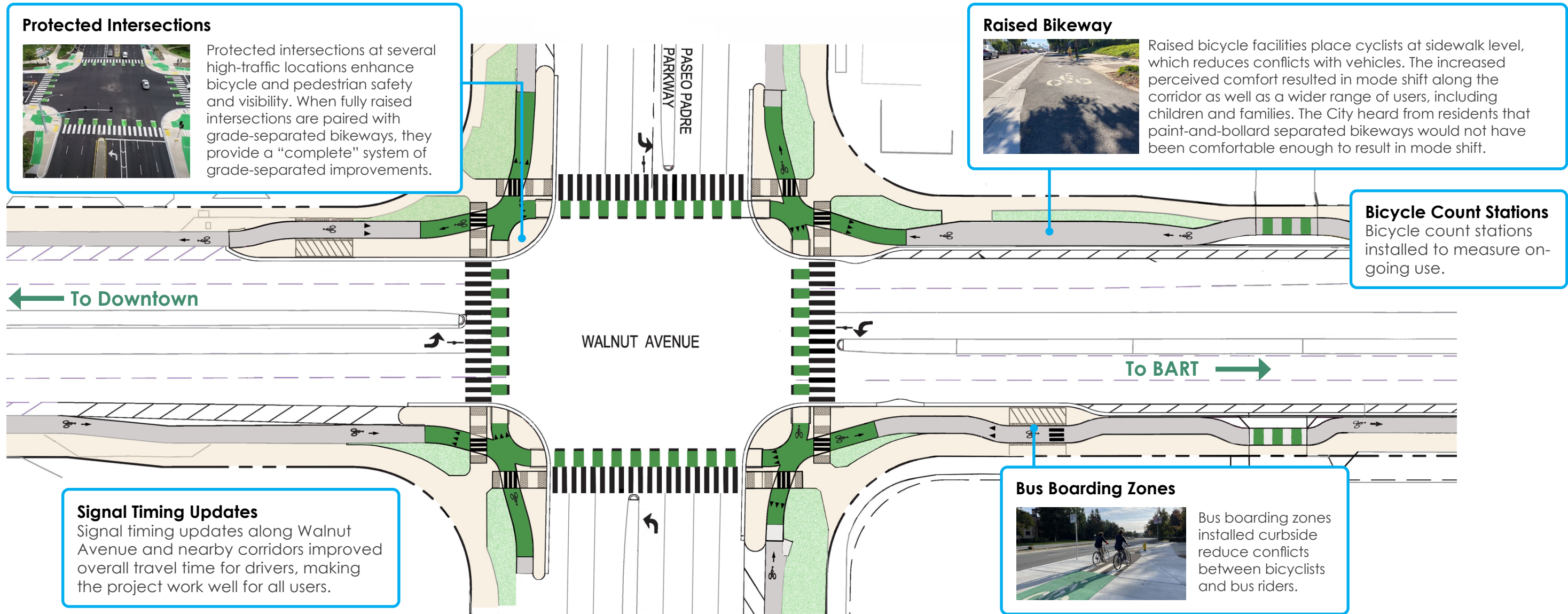
The **capital investment** in the raised bikeway design has had durability and maintenance benefits and serves as a model within the City for their "gold standard" bikeway design for upgrading the **interim materials** elsewhere in the network.

## Timeline

- 2015** **Vision Zero Program Launch**  
The Fremont City Council approves a Vision Zero policy in September 2015.
- 2016** **Buffered Bike Lanes**  
Walnut Avenue bike lane buffer and conflict markings striped.
- 2017** **Quick-build Separated Bikeway Pilot Project**  
Quick-build separation is installed on Walnut Avenue to test buffer materials.
- 2018** **Walnut Avenue Bikeway Funding Award**  
Alameda CTC awards funding for Walnut Avenue raised bikeway.
- 2020** **Grand Opening**  
The full-build project opens in the midst of the COVID-19 pandemic.
- 2024** **Opening of Protected Intersections at Liberty Street and Fremont Boulevard**  
Intersection improvement project is completed at Liberty Street and Fremont Boulevard.
- 2025 & Beyond** **Future Phases**  
Extension of raised bikeway along Walnut from Paseo Padre to Fremont Boulevard under design and scheduled for Spring/Summer 2025 construction.



