City of East Palo Alto

Peninsula Resilience Planning

Draft Safety Element Background Report

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INTRODUCTION

This Existing Conditions Background Report discusses the natural and human-caused hazards that can affect the City of East Palo Alto. Each issue identified in this report includes a general overview of each hazard, how/where the hazard affects the city and its residents, information on past hazard events, current programs, and regulatory frameworks in place to reduce the impacts associated with these hazards, as well as future conditions (including potential climate change impacts associated with these hazards). The intent of this report is to provide background information that informs how and why the goals, policies, and implementation actions within the updated General Plan Safety Element were developed.

The key issues considered relevant to the City of East Palo Alto include the following:

ISSUE 1: EMERGENCY PREPAREDNESS AND RESPONSE

General Overview

The City of East Palo Alto employs a multipronged approach for mitigating, responding to, and recovering from emergencies. This section reviews the city's major evacuation routes, emergency alert systems, and other emergency response programming. State law (Senate Bill 99, or SB 99) requires that the East Palo Alto Safety Element identify residential areas with only one way in and out, as these may be areas where evacuations are constrained. State law (Assembly Bill 747, or AB 747) also requires that the Safety Element identify potential evacuation routes and their capacity, safety, and viability.

Emergency Alert Systems

SMC Alert/Rave Mobile Safety

SMC Alert is the primary alert system in East Palo Alto. SMC Alert is used by numerous San Mateo County agencies and messages are tailored to each agency. SMC Alert can be used to issue flood, fire, severe weather, or tsunami warnings; notify the community about the locations of emergency shelters; provide information about available evacuation routes; and activate special teams within the community, such as CERT volunteers. Some cities also use the system for smaller alerts, such as traffic accidents, fires, street closures, flooding, and related incidents. Community members opt in to receive SMC Alert messages and can receive alerts via email, cell phone, and voice message to landline phones. Alerts are available in a wide variety of languages, including English, Spanish, and Filipino (standardized Tagalog), among many

others. Individuals can sign up for SMC Alert via the County's website: https://www.smart911.com/smart911/ref/reg.action?pa=smcgov.

Rave Mobile Safety was adopted by the County in December 2022 as the new alerting platform for SMC Alert. Approximately 60 percent of East Palo Alto households have signed up for SMC Alert. However, approximately 30 percent of households are not signed up and 10 percent do not know whether they are signed up.[1]

Wireless Emergency Alerts

Another alert system includes Wireless Emergency Alerts (WEAs) which are short emergency messages from authorized public alerting authorities that can be broadcast from cell towers to any WEA-enabled mobile device in a locally targeted area. Wireless providers primarily use cell broadcast technology for WEA message delivery. WEA is a partnership among FEMA, the Federal Communications Commission and wireless providers to enhance public safety.

Genasys / Zonehaven

Public safety agencies throughout San Mateo County use the Genasys app (formerly known as Zonehaven) to communicate areas that are being evacuated due to fire or other emergencies. Genasys provides first responders, public safety workers, and residents with tools to navigate the evacuation process, including information about when it is safe to return. Residents are encouraged to download the Genasys Protect app to find their evacuation zone and have access to the mapping program and evacuation orders in real time. Many jurisdictions within San Mateo County host evacuation plans and maps on the Genasys platform.

The Genasys platform divides East Palo Alto into three zones to provide information tailored to impacted areas. Users of the app can choose the zone or zones for which they would like to receive alerts. However, recent reporting from San Mateo County reported that over 90 percent of East Palo Alto households do not know their zone number in Zonehaven.[2]

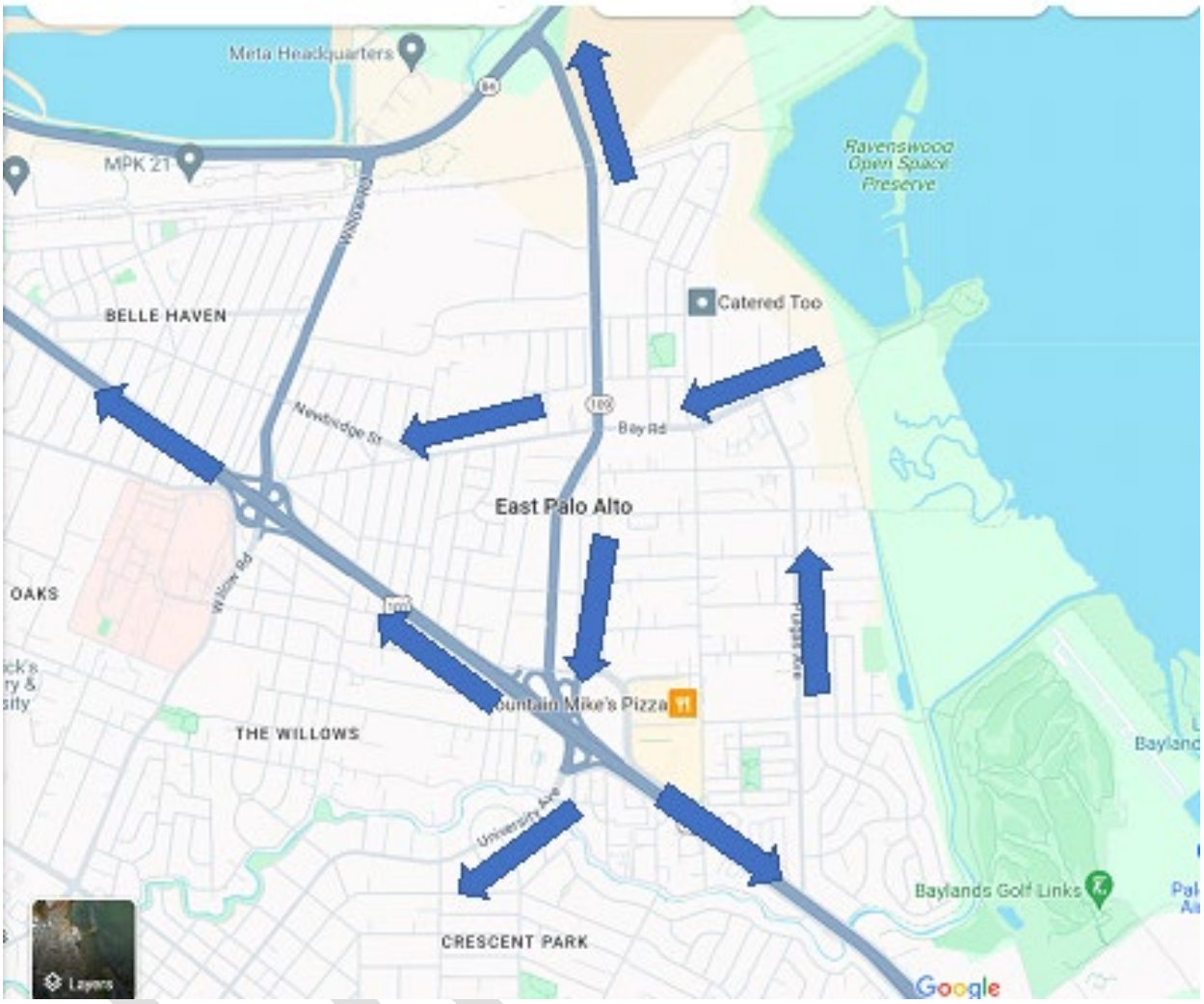
Major Evacuation Routes

If an evacuation is necessary in East Palo Alto, it will be conducted by members of the East Palo Alto Police Department. They will work closely with the Menlo Park Fire Department, the San Mateo County Department of Emergency Management, and emergency responders in neighboring communities to make sure that evacuations are conducted as quickly and safely as possible.

There is currently no standardized county-wide evacuation plan and the City of East Palo Alto does not have a publicly available evacuation plan. The City is participating in the county-wide All-Hazards Evacuation Plan, which will analyze potential evacuation scenarios across San Mateo County, identify potential evacuation routes, and recommend improvements. This work began in 2024, and is expected to finish in 2025. The Safety Element will reference this study to meet the requirements of SB 99 and AB 747.

In the interim, City staff have identified Highway 101, State Route 84 (Bayfront Expressway and the Dumbarton Bridge), Pulgas Avenue, Bay Road/Newbridge Street, University Avenue, and Bayshore Road as the primary evacuation routes. Figure 1 shows the location and direction of these routes. In an actual emergency, the evacuation routes will vary depending on the specifics of the event. See Figure 1 for a map of the city's evacuation routes.

Figure 1: Evacuation Routes



Evacuation Constraints

Under SB 99, jurisdictions updating the Housing Element of their General Plan are required to identify residential parcels with access to fewer than two evacuation routes as part of their Safety Element. Occupants and residents of these parcels may be unable to evacuate quickly in the event of an emergency, and are therefore more vulnerable to sudden or fast-spreading emergency conditions such as flash floods and wildfire.

Existing Programs and Regulations

Preparedness and Response Programs

San Mateo County and East Palo Alto use a variety of programs, plans, and initiatives to manage and guide emergency response. Resources and programs include both County-operated and volunteer programs, City programs and resources, as well as participation in regional mutual-aid agreements. f

The County of San Mateo is required under State law to prepare and maintain a Standardized Emergency Management System (SEMS) Multihazard Functional Plan. The California Governor's Office of Emergency Services (CalOES) provides guidelines outlining the requirements of the San Mateo County SEMS.

County Initiatives

Department of Emergency Management

The County of San Mateo Department of Emergency Management (DEM) provides essential services that prepare and assist San Mateo County agencies in the event of a disaster or other emergency. DEM coordinates countywide preparedness, response, and protection services and activities for large-scale incidents and disasters. DEM is responsible for alerting and notifying appropriate agencies within the county's 20 cities when disaster strikes, coordinating all responding agencies and ensuring resources are available and mobilized during disasters. DEM is responsible for developing and maintaining plans and procedures for all jurisdictions within San Mateo County. In addition to creating plans, DEM develops exercises to evaluate operational and response capabilities.

During significant incidents or emergencies, DEM is responsible for activating the County of San Mateo Emergency Operations Center to support local jurisdictions as needed. DEM coordinates and contracts to CalOES and Federal Emergency Management Agency (FEMA) during an emergency for federal and State support.

The DEM is funded in part through a Joint Powers Authority governed by the Emergency Services Council (see below).

San Mateo County Operational Area Emergency Services Council

The San Mateo County Operational Area Emergency Services Council is a Joint Powers Authority (JPA) composed of all local governments within the geographic area of the county, special districts, unincorporated areas, and participating nongovernmental entities. The Council is responsible for providing coordinated plans for the protection of people and property in the event of an emergency. The Council works in coordination with local government entities to review, approve, and recommend for adoption of emergency and mutual aid plans and agreements, rules, ordinances, resolutions, and regulations by the Board of Supervisors and other legislative agencies.

Emergency Operations Plan and Center

The County's Emergency Operations Plan (EOP) establishes policies and procedures and assigns responsibilities to ensure the effective management of emergency operations within San Mateo County. The County Department of Emergency Management (DEM) implements the EOP and activates the Emergency Operations Center (EOC).

The EOC provides a central location of authority and information and allows for face-to-face coordination among personnel who make emergency decisions. The following functions are performed in the San Mateo County Operational Area EOC:

- Coordinating emergency operations.
- Releasing warning information.
- Developing emergency policies and procedures.
- Collecting and sharing information with County, City/Town, special districts, State agencies, military, and federal agencies and political representatives.
- Maintaining maps, information display boards, and other data pertaining to emergency operations.
- Analyzing and evaluating of all data pertaining to emergency operations.
- Directing and coordinating support of emergency response resources.
- Maintaining contact and coordination with Disaster Operations Centers, East Palo Alto's EOC, and the Coastal Region.
- Providing emergency information and instructions to the public, making official releases to the news media and the scheduling of press conferences, as necessary.

San Mateo County's EOC is activated when local jurisdictions or County departments need emergency support. According to SEMS Regulations, the San Mateo County EOC must activate and use the SEMS when the following conditions exist:

- A local government within San Mateo County has activated its EOC and requests activation of the San Mateo County EOC to support its emergency operations.
- Two or more cities within San Mateo County have declared a local emergency.
- The County and one or more cities have declared a local emergency.

San Mateo County Emergency Managers Association

The San Mateo County Emergency Managers Association is composed of Emergency Managers/Representatives from cities, towns, County departments, special districts, and community organizations within San Mateo County and is intended to support emergency management, training, and exercise planning.

Countywide Hazardous Materials Emergency Response Team

Hazardous materials response, mitigation, and cleanup for San Mateo County is managed by the Belmont Fire Protection District's Hazardous Materials Team through a contractual agreement between the County of San Mateo, the Emergency Services Council, and the Belmont Fire Protection District.

San Mateo County Sheriff's Office Emergency Services Bureau

The Sheriff's Office Emergency Services Bureau is made up of sworn specialized units and volunteer forces to respond to emergency law enforcement activities, search and rescue missions, evidence searches, and

requests for mutual aid. San Mateo County Search and Rescue is a professional volunteer force of the San Mateo County Sheriff's Emergency Services Bureau.

Multijurisdictional Hazard Mitigation Plan

The Department of Emergency Management published San Mateo County's 2021 Multijurisdictional Local Hazard Mitigation Plan (MJLHMP), a large regional and cross-jurisdictional effort to plan for the reduction of risk from natural and human-made disasters.

The MJLHMP assesses hazard vulnerabilities and identifies mitigation actions that jurisdictions will pursue to reduce the level of injury, property damage, and community disruption that might otherwise result from such events. The MJLHMP addresses natural and human-caused hazards, including flooding, drought, wildfire, landslides, severe weather, terrorism, cyber threats, pandemic, and the impact of climate change on hazards, as well as other hazards.

Adoption of the MJLHMP helps the County remain eligible for various types of pre- and post-disaster community assistance, such as grants from FEMA and the State government.

The Department of Emergency Management led the 2021 MJLHMP effort, in coordination with County departments, all 20 cities, and regional special districts. The process was informed by a steering committee and robust public engagement. Information about and recommended actions to reduce hazards specific to East Palo is in Volume 2 of the MJLHMP.

Disaster Debris Management Plan

Disasters can produce substantial volumes of debris, creating hazardous conditions that endanger the public and disrupt the essential daily lifestyle and economy of the community. The County of San Mateo Disaster Debris Management Plan (DDMP) provides a comprehensive framework for management of debris following a disaster. It addresses the roles and responsibilities of government organizations as well as private firms and nongovernmental organizations that might have a role in debris operations.[vi] The County's Public Works Department serves as the lead department for debris management for unincorporated areas of the county.

County of San Mateo Health System

The County of San Mateo Health System operates Emergency Medical Services (EMS), which provides emergency medical resources in response to 911 calls countywide. As of 2019, EMS responded to 90 percent of requests for advanced life support within 6 minutes and 59 seconds in metro and urban areas, and 11 minutes and 59 seconds in suburban and rural areas. EMS responded to 90 percent of ambulance transport requests within 12 minutes and 59 seconds in metro and urban areas, and 19 minutes and 59 seconds in suburban and rural areas.

The health emergency preparedness unit strengthens the community's ability to respond to all types of public health and medical incidents. The health emergency preparedness unit continually collaborates with community stakeholders and organizations to facilitate response and recovery for public health and medical emergencies.

The San Mateo County Healthcare Coalition coordinates strategic planning activities amongst healthcare facilities of various healthcare delivery sectors, public health agencies, other government entities, and community partners to prepare for, respond to, and recover from emergencies and other incidents that impact public health.

San Mateo County Emergency Medical Services Agency uses ReddiNet as its county-wide emergency communications system. ReddiNet allows the County to track hospital status, mass casualty incidents, hospital bed count, and facility assessments and to locate family members through access to the Family Reunification Center.

