12. OLD BAYSHORE HIGHWAY AND AIRPORT BOULEVARD

City of Burlingame

VULNERABILITY SUMMARY

Old Bayshore Highway (Bayshore) and Airport Boulevard (Airport) are **moderately** vulnerable to sea level rise. The roads are sensitive to flooding when water is deep enough to limit traffic, restricting the only access to Burlingame's hotel corridor. Exposure is moderate, as high tides prevent rainwater from draining, which creates ponding, isolating parts of the roadway. Adaptive capacity is moderate because there are emergency measures to maintain access and some detours to access businesses; however, none would serve the hotel corridor. Closure of Bayshore could affect Burlingame due to significant revenue loss, and would affect travelers to and from San Francisco International Airport (SFO).

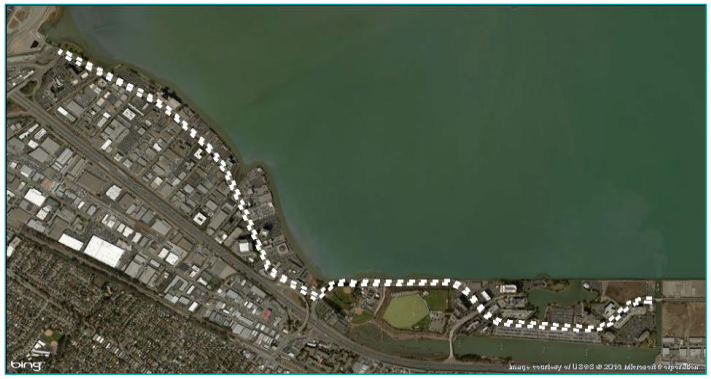
SENSITIVITY	*EXPOSURE*	*ADAPTIVE CAPACITY*	*CONSEQUENCES*
Moderate	*Moderate*	*Moderate*	*High*

ASSET CHARACTERISTICS

Old Bayshore Highway and Airport Boulevard | Burlingame

Asset Description and Function:

Bayshore and Airport run parallel to Highway-101, and are primary access routes for much of coastal Burlingame. In particular, they connect travelers from SFO to at least 12 major hotels along Airport, which provide significant income for the city: 35-40% of the annual budget comes from Transient Occupancy Tax from this area. The road also protects underground water mains and utilities that supply the businesses and hotels, and it provides access to a wastewater treatment plant.



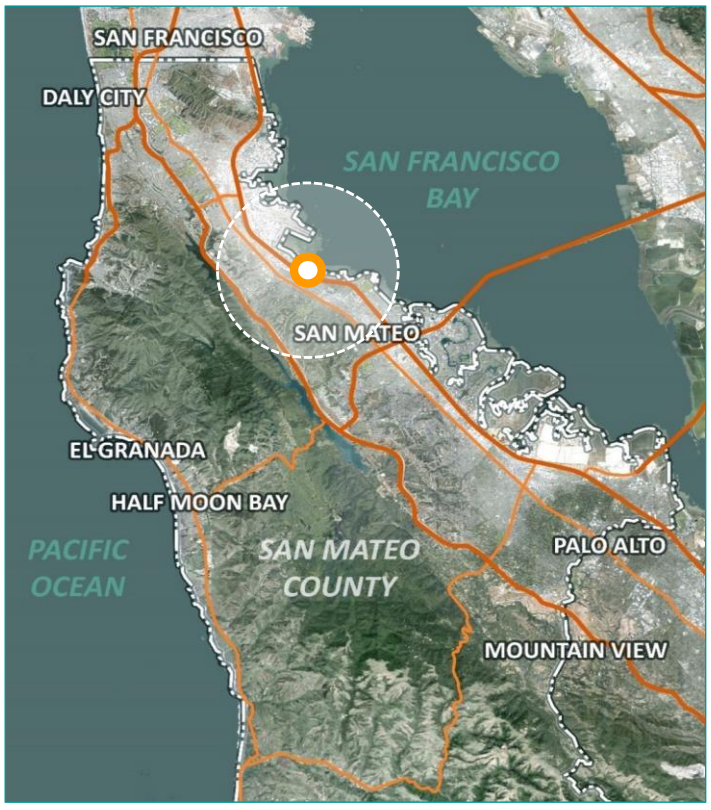
Asset Type	Ground transportation (Local Road)
Asset Risk Class	3
Size	4 linear miles
Year of Construction	1960s
Elevation	7 feet (average)
Level of Use	34,100 vehicles/day
Annual O&M Cost	Portion of $2M budget
Special Flood Hazard Area	Asset is in SFHA
Physical Condition	Good
Landowner	City of Burlingame

