

DATE: May 15, 2023

TO: Council Transportation Committee

FROM: Brandon Whyte, Active Transportation Planner
Ria Hutabarat Lo, Transportation Manager
Damian Skinner, Assistant Public Works Director

VIA: Dawn S. Cameron, Public Works Director

SUBJECT: **Castro Street Bikeway Feasibility Study, Project 17-53**

RECOMMENDATION

Receive information on the Castro Street Bikeway Feasibility Study concept drawings and provide the following recommendations to the City Council:

1. For the Castro Street/Church Street intersection, approve the Short-/Medium-Term Alternative 2 (no changes for the intersection) and the Long-Term Alternative 2 (continuing the bike lanes through the Church Street intersection by studying options for a pedestrian scramble or converting to a roundabout).
2. Approve Short-/Medium-Term Alternative 2 for the Castro Street segment from Yosemite Avenue to California Street, which calls for providing bike lanes where possible and converting angled parking to parallel parking, except for the Castro Street/Church Street intersection recommendation.
3. Approve the Long-Term Alternative 2 for the Castro Street segment from Yosemite Avenue to California Street, which calls for providing additional bike lanes by narrowing the median 5' where needed, moving the cork oak trees within the median in the short term to prepare for future narrowing of the median, and studying options for a pedestrian scramble or converting to a roundabout at the Castro Street/Mercy Street intersection, except the recommendation for the Castro Street/Church Street intersection.

BACKGROUND

Castro Street Bikeway Feasibility Study, Project 17-53, was approved as part of the Fiscal Year 2016-17 Capital Improvement Program (CIP) to support the Council's Major Goal to "develop and implement comprehensive and innovative transportation strategies to achieve

mobility, connectivity, and safety for people of all ages.” The Castro Bike Feasibility Study aims to assess options for improving bicycle accommodations along Castro Street between El Camino Real and California Street.

An initial draft report with three concept alternatives was presented to the Bicycle/Pedestrian Advisory Committee (BPAC) on [August 26, 2020](#) and Downtown Committee (DTC) on October 12, 2020. At that time, the three concept alternatives were:

- Alternative 1: Class II bike lanes;
- Alternative 2: Class III sharrows; and
- Alternative 3: Hybrid option with Class II bike lanes between El Camino Real and Yosemite Avenue-High School Way and Class III sharrows between Yosemite Avenue-High School Way and California Street.

Staff recommended Alternative 3. Both BPAC- and DTC-supported Alternative 1 (Class II bike lanes) and did not support Alternative 2 (Class III sharrows). The committees indicated that if Class II bike lanes were infeasible for the whole study segment, members would endorse the hybrid principle of Alternative 3 but called for the extension of the Class II bike lanes toward California Street to provide lower stress conditions appropriate for Safe Routes to School. Members also requested investigation of intersection improvements at the Castro Street/El Camino Real intersection.

After further refining Alternative 3, the Castro Street Bikeway Feasibility Study was presented to the BPAC again on [April 28, 2021](#), with alternatives listed above. At this meeting, BPAC members reiterated their preference for bike lanes throughout the study segment (Alternative 1) and requested consideration of 10' travel lanes, pedestrian refuge islands, protected bikeways with flex posts, parallel vehicle parking, a pedestrian scramble, and removal of the protected left turn at Castro Street/Church Street intersection. The BPAC unanimously passed three motions for project recommendations:

1. Staff should make a second editorial pass, and the report should represent changes made to the plan as a result of BPAC and DTC feedback.
2. Support Alternative 1 (bike lanes) instead of Alternative 3 (hybrid), and explore improvements at the Castro Street/Church Street intersection, such as a pedestrian scramble phase to address pedestrian conflicts, or eliminating vehicle left-turn movements to provide space for bike lanes.
3. Evaluate removal of angled parking or conversion to parallel parking in order to provide space for bike lanes and reduce conflicts between bicycles and parking vehicles.

In order to respond to the above input from the BPAC, the DTC, and community members, staff updated the project scope in early 2022 to analyze feasible improvements in the short/medium term (two to seven years) and long term (eight to 20 years). A longer-term horizon would be required to fund, plan, and design more significant changes needed to support bike lanes throughout the project area.

In early 2023, staff presented new design concepts to the BPAC and DTC at a community meeting. The new concepts are described in the following section.

ANALYSIS

The new study alternatives are listed in Table 1 and include four short-/medium-term alternatives and two long-term alternatives. Short- or medium-term alternatives provide a combination of bike lanes, protected bikeways, and sharrows, while long-term alternatives provide bike lanes and protected bikeways.