Volunteer Programs

San Mateo County's Coastside Emergency Corps is a community-based network of volunteers that assists public safety and health efforts in times of special need or disaster. Members of the Emergency Corps may also volunteer to promote community public health and emergency preparedness education. Specialized training of Emergency Corps members includes CERT, Ham radio, medical (beyond first aid/CPR,) Large Animal Evacuation Group, ICS/EOC Operations, and Red Cross Shelter Operations.

The Menlo Park Fire Protection District (see description below) also trains local volunteers, CERT, Ham radio to promote community public health and emergency preparedness.

Mutual Aid Agreements

In some cases, local emergency responders may not have the staff, vehicles, equipment, or other resources to fully respond to an emergency in their jurisdiction. In these instances, the local emergency commanders can request assistance from other communities. This external assistance is known as mutual aid. The California Disaster and Civic Defense Master Mutual Aid Agreement, an arrangement between State agencies and local governments establishes a framework for mutual aid.

Mutual aid regions are established under the Emergency Services Act. Six mutual aid regions numbered I-VI have been established within California. The San Mateo County Operational Area is part of the Mutual Aid Region II and the Coastal Administrative Region.

City Plans and Initiatives

Menlo Park Fire Protection District

The City of East Palo Alto relies on the Menlo Park Fire Protection District for emergency response services. Menlo Park Fire Protection District provides a full array of fire, rescue, and emergency medical services to the cities of East Palo Alto and Menlo Park, the Town of Atherton, and unincorporated areas of southern San Mateo County. Menlo Park Fire Protection District operates seven fire stations, employs 150 personnel,[3] and responds to approximately 11,000 calls for service annually. For an immediate response, no less than 33 personnel are on duty at all times, including two Battalion Chiefs, who are responsible for commanding incidents and relieving company officers of that responsibility on multicompany emergency operations and more complex incidents. M Menlo Park Fire Protection District has seven engine fire companies, two Truck/Ladder Companies, one EMS Rescue, one Type 1 Heavy Rescue Unit, and several water rescue crafts (airboat, rigid bottom inflatable boat, jet skis). Menlo Park Fire Protection District is also sponsor to FEMA Urban Search and Rescue Team Task Force 3.

While MPFPD is able to meet its response and service goals, ongoing and increasing traffic in the service area pose operational challenges, particularly along University Avenue in East Palo Alto and other nearby major routes like Willow Road and Marsh Road. In many circumstances, emergency responders must drive against the flow of traffic. The Belle Haven and east sides of East Palo Alto can be more challenging to access when traffic is congested.

City of East Palo Alto Emergency Operations Plan

The City's Emergency Operations Plan provides a guide for managing City services and coordinating response in the event of an emergency. Contents of the plan include general and specific event checklists, emergency management goals, and directions for activating the City's Emergency Operations Center (EOC). According to the Plan, the City of East Palo Alto will notify San Mateo County and remain in contact with the County when the jurisdictional Emergency Operations Center has been activated .

Future Conditions

Climate change is expected to affect the frequency and severity of future natural hazards in East Palo Alto, necessitating an adapted approach to emergency preparedness and response. The East Palo Alto vulnerability assessment contains information about how climate change will affect these hazards in future years.

ISSUE 2: FLOODING

General Overview

Flooding is the rising and overflowing of water onto land that is normally dry. Floods can happen during heavy rains, when ocean waves come on shore, or when dams or levees break. Floods can occur within minutes or over a long period, and may last days, weeks, or longer. Floods are the most common and widespread of all weather-related natural disasters. Floodwater can damage buildings and infrastructure, carry off structures or vehicles, and bury property under sediment. Standing water can cause damage to roads, foundations, and electrical circuits, as well as spread vector-borne illnesses. Other problems connected with flooding and stormwater runoff include erosion, degradation of water quality, and loss of environmental resources.

There are four types of flooding that primarily affect San Mateo County.

- Riverine flooding, the most common type of flood event, occurs when a watercourse such as a stream or creek overruns its banks.
- Stormwater flooding, sometimes called "ponding", occurs when rainfall and runoff accumulates in low-lying areas or areas with insufficient drainage, forming standing water.
- Flash floods are sudden events, typically caused by intense and localized storms. There is often little or no warning of flash floods, making them particularly dangerous.
- Shoreline floods occur when the ocean inundates normally dry lands by ocean waters, often a result of storm surges, tsunamis, or extreme high tide events.

Another source of flooding, dam failure, is discussed in greater detail below.

FEMA Regulatory Flood Zones

Flood hazard areas, also called floodplains, are the areas that become inundated by high volumes of water. They are usually adjacent to rivers, creeks, or lakes, or along the ocean. Floodplains are officially mapped FEMA using Digital Flood Insurance Rate Maps (DFIRMs). The two main floodplains of concern are the 100-year floodplain and the 500-year floodplain. The 100-year floodplain is the area that has a 1 percent (1 in 100) chance of being flooded in any given year, also known as a base flood. The 500-year floodplain is the area that has a 0.2 percent (1 in 500) chance of being flooded in any given year.

Flooding in East Palo Alto occurs primarily because of existing high-water tables, high tides, and creek overflows due to rain and storm run-off, in addition to inadequate storm drainage into the creek.

Easterly higher winds promote storm surge, contributing to widespread flooding particularly to neighborhoods that are situated along East Palo Alto levee embankments that border the westerly wetlands.

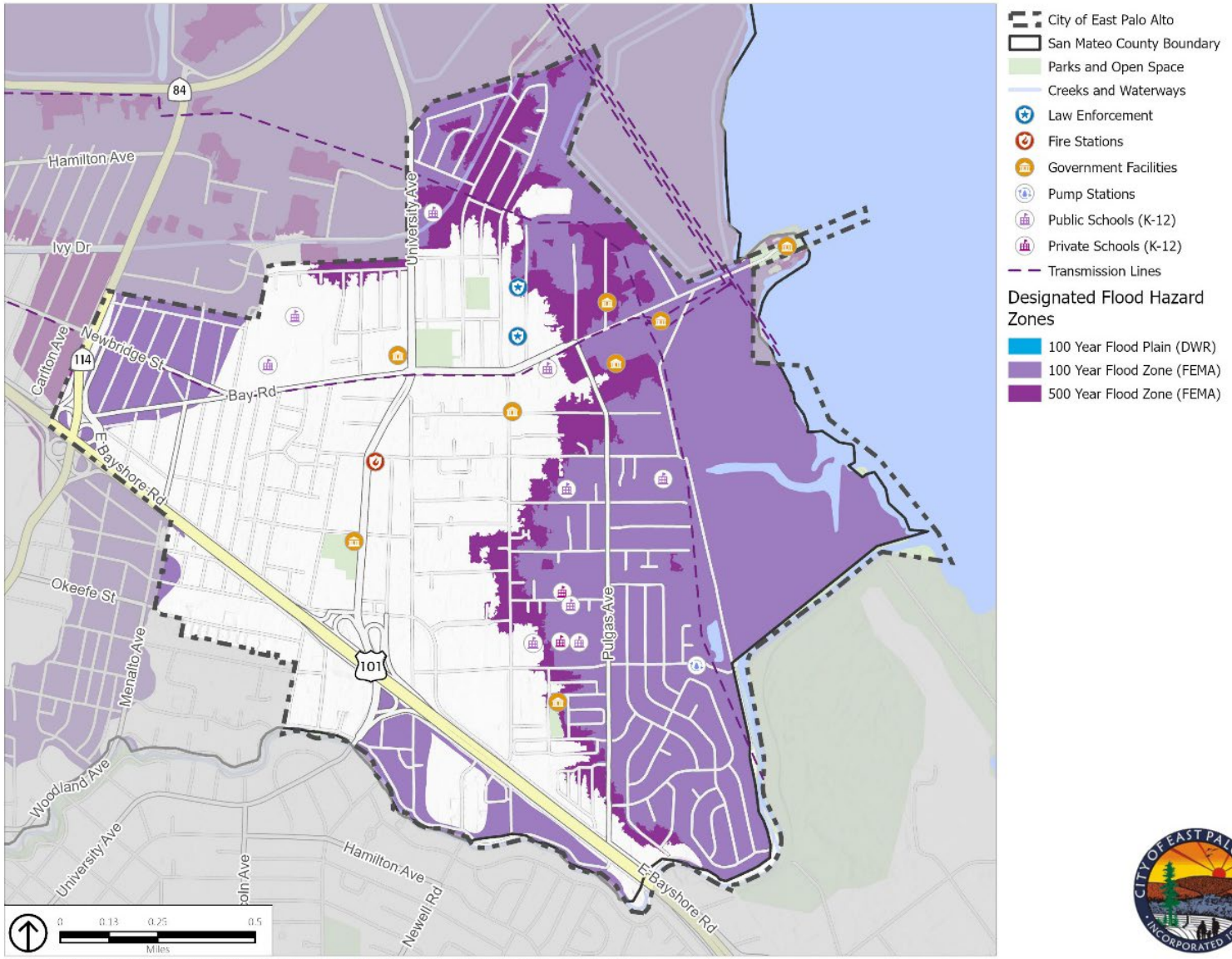
The combined effects of storm surge high tides, and creek flow can result in significant flooding in upstream areas of the creek. These consequences are most catastrophic to homes along the creek, outside of the floodplain, and are not protected by the levee.

Approximately half of the parcels in East Palo Alto are within a mapped floodplain and are considered flood-prone or hazard areas. As illustrated in Figure 2, areas along the bay and near San Francisquito Creek face the highest flood risks during storm events or high tide events. The following areas within the city are particularly vulnerable to flooding:

- The Weeks and Garden Neighborhoods, east of Pulgas Avenue;
- The Woodland Neighborhood, between San Francisquito Creek and the Bayshore Freeway;
- The University Village Neighborhood, north of Notre Dame Avenue;
- The portion of the Ravenswood Employment District closest to the Baylands;
- The Kavanaugh Neighborhood; and
- The Palo Alto Park Neighborhood, west of Menalto Avenue.

It is important to note that many structures within the 100-year floodplain have a higher than 1 percent probability of flooding in any given year. For instance, some areas near San Francisquito Creek have been flooded several times in the last 60 years. It is also possible that properties outside the flood zones could be subject to flooding even though FEMA's hydrologic models do not predict such flooding.[4]

Figure 2: Mapped Flood Hazard Zones



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; FEMA; DWR, 2021

Dam Failure

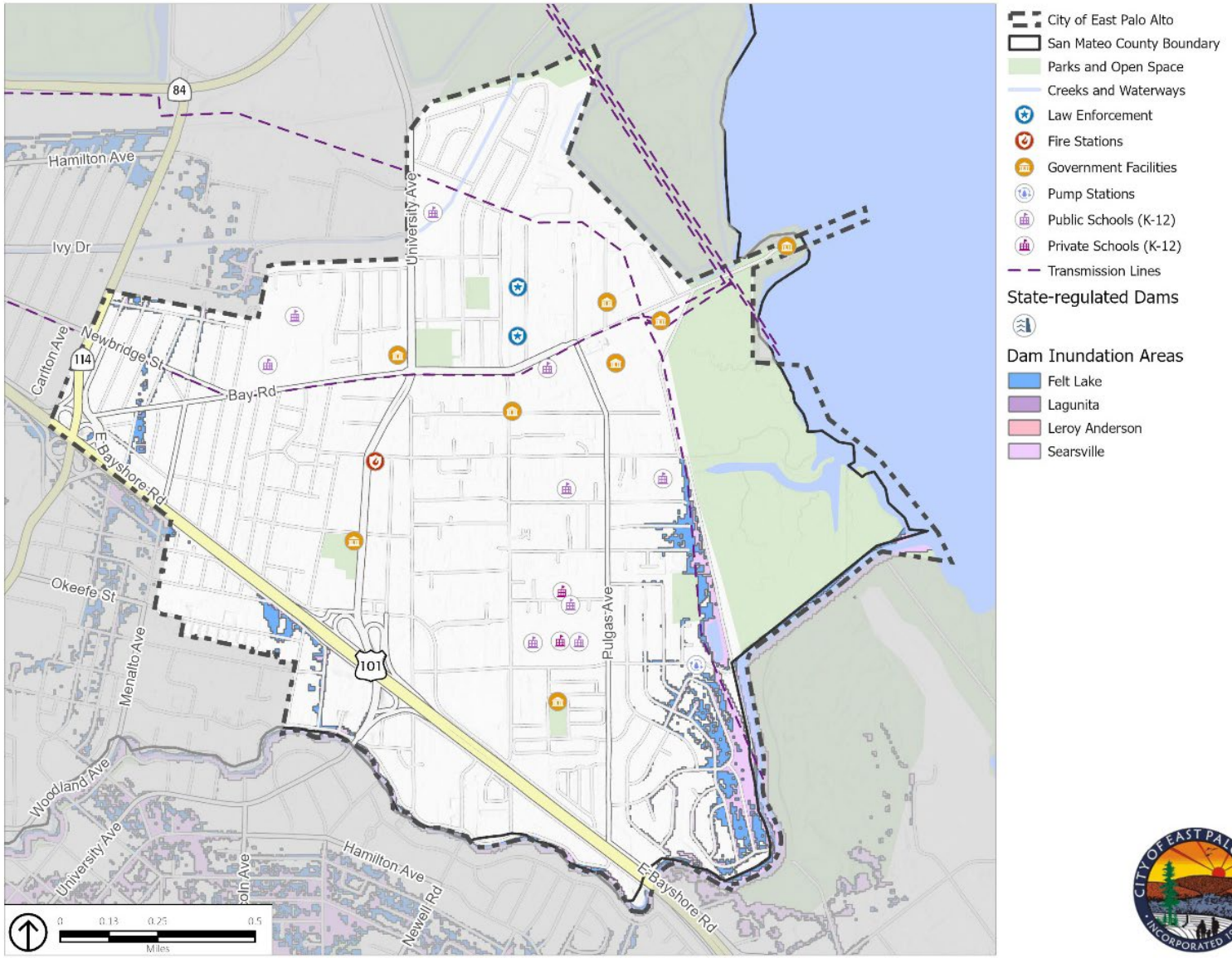
A dam failure is an uncontrolled release of water from a reservoir through a dam caused by damage or destruction to the dam or associated infrastructure. Distribution or aqueduct failures can create a similar sudden flood. These events can be the result of overwhelmed infrastructure and other structural deficiencies, which may be exacerbated by intense rainfall or prolonged flooding. Dam failures are catastrophic and can potentially harm human life and property downstream from the failure. In addition, ecosystems and habitats can be destroyed by fast-moving floodwaters, debris, and sedimentation from inundation. Although dam failures are very rare, these events are not unprecedented.

In a dam failure scenario, the greatest threat to life and property typically occurs in those areas immediately below the dam since flood depths and discharges generally decrease as the flood wave moves downstream. The primary danger associated with dam failure is the high-velocity flooding downstream of the dam and limited warning times for evacuation.

The County has identified the Searsville Dam, which impounds a creek tributary to San Francisquito Creek, as posing a potential dam failure hazard to portions of the Stanford campus, the City of Palo Alto, and the lower reaches of San Francisquito Creek, which forms the boundary of East Palo Alto and Palo Alto as it enters San Francisco Bay. The City is also within the inundation area of the Felt Lake Dam. See Figure 3 depicting dam inundation areas.

Both dams are owned by the Standford University Board of Trustees and inspected by the California Department of Water Resources Division of Safety of Dams and have been given satisfactory ratings. This rating means that no existing or potential deficiencies have been identified and that an acceptable performance is expected under all conditions.

Figure 3: Dam Inundation Areas



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; California Division of Safety of Dams, 2023

Past Events

East Palo Alto has a history of flooding problems due to its low-lying location along the bay, particularly in areas along San Francisquito Creek. The city has experienced eight major flood events since 1940. For example, tidal flood waters submerged streets in the University Village neighborhood in 1972. A heavy rain event in December 2012 led to significant flooding in multiple portions of the city.

