

Vulnerability of VTA's Assets



CAAP
CLIMATE ACTION & ADAPTATION PLAN

VTA Valley Transportation Authority

The Climate Action and Adaptation Plan (CAAP) provides actions that Santa Clara Valley Transportation Authority (VTA) can take, either alone or in partnership with others, to reduce greenhouse gas (GHG) emissions and advance climate resiliency. The CAAP guides VTA's climate action and sets forth a path towards ensuring our transportation system can withstand, respond to and recover quickly from extreme climate events for our community and future generations.

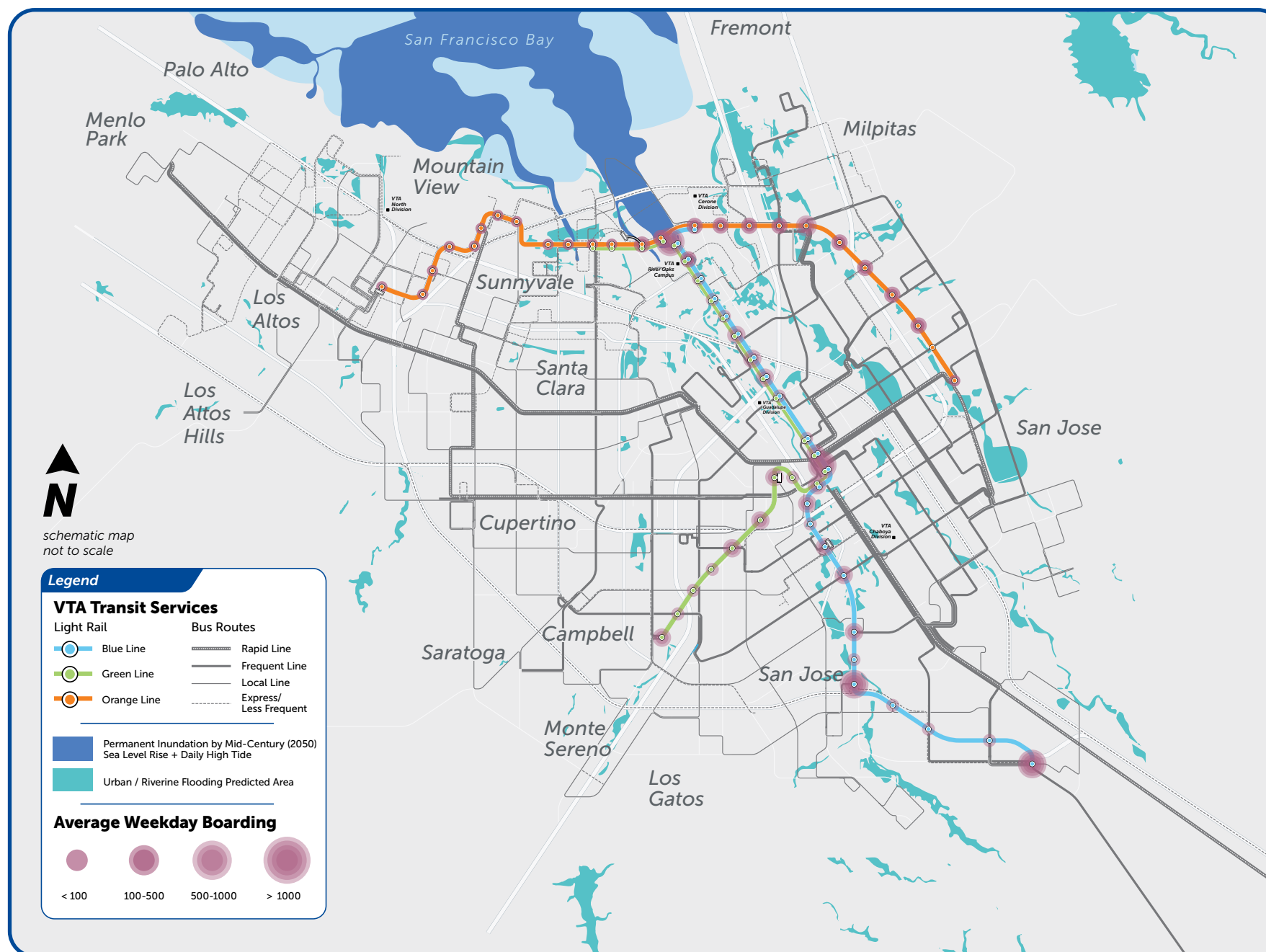
This handout explains how climate hazards are already impacting VTA's physical assets, operations, and the health and safety of our riders and workforce. The maps display areas of Santa Clara County that are vulnerable to sea level rise extreme precipitation, and wildfire. These climate hazards are expected to pose greater risks to Santa Clara County in the future, as they are projected to increase in severity, frequency, and duration. Extreme heat and drought are also analyzed in Chapter 4 of the CAAP but are not mapped as they affect VTA's entire service region and are not isolated to exposure of individual locations.



