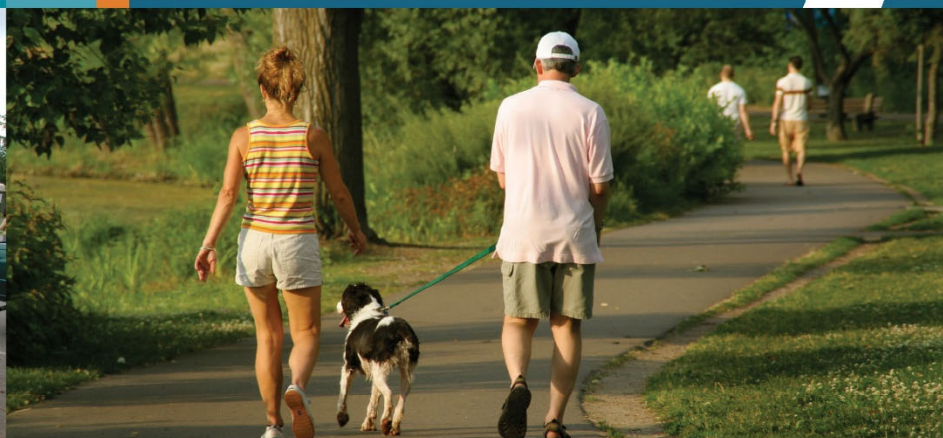




health and safety



Introduction

Community health and public safety responsibilities ~~have to~~ evolve to address the community's growth and changing needs. The City is committed to maintaining a high level of preparedness to protect the community from risks to life, property and the environment associated with both natural and human-caused disasters and hazards. In the future, more emphasis will be placed on sustainable approaches to community health and safety, including crime and fire prevention through design, improved use of technology, management of hazardous materials and improved disaster planning.

This Element includes goals, policies and strategies that address the potential risks associated with these hazards, actions the City can take to reduce these risks, and ways the City and community can take more sustainable approaches for preventing or minimizing injuries to life and damages to property.

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CONTEXT OVERVIEW

PURPOSE AND CONTENT

The Health and Safety Element includes the City's goals, policies, and strategies to minimize health and safety hazards and increase resilience in Cupertino. Section 65302(g) of the California Government Code requires that the Health and Safety Element contain background information and policies to address multiple natural hazards, an analysis of vulnerabilities from climate change, policies to improve climate change resilience, and an assessment of residential areas with evacuation constraints. The health and safety issues in Cupertino include the following:

- Emergency preparedness and response
- Fire hazards
- Hazardous waste and materials
- Electromagnetic fields
- Seismic and geologic hazards
- Flood and inundation hazards
- Climate change resilience
- Noise

This element is supported by the Health and Safety Element Background Report (**Appendix H**), which provides detailed information for each of the health and safety issues.

RELATIONSHIP TO OTHER LOCAL PLANS

Cupertino General Plan's Health and Safety Element is one of several plans that address community safety and related topics. Other City plans include the Santa Clara County Multi-Jurisdictional Hazard Mitigation Plan (Hazard Mitigation Plan), the Santa Clara County Community Wildfire Protection Plan, the Cupertino Climate Action Plan, and various local regulations. The Health and Safety Element is consistent with these other plans and integrates them as appropriate to ensure that the City has a unified strategy to address public safety and resilience issues.

GENERAL PLAN ELEMENTS

The Health and Safety Element provides policy direction and safety improvements that complement the intent and policies of other General Plan elements. How land uses are determined in areas prone to natural hazards, what regulations limit development in these areas, and how hazards are mitigated for existing development are all issues that tie the elements together. For instance, the Recreation, Parks, and Community Services Element must consider how hazards will affect the park and recreation infrastructure and facilities in Cupertino but also recognize that parks can provide strategies to reduce flood risks throughout the city. The Housing Element is also closely tied to the Health and Safety Element. Future potential development in the city must be protected from hazards and be able to adapt to climate change hazards to ensure homes and the people living in them remain safe. Health and Safety

Element policies, especially those concerning evacuation routes and critical facilities, must also be consistent with those of the Mobility Element. Interstate 280 and State Route 85 are Cupertino's primary evacuation routes, supported by routes designated as arterials in the City's Mobility Element.

SANTA CLARA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

The 2023 Multi-Jurisdictional Hazard Mitigation Plan assesses the risk of hazards and vulnerabilities from natural and human-caused hazards, including risk to people and facilities, and identifies short-term (five-year) mitigation actions to reduce or eliminate hazard risks. The Hazard Mitigation Plan includes a dedicated annex for the City of Cupertino, which discusses Cupertino's characteristics and history, development trends, hazard mitigation capabilities, integration with other hazard mitigation planning efforts, and vulnerabilities of specific facilities and infrastructure. Santa Clara County led the preparation of the Hazard Mitigation Plan in collaboration with the City and other local agencies and special districts, in accordance with the federal Disaster Mitigation Act of 2000 and the Federal Emergency Management Agency's hazard mitigation assistance guidance. The City Council adopted the Cupertino annex on October 1, 2024. The current Hazard Mitigation Plan, including Cupertino's annex, as certified by the Federal Emergency Management Agency, is incorporated into this Health and Safety Element by reference, as permitted by California Government Code Section 65302.6. It is available online at: www.cupertino.org/emergencyplans.

