

Capitola City Council Agenda Report

Meeting: September 28, 2023

From: Public Works Department

Subject: Bay Avenue and Hill Street Traffic Safety



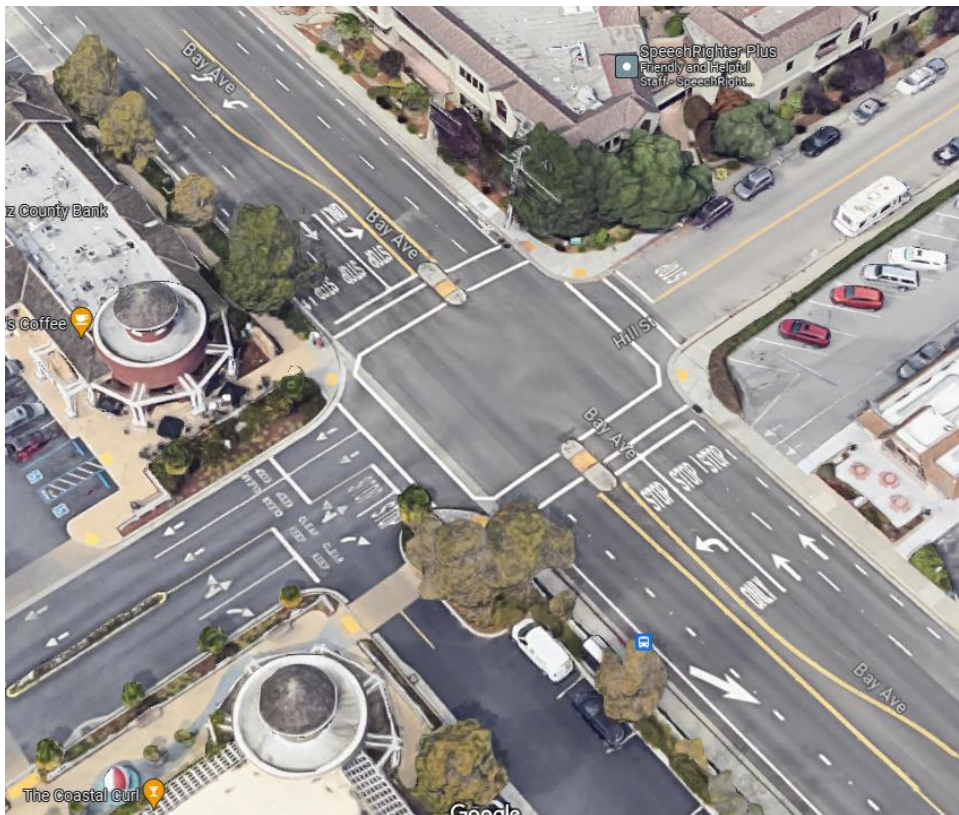
Recommended Action: Provide direction to staff regarding short-term and long-term options for improving traffic safety at the intersection of Bay Avenue and Hill Street.

Background: The Bay Avenue/Hill Street intersection is an all-way stop controlled intersection that provides connectivity to Highway 1 and the Capitola Village. The section of Bay Avenue at this location is a four-lane wide roadway with a center left turn lane. The City has received community feedback regarding concerns about pedestrian safety at the crosswalks. During peak hours, the intersection experiences congestion from heavy vehicle and pedestrian cross traffic due to access to the Nob Hill Plaza, the Rispin bridge crossing, and the surrounding residential and commercial land uses. The adopted FY 2023/24 budget includes \$50,000 to make improvements to this intersection.

There are currently nine lane approaches at the Bay Avenue/Hill Street intersection (Figure 1). This includes three lanes on Bay Avenue for both northbound and southbound traffic, one lane on Hill Street for westbound traffic, and two lanes from the Nob Hill Driveway for eastbound traffic. Additionally, there is a pedestrian crosswalk with a raised median and contrasting pavement, as well as Class II bike lanes on Bay Avenue.

