

15. SAMTRANS NORTH BASE FACILITY

San Mateo County Transit District

VULNERABILITY SUMMARY

The San Mateo County Transit District (SamTrans) North Base Facility (Facility) is **moderately vulnerable** to sea level rise. Flooding of the island or access road restricts bus access to the site (including a disaster relief bus), and the Facility would lose most functions (including its emergency relief function), making this asset very sensitive. The access road has not yet flooded, but could be exposed with water levels 24-36 inches above mean higher high water (MHHW). Adaptive capacity is moderate, as most functions could be performed elsewhere. Consequences of a loss of the asset or its functions could be high and would have a regional impact because the Facility serves all of San Mateo County.

SENSITIVITY
High

EXPOSURE
Moderate

ADAPTIVE CAPACITY
Moderate

CONSEQUENCES
High

ASSET CHARACTERISTICS

301 North ACCESS Rd | SOUTH SAN FRANCISCO

Asset Description and Function:

The Facility is the maintenance and operations facility for SamTrans, and it stores and serves SamTrans' bus and Redi-Wheels paratransit fleets. It also hosts one disaster relief bus that provides a critical service during emergencies. The Facility operates as the bus dispatch center and provides fueling, washing, and heavy-maintenance services. It employs 270 staff and its fleet serves 13.5 million riders per year (as of 2015).



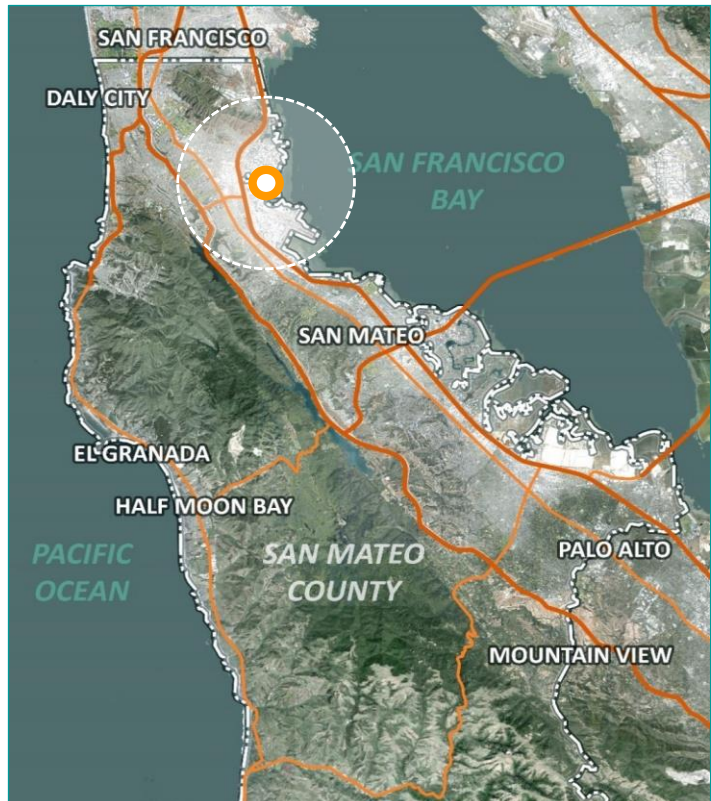
Asset Type	Public Transportation Infrastructure
Asset Risk Class	3
Size	27 acres
Year of Construction	1988
Elevation	-2 to 15 ft, MHHW
Level of Use	165 vehicles
Annual O&M cost	\$575,000
Special Flood Hazard Area	Asset is in SFHA
Physical Condition	Good
Landowner	San Mateo County Transit District

Underground Facilities

Storm drains and outfalls, fuel tanks, oil-water separators, and electrical infrastructure are underground.

Environmental Considerations

There is a bird sanctuary at the north end of the island. The island and surrounding area provide several "pocket" habitats from the sub-regional habitat corridor, including sand beaches, eel grass, oyster beds, macroalgal beds, mudflats, rocky intertidal areas, and tidal marshes.