Table 1 lists historical San Mateo County flood events identified in the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) Severe Storms Database (dating back to 1996), as well as previous flood events affecting the county for which federal disaster declarations were issued.

Table 1: History of Recent Flood Events

Date	Event	Locations
February 3, 1998	Flood	East Palo Alto, Menlo Park
December 31, 2005	Flood	Countywide
January 1, 2006	Flood	Countywide
December 23, 2012	Flood	East Palo Alto
December 2/11, 2014	Flash Flood, Flood	Belmont, San Bruno, San Mateo County
December 10, 2016	Flood	East Palo Alto
December 31, 2022	Flood	Bayshore
January 10, 2023	Flood	Countywide

February 3, 1998

Parts of East Palo Alto and Menlo Park experienced significant flooding along the San Francisquito Creek. This event impacted more than 1,100 homes and businesses and caused more than $28 million in damages. Hundreds of people were forced to evacuate and major thoroughfares were closed. Bell Street Park was flooded.

December 23, 2012

A storm caused water to flow over a 600-foot section of levee between Verbena Drive and Daphne Way, forcing evacuations for residents of seven homes with a total of 36 residents. One home was damaged and declared uninhabitable.

December 31, 2022

A low-pressure system descended from the Gulf of Alaska southward along the entire Pacific Coast and tapped into sub-tropical moisture originating from the Central Pacific to drop heavy rain throughout the state. The system brought rainfall over a two-day period totaling 10 inches in the coastal mountains. A flash flood watch was issued for the Santa Lucia Mountains and Dolan Burn Scar area, where up to 12 inches of rain fell. Roadway flooding caused a hard closure of State Route 92 between State Route 35 and State Route 1. Residents living near San Francisquito Creek in East Palo Alto lost many of their belongings, including their cars, and incurred hundreds of thousands of dollars of property damage.

Dam Events

The only recorded dam failure in San Mateo County was the failure of a small dam in the community of El Granada in 1926. According to the 2018 State of California Hazard Mitigation Plan, there have been nine failures of federally regulated dams elsewhere in the state since 1950. Overtopping caused two of the nine dam failures in the state, and the others were caused by seepage or leaks. The most catastrophic event was the failure of the St. Francis Dam in Los Angeles County, which failed in 1928 and killed an estimated 450 people.

The state's most recent dam emergency occurred in February 2017 when the Oroville Dam in Butte County was on the verge of overflow. The dam's concrete spillway was damaged by erosion and a massive hole developed. The auxiliary spillway was used to prevent overtopping of the dam, although it also experienced erosion problems. Evacuation orders were issued in advance of a potential large uncontrolled release of water from Lake Oroville, although ultimately no release occurred. Following this incident, State officials ordered that flood-control spillways be reinspected on 93 dams with potential geologic, structural, or performance issues that could jeopardize their ability to safely withstand a flood event. The San Andreas Dam near Millbrae and San Bruno was one of the dams reinspected.

EXISTING PROGRAMS AND REGULATIONS

Flood Control Agencies and Activities

Agencies responsible for flood control in San Mateo County include the Unites States Army Corps of Engineers, San Mateo County Flood Control District (OneShoreline), Federal Insurance Administration, and the California Department of Water Resources.

Federal Insurance Administration

The U.S. Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. The NFIP is administered by FEMA and enables property owners in participating communities to purchase insurance as protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages.

United States Army Corps of Engineers

The Unites States Army Corps of Engineers (USACE) operates projects and programs related to dam safety, levee safety, and emergency operations. The USACE can provide the full range of technical services and planning guidance that is needed to support effective floodplain management. General technical assistance efforts under this program include determining site-specific data on obstructions to flood flows, flood formation, and timing; flood depths; floodwater velocities; the extent, duration, and frequency of flooding; information on natural and cultural floodplain resources; and flood loss potentials before and after the use of floodplain management measures. Types of studies the USACE have conducted include floodplain delineation/hazard, dam failure analyses, flood warning, floodway, flood damage reduction, stormwater management, flood-proofing, and inventories of flood-prone structures.

The USACE Flood Risk Management Program (FRMP) works to focus the policies, programs, and expertise of USACE toward reducing overall flood risk. This includes the appropriate use and resiliency of structures such as levees and floodwalls, as well as promoting alternatives when other approaches, such as land acquisition and flood proofing, to reduce flood risk.

California Department of Water Resources

California Department of Water Resources (DWR) participates in activities to reduce flood risk, maintain levees, forecast river levels based on weather conditions, promote wise use of floodplains, and provide emergency preparedness and response assistance.

DWR's role in flood preparedness includes working with communities to improve community safety and lower insurance premiums for residents; holding preseason briefings for emergency responders to learn about resources and coordinate with other local agencies to prepare for flood season; conducting meetings with flood emergency response partners and county emergency operation officials throughout the state; providing training in effective flood fighting methods for mitigating flood; and providing grant funding for flood management projects, emergency preparedness, and feasibility studies. DWR can help affected communities obtain flood response resources through the Governor's Office of Emergency Services and works collaboratively with local, State, and federal agencies to collect and share weather and river runoff data via the California Data Exchange Center. In the event of a major flood, DWR activates its Flood Operations Center to coordinate response between local agencies and provide technical assistance.

San Mateo County Flood & Sea Level Rise Resiliency District (OneShoreline)

The San Mateo County Flood and Sea Level Rise Resiliency District, also known as OneShoreline, is an independent government agency that works across jurisdictional boundaries to secure and leverage public and private resources for the long-term resilience of San Mateo County. OneShoreline plans and implements solutions to the climate change impacts of sea level rise, flooding, and coastal erosion. OneShoreline's major current priorities include working with cities and developers to incorporate consideration for future climate conditions in property and infrastructure planning and advancing new multi-jurisdictional projects. A key component of OneShoreline's work is to partner with municipalities to remove properties from the FEMA-defined floodplain.

San Francisquito Creek Joint Powers Authority

In 1999, the City joined with the cities Menlo Park and Palo Alto, along with the San Mateo County Flood Control District and the Santa Clara Valley Water District to form the San Francisquito Creek Joint Powers Authority (SFCJPA). The San Francisquito Creek JPA assists East Palo Alto in reducing threats of flooding.

Stormwater Infrastructure

The storm drainage system in the city is composed of networks of pipes, channels, storage ponds, and pump stations that outlet to San Francisquito Creek and the San Francisco Bay. Stormwater in East Palo Alto drains into two major drainage systems: the Runnymede Storm Drain System and the O'Connor Storm Drain System. Due to its proximity to the San Francisco Bay, portions of the drainage system are influenced by tide. Over half of the drainage area is reliant on pumping from the O'Connor pump station.

The City has a Storm Drain Master Plan, adopted in 2015, that guides the development of a comprehensive approach to storm drain facilities. As of 2015, many of the streets in East Palo Alto lack storm drains. Where storm drains exist, they lack the capacity to handle stormwater during heavy rain events. During 10- and 20-year storm events in East Palo Alto, storm drains can overflow, flooding the streets, and in the case of the 1998 floods, parts of the city were effectively stranded. Low-lying areas face extra risk of floods related to levee breaks, ruptures, or overtopping. Additionally, the other infrastructure, such as pump stations, need replacement.

San Francisquito Creek Storm Capacity Revitalization

During 2016 and into 2018, the San Francisquito Creek received a significant capacity upgrade. The creek was widened by approximately 250 square feet between US 101 Highway and the entrance to the Bay. In addition to the widening of the creek, the levees received extensive corrugated steel 100-foot sea walls which align the creek between East Palo Alto and Palo Alto. Crossing points such as the Friendship Bridge became a two-part bridge spanning across to the newer levee landing.

Levees

Many bayfront areas in and near East Palo Alto feature earthen levees intended to protect against tidal influx. The incomplete system generally follows the shoreline but also upland portions of San Francisquito Creek.

City Plans and Regulations

The City requires stringent building codes, such as the mandatory elevation of structures to 18 inches above the height of flood waters, which mitigate inundation risk. East Palo Alto reviews the effectiveness of these activities annually and provides FEMA with a progress report each year that identifies action taken to reduce the potential for loss of life and damage to property.

The City adopted its Green Infrastructure Plan in 2020. The purpose of the Green Infrastructure Plan is to guide the identification, implementation, tracking, and reporting of green infrastructure projects within the city.

Future Conditions

Climate change is expected to affect the frequency and severity of future flooding in East Palo Alto. Please review the East Palo Alto Vulnerability Assessment Report for details.

ISSUE 3: SEA LEVEL RISE

General Overview

Sea level rise is an increase in the ocean's surface height relative to the land. The two major causes of sea level rise are thermal expansion caused by warming of the ocean (since water expands as it warms) and increased melting of land-based ice, such as glaciers and ice sheets. Sea level rise is a gradual process, taking place over years or decades, affecting coastal communities and those along the San Francisco Bay. Sea level rise has the potential to inundate homes, businesses, and infrastructure near shorelines and to cause erosion of shorelines over time. Rising seas increase the risk of flooding, storm surge inundation, erosion and shoreline retreat, and wetland loss. The cities and infrastructure that line many shorelines are already vulnerable to damage from storms, which will likely increase as the sea level continues to rise and inundate areas further inland.

Rising sea levels can cause the shoreline to flood more frequently and severely during storms or king tide events because ocean levels are higher during normal conditions. The most damaging events over the next few decades are likely to be dominated by large storm events in combination with high tides and large waves. Additionally, rising sea levels can cause inland areas in the watershed to flood. Impacts will generally become more frequent and more severe in the latter half of this century.

The county is already exposed to present-day flooding when large rain events coincide with high tides on the San Francisco Bay. The county becomes more highly vulnerable to flooding when considering the effects of rising sea levels. Future flooding and coastal erosion could pose considerable risks to life, safety, critical infrastructure, the County's natural and recreational assets, and the economy. To address the issue, the County performed a regional sea level rise vulnerability assessment (SLA VA) to evaluate the potential impacts of future flooding and inundation. The SLA VA revealed:

- The assessed value of parcels in the project area exposed to near-term (present-day) flooding exceeds $1 billion.
- The assessed value of parcels exposed to erosion and flooding in the long-term (50–100 years) totals roughly $39.1 billion.
- More than 30,000 residential parcels and 3,000 commercial parcels may also be vulnerable in the long-term.

Furthermore, flooding, erosion, and sea level rise not only directly threaten people and property in the sea level rise hazard areas, but they also affect all communities in the county, even those on high ground. Such indirect effects are present because assets and infrastructure in the sea level rise areas provide critical services and functions to communities outside these areas.

Sea Level Rise: Scenarios

The SLA VA used three sea level rise scenarios to evaluate potential impacts to communities (see Table 2). These three scenarios are referenced when discussing potentially affected assets and infrastructure within the community.[5] According to California's 2024 guidance on sea level rise, communities should plan for as much as approximately 3 feet (36 inches) of sea level rise by 2070, and as much as 6.6 feet (79.2 inches) by 2100. [6]

Table 2: Sea Level Rise Scenarios*

Baseline	1% annual chance flood (present-day extreme flood, also known as a 100-year flood)
Mid-Level Scenario	1% annual chance flood + 3.3 feet of sea level rise
High-End Scenario	1% annual chance flood + 6.6 feet of sea level rise

*The SLA VA used sea level rise inundation data from the United States Geological Survey (USGS) and from Point Blue's *Our Coast, Our Future* tool, which provided the best available data at the time. The best available science on sea level rise projections at the time was the National Research Council's *Sea Level Rise for the Coasts of California, Oregon, and Washington*.

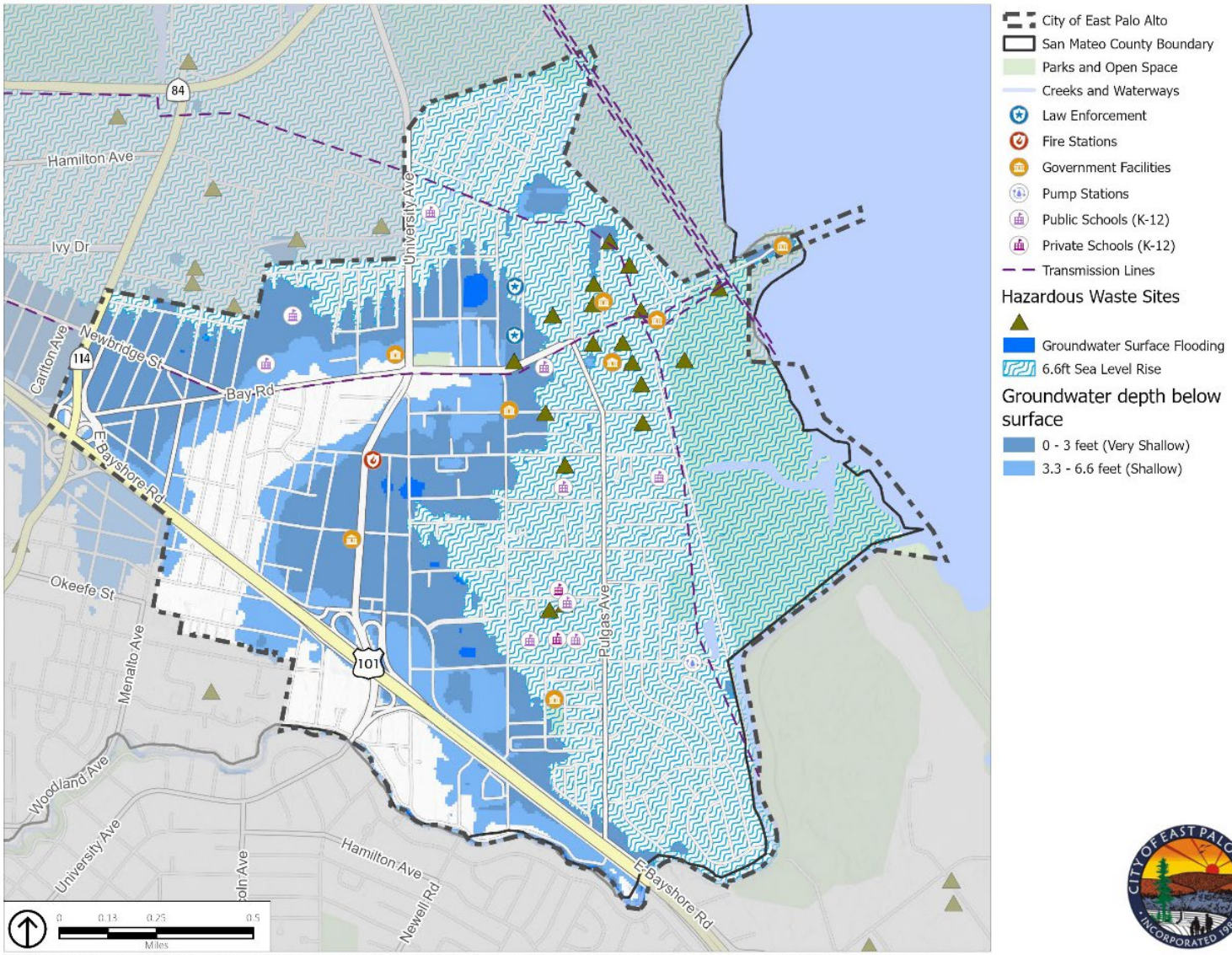
The scenarios were also informed by regional sea level rise guidance documents, such as the California Coastal Commission's August 2015 *Sea Level Rise Guidance, Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits*. The methodology incorporated strategies from the San Francisco Bay Conservation and Development Commission's *Adapting to Rising Tides* (ART) project.