Table 1: Alternatives for Castro Street Bikeway

Time Horizon	Alternative	On-Street Parking	Bike Facilities by Segment of Castro Street				
			El Camino Real to Yosemite Avenue	Yosemite Avenue to 120' south of Church Street	120' south and 60' north of Church Street	60' north of Church Street to Kaiser driveway	Kaiser driveway to California Street
Short-/Medium-Term (2 to 7 years)	1	Angled	Buffered bike lane northbound (NB); Protected bikeway southbound (SB).	Bike lanes	Sharrows	Bike lanes	Protected Bikeway NB, Sharrows SB.
	2	Parallel		Bike lanes			
	3	Angled		Bike lanes			
	4	Parallel		Bike lanes			
Long-Term (8 to 20 years)	1	Angled		Bike lanes			Protected bikeway NB, Buffered bike lane SB.
	2	Parallel					

Short-/Medium Term Intersection Improvements Across All Alternatives (Three Years)

Castro Street/El Camino Real Intersection and Approaches

For all of the alternatives, protected intersection treatments will be installed at Castro Street and El Camino Real, with protected or buffered bikeways on the approaching street segment from El Camino Real to High School Way-Yosemite Avenue (see Figure 1). The angled parking in the northbound direction would be converted to parallel parking. The concept plans for this segment assume Fairmont Avenue is closed and vacated as part of a future redevelopment project, consistent with the Downtown Precise Plan. Based on this assumption, there would be no reduction in motor vehicle parking between El Camino Real and Yosemite Avenue with the conversion to parallel parking.

These improvements are included in the recommended five-year CIP for Fiscal Year 2024-25 in order to begin design directly after the Caltrans improvements along El Camino Real are completed. These improvements will improve safety for students bicycling and walking across El Camino Real to Graham Middle School.

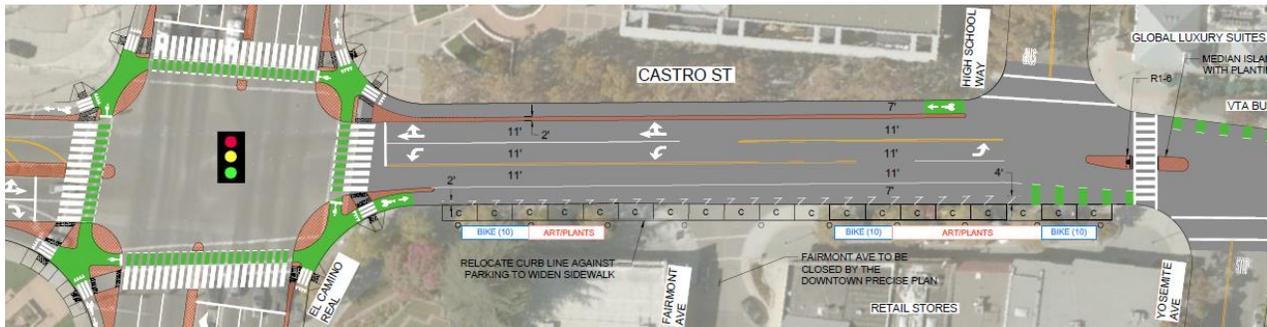


Figure 1: Concept Design for Protected Intersection at Castro Street/El Camino Real

Castro Street/California Street Intersection

At the intersection of Castro Street/California Street, a roundabout is recommended to be delivered as part of Castro Street Interim Pedestrian Mall, Project 23-49, with a timeline for design and construction within the next three years.

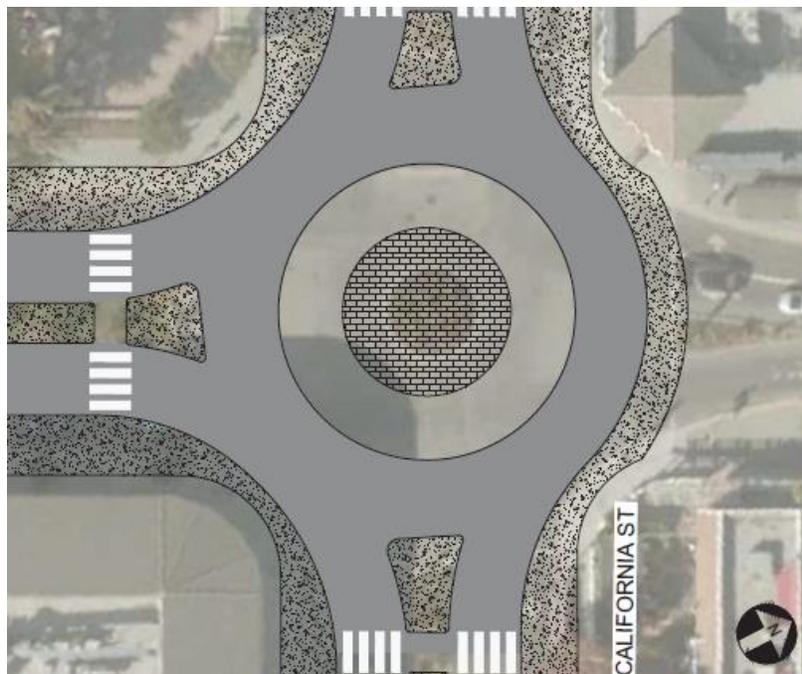


Figure 2: Rough Concept Design for Roundabout at Castro Street/El Camino Real

Short-/Medium-Term Alternatives (Three to Seven Years)