SANTA CLARA COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

The 2023 Santa Clara County Community Wildfire Protection Plan is a plan is to reduce fire hazards through increased information and education about wildfires, hazardous fuels reduction, actions to reduce structure ignitability, and other recommendations to assist emergency preparedness and fire-suppression efforts. The Santa Clara County Fire Department (Fire Department) prepared and published this plan, in collaboration with the Community Wildfire Protection Plan Core Team, made up of representatives of Santa Clara County organizations, including the City. The Santa Clara County Community Wildfire Protection Plan complements local agreements and existing plans for wildfire protection to coordinate efforts in determining appropriate fire management actions. The Community Wildfire Protection Plan is available online at: www.cupertino.org/emergencyplans.

CITY OF CUPERTINO CLIMATE ACTION PLAN

On August 16, 2022, the Cupertino City Council adopted the City's Climate Action Plan 2.0 to address climate change challenges. Cupertino's goal is to reduce the City's greenhouse gas emissions to net zero by the year 2040. The Climate Action Plan describes a series of community-wide and municipal measures and actions that will aid the City in reducing greenhouse gas emissions to meet community goals. The Climate Action Plan includes topics such as energy, transportation, waste, water, plants and animals, and natural systems, as well as an adaptation chapter that is intended to help residents prepare for extreme weather events and the impacts of a changing climate. The Climate Action Plan is viewed as a strategic framework that will be re-evaluated regularly. The Climate Action Plan has targeted communitywide carbon neutrality by 2040 in line with the emergency climate declaration made by the City Council in 2018 and in support of state and international climate goals. The Climate Action Plan is available online at: <https://www.cupertino.gov/Your-City/Divisions/Environment-Sustainability/Climate-Action>

CLIMATE CHANGE VULNERABILITY

Changes to the global climate system are expected to affect future occurrences of natural hazards in and around Cupertino. Many hazards are projected to become more frequent and intense in coming years and decades, and in some cases, these trends have already begun. According to California's Fourth Climate Change Assessment, Cupertino can expect to experience various changes from climate-related hazard events.

Climate change is expected to lead to an increase in wildfires in the surrounding area and across Santa Clara County due to hotter and drier conditions. Across the region, more frequent and intense wildfires may also create poor air quality for Cupertino. Warmer temperatures are projected to cause an increase in extreme heat events. The number of extreme heat days, defined in Cupertino as a day when the high temperature is at least 93.2 degrees Fahrenheit (°F), is expected to rise from a historical annual average of 5 to 14 days by the middle of the century (2035 to 2064), and an average of 24 days by the end of the century (2070 to 2099).

Both droughts and floods are expected to become more frequent as rainfall is likely to occur in fewer, more intense storms. Climate change is expected to cause an increase in heavy rainfall, which may also contribute to an increased risk of landslides in the hills around Cupertino. Climate change can increase infection rates from various diseases because many of the animals that carry diseases are more active during warmer weather. Warmer temperatures earlier in the spring and later in the winter can cause these animals to be active for extended periods, increasing the time these diseases can be transmitted.

What is vulnerability?

Vulnerability is the degree to which natural, built, and human systems are susceptible to harm from exposure to stresses associated with environmental and social change and from the absence of a capacity to adapt.

Source: California Governor's Office of Emergency Services. 2022. *California Adaptation Planning Guide*. <https://www.caloes.ca.gov/climate>.

VULNERABILITY ASSESSMENT

Under California law (California Government Code Section 65302[g]), the Health and Safety Element is required to include a vulnerability assessment of how people, buildings, infrastructure, and other key community assets may be affected by climate change. The City of Cupertino conducted a Climate Change Vulnerability Assessment as part of preparation of the Safety Element, which assessed how eight different climate-related hazards (air quality and smoke, drought, extreme heat, flooding, human health hazards, landslides, severe storms, and wildfire) may affect 45 different population groups and community assets. Each population or asset received a score of low, medium, or high vulnerability for each climate-related hazard. Cupertino's Vulnerability Assessment is included in the Health and Safety Element Background Report, **Appendix H** of the City's General Plan.

The Climate Change Vulnerability Assessment found that Cupertino's populations and assets are most vulnerable to flooding, extreme heat, and wildfire. Overall, residents in Cupertino tend to be most vulnerable to extreme heat, human health hazards, and flooding, which directly affect health outcomes. The most vulnerable population groups include those with chronic illness and/or disabilities, seniors living alone, households in poverty, and persons experiencing homelessness. Infrastructure and key services are also highly vulnerable, especially energy delivery and communication infrastructure, the transportation network and public transit services, and water and wastewater services, which can be disrupted by flooding that causes roadways to become impassable, extreme heat events that strain electricity transmission lines, and severe storms that cause Public Safety Power Shutoffs. To increase community resilience and help lower vulnerability, the Health and Safety Element includes goals, policies, and strategies, several of which are particular to the populations and assets identified to be highly vulnerable in the Vulnerability Assessment.