Underground Facilities

Water mains, storm drain outlets, utilities for businesses are underground.

Environmental Considerations

Special status plants, animals, and natural communities may be present in the project area; a more detailed analysis will be needed before implementing adaptation strategies.



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ASSET SENSITIVITY

The asset is moderately sensitive to inundation. Bayshore and Airport are the main access routes to much of coastal Burlingame. Therefore, if they were inundated, access to most businesses and to other facilities could be impacted; however, a detour may be possible in some locations. Because Airport and Bayshore provide the sole access road to many of the hotels, if it were inundated, businesses along this road would be isolated and inundated. Road access to the Burlingame wastewater treatment plant (WWTP) would be eliminated, and access to other underground utilities would also be affected.

There are different access points for Airport, so inundating different sections would only isolate those sections. A number of the assets in this area that can be accessed by the road are also likely sensitive to inundation; however, the effects on the hotels, parks, and businesses were not evaluated.

Bayshore Highway connects to multiple hotels near the airport.

SHORELINE VULNERABILITY

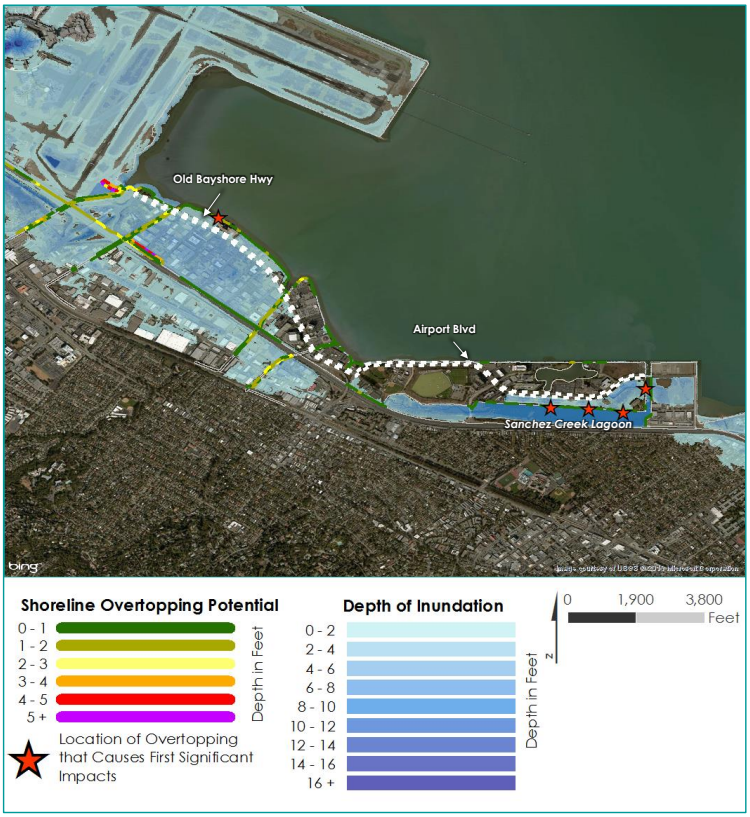
Shoreline Overtopping Analysis

The northwestern portion of the shoreline is first overtopped (red stars on map) when water surface elevations are between the current mean higher high water (MHHW) level and 12 inches above. Meanwhile, the southeastern portion is first overtopped (red stars on map) when water levels reach 12 to 24 inches above MHHW. The first significant impacts occur when water surface elevations are between 24 and 36 inches above the current MHHW level. (Overtopping discussion continues in Exposure Discussion section on next page).