Sea level rise has secondary effects beyond inundation. As sea levels rise, the dense saltwater moves inland beneath the ground/soil, which forces up the layer of the less dense fresh groundwater that floats above it. In many coastal areas, even a few inches of sea level rise can raise the fresh groundwater table enough to flood basements of homes and buildings, escape through cracks in sewer lines, and damage underground infrastructure hindering its effectiveness. Groundwater can also seep into toxic sites (oil wells, fuel storage tanks, etc.) from below, releasing hazardous materials and spreading these pollutants far beyond the limits of the original contamination areas. Low-lying inland areas could flood from below by emergent groundwaters faster than coastal floodwaters ~~can~~ overtop the shoreline. This rising groundwater will create potential exposure pathways that could impact not only the environment but public health as well. Rising groundwater can further impact East Palo Alto by increasing liquefaction susceptibility during earthquakes. Figure 4 shows the potential emergency groundwater areas in the city in high seal level rise scenario.

According to the County's Sea Level Rise Vulnerability Assessment, 714 acres of East Palo Alto are at risk of inundation under the mid-level scenario and 992 acres are at risk under the high-end scenario (see Figure 5). Nearly 60 percent of East Palo Alto's population is vulnerable to sea level rise in the mid-level scenario. Nearly all of the city's wetlands (a total of 237 acres) are vulnerable, but it is not clear to what extent they may withstand sea level rise. Approximately 34 percent of East Palo Alto's local roadways will be affected in the event of a flood in the mid-level scenario. Infrastructure that would be important in the event of a flood, such as outfalls, an electric substation, a stormwater pump, storm drains, and energy transmission lines, will also be affected.

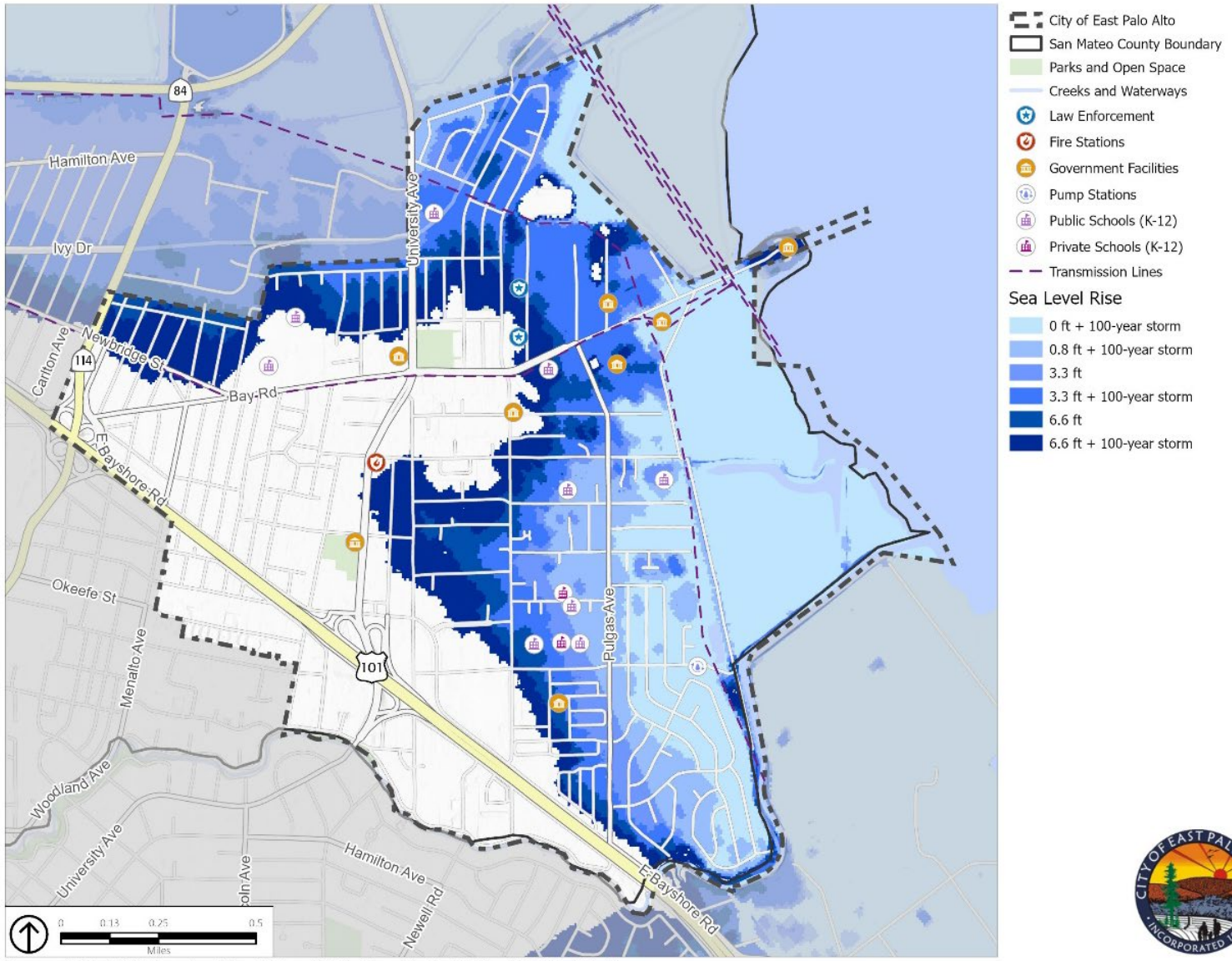
Other assets that serve the community on a daily basis may also be significantly affected. Approximately 60 percent of its schools, nearly 60 percent of its emergency shelter sites, and half of its parks are vulnerable to flooding in the event of a major storm in the mid-level scenario.[7]

Figure 4: Emergent Groundwater, High-End Sea Level Rise Scenario



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; California Office of Environmental Health Hazard Assessment, 2021; USGS, 2020

Figure 5: Projected Sea Level Rise



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; USGS CoSMoS

Past Events

Sea level rise is a dynamic phenomenon that is constantly evolving, the impacts of which are often not experienced as singular events. Over the past century, the water levels in San Francisco Bay have risen by eight inches.[8]

Existing Programs and Regulations

Sea Level Rise Management Agencies and Activities

A number of agencies in San Mateo County and within the greater Bay Area participate in the process of planning for and managing sea level rise, including the Bay Conservation and Development Commission, Adapting to Rising Tides, Sea Change San Mateo County, Bay Adapt, OneShoreline, and the San Mateo County Resource Conservation District. Major reports and initiatives developed by these agencies include the County of San Mateo South Coast Sea Level Rise Vulnerability Assessment & Adaptation Report, County of San Mateo Sea Level Rise Vulnerability Assessment, and the report Sea Level Rise & Overtopping Analysis for San Mateo County's Bayshore.

Future Conditions

Climate change is expected to affect the frequency and severity of future Sea Level Rise in East Palo Alto. Please review the East Palo Alto Vulnerability Assessment Report for details.

ISSUE 4: SEISMIC HAZARDS

General Overview

An earthquake is the vibration of the earth's surface following a release of energy in its crust. This energy can be generated by a sudden dislocation of the crust or by a volcanic eruption. Most destructive quakes are caused by dislocations of the crust as stress builds up along sections of the crust. When the stress exceeds the strength of the rocks or the friction holding the halves of the fault together, the crust breaks and snaps to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake at varying speeds.

Geologists have found that earthquakes reoccur along faults, which are zones of weakness in the earth's crust. When a fault experiences an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake can still occur. In fact, relieving stress along one part of a fault may increase it in another part. California is seismically active because of movement of the North American Plate and the Pacific Plate to the west. The major fault between these plates, the San Andreas Fault, runs through San Mateo County.

The sliding movement of the surface of the earth on either side of a fault is called fault rupture. Fault rupture begins below the ground surface at the earthquake hypocenter, typically between 3 and 10 miles below the ground surface in California. If an earthquake is large enough, the fault rupture will travel to the ground surface, potentially destroying structures built across its path.

Faults are more likely to experience earthquakes if they have more rapid rates of movement, have experienced recent earthquakes, experience greater total displacements, and are aligned so that movement can relieve the accumulating tectonic stresses. Geologists classify faults by their relative hazards. "Active" faults, which represent the highest hazard, are those that have ruptured to the ground surface during the Holocene period (about the last 11,000 years). "Potentially active" faults are those that

displaced layers of rock from the Quaternary period (the last 1,800,000 years). The majority of the seismic hazards are on well-known active faults. However, inactive faults, where no displacements have been recorded, also have the potential to cause earthquakes.

All of East Palo Alto would likely experience severe ground shaking in a large earthquake. Much of the city's multifamily housing is provided in buildings with soft-story construction, which are buildings that have large open spaces on the ground or lower floors, such as a garage or open retail areas. Soft-story construction is particularly vulnerable to failure in the event of an earthquake.

Earthquake Classification

Earthquakes are typically classified by the amount of energy released, measured in magnitude, or by the impact on people and structures, measured in intensity.

Magnitude

An earthquake's magnitude is a measure of the energy released at the source of the earthquake. Magnitude is commonly expressed by ratings on the moment magnitude scale (Mw), the most common scale used today. This scale is based on the distance a fault moved and the force required to move it. The scale is presented in Table 3.

Table 3: Moment Magnitude Scale

Classification	**Magnitude**
Great	8 or greater
Major	7.0 to 7.9
Strong	6.0 to 6.9
Moderate	5.0 to 5.9
Light	4.0 to 4.9
Minor	3.0 to 3.9
Micro	Less than 3.0

Intensity

The most commonly used earthquake intensity scale is the modified Mercalli intensity scale. Ratings of the scale as well as the perceived shaking and damage potential for structures are shown in Table 4. The modified Mercalli intensity scale is generally represented visually using shake maps, which show the expected ground shaking at any given location produced by an earthquake with a specified magnitude and epicenter. The intensity of an earthquake varies depending on the distance from the earthquake, the rock and soil conditions at sites, and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust. A shake map shows the variation of ground shaking in a region immediately following significant earthquakes.

Table 4: Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage	
		Resistant Buildings	Vulnerable Buildings
I	Not felt	None	None
II to III	Weak	None	None
IV	Light	None	None
V	Moderate	Very Light	Light
VI	Strong	Light	Moderate
VII	Very Strong	Moderate	Moderate/Heavy
VIII	Severe	Moderate/Heavy	Heavy
IX	Violent	Heavy	Very Heavy
X to XII	Extreme	Very Heavy	Very Heavy

Fault Locations

San Mateo County is in a region of high seismicity because of the presence of the San Andreas Fault that bisects the county, the Hayward Fault across the bay to the east, and the San Gregorio Fault to the west (see Figure 6). The primary seismic hazard for the county is potential ground shaking from these three large faults.

San Andreas Fault

The San Andreas Fault spans the boundary of the Pacific and North American plates, running 810 miles from the Gulf of California through the Mendocino fracture zone off the shore of northern California. The San Andreas Fault lies about seven miles to the west of East Palo Alto.

The San Andreas Fault has three segments. The southern segment extends from the Gulf of Mexico to Parkfield, in Monterey County. The central segment extends from Parkfield to Hollister, in San Benito County. The northern segment extends northwest from Hollister, through San Mateo County, including Daly City and San Bruno, to its junction with the Mendocino fracture zone and the Cascadia subduction zone in the Pacific Ocean. The San Andreas Fault has a 21 percent chance of generating a magnitude 6.7 or greater earthquake in the next 30 years.[9]

A rupture along the peninsula would cause extremely violent ground shaking throughout the county. The bay margins are likely to experience liquefaction in a major earthquake.

Hayward Fault

The Hayward Fault is a 45-mile-long fault that parallels the San Andreas Fault in the East Bay. The Hayward Fault extends through some of the Bay Area's most populated areas, including San Jose, Oakland, and Berkeley. The Hayward Fault is about 10 miles to the east of East Palo Alto.

The Hayward Fault has a 31-percent chance of producing a magnitude 6.7 or greater earthquake in the next 30 years.[10] An earthquake of this magnitude has regional implications for the entire Bay Area, as the Hayward Fault crosses numerous transportation and resource facilities, such as highways and the Hetch Hetchy Aqueduct. Disruption of the Hetch Hetchy system has the potential to severely impair water service to San Mateo County. The Hayward Fault is increasingly becoming a hazard priority throughout the Bay

region because of its increased chance for activity and its intersection with multiple highly populated areas and critical facilities.

San Gregorio Fault

The San Gregorio Fault is a northwest-trending right-lateral slip deformation near the western edge of San Mateo County, crossing briefly over uninhabited land in San Mateo County around Pillar Point at Half Moon Bay. The fault runs from southern Monterey Bay through Bolinas Bay, where its north section intersects with the San Andreas Fault offshore north of San Francisco. San Gregorio is the principal active fault west of the San Andreas for the Bay Area region. The San Gregorio Fault is about 20 miles to the west of East Palo Alto.

The San Gregorio Fault is one of the less studied fault lines, the result of its primary location offshore and its proximity to the better-known San Andreas Fault and Hayward Fault. Its probability of experiencing a magnitude 6.7 or greater earthquake within the next 30 years is 6 percent[11]—significantly less than San Andreas Fault or Hayward Fault. However, the location of the fault poses a significant threat to San Mateo County.

Earthquake-Related Hazards

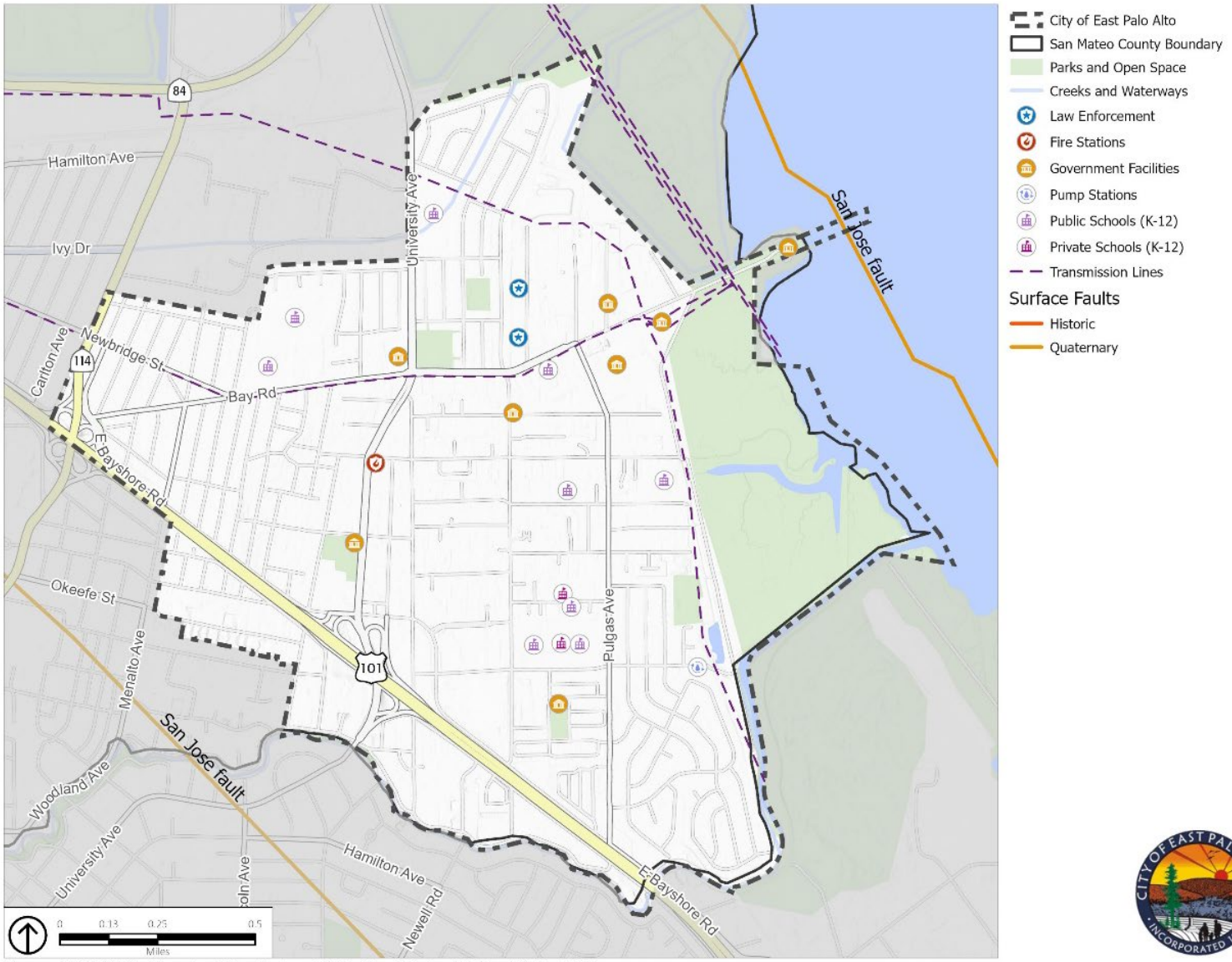
In addition to shaking and surface rupture, this can also include landslides, liquefaction, and tsunamis.