PUBLIC SAFETY ISSUES

The City's commitment to public safety encompasses two broad areas of responsibility: (1) provide public safety services, including preparing a response for emergencies such as natural disasters or structure fires; and (2) plan for a safe environment in which the public is not exposed to unnecessary risks to life and property. There are multiple areas in which the City develops policies and strategies to address Public Safety Issues as further described below.

EMERGENCY PREPAREDNESS AND RESPONSE

Emergencies can severely impact the health of a community and a city or agency's ability to provide needed services. Emergencies can include natural disasters such as earthquakes, floods, and forest fires, or other events such as infrastructure disruptions, security incidents, and~~or~~ hazardous spills.

Emergency preparedness includes activities that are undertaken before an emergency occurs so there is an effective and coordinated response. Emergency response accounts for actions taken after an emergency or disaster to minimize the negative effects, such as evacuation, emergency communication,

and coordinating first responders. Emergency preparedness and response requires the integration of the following elements into each of the City's functions: emergency planning, coordination, mitigation, training, and public education. The City, its contributing agencies, and the community are partners in ensuring that emergency planning is effectively implemented.

LOCAL EMERGENCY RESPONSE

The City of Cupertino's Office of Emergency Management, Santa Clara County Sheriff's Office West Valley Patrol Division, and Santa Clara County Fire Department conduct emergency preparedness activities in Cupertino.

City of Cupertino's Office of Emergency Management

The City's Office of Emergency Management (OEM) works to mitigate risks, to prepare, respond, and recover from emergencies affecting the city. OEM works with the Santa Clara County Sheriff's Office and Santa Clara County Fire Department to conduct emergency response activities in Cupertino.

OEM coordinates several volunteer programs vital to the community's preparedness and resilience. These programs include the Cupertino Citizen Corps, Block Leaders, and Neighborhood Watch. These initiatives engage residents in proactive measures to safeguard their neighborhoods, ensuring a robust community response in the face of emergencies. The OEM conducts regular community training sessions, equipping residents with essential disaster preparedness and response skills. For instance, the Cupertino Citizen Corps offers Community Emergency Response Team (CERT) training courses, which prepare volunteers to assist during emergencies and provide CPR and first aid certification. The Block Leaders program also trains residents to organize and support their immediate community, fostering a network of informed and prepared individuals.

Citywide exercises are essential for the OEM, simulating disaster scenarios to help officials, first responders, and volunteers practice their response strategies. These exercises ensure everyone knows their roles and can act promptly during emergencies. The OEM collaborates closely with City departments and public safety agencies to provide a unified and coordinated response.

The OEM also focuses on planning and protocol development and drafting and updating emergency response plans that align with state and federal guidelines. These plans cover various hazards, including earthquakes, floods, and wildfires, ensuring swift and effective recovery after an emergency. The collaborative efforts with City departments and public safety agencies ensure comprehensive coverage and efficiency.

By fostering a culture of preparedness and community involvement and working closely with City departments and public safety agencies, the OEM plays a crucial role in safeguarding Cupertino's residents, infrastructure, and services from potential hazards.

Santa Clara County Sheriff's Office

The Santa Clara County Sheriff's Office, specifically the West Valley Patrol Division of the Santa Clara County Sheriff's Office, provides law enforcement services to the City of Cupertino in addition to the cities of

Saratoga and Los Altos Hills, and the western unincorporated county areas from Summit Road to Moffett Field. The West Valley Patrol Division provides progressive law enforcement services and works towards maintaining healthy community partnerships.

The Sheriff's Office is integral to Cupertino's emergency response framework. In natural disasters, accidents, or other emergencies, the West Valley Division collaborates with the Office of Emergency Management and the Fire Department to coordinate evacuations and manage emergencies to deliver a swift, coordinated response.

The Santa Clara County Sheriff's Office strives to maintain high standards for their response times to ensure that critical situations are addressed promptly, enhancing the safety and security of the community, as follows:

- **Priority 1 incidents**, which include emergencies requiring immediate response, the expected response time is within five minutes.
- **Priority 2 incidents**, which involve urgent but not life-threatening situations, have a target response time of under nine minutes.
- **For Priority 3 incidents**, which are non-emergency calls, the Sheriff's Office aims to respond within 20 minutes.

The Sheriff's Office also participates in public safety education programs, informing residents about crime prevention, personal safety, and emergency preparedness. Deputies routinely participate in community events across all cities in this endeavor.