Cross-Cutting Vulnerabilities

Though the creeks were modified and designed to pass 1% annual chance water levels, any storms coincident with high tides would increase the likelihood of flooding on Bayshore. The shoreline that protects the road is mostly in private ownership, and the floodwall is under the jurisdiction of the San Francisco Bay Conservation and Development Commission (BCDC), making Bayshore vulnerable to the decisions and management of many others.

First Significant Impacts: 36 inches above MHHW.



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SEA LEVEL RISE EXPOSURE ANALYSIS

Exposure Discussion

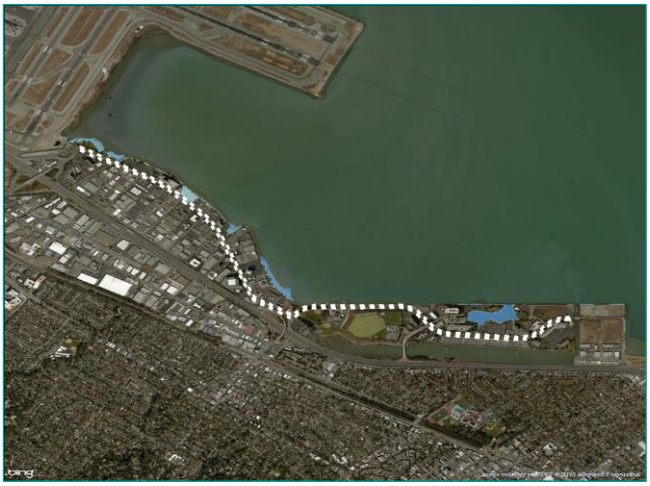
Bayshore is moderately exposed to sea level rise. The roadway has not been fully submerged in the past, though isolated areas have been flooded. This happens when high tides coincide with heavy rains, giving water nowhere to drain. Exposure of the asset to impacts of sea level rise is therefore moderate, despite the fact that even the baseline scenario (to the right) shows minimal flooding of the asset (2 feet deep maximum).

There are two low sections of shoreline that could cause coastal flooding on this segment of Bayshore. The first is a low spot of the shoreline adjacent to San Francisco Bay, roughly 300 feet to the northeast of the northwestern section of the road (northernmost red star on map, previous page). The other low spots are roughly 300 feet west and south of the southeastern segment of the road, where the Sanchez Creek Lagoon (connected tidally to San Francisco Bay) overtops the embankment (southernmost red stars on map, previous page).

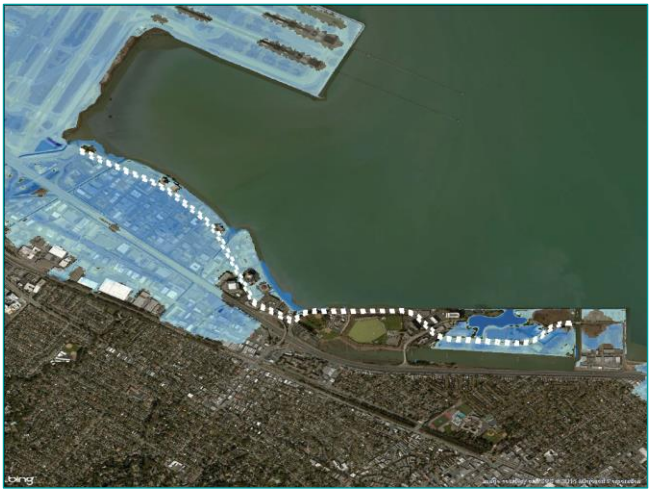
Under increased water levels (mid-level and high-end scenarios), the flood depth and extent on those previously affected areas could expand (up to 7 to 10 feet deep), thereby cutting off access to large segments of the road.