Liquefaction

Soil liquefaction occurs when water-saturated sands, silts, or gravelly soils are shaken so violently that the individual grains lose contact with one another and float freely in the water, turning the ground into a puddinglike liquid. Building and foundations lose load-bearing strength and may sink into what was previously solid ground. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people.

The soils underlying East Palo Alto are particularly susceptible to liquefaction, which has serious implications for older structures that were before state and local building codes were updated (in the early 1970s) to be more resilient against seismic and soils-related hazards. As shown in Figure 7, the areas at greatest risk of liquefaction are the Baylands neighborhoods as well as the area along US Highway 101/San Francisquito Creek.

Figure 6: Regional Faults



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; USGS, 2020

Tsunami

A tsunami is a series of high-energy waves that radiate outward like pond ripples from an area where a generating event occurs, arriving at shorelines over an extended period. Tsunamis can be induced by earthquakes, landslides, and submarine volcanic explosions. Tsunamis are typically classified as local or distant, depending on the location of their source in comparison to where waves occur.

In the open ocean, a tsunami may be only a few inches or feet high, but it can travel with speeds approaching 600 miles per hour. As a tsunami enters the shallow waters near a coastline, its speed diminishes, its wavelength decreases, and its height increases greatly. At the shoreline, tsunamis may take the form of a fast-rising tide, a cresting wave, or a bore (a large, turbulent wall-like wave). The first wave is usually followed by several larger and more destructive waves.

At some locations, the advancing turbulent wave front will be the most destructive part of the tsunami wave. In other situations, the greatest damage will be caused by the outflow of water back to the sea between crests, sweeping away items on the surface and undermining roads, buildings, bulkheads, and other structures. This outflow action can carry enormous amounts of highly damaging debris, resulting in further destruction. Ships and boats may be forced against breakwaters, wharves, and other craft, or be washed ashore and left grounded after the withdrawal of the seawater.

Tsunamis are often referred to as local or distant. The type of tsunami depends on the location of the source of the tsunami and where it may strike land. The source of a local tsunami is close to the coast or shoreline and may arrive in less than one hour. The danger is greatest for local tsunamis because warning time is limited.[12]

Tsunamis affecting the Bay Area are most likely to be generated by very distant subduction faults such as those in Washington and Alaska, but local tsunamis can be generated from strike-slip faults (such as the small one that was triggered by the 1906 earthquake). The 2011 Honshu, Japan, earthquake caused tsunami damage in Santa Cruz, Crescent City, and Berkeley marinas.[13]

There is a tsunami warning system for the Pacific Ocean, involving 26 countries with numerous seismic stations, water level stations, and information distribution centers. The warning centers issue tsunami watches, warnings, and advisories. A watch is issued when a large earthquake has occurred far away from the region and the threat is still being determined. The warning system is activated when a Pacific basin earthquake of magnitude 6.5 occurs or an earthquake is widely felt along the North American coast.

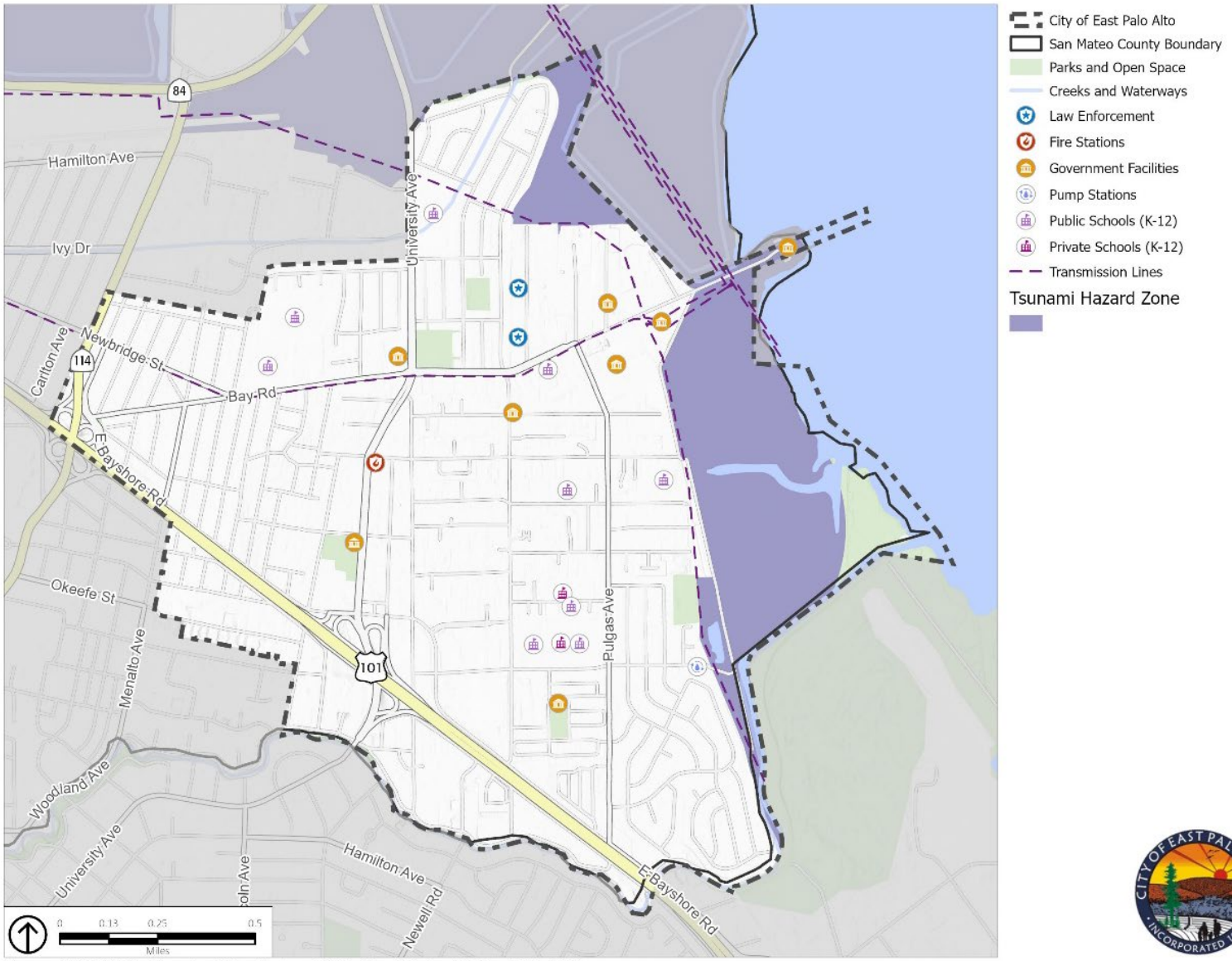
CalOES has prepared a series of maps showing the potential inundation line for a tsunami runup along the San Francisco Bay shoreline from a number of extreme, yet realistic, tsunami data sources.

East Palo Alto's position within San Francisco Bay limits the potential for tsunami damage (see Figure 11). However, tsunami waves may impact areas of the city directly adjacent to the bay. The California Department of Conservation has identified the area around Ravenswood Slough and Cooley Landing as potential tsunami inundation areas.

Figure 7: Liquefaction Hazard Areas

Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; CGS, 2021

Figure 8: Tsunami Hazard Areas



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; CGS, 2021

Past Events

Table 5 lists recent earthquakes with a magnitude of 5.0 or greater within 100 miles of San Mateo County. The last significant (greater than magnitude 6.0) seismic event in the San Mateo vicinity was the 7.1 magnitude San Andreas Loma Prieta Earthquake in 1989, which originated 10 miles northeast of Santa Cruz. Other significant local earthquakes include the 1906 earthquake in San Francisco and the 2014 Napa earthquake. Although the 1906 earthquake is most associated with the City of San Francisco, San Mateo County was also greatly affected.

Table 5: Recent Earthquakes Magnitude 5.0 or Larger Within 100-Mile Radius of San Mateo County

Date	Magnitude	Epicenter Location
3/22/1957	5.3	Daly City
3/31/1986	5.70	12 miles east-northeast of Milpitas, CA
10/17/1989	7.1	10 miles northeast of Santa Cruz, CA
9/3/2000	5.17	8 miles northwest of Napa, CA
8/10/2001	5.50	9 miles west of Portola, CA
10/31/2007	5.6	10 miles northeast of San Jose, CA
8/24/2014	6.0	6 miles southwest of Napa, CA

Existing Programs and Regulations

Title 15 of the City's Municipal Code contains the City's Residential Code and Building Code, both of which establish standards for seismic safety in new construction and major renovations.

Future Conditions

The frequency and severity of future seismic hazards in East Palo Alto is expected to continue.

ISSUE 5: GEOLOGIC HAZARDS

General Overview

Common geologic hazards are landslide, subsidence, and differential settlement.

Landslide

A landslide is a mass of rock, earth or debris moving in a downward direction. They occur when a slope loses its structural integrity and can no longer hold itself together. Landslides can move slowly or very quickly. Mudslides, a type of landslide, are rivers of rock and soil saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall.

Slides are caused by a combination of geological and climate conditions and the influence of urbanization. They can be initiated by storms, earthquakes, fires, or human modification of the land. The sites of large landslides are typically areas of previous landslide movement that are periodically reactivated by significant precipitation or seismic events. In San Mateo County, landslides typically occur during and after severe storms that saturate steep, slide-prone soils. Most weather-induced landslides in the county occur

in the winter after the water table has risen. Landslides that result from earthquakes can occur at any time. The probability of a landslide in the county in any given year is high.

Landslides in hillside terrain can pose a serious hazard to downslope property and structures. They can disrupt roadways and other infrastructure lifelines, destroy private property, and cause flooding, bank erosion, and rapid channel migration. Landslides can travel miles from their source, growing as they descend and pick up debris.

The degree of local landslide hazard depends on soil type and steepness of slope. Soil type is a key indicator for landslide potential and is used by geologists and geotechnical engineers to determine soil stability for construction standards. Other factors that increase landslide risk include a slope greater than 33 percent, a history of landslide activity in the last 10,000 years, and stream or wave activity, which can cause erosion and undercut a bank and cause the surrounding land to become unstable. Wildfire can also make landscapes more susceptible to landslides, flash floods, and debris flows.

East Palo Alto's relatively flat typography means that landslide risks are generally low. As Figure 9 shows, there are no identified landslide hazard areas within the city.

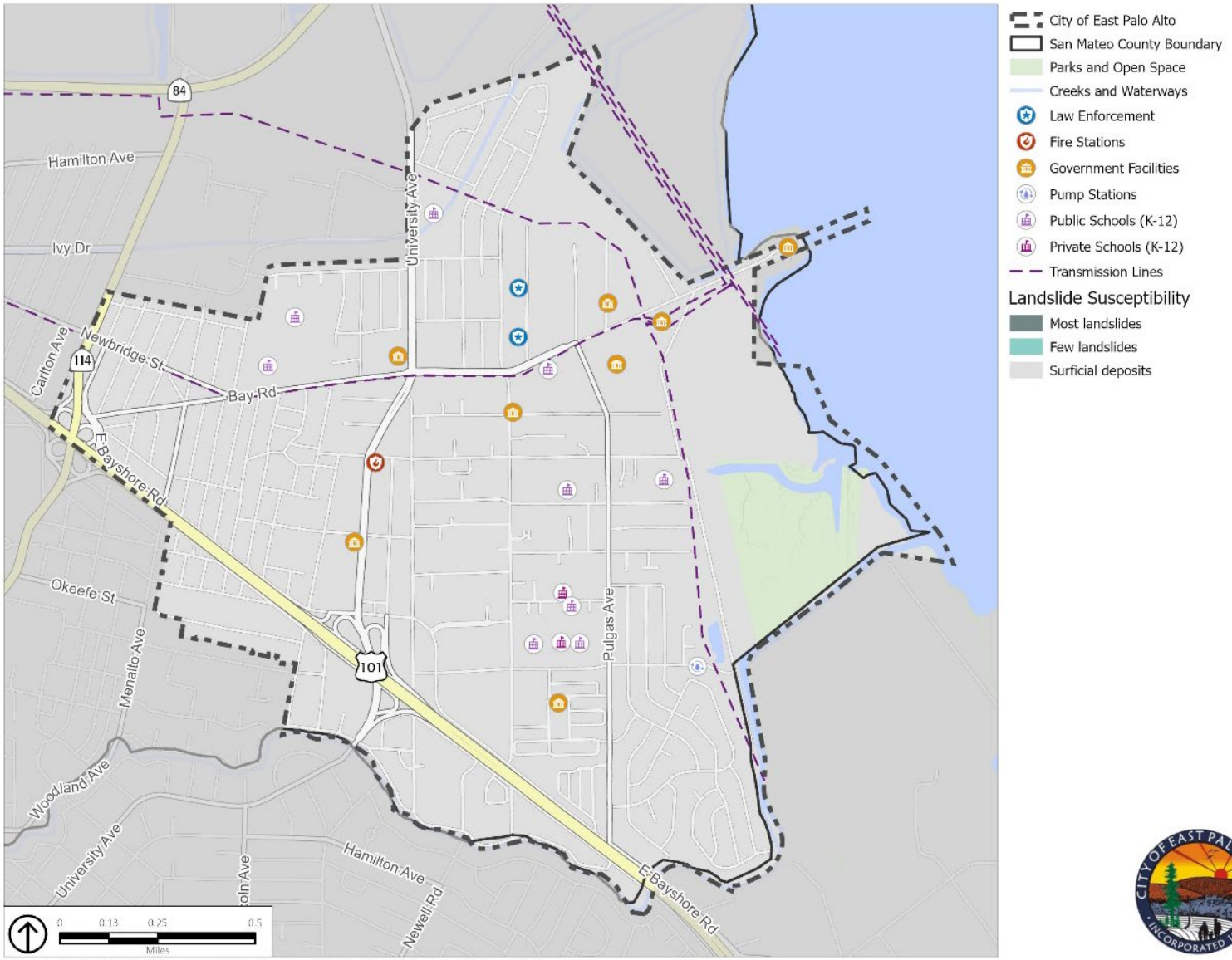
Subsidence

Subsidence means a failure or collapse of the existing ground and media . This is usually caused when subsurface materials are extracted or dissolve, leading to a surface failure. Subsidence can occur when groundwater is extracted or when subsurface organic soils decompose and shrink. Groundwater extraction in East Palo Alto has been minimal, allowing groundwater recharge to limit the potential for subsidence to occur.

Differential Settlement

Differential settlement is a type of subsidence. Differential settlement describes a condition in which adjacent areas of soil sink or settle at different rates. When buildings or structures straddle lands with differing settlement rates, the portion of the building or structure below the sinking soil can be damaged. Typically, differential settlement occurs slowly so that acute harm to humans is not generally a concern. However, over time, differential settlement can result in substantial damage to buildings and structures. Areas of East Palo Alto that are made up of former tidal flats could be susceptible to differential settlement where low-strength native soils are immediately adjacent to loose or unconsolidated fill.