~~The City, and a number of surrounding jurisdictions, contracts with the Santa Clara County Sheriff's Office, West Valley Division, for law enforcement services. Law enforcement services include police patrols, criminal investigations, traffic enforcement, accident investigation and tactical teams.~~

Santa Clara County Fire Department

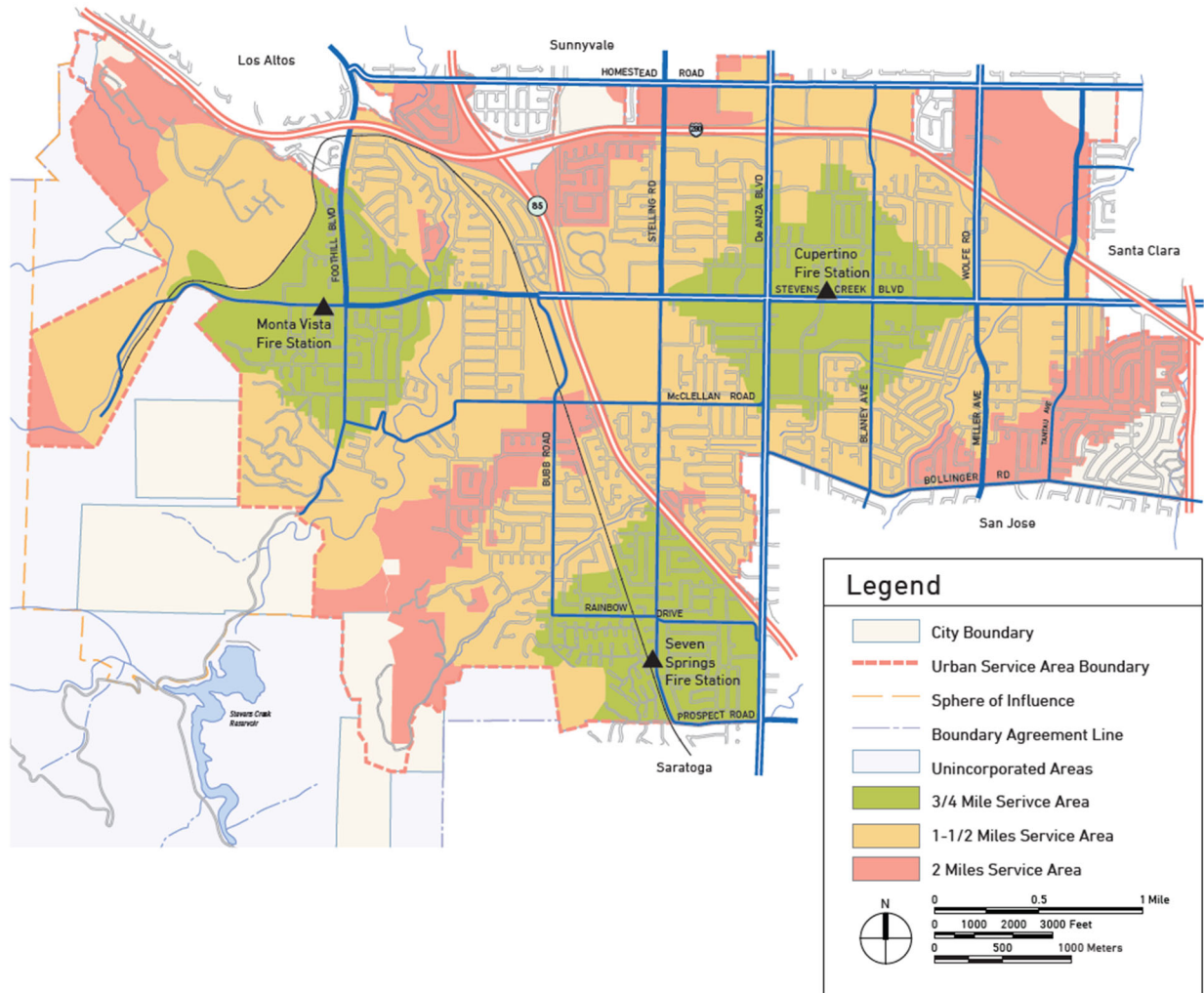
Firefighting and emergency medical services are provided to Cupertino by the Santa Clara County Fire Department through three fire stations:

- **Cupertino Fire Station** at 20215 Stevens Creek Boulevard
- **Monta Vista Fire Station** at 22620 Stevens Creek Boulevard
- **Seven Springs Fire Station** at 21000 Seven Springs Parkway

Figure HS-1 shows the location of fire stations and their service areas in Cupertino.

~~Response time is one metric for measuring level of service for fighting fire and emergency services. It is the policy of SCCFD to respond to 90 percent of emergency calls not requiring a paramedic in under seven minutes. For situations where emergency medical services are required, it is the policy that paramedics arrive in less than seven minutes at least 90 percent of the time. An increase in calls for fire service and traffic congestion may affect SCCFDs' critical response time, and the District may need to adjust or expand staff, and equipment in areas of high service demand in the future. Figure HS-3 shows the location of fire stations and their service areas in Cupertino.~~

FIGURE HS-1
FIRE SERVICE



Santa Clara County Fire Department is a full service, all-risk, “all hazard” fire department that provides similar services to six other West Valley cities and adjacent unincorporated county areas. The Santa Clara County Fire Department is an internationally accredited agency through the Commission on Fire Accreditation International; therefore, frequently monitors and reviews multiple performance metrics to assure prompt and efficient delivery of firefighting resources to all emergencies based on risk. These metrics are compiled into the Department’s Community Risk Assessment -Standards of Cover document available on the Santa Clara County Fire Department website.

The current performance benchmark is when fire apparatus arrives on scene to an emergency incident is:

- Structure fire incidents, the first unit should arrive within 7 minutes, 40 seconds, 90 percent of the time.
- Emergency medical incidents and non-structure fires, the first unit should arrive within 8 minutes, 40 seconds, 90 percent of the time.