# Project Features



## Key Stakeholders

- School for the Blind/School for the Deaf: City of Fremont engaged with students to get feedback on accessibility of the design.
- Fremont Fire Department: FFD provided feedback on the design to develop the cross-section of Walnut Avenue.

## Contact Info

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# 14TH STREET SAFETY PROJECT



Investing in 14th Street as a community destination for safe strolling, shopping & biking

## Project Overview

14th Street is an east-west thoroughfare that connects major destinations in Downtown Oakland. The corridor has been a significant safety issue for many years, with a dense concentration of traffic injuries and deaths.

In response to the safety need, the City secured a state grant for a major streetscape project to implement a road diet, separated bikeways, pedestrian safety improvements, lighting, and transit stop updates.

The project has experienced significant controversy and delay. This design process illustrates potential challenges in reaching community-based design solutions while implementing an urgent timeline responsive to existing safety needs.

Existing conditions at 14th St between Franklin St and Webster St



## Design Considerations

- No existing bike facility
- 25 MPH speed limit
- 4 lane road
- 8 KSI crash history (2012-2021)

### COMMUNITY ENGAGEMENT Stakeholder Feedback

A central challenge in the project has been balancing the pace of community outreach on design refinements with the urgency of the safety need. Since the City began final design in 2016 after getting a state Active Transportation Program (ATP) funding award, vehicle collisions killed 3 people—two walking and one biking.

While there was some outreach on the corridor needs ahead of the ATP grant application, the bulk of outreach on design happened after the award. During community engagement as part of final design for the streetscape project, the City learned many residents of the Black Arts Movement Business District did not feel included in the process and did not feel like their mobility needs were addressed.

Community members and stakeholders all agreed on the safety need, but there was debate and controversy about how to advance major investments in street safety while maintaining and enhancing the culture, character, and business community on the corridor. During the height of controversy, the project was put on pause for an extended period.

When outreach efforts re-started, the City focused on rebuilding trust with stakeholders and addressing specific needs in the design.

### PARKING/CURB MANAGEMENT Parking and Loading

A diverse group of restaurants, shops, and other small businesses line 14th Street east of Broadway. There is significant nightlife in addition to a range of businesses open throughout the day. Several business owners voiced concerns about the availability and pricing of parking as a result of the project.

With proposed separated bikeways in a dense business district, the project team also needed to consider curb management strategies for loading and deliveries as well as accessible passenger loading for the Hong Fook Senior Center.

### TRANSIT COORDINATION AC Transit Coordination

AC Transit's Line 14 is a high-frequency route along 14th Street. Some bus stops along the corridor lack amenities and require improvements for passenger experience. Bikeway design required careful coordination with AC Transit on bus-bike interaction at bus stops.

## Design Strategies

The extensive **coordination and outreach** process leading up to the final design has been a learning opportunity for the team that led to design refinements to meet community needs.

Following opposition and concerns from businesses, the City built relationships with local businesses to understand and discuss options for parking and curb management. Several parking spaces will be removed on 14th Street but replaced with angled parking on an adjacent street through a coordinated paving project. Merchants were provided with parking discounts and validation for employees and customers as part of a proactive parking management strategy.