Figure 9: Landslide Hazard Areas



Source: ESRI, 2023; County of San Mateo, 2023; PlaceWorks, 2023; ; USGS

Past Events

There is a limited history of recorded landslide events within East Palo Alto. However, residents may have been impacted by road closures and damage to structures and infrastructure resulting from landslides that occurred in other parts of the county. Table 6 summarizes the impacts of past major landslide events within San Mateo County.

Table 6: Past Landslide Events in San Mateo County

Date	Event Type
December 17, 2005, to January 12, 2006	A series of winter storms caused flooding, landslides, and mudslides in the region. Damage estimates for the San Mateo County region exceeded $100 million. Three homes were nearly wiped out by mudslides.
April 2006	Severe storms resulted in debris flowing across the county. The hardest hit areas were water-soaked hillsides in Brisbane, Broadmoor, and El Granada. In total, 83 damage sites were documented throughout San Mateo County. Damage was estimated at nearly $13 million, with at least $6 million charged to county road damage. A slide caused Highway 1 at Devil's Slide to be closed for several months. A landslide also blocked lanes on State Route 84.
Winter 2017	A series of severe winter storms caused flooding and mudslides across San Mateo County.
March 2023	Highway 84 between Foxhill Road and Portola Road was closed due to a landslide triggered by severe weather. The slide resulted in the failure of approximately 250 feet of roadway on March 8, 2023. A temporary one-way traffic control opened on July 27, 2023, with the full reopening of SR-84 tentatively scheduled for December 2023. On March 22, 2023, a landslide on the 600 to 800 blocks of Patrol Road in Woodside impacted approximately 30 homes. Residents were urged to evacuate, and Patrol Road was closed.
September 8, 2023	A landslide shut down eastbound Highway 84 west of Highway 35. The road was closed for several hours.

Existing Programs and Regulations

Chapter 15.48 of the City's Municipal Code contains requirements pertaining to excavation, grading, filling, and clearing.

The City's land subsidence monitoring program tracks land subsidence associated with groundwater pumping. In August 2014, licensed land surveyors created five new survey sites at locations distributed across the city.

Future Conditions

The frequency and severity of future geologic hazards in East Palo Alto is expected to continue.

ISSUE 6: FIRE HAZARDS

General Overview

Fire hazards include both wildfires and urban fires. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural ignition sources, has created conditions for extensive wildfires. Historically, the fire season extended from early summer through late fall of each year during the hotter, dryer months, although it is increasingly a hazard that can occur year-round. Fire conditions arise from a combination of high temperatures, low-moisture content in the air and plant matter, an accumulation of vegetation, and high winds.

Wildland Fire

A wildland fire is any uncontrolled fire on undeveloped land that requires fire suppression. Wildfires can occur naturally and are important to many ecosystem processes; however, most are started by people. Wildland fires occur on mountains, hillsides, and grasslands. Fuel, weather, and topography are primary factors that affect how wildland fires spread. The climate of San Mateo County and the surrounding area keeps the grass dry and more readily combustible during fire season.

Wildland-Urban Interface Wildfire

The wildland-urban interface (WUI) is an area where buildings and infrastructure mix with areas of flammable wildland vegetation, allowing fires to easily spread to buildings and structures. Hundreds of homes now border major forests and brush areas in California. Human-caused fires are the leading cause of WUI fires, and with thousands of people living near and visiting wildland areas, the probability of human-caused fires is growing. East Palo Alto has no WUI areas.

Fire Hazard Areas

While the city itself is not designated as a fire hazard severity zone, the State Fire Marshal has identified portions of the Bay shoreline (outside city limits and populated areas) as having an elevated risk from grass fires.

Wildfire Protection Responsibility Areas

Hundreds of agencies have fire protection responsibility for wildland and WUI fires in California. Local, state, tribal, and federal organizations have primary legal (and financial) responsibility for wildfire protection. In many instances, two fire organizations have dual primary responsibility for the same parcel of land—one for wildfire protection, and the other for structural or improvement fire protection. The California Department of Forestry and Fire Protection (CAL FIRE) designates lands into responsibility areas based on who is financially responsible for fire protection services.

Local Responsibility Areas

Local Responsibility Areas (LRAs) are areas protected by local agencies, including city and county fire departments, local fire protection districts, and CAL FIRE when under contract to local governments. LRAs may include flammable vegetation and WUI areas where the financial and jurisdictional responsibility for improvement and wildfire protection is that of a local government agency. East Palo Alto is an LRA.

State Responsibility Areas

State Responsibility Areas (SRAs) include unincorporated areas and State lands where the State/CAL FIRE has financial responsibility for fire protection. CAL FIRE can also provide fire protection services by contract to cities and counties.

Structural Fires

Structural fires occur in built-up environments, destroying buildings and other human-made structures. These disasters are often due to faulty wiring or mechanical equipment, or combustible construction materials. The absence of fire alarms and sprinkler systems can exacerbate the damage associated with a structural fire. Structural fires are largely from human accidents, although deliberate fires (arson) may be a cause of some events. Older buildings that lack modern fire safety features may face greater risk of damage from fires. To minimize fire damage and loss, the local Fire Code, based on the State Fire Code, sets standards for building and construction. They require the provision of adequate water supply for firefighting, fire-retardant construction, fire sprinkler requirements, and minimum street widths, among other things.

Secondary Hazards

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Wildfires cause the contamination of reservoirs, destroy transmission lines, and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soil and cause failures on slopes. Major landslides can occur several years after a wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases the runoff generated by storm events, thus increasing the chance of flooding.

Additionally, while East Palo Alto is unlikely to experience a major wildfire within its city limits, it is vulnerable to smoke from wildfires taking place across the region and state. Limited air monitoring resources within the city have historically made it difficult to determine the scale of the impact and to provide adequate air quality warnings.

Past Events

While San Mateo County has a prolific fire history, few of its fires have caused sufficient damage to trigger a state or federal disaster declaration. Notable fires of record are the November 1929 fire near Montara that destroyed 25 homes, a church, and cattle, and the August 2020 CZU Lightning Complex in Santa Cruz and San Mateo Counties, caused by a reported 12,000 lightning strikes. While there have been few wildland fires within East Palo Alto itself, the city has been affected by smoke from wildfires throughout the state and region.

The CZU Lightning Complex fires burned in San Mateo and Santa Cruz Counties starting on August 16, 2020. This fire destroyed 1,490 structures, damaged 140 others, and caused one injury and one fatality. Fires burned in both Butano and Big Basin Redwoods State Parks, where several historic buildings were destroyed, including the visitor's center at Big Basin. The fire burned a total of 86,509 acres.[14] According to CAL FIRE, the CZU Lightning Complex fire was the 12th most destructive California wildfire as of 2023. This fire triggered air quality concerns across the Bay Area. The Bay Area Air Quality Management District issued 25 consecutive days of air quality alerts in the Bay Area, including East Palo Alto, during the CZU Lightning Complex fire.

Although San Mateo County has not experienced many major wildfire events, nearby Alameda County has demonstrated some worst-case scenario fires that could occur in other Bay Area counties. At the time it occurred, the October 1991 Oakland/Berkeley Hills "Tunnel Fire" was the most damaging fire (now the third-most damaging) and the second deadliest (currently the third deadliest) fire in California. This WUI fire resulted in 25 lives lost, including a fire battalion chief and an Oakland police officer, 148 people injured, and 2,900 structures destroyed. The blaze started from a grass fire in the Berkeley Hills and burned 1,600 acres. According to the Insurance Information Institute, the estimated private property loss was $1.7 billion.

Existing Programs and Regulations

CAL FIRE Wildfire Mapping

CAL FIRE has modeled and mapped wildfire hazard zones using a computer model that designates moderate, high, or very high FHSZs. FHSZ ratings are derived from a combination of fire frequency (how often an area burns) and expected fire behavior under severe weather conditions. CAL FIRE's model derives fire frequency from 50 years of fire history data. Fire behavior is based on fuel loads (such as the level and type of vegetation), weather conditions (temperature, wind, precipitation, humidity, etc.), slope and elevation, fire ignition patterns, and expected rate of spread. It accounts for flying ember production, which is the principal driver of the wildfire hazard in densely developed areas, as well as the relative density of vegetative fuels that can serve as sites for new spot fires within the urban core and spread to adjacent structures. The model refines the zones to characterize fire exposure mechanisms that cause ignitions to structures.

CAL FIRE periodically reviews and revises the FHSZ boundaries based on updated modeling and scientific information. Individuals should consult the most recent available mapping, available from CAL FIRE's Fire and Resource Assessment Program (FRAP) at https://frap.fire.ca.gov/.

County Fire Management and Response

Santa Cruz and San Mateo Counties updated their joint Community Wildfire Protection Plan (CWPP) in 2018. A CWPP is a tool for communities to identify landscape-scale hazards and take strategic action to reduce wildfire risk for healthier ecosystems and more resilient communities. The updated CWPP assesses hazards and priorities within the two counties, identifies at-risk communities, and provides fuel-reduction recommendations for high-priority areas. The CWPP can also aid communities to apply for state and federal funding for fire prevention projects and programs.

Wildfire Fuel Management Program

This five-year Wildfire Fuel Management Program is a plan developed by the San Mateo County Parks Department designed to identify and prioritize wildfire fuel reduction projects. The program identifies the projects deemed to have the highest priority to be completed during the selected timeframe. This process involves direct collaboration between department field staff and natural resource management staff to identify the necessity and scope of various projects within park properties and completion of a systematic ranking process of projects to determine which are of the highest priority for the treatment plan timeframe. The plan outlines how the projects will be implemented and then stipulates how these fuel breaks will be maintained in the future. Although no current fuel management activities are proposed in or around East Palo Alto, this program may assist with these activities.

City Fire Management and Response

The Menlo Park Fire Protection District (MPFPD), described in the Emergency Preparedness and Response section (Issue 1), provides fire response services in the city. MPFPD has had a long-standing weed abatement program intended to minimize risks from grassland fire.

Municipal Code Chapter 8.16, Fire Code and Prevention, and Chapter 15.58, Fire Code, both address and are intended to minimize fire risk in East Palo Alto.

Future Conditions

Although climate change is expected to affect the frequency and severity of future fire hazards throughout San Mateo County, East Palo Alto is not generally at risk of wildfires.

ISSUE 7: SEVERE WEATHER

General Overview

Severe weather is generally any destructive weather event, but usually occurs in San Mateo County as localized storms that bring heavy rain, hail, thunderstorms, and strong winds. Severe weather is usually caused by intense storm systems, although types of strong winds can occur without a storm. The most common severe weather events that have historically impacted San Mateo County are heavy rains (usually a result of atmospheric rivers), thunderstorms, and windstorms. Utilities may temporarily turn off power to specific areas to reduce the risk of fires caused by electric infrastructure, an action called a public safety power shutoff (PSPS) event.

Atmospheric Rivers

Atmospheric rivers are long, narrow regions in the atmosphere that transport water vapor from the tropics. When the atmospheric rivers make landfall, they release this water vapor in the form of precipitation, often causing heavy rains that can lead to flooding and mudslide events. These events can cause significant injuries, disrupt travel, and damage property. However, they also play a critical role in replenishing California's water supply.

Fog

Fog forms when air close to the ground can no longer hold all the moisture it contains, causing the excess moisture to condense as a low cloud. This occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents and airport delays, and impair the effectiveness of emergency response. Cool marine air and fog are common in the Bay Area in the summer.

Thunderstorms

A thunderstorm is a rain event that includes thunder and lightning. According to NOAA's National Severe Storms Laboratory, a thunderstorm is classified as "severe" when it contains hail with a diameter of one inch or greater, wind gusts exceeding 57.5 miles per hour (mph), or tornado. Lightning can cause forest and brush fires and deaths and injuries to livestock and other animals. According to the National Lightning Safety Institute, lightning causes more than 26,000 fires in the United States each year. "Lightning sieges" are extreme lightning events in which lightning strikes multiple points at once. In August 2020, an estimated 12,000 lightning strikes caused a set of fires known as the CZU Lightning Complex in San Mateo and Santa Cruz Counties.[15]

Tornadoes

A tornado is a violently rotating column of air extending between a cloud and the surface of the earth, with winds that can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. However, tornadoes are rare in San Mateo County; only five have been recorded since 1950.

Windstorms

Windstorms are generally short-term events involving winds or gusts of over 50 to 60 mph that are strong enough to cause property damage. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles.

Windstorms can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. During wet winters, saturated soil causes trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in dry roadside vegetation. Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

Secondary Hazards

Major riverine or urban flooding can result from heavy rain. Rain falling on saturated soils on slopes or on areas recently burned by wildfire may lead to landslides. Lightning during thunderstorms presents a risk of starting a wildfire. Storms can also exacerbate existing areas of vulnerability, such as increasing the frequency of erosion along coastal cliffs.

Poor air quality is a secondary impact of severe weather. Cold weather may trap air pollutants near the ground surface.

Public Safety Power Shutoff

Electricity utilities throughout California, including the Pacific Gas and Electric Company (PG&E), have begun to occasionally "de-energize", or turn off the electricity for power lines that run through areas where there is an elevated fire risk. This is intended to reduce the risk of power lines sparking or being damaged and starting a wildfire. A PSPS event may occur at any time of the year, usually during high wind events and dry conditions. PSPS events may be limited to specific communities, or they may affect broad swaths of the state. Given the long, connected nature of power supply systems, a shutoff event targeted to a small at-risk area can affect a larger area outside the risk zone. The duration of a shutoff is related to the severe weather that triggers it. However, a shutoff typically ends within 24 hours after the severe weather has passed.

Past Events

Table 7 lists a selection of past severe weather events in San Mateo County as recorded by the NOAA since 1950.

Table 7: Past Severe Weather Events

Date	Type	Description
October 24, 1962	Severe Storms	Federal disaster declaration issued (DR-138)
February 2 through April 30, 1998	Severe Winter Storms and Flooding	Federal disaster declaration issued (DR-1203). Heavy flooding occurred in East Palo Alto. Floods forced the evacuation of hundreds of people, damaged millions of dollars of property, and closed major roads.
February 15, 2009	High Wind	An eastern Pacific storm produced strong wind and heavy rain as it moved through the San Francisco Bay Area. Over 61,000 Bay Area customers lost power.
April 14, 2009	High Wind	High winds along the San Francisco Bay Area shoreline caused numerous power outages and downed trees. A big rig blew over in the westbound lane of the San Mateo Bridge, closing the entire bridge for more than an hour.
October 13, 2009	High Wind	Heavy rain combined with very strong wind through Northern and Central California to cause numerous trees, tree limbs, and power and telephone poles to fall. PG&E reported over 277,000 customers had lost power in the San Francisco and Monterey Bay areas with $13 million dollars in damage. Record-breaking heavy rain led to flooding and debris flows. In San Mateo County, at least 47 trees and 31 sets of power lines were knocked over. Wind also caused power outages across San Mateo County. Approximately 58,000 community members lost power during the storm.
January 18, 2010	High Wind	High wind knocked over power poles along San Mateo County's coast, causing 12,000 customers to lose power. At least 12,000 customers lost power in San Mateo County.
January 20, 2010	Thunderstorm and Wind	The third in a series of significant storms brought strong winds and heavy rain to the San Francisco and Monterey Bay areas. Around 159,000 customers lost power across the San Francisco Bay area, with nearly 22,000 customers without power in the Monterey Bay area. Numerous power lines and trees were knocked down when strong wind combined with saturated soil.
February 15, 2011	High Wind	Strong and gusty wind developed ahead of a long wave trough. A mesonet automated weather reporting system measured a wind gust of 60 mph at midnight. Other automated observation systems around the area above 1,000 feet in elevation reported gusts up to 83 mph. Overall, more than 6,500 customers lost power in the San Francisco Bay Area.
December 21 through December 26, 2012	Heavy Rain, Flooding	A series of storm systems, part of a large Atmospheric River type of pattern, impacted the area during late December 2012. From December 21 through 26, heavy

Date	Type	Description
		rain, gusty winds, flooding, and mudslides occurred across the Bay Area in these consecutive events. Downed trees, powerlines, and flooded roadways impacted community members. In East Palo Alto, heavy rain triggered a levee breach between Verbena Drive and Daphne Way, forcing evacuations for residents of seven homes. One home was damaged and declared uninhabitable.
December 13, 2021	Heavy Rain	An atmospheric river impacted the Bay Area on December 31st, resulting in significant rainfall across the San Francisco Bay Area. During the morning, a surface low developed west of San Francisco and the river stalled over the Bay Area. This resulted in significant rainfall totals for many Bay Area communities.
December 2022 through January 2023	Severe Storms, Heavy Rain, Flooding	Heavy rain triggered flooding of San Francisquito Creek. Flooding damaged property and buildings, flooded Highway 101, downed trees, and caused power outages.
March 2023	Severe Storms, Heavy Rain	Severe weather and downed power lines led to power outages in East Palo Alto. Parts of eastbound University Avenue and Cooley Avenue were closed.