These times are from when the incident is acknowledged at the dispatch center, a unit(s) are dispatched, responds, and arrives on scene.

Increases in population density will lead to an increase in service demand and potentially traffic congestion. This will impact the Fire Department’s critical response times, and the Department may need to adjust or expand staffing levels and equipment in areas of high service demand in the future.

The Fire Department’s Fire Prevention Division provides comprehensive fire/life safety plan review for land development, new building construction, interior remodel projects, fire suppression, and fire alarm systems. -The Division’s staff also perform construction inspections to ensure that completed projects conform to State and local fire safety regulations. In addition to conducting construction-related plan reviews and inspections, the Santa Clara County Fire Department provides annual occupancy and special event inspections, Defensible Space Inspections, and also offers community educational programs, such as those on Community Emergency Response Team (CERT) training, cardiopulmonary resuscitation (CPR), and first aid certification.

The Fire Department also provides first response Advanced Life Support paramedic level services to Cupertino. through an exclusive operating area agreement between the County of Santa Clara and Rural/Metro of California, Inc., d/b/a American Medical Response.

The Department maintains a Santa Clara County Emergency Medical Service Multi-Casualty Incident supply trailer for large-scale emergency medical incidents and is a participant in Master Mutual Aid in the event of major disasters. In the event of a wildfire or an emergency, the Fire Department can issue evacuation warnings or evacuation orders in coordination with the Santa Clara County Sheriff’s Office and Cupertino’s Office of Emergency Management.

EMERGENCY PLANNING

The State of California requires all state, regional, and local agencies and utilities, including the Pacific Gas and Electric Company (PG&E) and Santa Clara Valley Water District, to maintain their own emergency plans relating to the infrastructure they install and maintain. The City of Cupertino's Office of Emergency Management (OEM) coordinates citywide emergency planning and protocol development.

CUPERTINO EMERGENCY PLAN

Additionally, State law requires cities to prepare an emergency plan ~~in order to~~ effectively respond to natural or human-caused disasters that threaten lives, the natural environment, or property. In the event of an emergency, the City would implement the Cupertino Emergency Operations Plan and rely on State, regional, and local agencies to implement their emergency operations plans, with the City supporting as needed.

The Cupertino Emergency Operations Plan establishes an organizational framework to enable the City to manage its emergency response activities and to coordinate with County, State, and ~~f~~Federal agencies. The Emergency Operations Plan was prepared in accordance with the National Incident Management System (~~NIMS~~) and is used in conjunction with the State Emergency Plan, the Santa Clara Operational Disaster Response and Recovery Area Interim Agreement, Santa Clara County Emergency Operations Plan, as well as plans and Standard Operating Procedures (~~SOPs~~) of contract agencies and special districts. The City reviews the Emergency Operations Plan annually and conducts periodic emergency disaster drills to ensure the plan is effective.

When an incident occurs anywhere in Cupertino, the Santa Clara County Sheriff's Office and/or the Santa Clara County Fire Department will be the first to arrive at the scene, where they will implement the incident command system (ICS) and determine which agencies and resources need to be involved. Support personnel, such as City staff, special districts, and volunteer groups, are trained to perform specific functions in ICS and the Emergency Operations Center.

The City maintains the Cupertino Alert, Warning, and Notification Program, which provides critical alerts and warnings to the public while sharing information among City departments and partner agencies before, during, and after an emergency. The Alert, Warning, and Notification Program is designed to help the City's departments effectively coordinate information sharing and provide alerts, warnings and notification to the public before, during, and after any emergency or situation.

To reach as many people as possible with crucial information, the City's emergency alert, warning, and notification plan includes several information methods, such as the Emergency Alert and Warning System (AlertSCC, Genasys Protect), Integrated Public Alert and Warning System (IPAWS), Cupertino.org, the City Channel (TV), Radio Cupertino, and social media sites such as Nextdoor, Facebook and X. AlertSCC is capable of notifying anyone who lives or works in Cupertino that is impacted by, or is in danger of being impacted by, an emergency. Alerts are distributed through AlertSCC via voice or text

messages to cell phones, home phones, personal digital assistants, laptops, desktop computers, and Teletypewriter/Telecommunications Devices for the Deaf (TTY/TDD) devices for the hearing impaired. IPAWS, FEMA's national alert system, is an online tool enabling jurisdictions to send emergency alerts to the public. It enables emergency officials to issue effective warnings during serious emergencies using the Emergency Alert System, Wireless Emergency Alerts, and the National Oceanic and Atmospheric Administration Weather Radio. The City also uses volunteers to disseminate public information about extreme weather events through an outreach program called Raising Awareness of Community Hazards.