As listed in Table 1, there are four short-term alternatives that aim to provide bike lanes in the short/medium term between Yosemite Avenue and California Street (Figures 3 through 6). Key comparative features of the alternatives are as follows:

- Alternatives 1 and 2 provide bike lanes (Class II) where possible and do not change the current alignment of the Castro Street and Church Street intersection.
- Alternatives 3 and 4 are similar to Alternatives 1 and 2, with the addition of removing the eight-phase signal at the Castro Street and Church Street intersection to facilitate continuous bike lanes through the intersection.
- Alternatives 1 and 3 maintain the existing angled on-street parking, while Alternatives 2 and 4 convert angled parking to parallel parking.

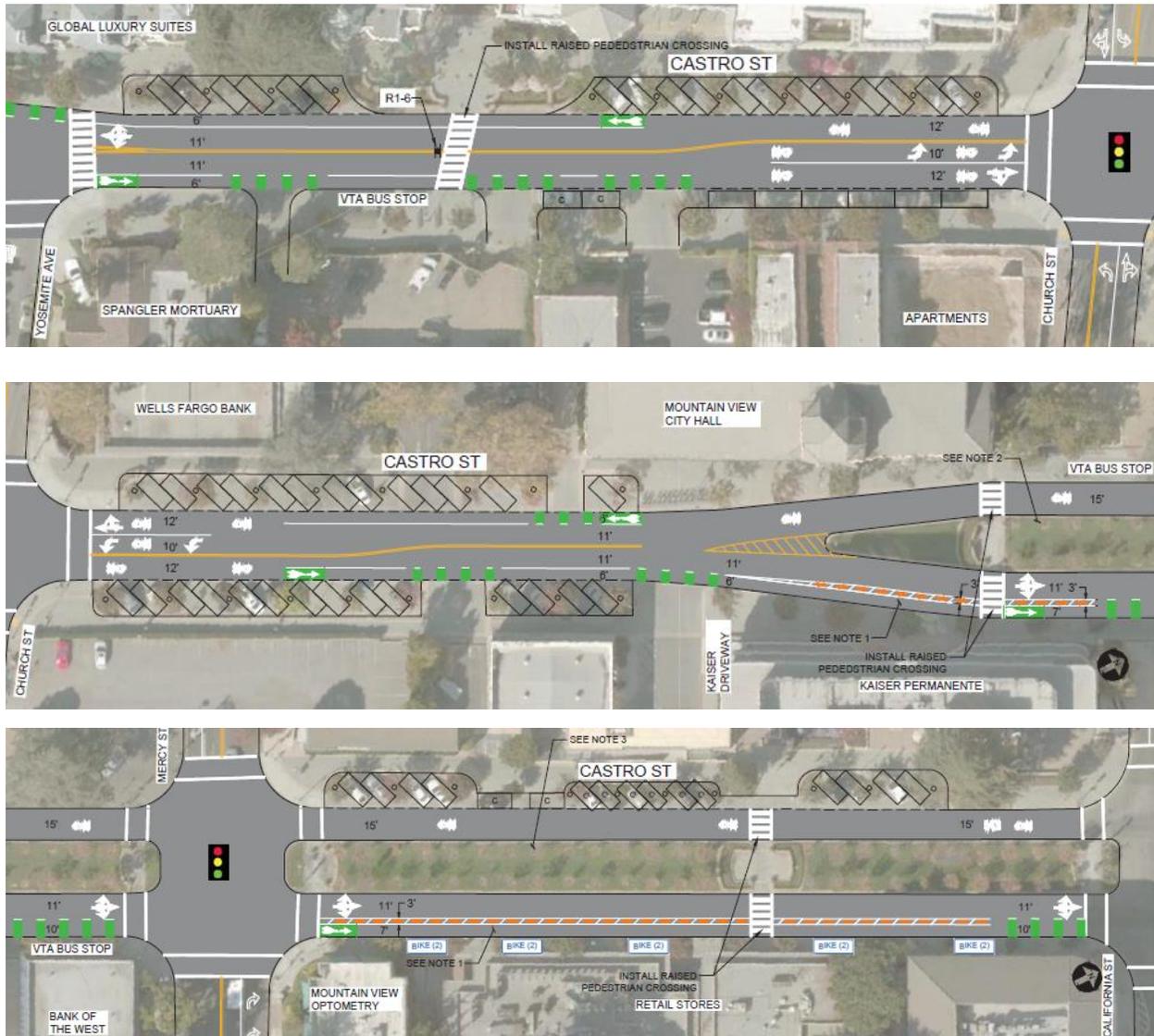


Figure 3: Short-/Medium Term Alternative 1—Yosemite Avenue to California Street, Some Bike Lanes and Angled Parking; No Changes to Church Street Intersection