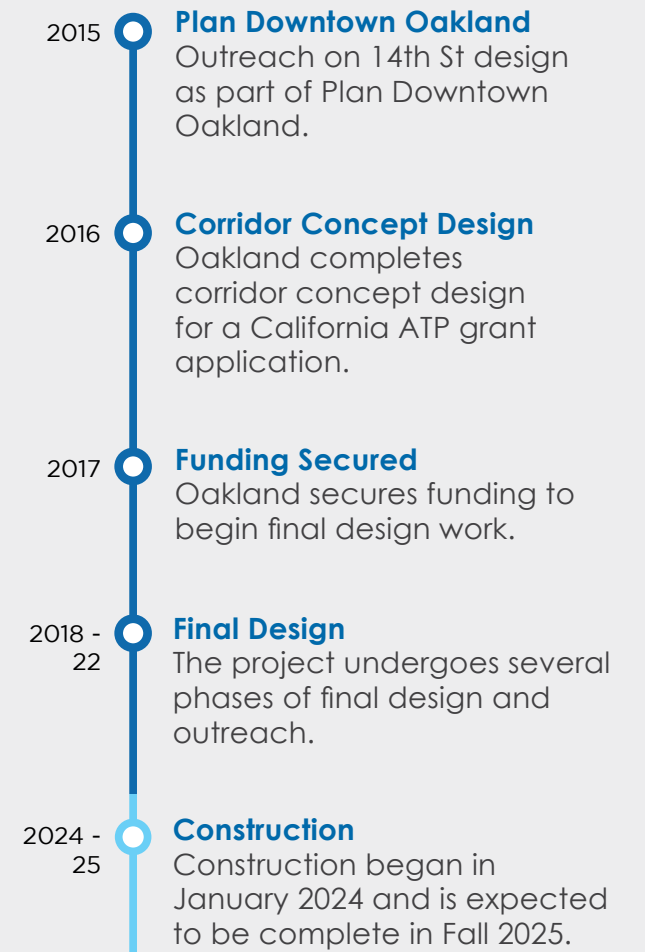
To manage curb needs, the City developed a block-by-block curb management plan with loading zones, accessible passenger loading, parking, and bus stops. In a key block with several night clubs, the design includes raised bikeways to provide flexible pedestrian space at night.

Another outcome of **community engagement** was a significant focus on the public art vision led by the Black Arts Movement Business District. Oakland earmarks 1.5% of the budget for capital projects to public art, allowing for community-led public art on the corridor.

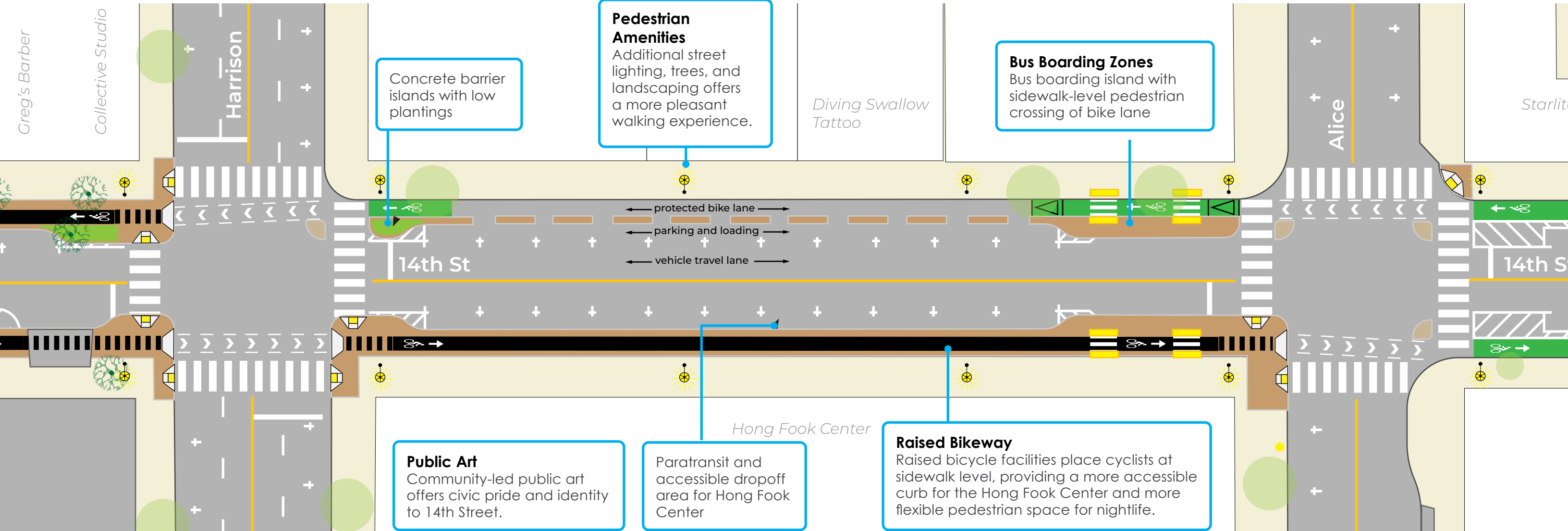
While the final design on 14th Street will represent a significant **capital investment** in multimodal safety, bikeway connectivity, and public art, the City also acknowledges the drawbacks of the long community-focused design process. In the intervening time it took to reach consensus and political approval, 38 people were severely injured on the corridor. Two pedestrians were killed in crosswalks, and one bicyclist was killed just days before Council approval of the design. Staff have reflected that proactive engagement before submitting the grant application and an **interim bikeway type** with striping-only road diet could have improved safety in the meantime.