EMERGENCY OPERATIONS CENTER

The City's Emergency Operations Center is located on the first floor of City Hall, with an alternative location in the Service Center on Mary Avenue. The staffing and duties of the Emergency Operations Center are actively managed through the City's Emergency Operations Plan.~~The EOC can be fully functional within 30 minutes of activation for a Level 3 activation on a work day, to up to multiple hours for a Level 1 activation on a weekend.~~ Capabilities include emergency backup power, computer network and internet access, and telephone and radio communications to City and County sites. ~~While the staffing and duties are actively managed through the City's Emergency Operations Plan, there may be additional physical and seismic improvements required to City Hall to ensure that it can continue to meet the requirements of an Emergency Operations Center EOC.~~ It should be noted that due to structural deficiencies at the existing City Hall location, there may be additional physical and seismic improvements required to City Hall building to ensure that it can continue to meet the requirements of an Emergency Operations Center.

Additional communication support is provided by volunteers from Cupertino Amateur Radio Emergency Service (CARES). CARES volunteers coordinate extensive citywide communications capabilities, including helping to connect neighbors, public safety officials, special districts, the City, and County dDepartments.

DISASTER SERVICE WORKERS AND OTHER VOLUNTEERS

~~During emergencies, all City employees are designated Disaster Service Workers under Section 3100 of the California Government Code.~~All City employees are designated Disaster Service Workers under Section 3100 of the California Government Code during declared emergencies. They ~~are~~ may be required to remain at work as long as they are needed, and receive specific training in personal and home preparedness, First Aid, CPR, National Incident Management System~~NIMS~~, and Terrorism Awareness.

Volunteer groups also play an important role in the City's Emergency Operations Plan. ~~The City is part of a countywide volunteer services plan and is working with the Emergency Volunteer Center, Blockleaders, and Neighborhood Watch to develop a plan for coordinating and deploying volunteers.~~ Citizen Corps members (CARES, CERT, and Medical Reserve Corps) continue to receive appropriate training and equipment to rapidly respond throughout the ~~City~~city and augment professional first

responders. Unregistered and untrained volunteers may be utilized and trained, as needed during a disaster.

EMERGENCY EVACUATION

With advanced warning, evacuation can effectively reduce injury and loss of life during a catastrophic event. Emergency evacuations can be triggered by a number of hazard events, especially wildfire and flooding, with the main goal of providing information to support residents and employees leaving a hazardous area in an orderly fashion. As shown in **Figure HS-2**, primary emergency access and evacuation routes include Interstate 280, which intersects the city from the northwest to the east along the northern portion of the city, State Route 85, which intersects the city from the north to southeast through the central portion of the city, and other local roadways that connect to these primary evacuation routes. It is important to note that the recommended evacuation routes in any given situation will depend on the specifics of the emergency.

The Santa Clara County Sheriff's Department manages evacuation events in Cupertino in coordination with the City's Emergency Manager and Santa Clara County Fire Department. During an evacuation event the City and County Sheriff's Department use the online Genasys Protect platform to identify evacuation zones and send out notifications to residents in those zones with evacuation warnings and/or orders. Evacuation orders and warnings are also sent out through AlertSCC emergency notification platform. There are 34 contiguous evacuation zones in the city. Maps of each zone are available through the City's website: www.cupertino.gov/evacuation.

California Government Code Section 65302(g)(5) requires cities to identify evacuation constrained residential parcels in hazard areas that do not have at least two emergency evacuation routes. Nearly all parcels in the city are in at least one hazard zone. **Figure HS-3** shows residential parcels with evacuation constraints. This includes residential parcels located on a single access road and parcels in cul-de-sac neighborhoods with 10 parcels or more. As shown on **Figure HS-3**, evacuation constrained residential parcels in the western portion of Cupertino are also within Fire Hazard Severity Zones. The lack of multiple emergency access points limits roadway access for these properties, which may create difficulties if there is a need to evacuate.