Figure 4: Short-/Medium-Term Alternative 2—Yosemite Avenue to California Street—Some Bike Lanes and Parallel Parking; No Changes to Church Street Intersection

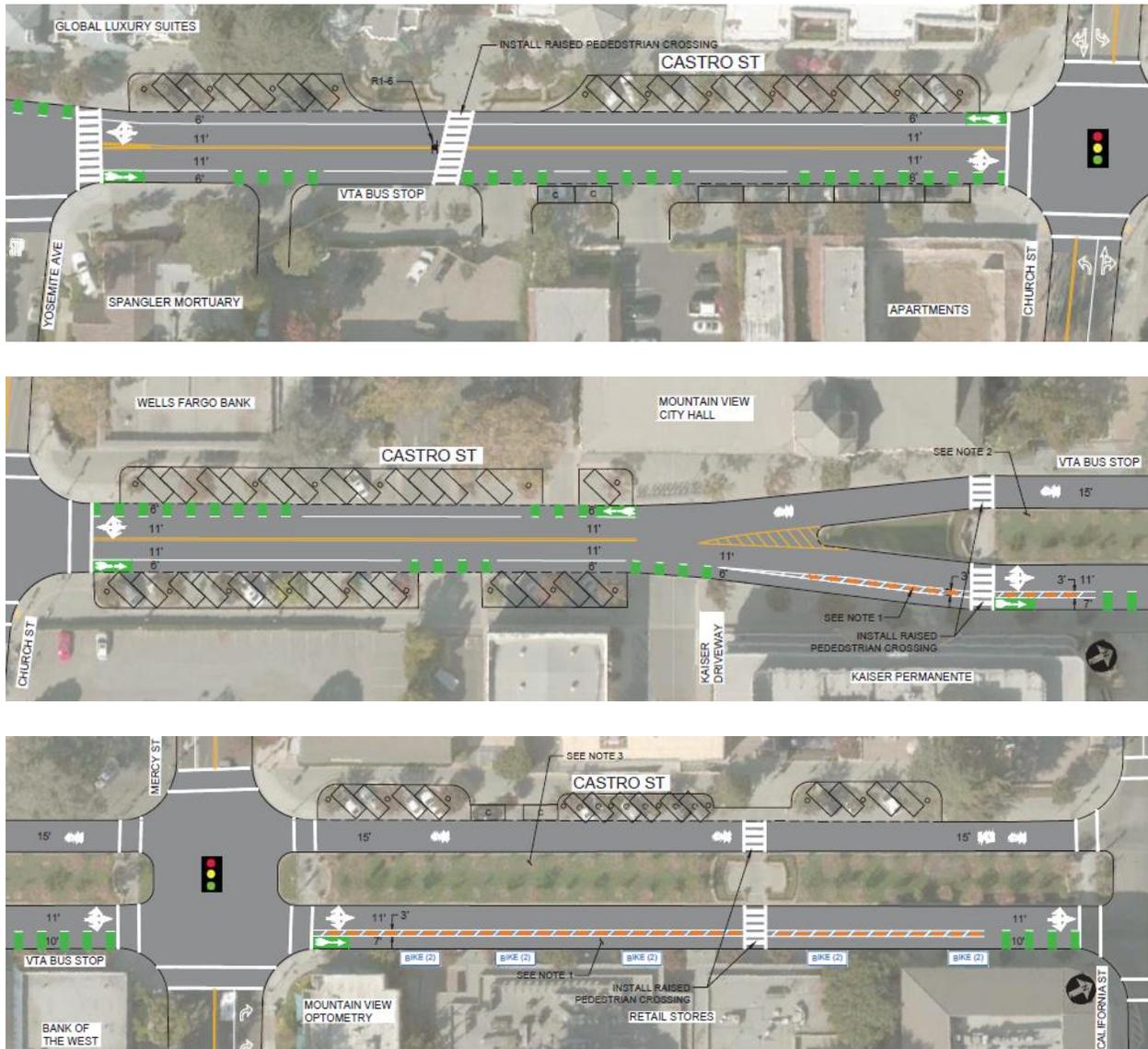


Figure 5: Short-/Medium Term Alternative 3—Yosemite Avenue to California Street, More Bike Lanes and Angled Parking; Remove 8-Phase Signal at Church Street



Figure 6: Short-/Medium-Term Alternative 4—Yosemite Avenue to California Street, More Bike Lanes and Parallel Parking; Remove the 8-Phase Signal at Church Street

Common Features

None of the short-/medium-term alternatives exclusively use sharrows (shared-use lanes for motorists and bicyclists). However, sharrows are proposed where the total curb-to-curb width is less than 16'. The minimum lane width required for VTA buses is 11', and the minimum width for a bike lane is 5'. Castro Street between California Street and the Kaiser Permanente driveway in the southbound direction is 15' and cannot accommodate a bike lane in addition to VTA bus operations. In Alternatives 1 through 4, the northbound lane in this area is proposed to have a protected bikeway, utilizing *Tuff Curbs* (see Figure 7) or a similar treatment with no flexible

vertical posts. Flexible posts are not utilized in order to comply with the City Fire Code regarding the provision of an unobstructed travelway 20' wide ([MVCC §14.10.14](#)).