Sea Level Rise

Sea level rise can cause permanent flooding to an area, resulting in cascading disruptions to transit service and damage to physical assets.

Portions of the Green Light Rail Line and Orange Light Rail Line are highly vulnerable to sea level rise by mid-century. Below grade transportation assets, such as tunnels, areas of depressed tracks, and bike trails, are especially vulnerable to flooding from sea level rise. For example, the area near Bayshore/NASA station is already prone to flooding as that portion of the light rail track is below street level. Lockheed Martin Transit Center is also vulnerable to permanent flooding from sea level rise. Light rail is a fixed, interconnected system that lacks redundancy. Therefore, if one section of rail is comprised, the whole system will be impacted.



Note: Sea Level rise data gathered from Bay Conservation and Development Commission (BCDC) Adapting to Rising Tides Bay Area Sea Level Rise and Shoreline Analysis; this figure is based on projected exposures by mid-century (2050). Flooding data gathered from the Federal Emergency Management Agency (FEMA) National Flooding Hazard Layer; this figure is based on exposure to current conditions.



Extreme Precipitation

Extreme rainfall events can cause temporary urban/inland flooding due to increased riverine flows and stormwater runoff. Many bus lines have potential exposure to urban/inland flooding, especially lines 44, 85, and 89. These routes provide connections to Milpitas BART Station, City of Gilroy, and California Avenue Caltrain Station. A total of 322 bus stops in VTA's network are also vulnerable to flooding due to extreme precipitation events. The light rail system relies on electricity to operate, so any loss of power due to heavy rain and strong winds would result in service disruptions.

This hazard poses staffing challenges such as the inability for VTA operators to report to work and the need for an increased workforce to assess and repair damages while supplying alternative services. There are also safety concerns related to poor driving conditions and limited access to areas affected by flooding.