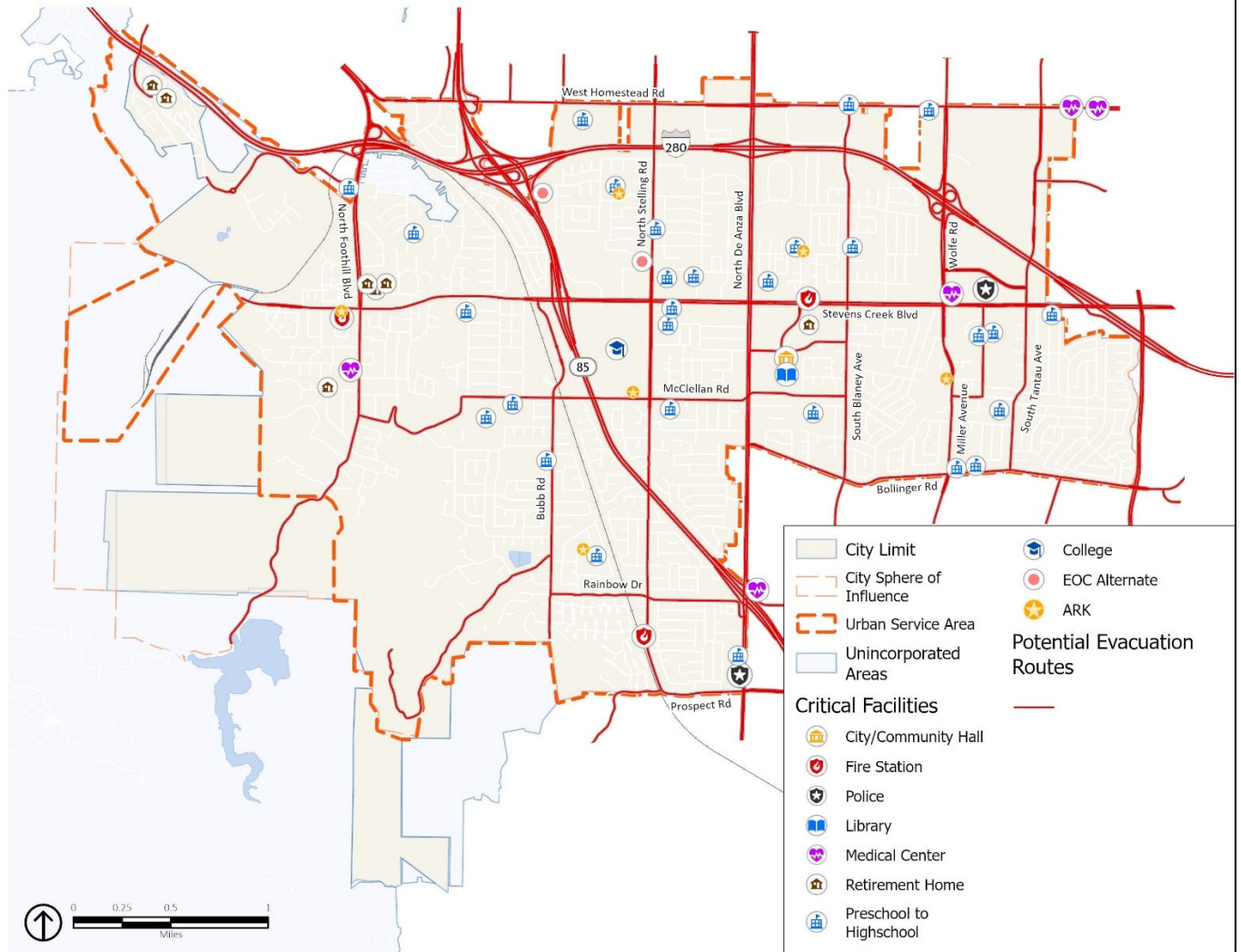
California Government Code Section 65302.15 requires Safety Elements to identify evacuation routes and their capacity, safety, and viability and evacuation locations under a range of emergency scenarios. In coordination with the Santa Clara County Sheriff's Office and Santa Clara County Fire Department, the City conducted an Evacuation Route Capacity Assessment in October 2025 in compliance with Government Code Section 65302.15. The assessment evaluates the capacity, safety, and viability of evacuation routes and locations under three wildfire evacuation scenarios, assuming that evacuations would occur in the western portions of Cupertino:

- **Scenario A:** A wildfire evacuation in the Fall at 2:00pm and all roadways would be open.

- **Scenario B:** A wildfire were to occur after an earthquake and evacuation would occur in the Summer at 6:00pm with road closures.
- **Scenario C:** A wildfire were to occur after an earthquake and evacuation would occur in the Fall at 2:00pm with road closures.

