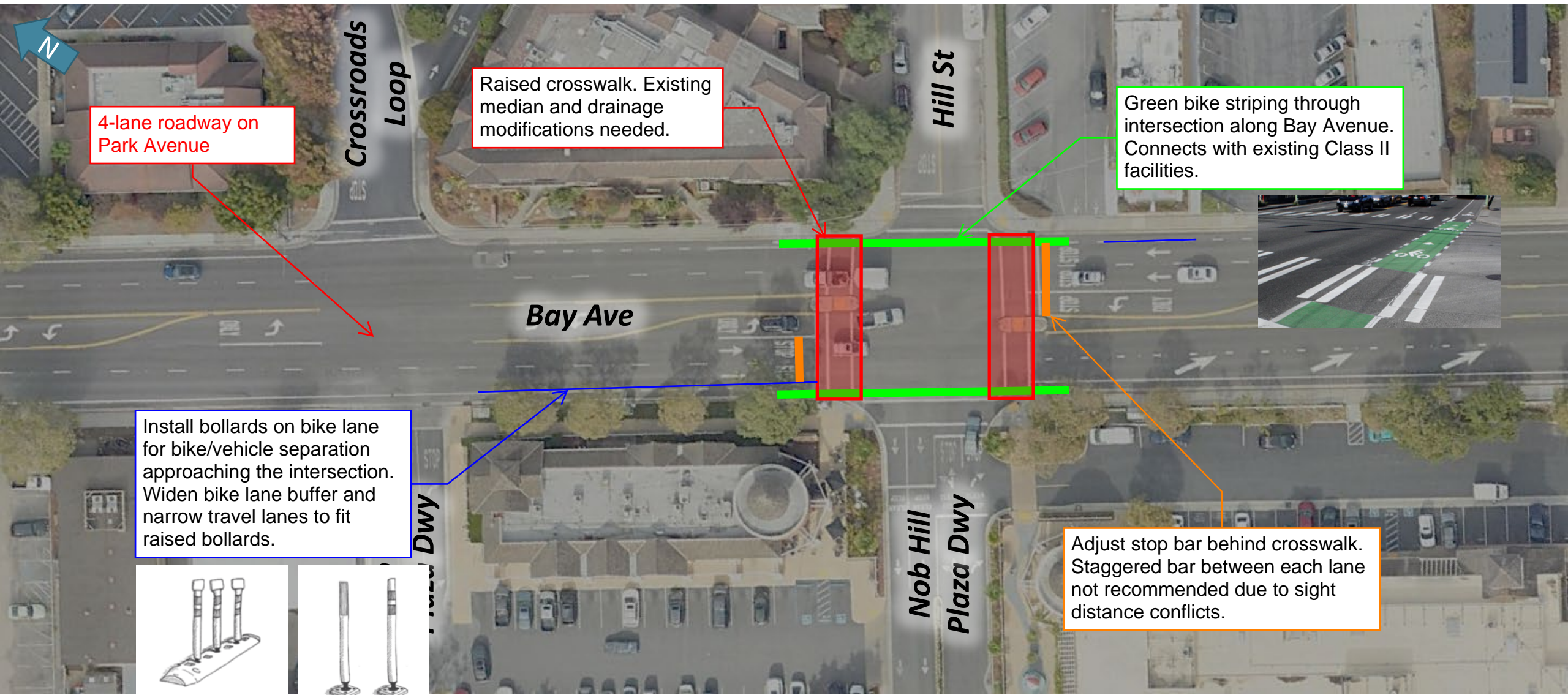

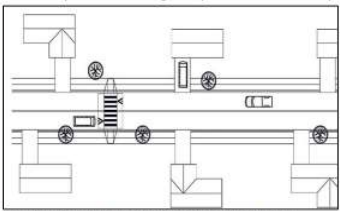
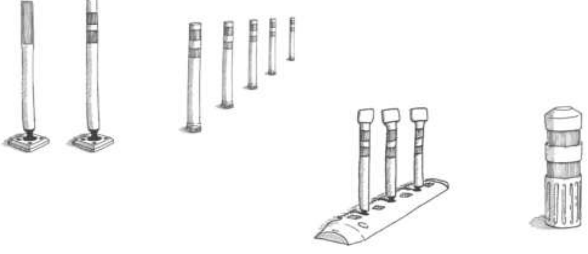
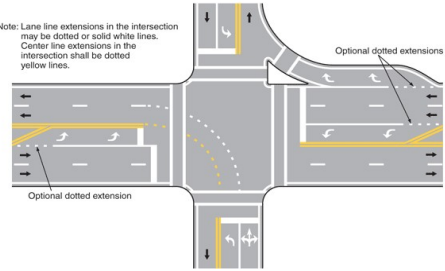