Figure 7: Tuff Curb® is a Durable, High-Visibility Traffic Separator Curb

Based on input from the BPAC, the short-/medium-term locations would also feature raised, midblock crossings to improve the pedestrian experience along Castro Street. Midblock crossings are located near 440, 500, and 650 Castro Street.

Assessment of Short-/Medium-Term Alternatives

Alternatives 1 to 4 maximize bike lanes along Castro Street between Yosemite Avenue and California Street to the greatest extent possible without significant infrastructure changes to curb lines or medians.

Alternatives 3 and 4 are expected to affect traffic operations at the Castro Street and Church Street intersection, including removing left-turn lanes and signal modifications. The Castro Street and Church Street intersection was recently converted from four to eight phases, including a protected left-turn phasing to eliminate conflicts between pedestrian crossings and vehicle left-turn movements. Adding bike lanes in this segment would result in reconstructing the improvements and reintroducing possible pedestrian-vehicle conflict points. For this reason, City staff does not support Alternatives 3 and 4 in the short to medium term. Under Alternatives 1 and 2, an effort has been made to minimize the use of sharrows as much as possible by bringing the bike lanes closer to the intersection. This is achieved by sizing the left-turn lane based according to anticipated traffic volumes: the northbound left-turn lane would be reduced from the existing 215' to a proposed 120', and the southbound left-turn lane would be maintained at 60' long.

Parallel parking decreases the crash risk for all roadway users compared to angled parking. This crash reduction also lowers crash severity for cyclists. Alternatives 2 and 4 provide parallel

parking and allow for the space behind the trees to be utilized for other purposes, such as plants, art, or bike parking. Staff suggests the provision of some bike parking to help offset the reduction in motor vehicle parking (five spaces) caused by the conversion from angled to parallel.

Cost estimates will be generated later, but a rough relative cost is provided in Table 1.

Table 1: Comparison of Short-/Medium-Term Alternatives for Castro Street Bikeway, Yosemite Avenue to California Street

Short-term Bikeway Alternatives for Castro Street					
	Major Feature	Parking Alignment	Parking Change	Relative Cost	Automotive Level of Service
Alt 1	Some Bike Lanes	Angled Parking 	 -7  +40	\$	No Change
Alt 2	Some Bike Lanes Bike Racks/Art	Parallel Parking 	 -12  +94	\$\$	No Change
Alt 3	Bikes Lanes Throughout (including Church and Castro)*	Angled Parking 	 -7  +40	\$\$\$	No Change
Alt 4	Bikes Lanes Throughout (including Church and Castro) Bike Racks/Art*	Parallel Parking 	 -12  +94	\$\$\$	No Change

* Except where current curb-to-curb widths prohibit.

Note: Seven automobile parking spaces are being removed in all scenarios in the northbound direction between Mercy and California Streets to comply with fire code.

Long-Term Alternatives (Eight to 20 Years)

Two long-term alternatives were developed to address competing interests of pedestrian and bicycle improvements at the Castro Street and Church Street intersection and providing Class II bike lanes throughout the project corridor. Long-Term Alternative 1 maintains the existing angled parking, while long-term Alternative 2 converts angled parking to parallel.