As of Spring 2024, the project has broken ground.

## Timeline



# Project Features



Planned Improvements at 14th St and Broadway, including protected bike lanes, directional curb ramps, etc



## Key Stakeholders

- Black Arts Movement Business District
- 14th Street businesses/merchants
- African American Museum and Library, Oakland Main Library
- Hong Fook Center/Family Bridges

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# CROSS ALAMEDA TRAIL



Transforming an abandoned rail line into a cross-town bicycling and walking corridor through proactive segment phasing

## Project Overview

The Cross Alameda Trail (CAT) follows the former alignment of a freight railroad line that served the City's industrial northern waterfront during the early 20th century. Advocacy groups in the early 2000s developed a vision for a continuous greenway that would connect Alameda's businesses and neighborhoods to schools and regional transportation hubs. Since then, the CAT alignment has been included in the City's General Plan and Bicycle and Pedestrian Plans, supporting a long-term effort to deliver the full trail corridor in phases. The effort included community advocacy groups, coordination with City Rec and Parks Department, and a City-led lawsuit.

To date, the City of Alameda has fully completed six of the ten segments, equivalent to three miles of the 4.2-mile full corridor. The CAT is primarily composed of separate bicycle and pedestrian paths, along with separated bike lanes. These have been implemented as part of City parks, on-street bikeway projects, and developer-led bikeway projects. Because of the overall vision, the City has advanced each of these segments opportunistically to result in a complete trail corridor.

The impressive pace of development resulted from dedicated pursuit of public funding and proactive developer engagement on the alignment vision.



**2 Site A on West Atlantic Ave (2020)**



Raised separated bikeway implemented by Alameda Point Site A development

**5 Del Monte Clement Extension (2022)**



Raised two-way bikeway, sidewalks, and new roadway constructed by developers of the Del Monte housing project.

**6 Clement Avenue at Marina Cove (2017)**



Two-way separated bikeway constructed by developers of the adjacent housing project. This segment uses dowel-in-place concrete curb stops with plastic posts.

**Alameda Point Site A**

**1 Ferry Way (& Seaplane Lagoon Ferry)**

**3 Ralph Appezato Memorial Parkway & Atlantic Gap**

**4 Jean Sweeney Open Space Park**

**5 Del Monte Clement Extension**

**7 Clement Avenue Extension at Pennzoil**

Construction for new housing development at former Pennzoil property in progress as of 2024. The developer will construct sidewalks and two-way separated bicycleways.

**9 Clement Avenue/Tilden Way**

Construction will begin in 2024 for Clement Ave extension to Tilden Way, which will feature separate bicycle paths, pedestrian paths, and a roundabout at the Tilden Way/Blanding Ave/Fernside Blvd intersection.

**1 Ferry Point & Seaplane Lagoon Ferry (2021)**



Separated bikeway connection to the new Seaplane Lagoon Ferry Terminal

**6 Marina Cove II Clement Extension**

**7 Pennzoil**

**8 Clement Avenue (Grand St to Broadway)**


Partially Built/In Progress

**8 Clement Avenue**

**9 Clement-Tilden**

**10 Miller-Sweeney (Fruitvale) Bridge**

**3 Ralph Appezato Memorial Parkway Completed/In Progress – 2020/2024**



Bicycling and walking paths on abandoned railroad right of way along the roadway. City-led project with grant funding.



Two-way separated bikeway with western portion completed by Alameda Marina housing developer. Construction of the eastern portion (0.7 miles) is a City-led project under construction as of Spring 2024. This segment combines cast-in-place curbs with K71 posts.

