

MEMORANDUM

COUNTY OF SAN MATEO PLANNING AND BUILDING DEPARTMENT

DATE: December 8, 2020
TO: Midcoast Community Council
FROM: Joe LaClair, Planning Manager
SUBJECT: Miramar Coastal Trail Alignments & Coastal Erosion in Connect the Coastside

Summary:

Coastal erosion is a long-term risk for transportation facilities in the Midcoast, including segments of Highway 1 and the California Coastal Trail. The closure of the Medio Creek bridge on the Coastal Trail was necessary because the structure is unsafe due to corrosion weakening structural elements of the bridge. Replacement of the bridge requires a Coastal Development Permit from the Coastal Commission. The rate of shoreline erosion in Miramar is uncertain because of existing riprap shoreline protection. Ultimately, sea level rise will exacerbate coastal erosion in this area, potentially requiring the removal of coastal infrastructure and realignment of the shoreline inland, including the Miramar segment of the California Coastal Trail. Interim repair of the Medio Creek bridge is appropriate to restore public access while inland realignment route alternatives are considered and pursued.

Connect the Coastside will discuss the potential impacts of sea level rise and coastal erosion on existing and proposed transportation infrastructure in the plan area, including segments of Highway 1 and the California Coastal Trail. In particular, the segment of Highway 1 in Princeton/El Granada in the vicinity of Surfer's Beach is vulnerable, as is the segment of the Coastal Trail from Surfer's Beach down to Alcatraz Avenue in Half Moon Bay. Connect the Coastside will include the sea level rise projections from San Mateo County's Sea Change project, which are the same projections being used in Plan Princeton. Connect the Coastside will also include a recommendation to explore inland route alternatives for the Coastal Trail in the Princeton/Miramar area.

Sea Level Rise (SLR)

The current draft of Plan Princeton considers State and local guidance for determining appropriate local SLR projections for the Plan Princeton Study Area. Consistent with the County of San Mateo's Sea Change work (<https://seachangesmc.org/>) and the Ocean Protection Council's (OPC) guidance, Plan Princeton relies on the Our Coast, Our Future (OCOF) (<https://data.pointblue.org/apps/ocof/cms/>) tool as the best available SLR

inundation modeling data for the local study area. OCOF’s modeling tool is based on a suite of preset SLR values from the USGS CoSMoS model. Staff has reviewed OCOF’s numerous flood scenarios for the Plan Princeton study area and has identified a range of SLR scenarios from low to high-end that likely represent noticeable changes in local flood impacts on the Princeton area. Staff has related these selected scenarios to a potential bracket of time consistent with the planning horizons from OPC (2018).

Plan Princeton SLR Projections		
Time Period	Sea Level Rise	Storms
2030 - 2045	19.2 inches (1.6 feet)	1% Flood (100-year)
2045 - 2070	39.6 inches (3.3 feet)	
2070 - 2100	79.2 inches (6.6 feet)	

Coastal Erosion

According to the US Army Corps of Engineers, the smooth arcuate-shaped shoreline extending from Princeton down to southern Half Moon Bay resulted from prevailing northwest swell refraction around the Pillar Point headland that evenly distributed wave energy, and its resulting effect on sediment supply to the Princeton [and Half Moon Bay] shoreline (USACE, 2017). The Pillar Point Harbor breakwaters disrupted the natural littoral cell sand transport process by isolating the harbor, and Princeton shoreline, from the larger Santa Cruz Littoral Cell, thereby changing the hydrodynamic system and wave patterns with respect to sediment supply and shoreline erosion as the breakwaters became a barrier for littoral and offshore sediment material that once supplied sand to the Princeton shoreline. The breakwaters also disrupted the wave patterns in the area downshore of the breakwaters, increasing shoreline erosion at least as far south as southern Half Moon Bay.

The San Mateo County (SMC) Sea Change assessment relies on the Pacific Institute’s erosion data for the San Mateo coastline to assess the erosion risk on the coast. Furthermore, the USGS’ currently published CoSMoS data for SLR projections does not take erosion into account. Various studies have recognized the erosion concerns along the Princeton and Half Moon Bay shoreline due to the breakwaters constructed by the USACE in 1959 – 1961, which have modified the shoreline sufficiently to require a particularized approach to characterizing shoreline erosion.

Projected Shoreline Erosion for Plan Princeton

A projected shoreline erosion rate of 6 in./yr. (-0.5 ft./yr.) is proposed for Plan Princeton. This erosion rate is derived from doubling the average projected erosion rate of 3 in./yr., estimated by the County’s consultants to account for additional erosion caused by SLR. County staff believes the projected shoreline erosion rate of 6 in./yr. is an appropriate rate for erosion along the Princeton shoreline based on our review and analysis of best available science on historical erosion rates and shoreline changes, project-specific shoreline erosion

studies, and historical aerial photography, accompanied by the understanding that SLR will accelerate shoreline erosion by changing the frequency and location of wave impacts along the Princeton shoreline.

Projected Shoreline Erosion for Miramar

There have been no specific studies of erosion rates in Miramar. Review of historical aerial imagery shows that little coastal erosion has occurred in Miramar over the last 30 years, except for the banks at the mouth of Medio Creek, due in large part to the installation of riprap shoreline protection. It is not known at this time how long shoreline protection can maintain the shoreline in its current location as sea level rises. The installation of shoreline protection in conjunction with replacement of the Medio Creek Bridge can restore public access on the Coastal Trail, while inland route alternatives are considered and developed in the longer term.

Coastal Trail Alignment in Miramar – Connect the Coastside

Connect the Coastside will include several potential alignments for the Coastal Trail in Miramar, including the existing alignment as well as potential inland alternatives, from Alcatraz Avenue in Half Moon Bay across State Parks property and following either an Alameda Avenue or First Avenue alignment, connecting to the existing Coastal Trail north of Magellan Avenue. Inland alignments would require a bridge over Medio creek, and acquisition of private property to complete the chosen alignment. The trail configuration, e.g, Class I Trail, Class II bike lanes or Class III bikeway both with sidewalks would be determined through a community planning process.