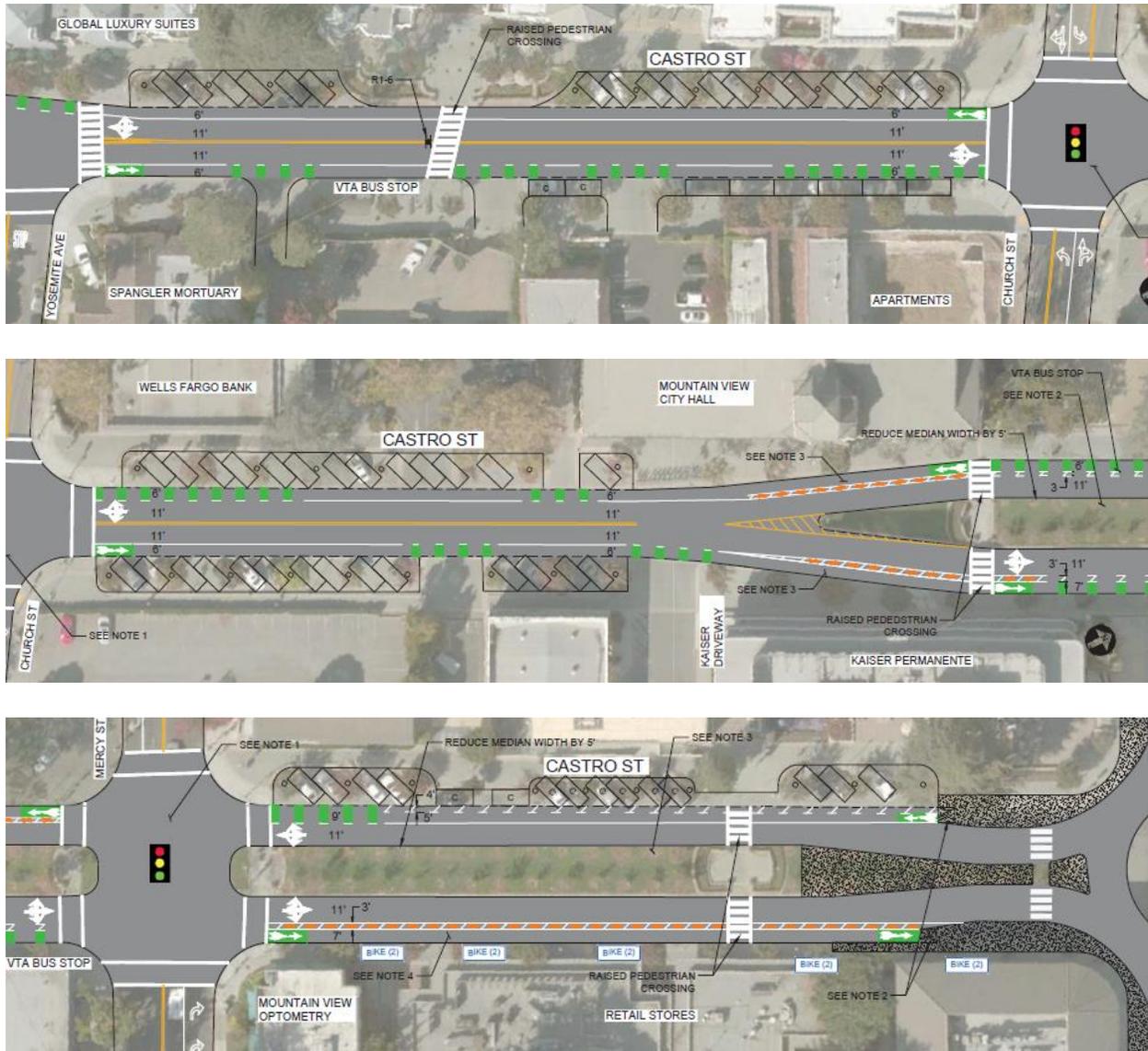


Figure 8: Long-Term Alternative 1—Yosemite Avenue to California Street, Class II or IV Bikeways and Angled Parking; Replace Eight-Phase Signals at Church Street and Mercy Street