**10 Miller-Sweeney (Fruitvale) Bridge**

Unbuilt/In Progress

This final leg connecting Alameda to Oakland is envisioned to feature separated bicycling and pedestrian infrastructure. In the interim, bicycle lanes will be added to the Bridge in 2024.

**Cross Alameda Trail Segments**

- Completed
- ..... In progress
- ..... Planned



Two-way separated bikeway on Clement Ave (Segment 8)

## ✓ Design Considerations

### Segment 8: Clement Avenue

- No existing bike lanes
- 2 lanes
- 25 MPH speed limit
- 3,600 to 9,000 Average Daily Traffic
- 3 KSI crash history (2012-2021)

#### COMMUNITY ENGAGEMENT Public Engagement

Because of community sensitivity to parking and traffic impacts from previous bikeway projects, the City led a robust outreach process to evaluate tradeoffs and refine design. In this process, they learned that parking is a lower community priority on Clement Avenue than in other neighborhoods, resulting in a new cross section focused on more comfortable widths for the bikeway and buffer.

#### OPERATIONS AND MAINTENANCE Truck Route

The on-street segment of the CAT along Clement Avenue is designated truck route in Alameda. The final design had to not only include an All Ages & Abilities bicycle facility but also sufficient space for bi-directional truck traffic. Maritime business owners expressed significant concern about impacts of lane width constraints on their needs for oversized boat trailers along the corridor.

#### CIVIL ENGINEERING NEEDS Sidewalk Deficiencies

Clement Avenue has unused freight railroad tracks under the asphalt, which causes faster degradation of the pavement. The corridor also has significant sidewalk deficiencies, including a number of locations with utility poles blocking the sidewalk and inhibiting ADA access.

## ✂ Design Strategies

### Segment 8: Clement Avenue

The bikeway on Clement Avenue was originally planned to feature traditional bicycle lane facilities with 11-foot travel lanes and 7-foot parking lanes. As best practices in bikeway design evolved, the vision for a full two-way separated bikeway for the Cross Alameda Trail shifted the approach and bikeway selection on Clement Avenue to separated bikeways as well.

As City staff kicked off **community engagement**, the new cross section for the two-way separated bikeway needed to use minimum widths in order to maintain parking on both sides. This initial approach assumed that maintaining parking was a high priority. However, community input stressed the importance of roadway and bike lane width and much less concern over parking capacity in this more industrial area.

City Council ultimately approved a two-way bikeway with the removal of parking on Clement's north side in order to establish sufficient space for trucks and bicyclists.

The Clement portion of the Cross Alameda Trail has also used **segment phasing** as an implementation strategy. The segment of the bikeway in front of the Alameda Marina housing project was constructed by the developer. Construction on the eastern portion is underway as a City-led project that also includes roadway repair and sidewalk widening.

The on-street segment of the Cross Alameda Trail on Clement Avenue has had a successful outreach and design process partly because of the positive momentum from previous trail segments. The off-street trail portions of the bikeway—along Ralph Appezzato Memorial Parkway and Jean Sweeney Park—were the first to open, offering the public high-quality facilities and setting a clear vision for the rest of the project.

## Key Stakeholders

- Rails to Trails Conservancy: Early in the process, the advocacy organization established the first vision and engaged in public outreach.
- Railroads: The CAT repurposes multiple properties previously-owned by various railroads, requiring ongoing property acquisition negotiations between the City and the Railroad.
- Alameda Housing Authority: Located along the "Atlantic Gap," the Authority worked with the City to install a new midblock crossing along this one-block section of on-street separated two-way bikeway between two trail segments.
- Industrial and maritime business owners.



Two-way separated bikeway on Clement Ave near Marina Cove (Segment 6)

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# SAN LEANDRO CROSSTOWN CORRIDORS

Connecting schools across town with youth-focused design and outreach

## Project Overview

Bancroft Avenue and Williams Street are key corridors in the City of San Leandro, together home to eleven schools at all grade levels. Both corridors have existing bike lanes that were implemented between 1998-2010 as part of the City's first wave of bikeway development. These projects helped initiate bike networks and improved safety. However, the existing bike lanes primarily serve confident riders.