SAMTRANS NORTH BASE FACILITY

ASSET SENSITIVITY

The Facility is highly sensitive to flooding. If the yard flooded, buses and other vehicles would no longer be able to access the site, making it impossible to fuel or to be repaired here. If below-grade assets like fuel tanks, electrical conduits, and oil-water separators were inundated, there are no systems in place to remove water from them or maintain their function. While the electrical infrastructure can tolerate moisture, it could not function if flooded, especially by saltwater, which could cause corrosion.

Depending on the severity of temporary flooding, the Facility could be inoperable for 7 days or more, potentially leading to a higher rate of bus breakdowns and further disruption to transportation services in the County.

The underground fuel tanks are dual-walled and anchored, with secondary containment piping and monitoring systems, so they are not considered vulnerable to inundation or saltwater intrusion.

One of the oil-water separators is a new, spill-resistant model, but the other is more vulnerable. If the facility were to flood, water could enter the second separator, causing it to overflow and release its contents, onto the site and into San Francisco Bay.

Main yard and buses at SamTrans North Base Facility.



SHORELINE VULNERABILITY

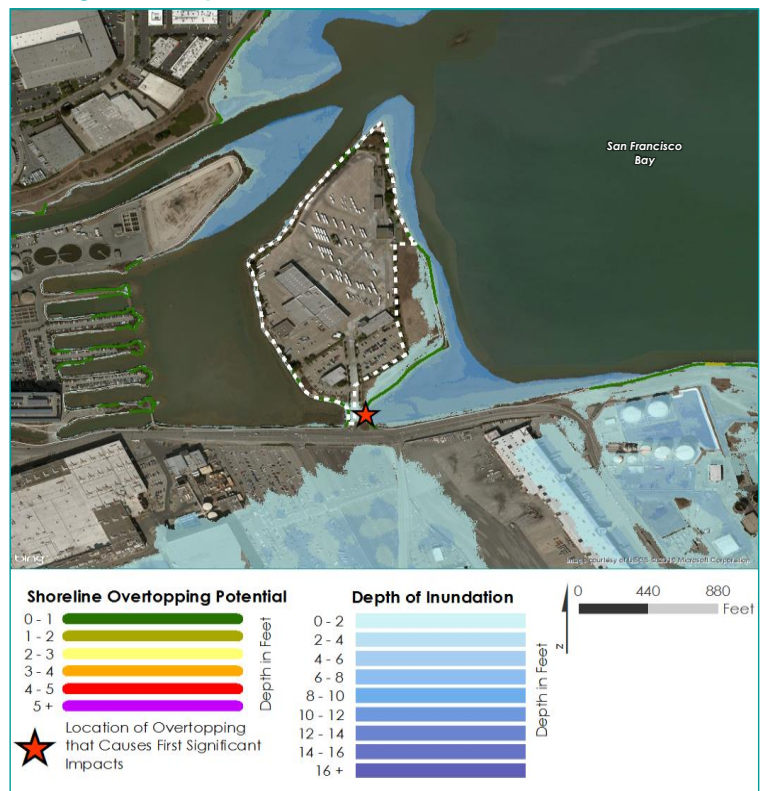
Shoreline Overtopping Analysis

When water surface elevations reach 12-24 inches above the current MHHW level, San Francisco Bay water could overtop the berm to the east of the entrance road of the Facility (see red star on the map to the right). The first level of inundation that is expected to cause significant impacts to the Facility, however, does not occur until water elevations reach 24-36 inches above MHHW.

Cross-Cutting Vulnerabilities

The Facility supports public transportation service across the county, and loss of service at the base would make it more difficult for vehicles to refuel or be repaired. This could limit mobility for many in the County, especially in resource-limited communities or those with functional and access needs who rely heavily on public transportation. Furthermore, the asset is home to one of SamTrans' Disaster Relief Buses, which could be trapped at the Facility and unable to assist communities during a disaster.

First Significant Impacts: 36 inches of sea level rise.