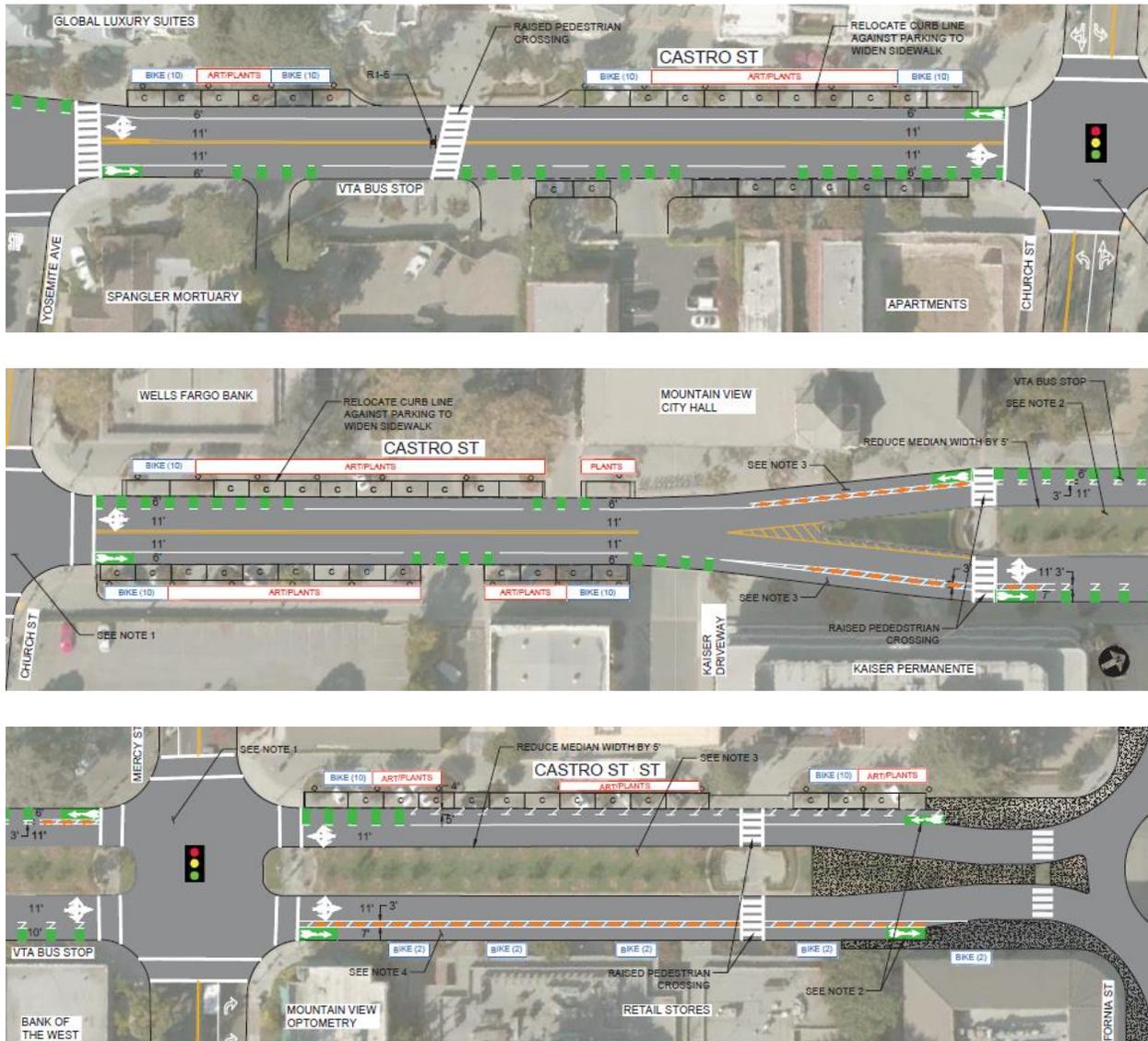


Figure 9: Long-Term Alternative 2—Yosemite Avenue to California Street, Class II or IV Bikeways and Parallel Parking; Replace 8-Phase Signals at Church Street and Mercy Street

Common Features

Both long-term alternatives provide bike lanes (Class II) from Yosemite Avenue north to the Kaiser Permanente driveway. To provide bike lanes through the Castro Street and Church Street intersection, features such as a roundabout or pedestrian scramble (where all signals are held red to allow pedestrians to cross all at once) would be considered as part of the concept design.

Both long-term alternatives provide protected bikeways north of the Kaiser Permanente driveway for the northbound travel lane and buffered bike lanes for the southbound travel lane.

The protected bikeways in the northbound lane are suggested to have a low, mountable concrete curb or semiraised bikeway with a mountable curb. The buffer space provided for southbound travel is placed near vehicle parking rather than the motor vehicle travel lane to decrease crash risk created by opening car doors in this high-turnover parking area.

To provide a bike lane in the southbound direction between California Street and the Kaiser Permanente driveway, a 1' portion of the landscaped median would need to be removed to widen the road. The current road width in this segment does not meet current Fire Code requirements, and any changes to the median would trigger a requirement to conform the road to the current Fire Code. Therefore, the median would have to be narrowed by 5' to provide the 20' clearance between curbs, providing space for a buffered bike lane and bus operations. This impacts the median trees in the southbound direction; however, there is room to keep them in the median by transplanting them a small distance toward the center of the median. Please note that trees in the current parking areas are not affected by long- or short-/medium-term alternatives.

Assessment of Long-Term Alternatives

Further analysis is needed at the intersections of Castro Street/Church Street and Castro Street/Mercy Street. The study recommends analyzing the feasibility of the following types of intersection improvements should the long-term alternatives be pursued:

- **Pedestrian Scramble**—A pedestrian scramble is where all vehicle signals are held on a red signal while pedestrians have a white walk symbol to cross in any direction at the intersection. A pedestrian scramble would increase travel times for all users, which could increase unauthorized pedestrian crossings but would decrease conflict points between motorists and pedestrians.
- **Roundabout**—A roundabout would lower travel times for all users while providing bike lanes up to the intersection. The provision of a roundabout at either location will not require additional right-of-way or impact existing buildings. However, some sidewalk space may be required. Overall, a roundabout would be a significant capital improvement and further consideration of feasibility would be necessary.

Parallel parking decreases the crash risk for all roadway users compared to angled parking. This crash reduction also lowers crash severity for cyclists. Parking and other implications of the alternatives are shown in Table 2. The number of parking spaces lost includes the spaces lost in the short-/medium-term alternatives; therefore, the long-term Alternative 1 includes losing three more parking spaces over short-/medium-term Alternatives 1 and 3; and long-term Alternative 2 involves no additional parking spaces lost over short-/medium-term Alternatives 2 and 4. Long-term Alternative 2, with parallel parking, also allows for the area behind the trees to be utilized for other purposes such as plants, art, or bike parking.

Cost estimates will be generated at a later date; however, a rough relative cost is provided in Table 2.