The primary concern at this intersection is the high number of lanes, combined with the presence of pedestrian crossings and bike lanes, can make it challenging for drivers to effectively navigate the stop-controlled intersection.

Figure 1. Existing Bay/Hill Intersection Layout



There were a total of 16 accidents at the Bay Avenue/Hill Street intersection between November 2017 and August 2023. The most common collision occurred from broadside crashes between two vehicles making improper turns at the intersection (six). All but one of the reported collisions involved two vehicles, and the collision severity ranged from property damage to injuries. Two pedestrian-involved collisions occurred in December of 2022 and August 2023, due to vehicles failing to yield for a pedestrian in the crosswalk. The Police Department issues an average of 22 citations per year in/near this intersection.

The City Council allocated \$50,000 to the “Bay Avenue/Hill Street Pilot Project” in the Fiscal Year 2023-24 Budget. Following City Council direction, this report is being presented to identify areas in this intersection where traffic, pedestrian, and bicycle concerns have been identified and to provide potential short- and long-term options to address these concerns for the City Council’s consideration.

Discussion: The City contracted with Kimley Horn to perform an evaluation of the traffic operations and feasible intersection improvements at Bay Avenue/Hill Street that could improve traffic operations and safety for vehicles, bicyclists, and pedestrians (Attachment 1). This analysis considered level of service (LOS), vehicle queue lengths, and bike and pedestrian access. LOS is a measure of how well the intersection functions from a traffic flow perspective during typical peak traffic periods.

The Bay Avenue/Hill Street intersection currently operates at LOS C during the AM, Midday, and PM peaks with the existing all-way stop baseline geometry. Pursuant to the City’s General Plan, LOS C is identified as the minimum LOS operational standard generally and LOS D as the minimum acceptable standard at signalized and unsignalized intersections within the Village Area, along Bay Avenue, and along 41st Avenue.

“Queue length” is the space needed for cars to stack while waiting to complete a turn. This length should be long enough to accommodate all turning vehicles so that traffic doesn't back up into through-traffic lanes.

Bike and pedestrian access is generally improved in intersections with increased visibility, separated spaces, and when crossing distances are minimized.

Four alternatives were evaluated for the Bay Avenue / Hill Street intersection, and are summarized in Table 1:

1. Convert the intersection into signal control: This alternative involves installing traffic signals at the intersection to regulate the flow of vehicles, pedestrians, and cyclists. Signal control can help improve traffic operations and enhance safety by providing clear right-of-way instructions to all users.
2. Convert the intersection into a single lane roundabout layout with yield control: This alternative includes replacing the existing intersection with a roundabout, which would feature a circular roadway with yield control at entry points. Roundabouts are known for their traffic calming effects, improved safety, and efficient traffic flow.
3. Convert Bay Avenue into a 2-lane roadway with a road diet transition: This alternative proposes reducing the number of lanes on Bay Avenue to create a 2-lane roadway. This road diet transition aims to improve traffic operations and safety by reallocating space for other uses, such as bike lanes, wider sidewalks, or landscaped areas.
4. Maintain the existing all-way stop control: This alternative keeps the current configuration of the intersection with the all-way stop control.