With both corridors well-established as important bike routes for the City, community members advocated in 2018 for new attention on Bancroft and Williams, this time to upgrade and enhance access for students and people of All Ages and Abilities. In 2020, the City initiated a two-corridor study to develop a community-driven and Vision Zero-aligned plan for San Leandro's Crosstown Corridors.

*A cyclist testing out the two-way separated bikeway concept along Williams St at Halkin Elementary School*



## Design Considerations

### Bancroft Avenue

- 7,446 Avg Daily Traffic
- 34 MPH prevailing speed

### Williams Street

- 9,882 Avg Daily Traffic
- 31 MPH prevailing speed

### COMMUNITY ENGAGEMENT Student Engagement

Putting students and families at the center of the Crosstown Corridors study was a key challenge and opportunity for the City. While student involvement and feedback can greatly enhance the design process, reaching parents, students, and administrators during a busy school year can present challenges for outreach and communication.

### PARKING/CURB MANAGEMENT School Safety and Curb Access

With significant numbers of students traveling to school on both Bancroft Avenue and Williams Street each day, the corridor study needed to prioritize safety for walking and biking to school while also providing space for pick-up and drop-off to the school sites either on existing driveway loops or on-street curb space.

### PARKING/CURB MANAGEMENT Residential Parking

To provide separated, all ages and abilities bikeways, the Crosstown Corridors design concepts required some parking reduction along both corridors. The project team inventoried parking occupancy during various times of day to refine design and communication strategies about this tradeoff.

### TRANSIT COORDINATION AC Transit Coordination

Bancroft Avenue has a high-frequency bus route (AC Transit Line 40) that runs 60' articulated buses on weekdays. The corridor study and concept development helped the City identify locations with bus stop needs for length, ADA access, or amenities. The study also presented the need for proactive engagement with AC Transit on bus stop designs that would interact with the proposed bikeway, especially in constrained sections.

### MULTIMODAL INTERSECTION INTERACTIONS AND ACCESS Traffic Signal Modifications

Traffic signals along Bancroft Avenue at the pedestrian scramble on 136th Avenue and the signalized intersection at Estudillo Avenue needed to be modified to reduce conflicting movements.

### CIVIL ENGINEERING NEEDS At-Grade Railroad Crossings

Williams Street will need more engineering design considerations and coordination with the railroad agency to address at-grade railroad crossings along the corridor.

## Design Strategies

The Crosstown Corridors study represents a significant effort in **proactive coordination and engagement**. The City convened a project advisory group with business, school, AC Transit, BART, and community representatives to review progress and provide input. This technically -focused group helped refine bus stop design recommendations, parking and curb management strategies, and tie-ins with BART-led projects. The project team also **coordinated** outreach with the Alameda CTC for the East Bay Greenway corridor project.

Beyond technical stakeholder engagement, the City partnered with PilotCity and Bike East Bay to recruit teams of high school student interns for both summers of the project study. These interns helped spread the word about the online and in-person **outreach** opportunities and helped implement a major "tactical urbanism" pop-up event that involved one-day bikeway installations in three locations.

The pop-up bikeway event proved successful in energizing the community toward implementation while also elevating key issues on curb management and parking management. Because of the high-visibility event, additional feedback from the school district helped to refine the concept and establish a shared plan for busy school frontages. Since the Crosstown Corridors event, San Leandro has re-used materials and strategies to do an additional pop-up bikeway on E. 14th Street in partnership with Caltrans.

While the existing bike lane designs were not intended as **interim bikeway types**, they show the effectiveness of establishing space for biking on key corridors and then providing upgrades later. Because the full **capital investment** needed to deliver the two-way bikeways on Bancroft and Williams will take time, San Leandro has continued to provide striping and safety upgrades through repaving on both corridors, including green conflict markings, bikeway buffers, high-visibility crosswalks, and crosswalk safety enhancements.