Source: National Centers for Environmental Information, 2021a.

Existing Programs and Regulations

Chapter 13.16 of the Municipal Code establishes underground utility districts.

Future Conditions

Climate change is expected to affect the frequency and severity of future severe weather in East Palo Alto. Please review the East Palo Alto Vulnerability Assessment Report for details.

ISSUE 8: DROUGHT

General Overview

Drought is a significant decrease in water supply relative to what is needed to meet typical demand, leading to a water shortage for some activity, group, or environmental sector. While drought is a normal occurrence for Mediterranean climates such as that of San Mateo County, long and severe droughts have the potential to impact ecosystems and economic activity across the entire community. Most droughts are defined based on declines in average precipitation levels, declines in agricultural production, declines in streamflow and groundwater levels, or socioeconomic impacts from water shortages.

The severity of any given drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. While drought does not typically directly result in loss of life or

damage to structures, drought can have widespread impacts on the environment and the economy. Potential drought impacts include loss of crops, costs incurred by having to drill new wells, increased costs for water straining household finances and reducing commercial profits, reduced habitat and food supply for plants and animals, and increased risk of wildfire. A prolonged lack of precipitation dries out vegetation and makes plants more vulnerable to pests, both of which can increase susceptibility to wildfires.

Drought response is determined case by case, and response priorities are typically based on imminence of potential water shortages. The U.S. Drought Monitor recognizes a five-point scale for drought events: D0 (abnormally dry), D1 (moderate drought), D2 (severe drought), D3 (extreme drought), and D4 (exceptional drought). During severe drought conditions, water shortages are common and water restrictions may be imposed to meet essential community needs.

Droughts can affect groundwater storage as reserves are drawn down in anticipation of or in response to drought impacts, or as reduced precipitation causes groundwater supplies to be replenished at a slower rate. Drought affects groundwater sources more slowly than it affects surface water supplies, but groundwater supplies generally take longer to recover. This can lead to a reduction in groundwater levels and problems such as reduced pumping capacity or wells going dry. It can take groundwater supplies years to recover from heightened use during droughts. This reduced replenishment of groundwater affects streams. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation. Reduced groundwater levels mean that even less water will enter streams during periods of low precipitation.

The City of East Palo Alto purchases most its potable water from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS). Approximately 85 percent of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed in Yosemite National Park and flows down the Tuolumne River. The remaining 15 percent of the water supply originates locally in the Alameda and Peninsula watersheds. The city also sources a small amount of groundwater from the San Mateo Plain groundwater subbasin.

The San Mateo Plain is part of the Santa Clara Valley Groundwater Basin, a geologic trough between the Santa Cruz Mountains and East Bay Hills. The plain is a small subbasin and levels of groundwater pumping are typically low.

Past Events

San Mateo County has a history of severe droughts. DWR hydrologic data from the early 1900s shows multi-year droughts from 1912 to 1913, 1918 to 1920, 1922 to 1924, and 1928 to 1934. The 1929 to 1934 drought established the criteria for designing storage capacity and yield for large Northern California reservoirs. The following sections describe the most recent prolonged droughts that have impacted the planning area.

1976 to 1977 Drought

California had a severe drought due to lack of rainfall during the winters of 1976 and 1977. 1977 was the driest period on record in California at that time, with the previous winter recorded as the fourth driest in California's hydrological history at that time. The cumulative impact led to widespread water shortages and severe water conservation measures statewide. Over $2.6 billion in crop damage was recorded in 31

counties. FEMA declared a drought emergency (Declaration 3023-EM) on January 20, 1977, for all California counties.

1987 to 1992 Drought

California received precipitation well below average levels for four consecutive years. While the Central Coast was most affected, the Sierra Nevada range in Northern California and the Central Valley counties were also affected. During this drought, only 56 percent of average runoff for the Sacramento Valley was received. In 1991, the State Water Project sharply decreased deliveries to water suppliers. By February 1991, all 58 counties in California were experiencing drought. Urban areas as well as agricultural areas were impacted.

2007 to 2009 Drought

The state proclaimed a statewide drought emergency on June 4, 2008, after spring 2008 was the driest spring on record. On February 27, 2009, the state proclaimed a state of emergency for the entire state as severe drought continued. State courts imposed what was, at the time, the largest court-ordered water restriction in state history.

2012 to 2017 Drought

This drought set several records for the state. The period from 2012 to 2014 ranked as the driest three consecutive years for statewide precipitation. Calendar year 2014 set new records for statewide average temperatures and for low water allocations from the State Water Project. Calendar year 2013 set minimum annual precipitation records for many communities. Detailed executive orders and regulations addressed water conservation and management. The statewide drought emergency was lifted in April 2017.

2020 to 2023 Drought

The U.S. Department of Agriculture declared a drought disaster that included San Mateo County on April 21, 2020. April 2021 was the third driest April in the past 127 years. Between April and December 2021, San Mateo County was at the D3—Extreme Drought level, putting the county at risk for wildfire on a year-round basis. Excessive rainfall and flooding in late December 2022 and early January 2023 alleviated some of the drought conditions. Governor Newsom officially eased drought restrictions in March 2023. As of October 2023, San Mateo County was not considered to be in a state of drought.

In East Palo Alto, a history of regulatory decisions and limited infrastructure that have constrained the City's water supply have exacerbated drought conditions. Despite the city's low per-capita water consumption, the city's water demand exceeded its available supply several times since 2001 due to limited water allocations from the SFRWS that did not keep pace with population growth.

Due to the inability of its water allocations to support new development, the City issued a two-year mortarium on new construction in 2016 and did not allow new developments to progress unless developers could show that they had access to the necessary water. The City ultimately pursued two strategies for expanding its water supply: seeking more water from the SFRWS and developing groundwater supplies. As a result of these efforts, Mountain View and East Palo Alto approved a one million gallon-a-day transfer in 2017, and Palo Alto and East Palo Alto approved a 0.5 million gallon-a-day transfer in 2018. The City obtained groundwater by expanding operations at the Gloria Well. Completion of these projects was sufficient to resolve the majority of the City's water shortage issues.

While the City's period of acute crisis is over, the effects of East Palo Alto's decades of institutional neglect remain. The quality of water pipes and other infrastructure cause residents to be concerned about the quality of their tap water; residents have reported encountering brown or yellow tap water, tap water with poor taste or unpleasant odor, and have reported experiencing eye and skin irritation as a result of exposure to poor quality water. Many East Palo Alto residents purchase bottled water for activities such as cooking and drinking.

Existing Programs and Regulations

Bay Area Water Supply Conservation Agency

East Palo Alto is a member of the Bay Area Water Supply Conservation Agency (BAWSCA), which is the main water provider for much of San Mateo County. It allows many of San Mateo County's cities, water districts, and private utilities to coordinate to ensure the continual water supply necessary to maintain health, safety, and economic wellbeing of the community. BAWSCA agencies manage two-thirds of water consumption from the Hetch Hetchy Water System. BAWSCA applies a long-term water supply strategy for its customers throughout the Bay Area. This strategy recognizes that drought year shortfalls can be significant, resulting in system-wide cutbacks of up to 20 percent. BAWSCA focuses on identifying options for filling all or portions of the drought year supply shortfall.

In 2009, BAWSCA developed a Water Conservation Implementation Plan, which aims to help BAWSCA member agencies evaluate potential water savings the cost-effectiveness of various water conservation measures and to develop a regional plan for water conservation measures to serve as a guideline for member agencies. BAWSCA's core water conservation programs include the Water Efficient Landscape Education Program, Water-Wise Gardening in the Bay Area landscape education tool, native garden tours and symposiums, regional Water Conservation Database, Qualified Water Efficient Landscaper Training program, regional water demand and conservation savings projections, and development of the "Making Conservation a Way of Life" Strategic Plan.

In August 2017, BAWSCA released a drought report outlining State and local demand management actions to reduce water use, water supply actions, and regulatory and policy support.

BAWSCA has developed Drought Implementation Plans for both the SFPUC and BAWSCA. However, these plans do not specify trigger levels.

San Francisco Public Utilities Commission

East Palo Alto obtains its water from the SFPUC. The SFPUC issued its most recent Urban Water Management Plan (UWMP) in 2021. The UWMP provides an overview of water deliveries and uses, water supply sources, and water conservation programs. It also includes discussions on supply and demand projections out to 2045, available water supplies to meet existing and future demands under a range of water supply conditions, and measures to reduce long-term water demand, including the Water Shortage Contingency Plan. The SFPUC engages in a number of other water conservation activities, including groundwater monitoring and development of water recycling projects, which help support system-wide water conservation.

Groundwater Management

In 2015, the City initiated a Groundwater Management Plan (GWMP) process for its service area in the southern San Mateo Plain. Due to its current low level of groundwater use, the San Mateo Plain subbasin

has been designated as low priority by DWR. As a result, the City's GWMP is not required to comply with the State's Sustainable Groundwater Management Act. Nonetheless, the City's GWMP is compliant with the Groundwater Management Planning Act (Assembly Bill [AB] 3030, SB 1938, and AB 359).

The GWMP documents the relationships between waterflow and geology within the plain, including conditions along San Francisquito Creek. The GWMP describes historical and existing groundwater conditions, including groundwater levels and flow, recharge groundwater pumping and wells, groundwater quality and contamination sites, and the potential for saltwater intrusion and subsidence.

The GWMP recognizes the potential for adverse effects of pumping, identifies management goals and objectives, and describes management actions, including continuing stakeholder involvement, collaboration for groundwater recharge and protection, and coordinated planning. The City released its first Groundwater Monitoring Report in 2017.

City of East Palo Alto

Urban Water Management Plan and Water Shortage Contingency Plan

The City of East Palo Alto published its most recent Urban Water Management Plan (UWMP) in 2021. The UWMP includes descriptions of historical and projected water demands and water supplies, and reliability over a more than 20-year planning horizon. This document also describes the actions the City is taking to promote water conservation, both by the City itself and affiliated agencies. This includes a Water Shortage Contingency Plan (WSCP) to address potential water supply shortages, such as drought or other impacts to supply availability. The UWMP is updated every five years in accordance with State requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] Sections 10610 – 10656).

The WSCP is used in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. These actions may include implementing customer water budgets and surcharges or restricting landscape irrigation to specific days and/or times. The WSCP includes six levels of water conservation measures to address shortage conditions ranging from 10 percent to greater than 50 percent shortage, consistent with State requirements.

Municipal Code

Chapter 17.04, Water Conservation, and Chapter 17.06, Water Conservation in Landscape Ordinance, of the East Palo Alto Municipal Code, establish water conservation regulations.

Future Conditions

Climate change is expected to affect the frequency and severity of future drought in East Palo Alto. Please review the East Palo Alto Vulnerability Assessment Report for details.

ISSUE 9: EXTREME HEAT

General Overview

State guidance and the Cal-Adapt database define extreme heat as temperatures that are hotter than 98 percent of the historical high temperatures for the area, as measured between April and October of 1961 to 1990. Days that reach this level are called extreme heat days. In East Palo Alto, extreme heat is a daytime temperature above 92.4 degrees Fahrenheit (°F), and a warm night is nighttime low of above 60.9°F. An

event with five extreme heat days in a row is called a heat wave. Extreme heat affects community members' safety and increases community costs and energy generation as it continues. These events can also exacerbate wildfires and impact water supplies. High demand for power for air conditioning during extreme heat can stress and overwhelm the electrical grid, leading to brownouts or power loss. Extreme heat events may degrade the quality of roadways and railways, resulting in closures and travel delays.

Health impacts are the primary concern with these hazards, though economic and service impacts are also an issue. The Center for Disease Control and Prevention (CDC) recognizes extreme heat as a substantial public health concern. Historically, NOAA data indicates that extreme heat kills about 175 Americans annually, although this number has increased in recent years. From 2004 to 2018, studies by the U.S. Department of Health and Human Services indicate that there is an average of 702 deaths annually that are directly or indirectly linked to extreme heat. According to the California Climate Adaptation Strategy, heat waves have claimed more lives in California than all other declared disaster events combined.

Extreme heat events are dangerous because people exposed to extreme heat can suffer a number of heat-related illnesses, including heat cramps, heat exhaustion, and (most severely) heat stroke. Areas with lower extreme heat thresholds are not necessarily at lower risk, as persons and community assets used to cooler temperatures may be less prepared for extreme heat events.

Extreme temperatures can harm plants and animals that are not well adapted to these events, including natural ecosystems. Extreme heat can increase the temperature of water in lakes, streams, creeks, and other water bodies, especially during drought conditions when water levels are lower. In some cases, water temperatures may exceed comfortable levels for several plants and animals, causing ecological harm. Outdoor workers in construction or landscaping are also much more exposed to the elements than most people, so they are more susceptible to extreme heat conditions and the potential illnesses associated with extreme temperatures.

Indirectly, extreme heat puts more stress on power lines, causing them to run less efficiently. The heat also causes more demand for electricity (usually to run air conditioning units), and in combination with the stress on the power lines, may lead to brownouts and blackouts.

Secondary Hazards

During heat waves, the air becomes stagnant, and traps emitted pollutants, often resulting in increases in surface ozone. Heat waves and drought also dry out vegetation and provide more fuel for wildfires whose smoke is a serious medical hazard.

Past Events

In 2022, a combination of heat advisories and an excessive heat warning was issued for parts of Monterey Bay and its near coastal valleys, the San Francisco Bay Shoreline, and Marin Coastal Mountains from September 4th through 8th, along with a heat advisory for the Central Coast, San Francisco, and coastal North Bay on September 6th. Several daily record high temperature records were shattered, along with a handful of monthly and all-time records. Reports of power outages, heat-related illnesses, and deaths were received. Counties opened and operated one or more cooling centers to provide relief from the heat.

Table 8 lists some past extreme heat events in San Mateo County as recorded by NOAA in recent years.