# 11/21/2024 CC Notes



12/10/2024 21:21 Potential Improvements at Bay Avenue / Hill Street Intersection (Per 11/21/2024 City Council)								
Criteria	Raised Crosswalk		Raised Bollards		Stagger Stop Bar for Bay Ave Travel Lanes		Continuous Bike Intersection Crossing Markings	
	Physical Measure		Physical Measure		Striping / Signing Measure		Striping / Signing Measure	
	Benefits	Challenges	Benefits	Challenges	Benefits	Challenges	Benefits	Challenges
<b>Pedestrian &amp; Bike Safety</b>	Identified traffic calming measure that increases visibility to approaching vehicles Increased driver-yield compliance at crossing from vertical deflection Improved ADA access since crosswalk at same elevation as the sidewalk		Increased visibility to approaching vehicles Provides physical separation buffer between vehicle and bike/ped areas on roadway		Potential improved sight lines of bike/peds on crosswalk for driver in the forward staggered lane	For adjacent movements, stop bars staggered different distances between lanes would improve sight lines for the forward vehicle but reduce sight lines for back vehicle in next lane. No net improvement to overall safety (Bay Avenue 4-lane road)	Increased visibility and identification of bike space and intended path of travel within the intersection and at the approaches Reinforces bikes have priority over turning vehicles in conflict areas Provides connectivity to existing bike facilities	
<b>Traffic Operations</b>	Reduced vehicle speeds through crosswalk due to grade change improves bike/ped safety	Increased average vehicle delay and travel times through intersection due to slower speeds to traverse crosswalk	Bollards used to create curb extension / reduce curb radius will reduce vehicle turning speeds at corners			Potential impact to sight lines (see above)	No anticipated impacts	
<b>Vehicle Queues &amp; Vehicle Access</b>	No impact to non-emergency vehicles	Potential increase in queues to traverse through intersection from slower speeds Typically not appropriate for primary emergency vehicle routes. Requires coordination with fire & police	No impact to non-emergency vehicles	Posts at intersection corners may potentially be struck from large delivery or emergency vehicles	No anticipated impacts		No anticipated impacts	
<b>Design, Construction, &amp; Maintenance</b>	Recommended on streets with posted speed up to 30mph Existing raised crosswalks implemented in Capitola (Clares St and Jewel Box neighborhood)	Modification of drainage design along the curb needed to prevent ponding Increase noise due to vehicle acceleration/braking over crosswalk Recommend improvement to nighttime visibility for approaching vehicles / bikes	For bike lanes, center delineator within the buffer zone along the edge of the bikeway. Typical spacing is every 8 - 20 ft, depending on the thoroughfare's design speed / bikeway configuration. Allow a minimum of 1.5 ft. clear width for installation of smaller delineators	Ongoing maintenance from vehicle strikes. Smaller bollard sizes have lower durability and will require more replacement. For Bay Avenue with 4-lane geometry, wider bike lane buffer width (1.5' min) recommended to use bollards	Recommend stop lines to be placed at least 4-ft in advance of crosswalk (no stagger between adjacent lanes)	Staggered stop bar between left turn and through lanes permitted in MUTCD to increase turning radius clearance for large vehicles making a left turn. This issue is not present at Bay/Hill intersection (see example below).	Provides benefit on northbound and southbound Bay Avenue approaches with existing Class II bike facilities	May not be applicable to install on for the eastbound and westbound Nob Hill and Hill Street approaches due to lack of existing bike facilities/striping
<b>Cost Range</b>	\$6,000 to \$25,000 per crosswalk location (Asphalt) Additional costs for brickwork, stamped material, concrete ramps, and other enhancements used at pedestrian crossings		\$50 to \$200 per bollard or segment (depending on size and type) Flexible delineator post < High performance delineator < Raised lane separator < K71 Delineator Post		\$8 to \$20 per linear foot (white thermoplastic striping) Includes removal of existing striping		\$15 to \$30 per square foot (green thermoplastic striping) Includes removal of existing striping	
<b>Examples</b>	 <small>(Source: Google Maps, Boulder, Colorado)</small>	 <small>(Source: Delaware Department of Transportation)</small>		 <small>D - Typical dotted line markings to extend center line and lane line markings into the intersection Note: Lane line extensions in the intersection may be dotted or solid white lines. Center line extensions in the intersection shall be dotted yellow lines. Optional dotted extensions</small>				
<b>Source</b>	<a href="https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-2#3.14">https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer/module-3-part-2#3.14</a> <a href="https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/">https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/</a> <a href="http://www.pedbikesafe.org/BIKESAFE/countermeasures_detail.cfm?CM_NUM=27">http://www.pedbikesafe.org/BIKESAFE/countermeasures_detail.cfm?CM_NUM=27</a>		<a href="https://tacticalurbanismguide.com/materials/raised-lane-separator/">https://tacticalurbanismguide.com/materials/raised-lane-separator/</a> <a href="https://tacticalurbanismguide.com/materials/flexible-delineator-post/">https://tacticalurbanismguide.com/materials/flexible-delineator-post/</a>		<a href="https://mutcd.fhwa.dot.gov/hm/2009/part3/part3b.htm">https://mutcd.fhwa.dot.gov/hm/2009/part3/part3b.htm</a>		<a href="https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/intersection-crossing-markings/">https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/intersection-crossing-markings/</a>	