SAMTRANS NORTH BASE FACILITY

SEA LEVEL RISE EXPOSURE ANALYSIS

Exposure Discussion

The Facility is moderately exposed to sea level rise. Currently, the west side of the Facility experiences wind and tidal erosion without affecting the entire Facility. The Facility lies far above MHHW that it has not been exposed to inundation from San Francisco Bay to date. The Facility's bus parking lot is 4 feet above MHHW, and the two critical buildings (transportation/operations and maintenance/tires) are 15 feet above MHHW. Below-grade infrastructure experiences groundwater flooding during king tides and heavy rains, seeping through cracks in the concrete of the auto shop brake pits. Higher water levels would lead to more frequent inundation and deeper inundation. The southwestern corner of the Facility is low-lying and particularly vulnerable and could flood during severe storms. If the road connecting the Facility to the mainland were to flood (has not happened to date), access could be eliminated, shutting down the Facility as previously mentioned.

Baseline Scenario: Access road flooded 4 feet deep.



Mid-Level Scenario: SamTrans Island mostly inundated.



High-End Scenario: Asset is fully inundated.



Exposure Analysis Results

Scenario	Potential Inundation Depth (feet)	
	Minimum	Maximum
First Significant Impacts (36 inches)	0	2
Baseline 1% Flood	0	4
Mid-Level 1% + 3.3 feet	0	4
High-End 1% + 6.6 feet	1	8

SAMTRANS NORTH BASE FACILITY

ADAPTIVE CAPACITY, CONSEQUENCES, AND POTENTIAL ADAPTATION

Adaptive Capacity

The facility has relatively moderate adaptive capacity. In the case of a loss of complete service, all the facility's functions could be relocated to the SamTrans South Base Facility in San Carlos, assuming this facility (adjacent to San Carlos Airport) was not inundated. SamTrans has a plan in place for an earthquake, but this could also be enacted for severe flooding. The plans assume vehicles could leave the facility, at which point the dispatch, fueling, and repair operations would be transferred to San Carlos; however, if North Access Road were inundated, the vehicles would be isolated (affecting the adaptive capacity of the SamTrans network). The facility has backup generators at grade and subject to future inundation, but an event that flooded the generators would also flood the facility yard and interrupt service with or without backup power. The auto shop brake pits are equipped with sump pumps to mitigate groundwater flooding.

Consequences

Inundation of the asset would have high consequences, with the impacts felt regionally. The Facility has day and night shifts (200 and 15 workers, respectively), so the time of inundation affects both the number of people evacuating and the respective risk of injury. If the Facility were flooded, some or all components would need replacement at a total cost of over \$21 million, excluding vehicles. Water quality and resulting environmental and public health impacts are also possible if the oil-water separators spilled into floodwaters. Buses onsite during inundation would be out of service, reducing the level of transportation service county-wide, and adding to the repair/replacement cost. While most functions could be assumed by the SamTrans South Base Facility in San Carlos, buses would be required to travel farther for fuel and repairs, which could reduce service across the County. This disruption would disproportionately affect vulnerable populations such as senior citizens and resource-constrained residents who rely heavily on public transportation. Inundation could also strand the Disaster Relief Bus on site, reducing emergency response capabilities.

Additional Important Information

The northwest side of the island is subject to erosion from wind, waves, and channeled currents. An erosion and mitigation study is underway to investigate and address this issue.

Asset-Specific Adaptation

The Facility could employ non-structural methods like early evacuation plans and floodproofing essential assets. It could also use structural methods like riprap on the eroding west side or raising North Access Road in collaboration with the City of South San Francisco. More conventional solutions could be complemented with green measures. As over the long run, it could be very expensive to maintain and protect the full perimeter of the asset from sea level rise, it may be necessary to identify sites for relocation.

Vulnerable Transit Facilities

This is the only Asset Vulnerability Profile on vulnerable transit facilities in the County. The vulnerability assessment analysis shows that there are two vulnerable bus facilities in the County: the SamTrans North Base Facility in SSF and the SamTrans South Base Facility in San Carlos.

Fueling station at SamTrans North Base Facility.



Auto shop at the SamTrans North Base Facility.