Some businesses and hotels have underground facilities (e.g., basements, garages), parking lots, and first floors that could be exposed to higher water levels.

Baseline Scenario: Minimal flooding of the asset.



Mid-Level Scenario: Many areas of the asset affected.



High-End Scenario: Asset flooded at 13 feet deep.

Exposure Analysis Results

Potential Inundation Depth (feet)		
Scenario	***Minimum***	***Maximum***
First Significant Impacts *(36 inches)*	***0***	***7***
Baseline *1% Flood*	***0***	***2***
Mid-Level *1% + 3.3 feet*	***0***	***10***
High-End *1% + 6.6 feet*	***0***	***13***

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ADAPTIVE CAPACITY, CONSEQUENCES, AND POTENTIAL ADAPTATION

Adaptive Capacity

Adaptive capacity of Bayshore and Airport is moderate. The road is in good condition (with 40% of the service life remaining), and flood waters are not likely to damage the roadway itself. In addition, there are response plans, including detours and sandbags, to maintain access during a storm. Effectiveness of those measures, however, depends on the extent and location of flooding. They would likely be insufficient to be efffective if the high-end scenario were to occur. If inundation were extensive enough, there would be no detours available to access businesses, hotels, or critical facilities like Burlingame WWTP on Bayshore or Airport.

Consequences

Direct damages to the asset could be high, and the impact from the loss of revenue would be significant. If the road were damaged, it would cost the city approximately $200 per ton of material to repair and rebuild. However, under severe conditions, access to businesses and hotels on Airport could be lost entirely, which could lead to a loss of 35-40% of revenue for the City of Burlingame and disproportionately impact the vulnerable populations in Burlingame. An inundated roadway would also reduce any available evacuation routes for hotel guests and local businesses should an emergency arise. Flooding of the road may also affect or damage the water and utility lines that are protected by the road, each with its own additional repair costs. There are emergency response plans to provide equipment and detours to protect and maintain access to businesses and hotels along Bayshore and Airport during a flood. Engaging these measures would cost the city money and would likely reduce income at the businesses and hotels. Rerouting traffic if this asset were closed also has costs. Loss of access could result in additional damages caused by flooding at the Burlingame WWTP, if staff are unable to access the site.

Additional Important Information

In the event that the asset were to significantly inundate, many businesses and nearby hotels (in lower lying areas)would be flooded. Any future changes to the shore (e.g., riprap, floodwalls) provide jurisdictional challenges for the City of Burlingame because shoreline projects are subject to BCDC management and private ownership. Therefore, the future vulnerability of Bayshore and Airport depends not only on sea level rise, but also upon administrations outside the City of Burlingame. Future plans that affect the asset include flap gates for the nearby lagoon, though it is unclear whether design of flap gates will consider sea level rise.

Asset-Specific Adaptation

Adaptation options may consider raising the shoreline or building protection along the low spots (identified earlier) to prevent inundation of the asset. Because Bayshore is a linear feature, adaptation may require a regional approach that also addresses shoreline vulnerabilities north and south. Adaptation will be challenging because the area traversed by the roadway is managed by the City of Burlingame, meanwhile individual owners and the BCDC are involved in decision-making affecting this land. Coastal green infrastructure (CGI) in front of the road could help reduce the height of flood waters and diminish the need or size of a flood protection feature on land.

Bayfront Park at north end of Bayshore Highway.

Vulnerable Local Roads

There is another Asset Vulnerability Profile on vulnerable roads in the County: Mirada Road (AVP #28). The vulnerability assessment analysis shows that there are 373.8 miles of vulnerable local roads in the project area, and Bayshore and Airport represent 4 miles.