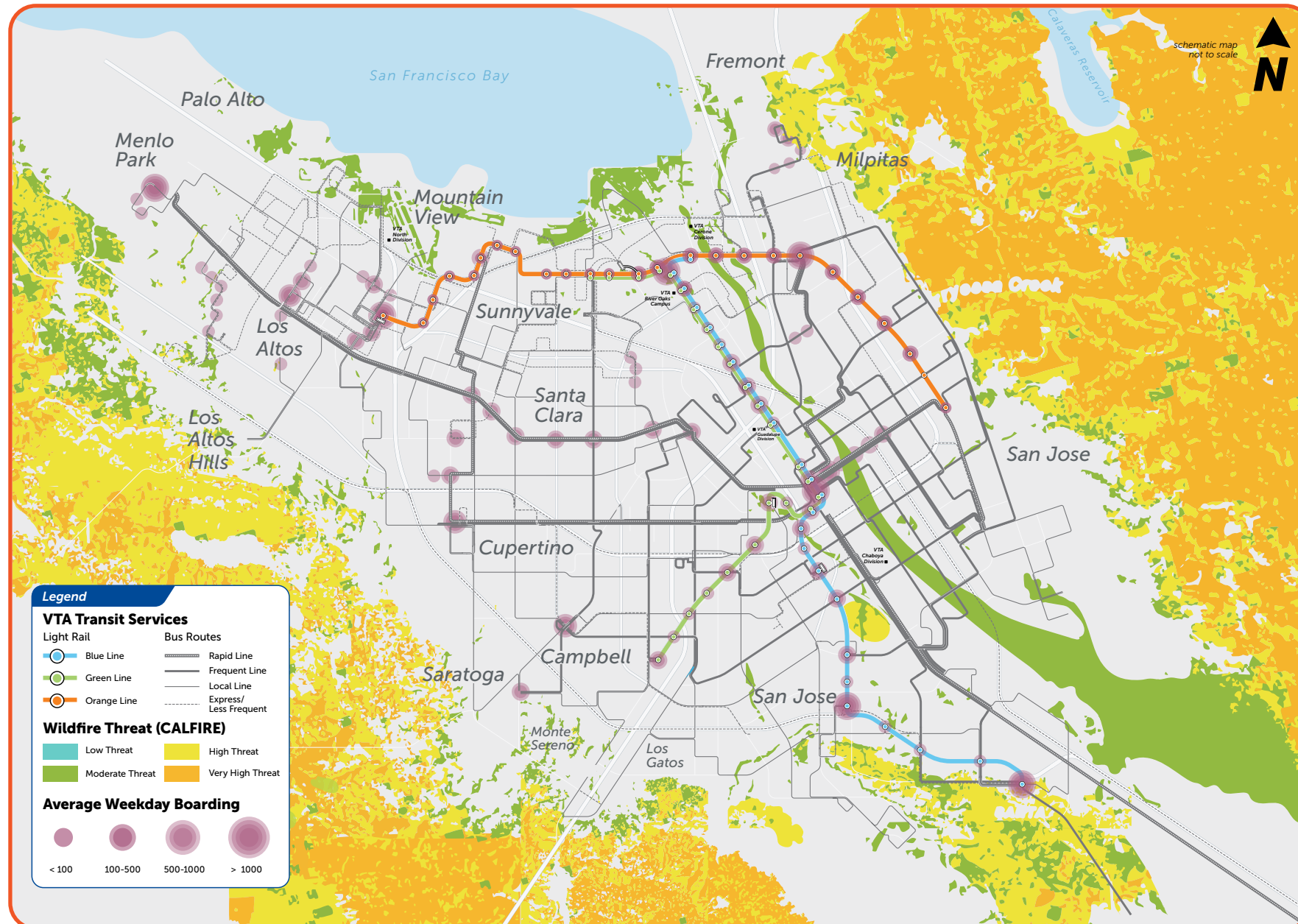
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Extreme Heat

Extreme heat is already a major issue for the light rail system, particularly impacting the overhead catenary system (OCS), brakes, and tracks. The OCS consists of tensioned overhead wires that are used to supply electricity to light rail vehicles. During extreme heat events, the overhead wires are prone to sagging because they are made of metal. Additionally, a phenomenon known as "heat kinks," which is the result of extreme heat bending, warping, and distorting rail tracks, could happen more frequently. These issues can lead to slower light rail service speeds, service disruptions, and costly maintenance. VTA's operations are highly reliant on external electricity sources, so any power outages during extreme heat events will have significant impacts to service.

Extreme heat ranks among the deadliest of all climate hazards in California and causes significant health risks to our community and workforce, with disproportionate effects on riders with access and functional needs.



Note: Wildfire threat data gathered from CAL Fire Threat Class; this figure is based on exposure to current conditions.
Source: schematics prepared based on research from Pathways Climate Institute 2023



Wildfire

Wildfire poses a direct risk to physical assets and infrastructure, and an indirect risk to public health of our riders and workforce. Wildfires could block access to routes and facilities, cause extensive damage to property and equipment, and require costly repairs. A total of 27 bus stops in VTA's network are highly vulnerable to wildfire. Wildfire smoke can cause eye and respiratory illness, especially among young people, older adults, people with preexisting health conditions, people with disabilities, and individuals who are already at higher risk of disproportionate exposure to poor air quality. Wildfire smoke could lead to more cars on the road as individuals opt to drive instead of walking, biking, or taking public transportation.



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