**Table 2: Comparison of Long-Term Alternatives for Castro Street Bikeway—
 Yosemite Avenue to California Street**

	Major Feature	Parking Alignment	Parking Change	Relative Cost	Automotive Level of Service
Alt 1	Class II/IV Bike Lanes	Angled Parking 	 -10  +10	\$	No Change*
Alt 2	Class II/IV Bike Lanes Bike Racks/Art	Parallel Parking 	 -12  +94	\$\$	No Change*

* Where Roundabouts are used LOS Improves

Note: Seven automobile parking spaces are being removed in all scenarios in the northbound direction between Mercy and California Streets to comply with fire code.

Community and Committee Feedback

Staff has obtained feedback on the above alternatives from the BPAC, the DTC, and the community, as described below.

On January 25, 2023, the BPAC reviewed the short- and long-term alternatives. The BPAC voted in favor of Short-/Medium-Term Alternative 2 (4-1 vote) and Long-Term Alternative 2 (unanimous). BPAC members expressed concerns about “dooring” (where a parallel parked motorist inadvertently opens their driver-side door into the bike lane and strikes a cyclist). Some members requested consideration of on-street parking removal wherever dooring was an issue. Staff evaluated the latter suggestion and found that it would result in a reduction in all but 14 of the on-street parking spaces located between California and Mercy Streets. In addition, BPAC members supported median tree transplanting in the short term as needed to support Long-Term Alternative 2.

The DTC reviewed the Castro Bikeway Feasibility Study alternatives on February 7, 2023 and March 7, 2023. The DTC voted unanimously in favor of Short-/Medium-Term Alternative 2 and Long-Term Alternative 2. The DTC members expressed concern about dooring, and one member suggested signage on the proper way to open a parallel parked car near a bike lane. The DTC did not support the increased parking loss required to eliminate dooring risk.

On April 13, 2023, City staff held a hybrid community engagement event at City Hall and virtually. Outreach for this event included 740 postcards mailed to surrounding tenants, businesses, and property owners, in addition to emails to project subscribers and general social media noticing. Approximately, 20 members of the public attended either in person or remotely. Staff presented short-/medium- and long-term alternatives and the BPAC and DTC feedback. Participants generally supported Short-/Medium-Term Alternative 2 and Long-Term Alternative 2. Participants requested that the raised midblock crossings previously presented in the long-term alternatives be provided as part of the short-term alternatives. Staff evaluated the suitability of this input and incorporated the suggested change into the descriptions of current alternatives.

Staff Recommendations

Short-/Medium-Term Alternatives

Based on the project assessment and feedback from community and Committee members, staff recommends Short-/Medium-Term Alternative 2, which converts angled parking to parallel parking and maintains the pedestrian improvements at the Castro Street and Church Street intersection while increasing the provision of bicycle lanes. Converting angled to parallel parking lowers crash risk and increases the pedestrian space for art, plantings, bike parking, or other uses. Staff suggests additional bike parking to help offset the reductions in motor vehicle parking caused by the conversion from angled to parallel parking. This alternative includes raised crosswalks at midblock locations.

Long-Term Alternatives

In the long term, staff recommends Long-Term Alternative 2 as it increases the provision of bicycle lanes, eliminates the use of sharrows, and converts angled parking to parallel parking, lowering crash risk while increasing the pedestrian space for art, plantings, bike parking, or other uses. In conjunction with Long-Term Alternative 2, staff suggests additional bike parking to help offset the reductions in motor vehicle parking caused by the conversion from angled to parallel parking.

If Council supports a long-term alternative, staff recommends transplanting the cork oak trees along the edge of the median of Castro Street a small distance toward the center of the median in the short term while the trees are less mature and more able to survive a transplant. According to Forestry staff, waiting to shift the trees for more than a couple of years will jeopardize their survival if they are transplanted at a later time.

NEXT STEPS

Staff will incorporate any additional feedback before forwarding the CTC's recommendations to the City Council.

With Council approval, implementation would be as follows:

- Intersection improvements at Castro Street and El Camino Real intersection and from El Camino Real to Yosemite Avenue would be pursued in the short-term after the Caltrans improvements planned for 2023 are completed (18 months) as part of a recommended CIP project for Fiscal Year 2024-25.
- Implementation of the roundabout at Castro Street/California Street intersection would be designed and constructed as part of the Interim Castro Pedestrian Mall, Project 23-49.
- Other short-/medium-term improvements approved by Council north of Yosemite Avenue will be addressed as opportunities arise and funding becomes available.
- Long-term improvements will need further vetting during the design process with additional outreach to downtown businesses and the DTC. If Council approves pursuing the long-term options, additional study and design would be added to the five-year CIP as an unscheduled project until prioritized for the next steps and funding.

ALTERNATIVES

1. Recommend different short-/medium-term and long-term alternatives to City Council.
2. Direct staff to modify a preferred alternative and return to Council Transportation Committee for further review.
3. Provide other direction.

BW-RHL-DS/LL/1/PWK

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