Table 8: Selected Recent Extreme Heat Events

Date	Description
July 22, 2006	High temperatures reached as high as 103°F with low temperatures at night only falling into the lower 70s.
May 17, 2009	High pressure aloft centered over Reno, Nevada, along with weak offshore flow at the surface caused temperatures to rise to near 100°F in the inland valleys of north-central California. Temperatures rose into the upper 80s to mid-90s across the peninsula of the San Francisco Bay Area. High temperatures resulted in heat-exhausted individuals, blown electric transformers, and power outages.
September 1, 2017	A strong upper-level ridge brought widespread hot temperatures to the Bay Area. Numerous daily and monthly records were broken as well as a few record max temperatures. Three San Mateo County community members died over the weekend because of the heat.
June 10, 2019	The combination of high pressure and strong offshore flow resulted in an early season heat wave across the Bay Area from June 9th to the 11th. Multiple daily records were broken across the region and multiple power outages were reported due to the heat. The heat wave across the region triggered power outages knocking out service to 57,000 people across nine counties over a two-day period.
August 19, 2020	A prolonged and oppressive heat wave swept the Central Coast and Bay Area for almost a week from August 14th to August 19th with widespread record-breaking temperatures observed across the region. Multiple days of triple-digit temperatures afternoon highs were recorded inland with some coastal locations even reaching the mid-90s.
July 21, 2022	A strong ridge of high pressure developed over the area, allowing temperatures to soar into the 90s to low 100s for all areas, except parts of the immediate coastline. A heat advisory was issued for all but coastal zones from late morning through the evening of June 21st.
September 6, 2022	A strong ridge of high pressure encompassed the Western United States from September 1st through 8th, leading to anomalously hot temperatures along the California coast. A combination of heat advisories and an excessive heat warning was issued for parts of Monterey Bay and its near coastal valleys, the San Francisco Bay Shoreline, and Marin Coastal Mountains from September 4th through 8th, along with a heat advisory for the Central Coast, San Francisco, and coastal North Bay on September 6th. The heat wave shattered several daily record high temperature records, along with a handful of monthly and all-time records. There were also reports of power outages, heat-related illnesses, and deaths due to the high temperatures.

Locally, the city has historically experienced an average of five extreme heat days per year. Within recent years, extreme heat days have been most frequent in September.

Existing Programs and Regulations

Title 15 of the Municipal Code, including the Green Building Code (Chapter 15.11) and the Energy Code (Chapter 15.25), establish standards for constructing new buildings and significantly renovating existing ones. These standards include requirements for increased energy efficiency and insulation, which can help to keep indoor air temperatures cooler during extreme heat. These buildings may also have more efficient

air conditioning systems, keeping power demands lower and helping to reduce the chance of blackouts by reducing stress on the electrical grid.

Future Conditions

Climate change is expected to affect the frequency and severity of future extreme heat in East Palo Alto. Please review the East Palo Alto Vulnerability Assessment Report for details.

ISSUE 10: HUMAN HEALTH HAZARDS

General Overview

Human health hazards are bacteria, viruses, parasites, and other organisms that can cause diseases and illness in people. Some of these diseases may cause only mild inconvenience, but others are potentially life threatening. These diseases can be and often are carried by animals such as mice and rats, ticks, and mosquitos. Warmer temperatures and high levels of precipitation can lead to increased populations of disease-carrying animals, creating a greater risk of disease and increased rates of infection. Diseases regularly spread by animals include West Nile virus, Zika virus, and Lyme disease.

The city's proximity to the Bay places it within flight distance of mosquitoes breeding in nearby saltwater marshes; although these species are not significant vectors of disease, they can be a nuisance to residents. In addition to mosquitoes breeding in saltwater marshes, mosquitoes breeding in water sources in gardens and yards, storm drains, and underground pipes can cause issues and potentially spread diseases. These include mosquito species able to transmit West Nile virus and other diseases.

Human health hazards and diseases can be local, regional, or even global events. The severity of disease outbreaks varies. Transmission rates depend on local weather and environment, and fatality rates depend on local conditions such as care system quality and capacity, and the general health and immunity of the local population.

Past Events

San Mateo County, like the rest of the United States, was included in the March 2020 FEMA major disaster declaration for the COVID-19 coronavirus pandemic. As of winter 2023, approximately 62 cases of COVID-19 were reported in the county each day and the county has reported a total of 184,001 COVID-19 cases and 912 deaths since monitoring began in January 2020. [16]

As recently as 2019, a major mosquito problem was reported by approximately 50 East Palo Alto residents and may have affected significantly more residents. While West Nile virus is the main mosquito-borne disease of concern in the area, San Mateo County has rarely had West Nile virus cases in the past two decades, and those that have occurred were acquired outside of the county.[17]

San Mateo County Health received confirmation on April 1, 2016, from the California Department of Public Health (CDPH) that the first San Mateo County resident has tested positive for Zika virus. The individual was infected with Zika virus while traveling abroad fully recovered.[18] Thirteen cases of Zika were reported in the county between 2015 and 2016.[19] One detection of West Nile virus occurred in San Mateo County in 2022.[20] According to testing conducted by the San Mateo County Mosquito and Vector Control District, approximately 1 to 3 percent of San Mateo ticks carry the agent for Lyme disease. [21] [22]

San Mateo County also dealt with effects from the 1918 to 1920 flu pandemic. Camp Fremont, a military base in Menlo Park, reported the first death in September 1918. By December of that year, 131 community members had died of the flu.

Existing Programs and Regulations

San Mateo County Health provides health services, including vaccination clinics, disease testing, and emergency response support, to residents of San Mateo County. The San Mateo County Mosquito and Vector Control District is San Mateo County's community-based mosquito control program. This program uses several methods to help control the risk of disease in San Mateo County, including surveillance, prevention, and control of mosquito populations. The Health Alert Center for San Mateo County allows community members to view all alerts and emergencies put out by the County Health Department.

Contact tracing is a public health practice that health departments use to identify and notify people who have been exposed to someone with an infectious disease. Public health departments have used contact tracing for decades to fight the spread of infectious diseases like measles, tuberculosis, syphilis, and HIV.

There is not much warning time for health or pandemic events. The most commonly relied upon warning signal is the appearance of early cases of a disease within a population. The Health Alert Network is the CDC's primary method of sharing cleared information about urgent public health incidents with public information officers; federal, state, territorial, tribal, and local public health practitioners; clinicians; and public health laboratories. The Health Alert Network collaborates with federal, state, territorial, tribal, and city/county partners to develop protocols and stakeholder relationships to ensure a robust interoperable platform for the rapid distribution of public health information.

Future Conditions

Climate change is expected to affect the frequency and severity of future human health hazards in East Palo Alto. Please review the East Palo Alto Vulnerability Assessment Report for details.

ISSUE 11: HAZARDOUS MATERIALS

General Overview

Hazardous materials are materials that pose a significant risk to public safety or human or environmental health. These include toxic chemicals, flammable or corrosive materials, petroleum products, and unstable or dangerously reactive materials. They can be released through human error, malfunctioning or broken equipment, or as an indirect consequence of other emergencies. Facilities that hold hazardous materials include hazardous waste storage and treatment facilities, laboratories, hospitals, water and wastewater treatment plants, waste management facilities, fueling stations, and automotive shops. The release of hazardous materials can occur as a result of natural hazard events, such as earthquakes and other geologic hazards, floods, or severe weather. Hazardous materials can also be released accidentally during transportation, as a consequence of vehicle accidents.

A release or spill of hazardous materials could result in fire, explosion, toxic cloud, or direct contamination of water, people, and property. The effects may involve a local site or many square miles. The large-scale release of hazardous materials in combination with events such as flooding or severe weather can spread contaminants across a wide area and amplify the potential long-term impacts on human and ecological health. Health problems may be immediate, such as corrosive effects on skin and lungs, or gradual, such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Numerous studies and plans have identified several different types of hazardous material contamination have been documented in East Palo Alto.

The greatest concentration of affected sites is in the Ravenswood Transit-Oriented Development (TOD) Specific Plan Area, centered around Bay Road and the Cooley Landing area. This area was historically home to numerous industrial uses dating back to the nineteenth century. Many historic industrial sites have moderate to substantial contamination of soils and groundwater, as the handling, use, and disposal of hazardous materials were not as tightly regulated as they are today.

Polychlorinated biphenyl (PCBs, a carcinogen), metals, petrochemicals, and other harmful materials can be found at such sites. Many of these sites are currently undergoing cleanup activities, and others have restrictions that prohibit sensitive uses like homes or schools from being placed on top.

Besides industrial sites, other documented sources of hazardous materials in the city include areas of uncontrolled fill (meaning that materials used to fill in marsh or shorelands are not sourced from specific locations and may potentially contain hazardous wastes), former gas stations (particularly if underground storage tanks leaked), and areas formerly in agricultural use. Though agricultural uses may sound relatively benign when compared to industrial uses or gas stations, former agricultural properties will often have pesticide residue in the top two feet or more of soil. In addition, buildings constructed and/or painted before the late 1970s may contain asbestos and/or lead-based paint; demolition or removal of such buildings must conform to federal and state policies to ensure the safe handling and disposal of hazardous materials. Natural gas pipelines run throughout East Palo Alto, including a large natural gas transmission line that runs along Donohue Street and O'Connor Street. Damage to these pipelines or other system failures could result in a release of natural gas, which is flammable and explosive.

As a result of a cluster of agricultural, heavy manufacturing, chemical manufacturing, and auto wrecking uses, the City of East Palo Alto was a member of the US Environmental Protection Agency's (EPA's) Brownfields National Partnership, which selected the city as a Brownfields Showcase Community in 1997. This designation made the City eligible to receive federal funding to revitalize brownfield areas, where the potential presence of pollutants or hazardous materials may limit reuse. The Gateway 101 and University Circle area brownfields were redeveloped, and now contribute significant revenue to the City's general fund. The adoption of the Ravenswood TOD Specific Plan is the first major step to remediate the city's remaining brownfields, which are clustered in the Ravenswood Employment District.

Past Events

On September 9, 2010, a 30-inch-diameter natural gas transmission pipeline in San Bruno ruptured and released vast quantities of natural gas. The escaping gas ignited and initiated structure fires in the community surrounding the pipeline. Eight people lost their lives, 51 people required in-patient hospitalization, and 38 homes were destroyed. PG&E estimated the property damage from the rupture to be over $220 million.

Smaller hazardous materials incidents have historically occurred periodically in East Palo Alto. Eighteen hazardous materials incidents have been reported in East Palo Alto since 2006. Fifteen of these incidents were related to petroleum exposure, and three were classified as chemical incidents.

Existing Programs and Regulations

In 1993, the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program was established to protect public health and safety, restore and enhance environmental quality, and sustain economic vitality. A Certified Unified Program Agency (CUPA) manages hazardous materials and waste at a local level. The CUPA consolidates, coordinates, and makes consistent the regulatory activities of several hazardous materials and hazardous waste programs, including Hazardous Materials Management, California Accidental Release Prevention, Hazardous Waste Management, Underground Storage Tanks, Aboveground Storage Tanks, and Emergency Response. In 1996, San Mateo County Environmental Health Services was designated by the State Secretary for Environmental Protection as the CUPA for San Mateo County.

The Menlo Park Fire Protection District, through enforcement of the CA Fire Code, issues Operational permits for the storage and use of hazardous materials. The Menlo Park Fire Protection District works with the local CUPA and other agencies to coordinate proper handling and enforcement of hazardous materials. The Menlo Park Fire Protection District is trained and able to respond to hazardous materials incidents and will call upon San Mateo County Hazardous Material Team through Automatic Aid.

Hazardous materials response, mitigation, and cleanup for San Mateo County is managed by the Belmont Fire Protection District's Hazardous Materials Team through a contractual agreement between the County of San Mateo, the Emergency Services Council, and the Belmont Fire Protection District.

The San Mateo County Hazardous Materials Team is a partnership between Belmont Fire Protection District, San Mateo County Environmental Health, and the San Mateo County Office of Emergency Services through the San Mateo County Emergency Services Council. It has been providing service to all areas of San Mateo County since 1984. The Response Team is staffed 24 hours a day, 365 days per year with seven cross-trained firefighters from Belmont, as well as an Environmental Health and an OES Officer.

A complete list of active and inactive hazardous waste-regulated facilities is currently available on the County's Open Data site. This website is maintained by the California Environmental Protection Agency and includes activities related to hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials.

Future Conditions

The frequency and severity of future hazardous materials releases in East Palo Alto will depend on the scale of future activities. Increases in the frequency and severity of other natural hazards, such as floods or landslides, can affect the frequency and severity of future hazardous materials releases.

ISSUE 12: AIRPORT HAZARDS

General Overview

Safety risks associated with airport operations comprise a distinct hazards category. Lands surrounding or near an airport have an increased risk of experiencing accidents involving aircraft. Additionally, lead emissions from aircraft engines have been found to lower local air quality.[23] East Palo Alto is near three airports: the Palo Alto Airport, the San Carlos Airport, and San Francisco International Airport (SFO). The Palo Alto Airport is a general aviation facility just south of East Palo Alto. The northern edge of the airport's runway is immediately adjacent to San Francisquito Creek, which in this location serves as both the city and county boundary. East Palo is approximately six miles south of the San Carlos Airport. The city falls in the airport's Overflight Notification Area. East Palo Alto is approximately 16 miles southeast of SFO. Aircraft noise sources include aircraft arrivals at SFO and transitioning onto approach for Runways 28L and 28R.

Past Events

There have been occasional aircraft safety incidents at neighboring airports, including Palo Alto Airport and SFO. In 2010, a small plane crashed onto Beech Street, cutting off power in Palo Alto for 12 hours.[24]

Existing Programs and Regulations

Palo Alto Airport

The City of Palo Alto owns and operates the Palo Alto Airport. Airport and land use compatibility issues are overseen by the Santa Clara County Airport-Land Use Commission. The County has prepared a comprehensive land use plan (CLUP) for the Palo Alto Airport, which identifies zones around the airport where land use and building height restrictions are needed to guard against potential conflicts with airport operations. California law (Government Code Section 65302.3) requires that a local General Plan be consistent with the applicable airport land use plan compatibility criteria.

The Palo Alto Airport CLUP identifies building height restrictions (pursuant to Federal Aviation Regulations part 77) to ensure no obstructions to air navigation are created. A portion of the height restriction zone extends into the Baylands area of East Palo Alto, which is commonly known as the Faber-Laumeister Tract and is part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). The Baylands are the only portion of East Palo Alto within the Palo Alto Airport Influence Area (AIA).

San Carlos Airport

The Airport Land Use Compatibility Plan (ALUCP) for the environs of San Carlos Airport is the key implementation document of the Airport Land Use Commission (the C/CAG Board) policies related to proposed land development in the vicinity of the Airport. The ALUCP provides the standards, criteria, and

policies on which the compatibility of proposed local land use policy actions are determined. The ALUCP also establishes the planning boundaries around San Carlos Airport that define noise, safety, height/airspace protection, and overflight areas for policy implementation, and areas within which notification of the proximity of the Airport is required as part of real estate transactions

San Francisco International Airport (SFO)

SFO is responsible for the noise impacts within the immediate vicinity of the airport. The primary mechanism for controlling airport hazards from SFO is the *Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport* (ALUC). This document regulates aircraft noise, as well as building height, safety policies, and compatibility criteria for areas within the plan's jurisdictional boundary. Applicable City land use and development plans and ordinances are reviewed by the City/County Association of Governments Board of Directors, acting as the San Mateo County's Airport Land Use Commission, to ensure consistency. East Palo Alto is within AIA A of SFO, meaning that property sellers are required to inform new buyers or tenants about the presence of the airport.[25]

An SFO Roundtable was formed to address community noise impacts from aircraft operations at SFO by monitoring a performance-based noise mitigation program, interpreting community concerns, and attempting to achieve noise mitigation through the collaborative efforts of the Federal Aviation Administration (FAA), SFO management, and local government. The Roundtable includes representatives from local cities, County Board of Supervisors, and U.S. Congresswoman Jackie Speier's Office. East Palo Alto is not a member of the Roundtable.

Future Conditions

The frequency and severity of future airport hazards in East Palo Alto will depend on the scale of future activities.

CONCLUSION

This background report provides details on the issues that are discussed at a higher level in the City of East Palo Alto's Safety Element, serving as a foundation for associated goals, policies, and implementation actions. It is a technical appendix to the main Safety Element document. It is not necessary to be familiar with this background report in order to understand or use the Safety Element, but some readers may find this supplemental information helpful. This background report also contains information that is required by the California Government Code as part of the Safety Element, but which does not need to be included in the main Safety Element document.

ENDNOTES

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