## Timeline

- 2018 **Pedestrian Plan and Bicycle Plan Updated**  
San Leandro identifies Bancroft Avenue and Williams Street as the top priority corridors in the 2018 Bicycle and Pedestrian Master Plan
- 2021 **Crosstown Corridor Study Kickoff**  
City staff kick off outreach and existing conditions analysis for a corridor study funded by a Caltrans planning grant.
- Spring 2022 **Vision Zero Safety Policy**  
During the Crosstown Corridors study process, City Council approved a Vision Zero safety policy for San Leandro
- Fall 2022 **Crosstown Corridors Final Concept and Report Approval**  
City Council approves two-way bikeway concepts for both corridors.
- 2023 **Funding Requests**  
City receives federal earmark for funding to support local match for future grants





# Project Features

## Two Way Separated Bikeway



Separated bicycle facilities with concrete or landscaped barriers provide additional space and protection between traffic and the bike lane.

## Bus Boarding Islands

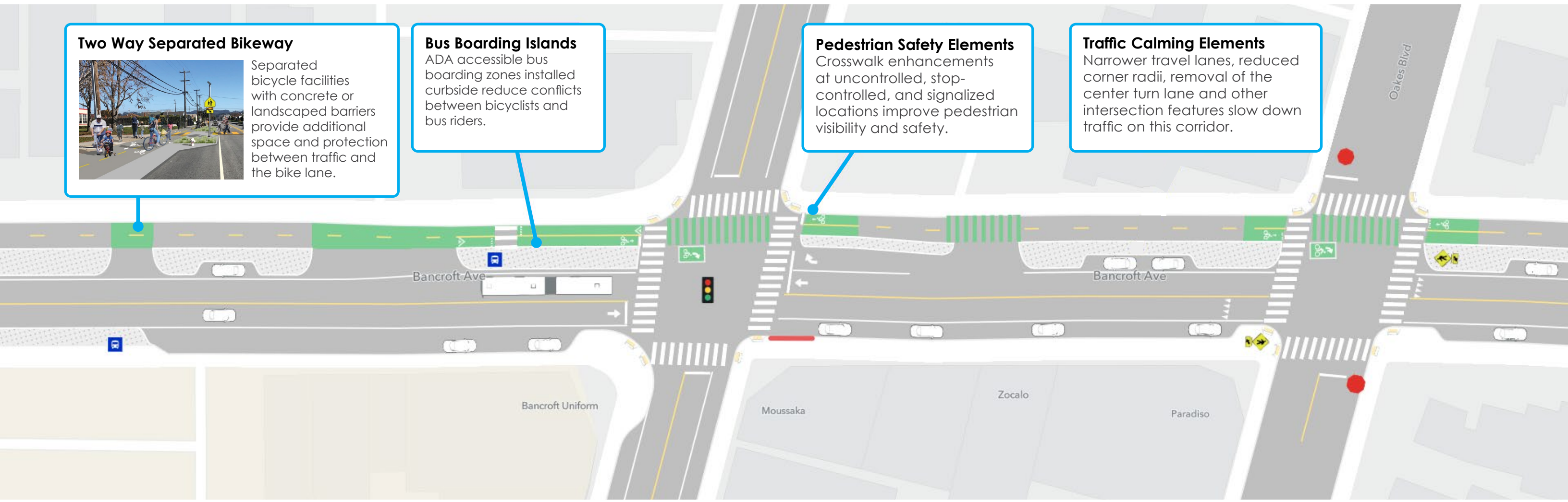
ADA accessible bus boarding zones installed curbside reduce conflicts between bicyclists and bus riders.

## Pedestrian Safety Elements

Crosswalk enhancements at uncontrolled, stop-controlled, and signalized locations improve pedestrian visibility and safety.

## Traffic Calming Elements

Narrower travel lanes, reduced corner radii, removal of the center turn lane and other intersection features slow down traffic on this corridor.



Bancroft Avenue design vision including two-way separated bikeway, crosswalk enhancements and traffic calming improvements



## Key Stakeholders

- San Leandro Unified School District: School board members and administrators shared feedback on site access and circulation
- AC Transit: Planners provided feedback and recommendations for bus stop location and design
- Broadmoor District Businesses: Owners provided feedback on safety and curb access needs on Bancroft Avenue
- Bike East Bay: Staff from the advocacy organization supervised summer interns and supported implementation of the pop-up tactical urbanism event

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