Table 1. Intersection Improvement Alternatives

	Signal	Roundabout	Road Diet	Comments
LOS	●	●	●	Roundabout (LOS A) and signal (LOS B) have less delay than AWSC (LOS B/C) or the Road Diet worst movement (LOS F).
Queueing	●	●	●	Each option will experience queuing during peak hours.
Collision Severity	●	●	●	Collision severity is typically reduced by the low-speed, low-angle of collision of a roundabout.
Collision Frequency	●	●	●	Single-lane roundabouts typically decrease collisions. Signals typically increase collisions.
Pedestrian Mobility	●	●	●	The roundabout provides more pedestrian islands, and allows pedestrians to cross one lane of traffic at a time.
Pedestrian Safety	●	●	●	The roundabout lowers speeds and number of conflicts. Road diet has narrower crossings and slower speeds.
ROW Acquisition	●	●	●	More land maybe required with the roundabout option.
Network Connectivity	●	●	●	All maintain good network connectivity.
Construction \$	●	●	●	Higher roadway area and landscaping costs with a roundabout; higher costs with signal due to electrical improvements. Signal and roundabout costs estimated at \$450,000; Road diet permanent improvements estimated at approximately \$200,000
Maintenance \$	●	●	●	Potential for landscaping maintenance at roundabout and at road diet approach islands
Aesthetics	●	●	●	Roundabout has opportunities for landscaping center island features. Road diet allows approach islands.
Emergency Response	●	●	●	All options provide good mobility for emergency response vehicles.
GHG emissions	●	●	●	Installing roundabouts in place of traffic signals or stop signs has been found to significantly reduce CO2 and other air pollution emissions.

Better **Worse**

From an intersection operations perspective, Alternative 2 (roundabout) would offer the best LOS and vehicle queuing results. This alternative would accommodate improved multi-modal access for bikes, pedestrians, and vehicles. However, it should be noted that substantial intersection and construction improvements would be necessary to convert the intersection into a roundabout, making it a more

complex and time-consuming project. However, a roundabout at this location would not require utility relocation, which is often the most time-consuming aspect of these projects.

Alternative 1, the signal configuration, would also provide acceptable LOS and vehicle queuing operations while offering improved multi-modal access for bikes and pedestrians. It is worth noting that while the LOS would be “improved” with a signal-controlled intersection, the typical delay for a vehicle to traverse the intersection would actually increase as compared to the other options.

Alternative 3, the road diet configuration, would result in the worst LOS operation, based on traditional traffic modeling, but would provide improved bike and pedestrian access through a 2-lane road diet and raised pedestrian crossing features. It is worth noting that City staff, have speculated that a traditional traffic model may overestimate the actual effect of implementing a road diet through this intersection as the sheer number of conflicting movements in the current intersection appear to create notable driver confusion, which can lead to lower levels of service.

Considering the community's primary concern for safety and the desire for near-term action, Staff recommends moving forward with a "quick build" project based on Alternative 3. Quick-build projects are reversible and adjustable traffic safety improvements that can be installed relatively quickly. They typically utilize cost-efficient and readily available materials such as paint, cones, barriers, and signage. These projects can create safer lanes for pedestrians, cyclists, and other road users. Unlike major capital projects, quick-build projects can be implemented within weeks or months and are intended to be evaluated and reviewed within the initial 24 months of construction.

Figure 2. Examples of a “Quick-Build” Intersection Project



Upon direction from the City Council, staff proposes conducting public outreach on the proposed intersection modifications in early 2024. This outreach would provide an opportunity for the community to provide input, ask questions, and express any concerns regarding the project. To minimize disruption, staff recommends scheduling the construction for late spring, avoiding the school year.

Fiscal Impact: Estimated cost to complete Alternative 3 is within the allocated \$50,000 budget in the FY 2023-24 budget. This quick build project would be temporary in nature, and there would be a budget

allocation in the FY 2024-25 budget to analyze its effectiveness and either remove or permanentize the improvements.

If the City Council directs staff to pursue Alternative 1 (signalization), the installation of signals would cost around \$450,000. There would be additional costs for bike and pedestrian accommodations. Operating a signal typically costs around \$5,000 annually.

If the City Council directs staff to pursue Alternative 2 (roundabout), the estimated cost would be similar to the traffic signal. This is because significant modifications to the intersection geometry would be required, along with extensive public outreach and additional traffic studies. However, there are significant sources of external funding available for roundabouts due to their GHG reductions, which staff could pursue should Council direct staff to proceed with this alternative.

Attachments:

1. Bay Avenue / Hill Street – Intersection Operations Analysis
2. Concept Layout - Alternative 2 Roundabout
3. Concept Layout - Alternative 3 Road Diet

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