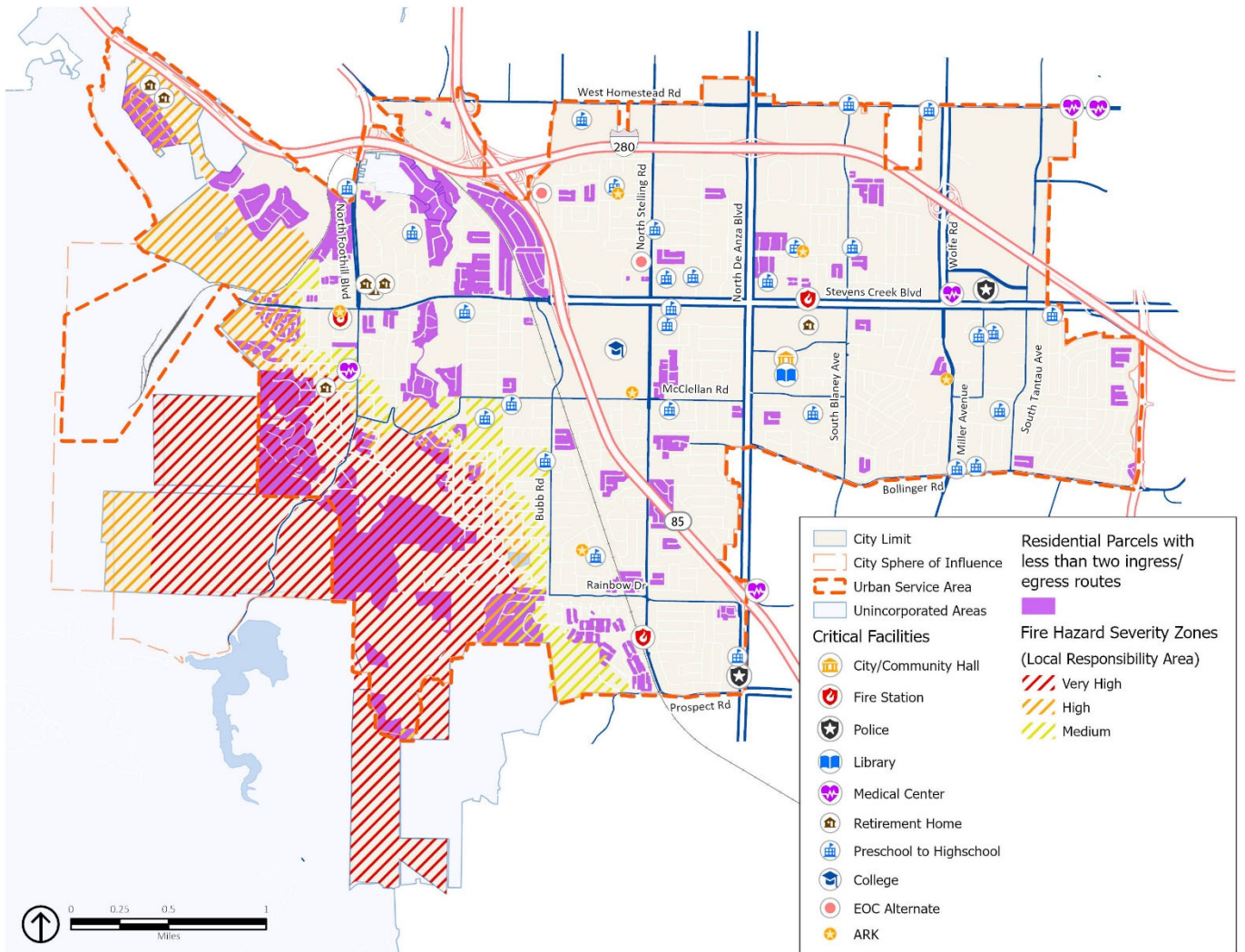
Based on these three scenarios, the assessment defines the evacuation area, evacuation routes, and estimates vehicle trips. The assessment found that each scenario would have varying capacity and viability constraints due to the number of evacuees, type of evacuees, and potential road closures. It is important to note that emergency scenarios are often unpredictable, and it is anticipated that evacuees would vacate at a rate that closely resembles a bell curve from the time an evacuation order is issued. **General Plan Appendix I** provides additional details about the Evacuation Route Capacity Assessment, including the analysis methods and results.

FIGURE HS-2
POTENTIAL EVACUATION ROUTES



Source: City of Cupertino, 2023; OpenStreetMaps, 2023

FIGURE HS-3
EVACUATION CONSTRAINED
RESIDENTIAL AREAS



Source: US Geological Survey; National Aeronautics and Space Administration; OpenStreetMaps; City of Cupertino, 2023; Cal FIRE, 2015

~~FIRE SAFETY~~ FIRE HAZARDS

Fire hazards include wildfires and urban fires. The combination of complex terrain, climate, vegetation, and development patterns contribute to an elevated risk of wildfire. Historically, the fire season extended from early summer through late fall of each year during the hotter, drier 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.

Two types of fires are of concern to Cupertino: wildfires, and structural fires.

WILDFIRES

Wildfires occur on mountains, hillsides, and grasslands. Fuel, weather, and topography are primary factors that affect how wildland fires spread. In and around Cupertino, grassland and woodland habitat provide highly flammable fuel that is conducive to wildfires. Due to Cupertino's geographical location, it is exposed to hazards from both wildland and urban fires. There are approximately 16 square miles of hillsides included in and around the boundary of the city. These areas include State Responsibility Area (SRA) lands west of the city, such as Rancho San Antonio Open Space, Picchetti Ranch Open Space, Saratoga Creek County Park, and Sanborn County Park, as well as Local Responsibility Area (LRA) lands, including McClellan Ranch Preserve, Stevens Creek County Park, Fremont Older Open Space, residential neighborhoods along the western hillsides of the city, and the hillsides of Saratoga.

There is limited information on historic fires in the Cupertino area. However, there is no recorded history of wildfires within the city. The closest known wildfire was the Stevens Fire which occurred on August 30, 2007. This wildfire burned 151 acres in the dry brush-covered hills near Stevens Creek Canyon southwest of Cupertino.

Changing climate conditions are expected to increase the fire risk in and around Cupertino. For instance, warmer temperatures brought on by climate change can exacerbate drought conditions and droughts can kill or dry out plants, creating more fuel for wildfires. Increased winds can result in more erratic fire behavior, making fires

Fire Hazard Severity Zones and Responsibility Areas

CAL FIRE designates Fire Hazard Severity Zones, which may be designated Very High, High, or Moderate. Several factors are considered, including fire history, existing and potential vegetation fuel, flame length, blowing embers, terrain, and weather patterns for the area. CAL FIRE designates Fire Hazard Severity Zones in two types of areas depending on which level of government is financially responsible for fire protection.

Local Responsibility Areas:

Incorporated communities are financially responsible for wildfire protection.

State Responsibility Areas: CAL FIRE and contracted counties are financially responsible for wildfire protection.

harder to contain. Warmer temperatures are also expected to occur later in the year, extending the wildfire season, which is likely to begin earlier in the year and extend later than it has historically.

FIRE HAZARD SEVERITY ZONE

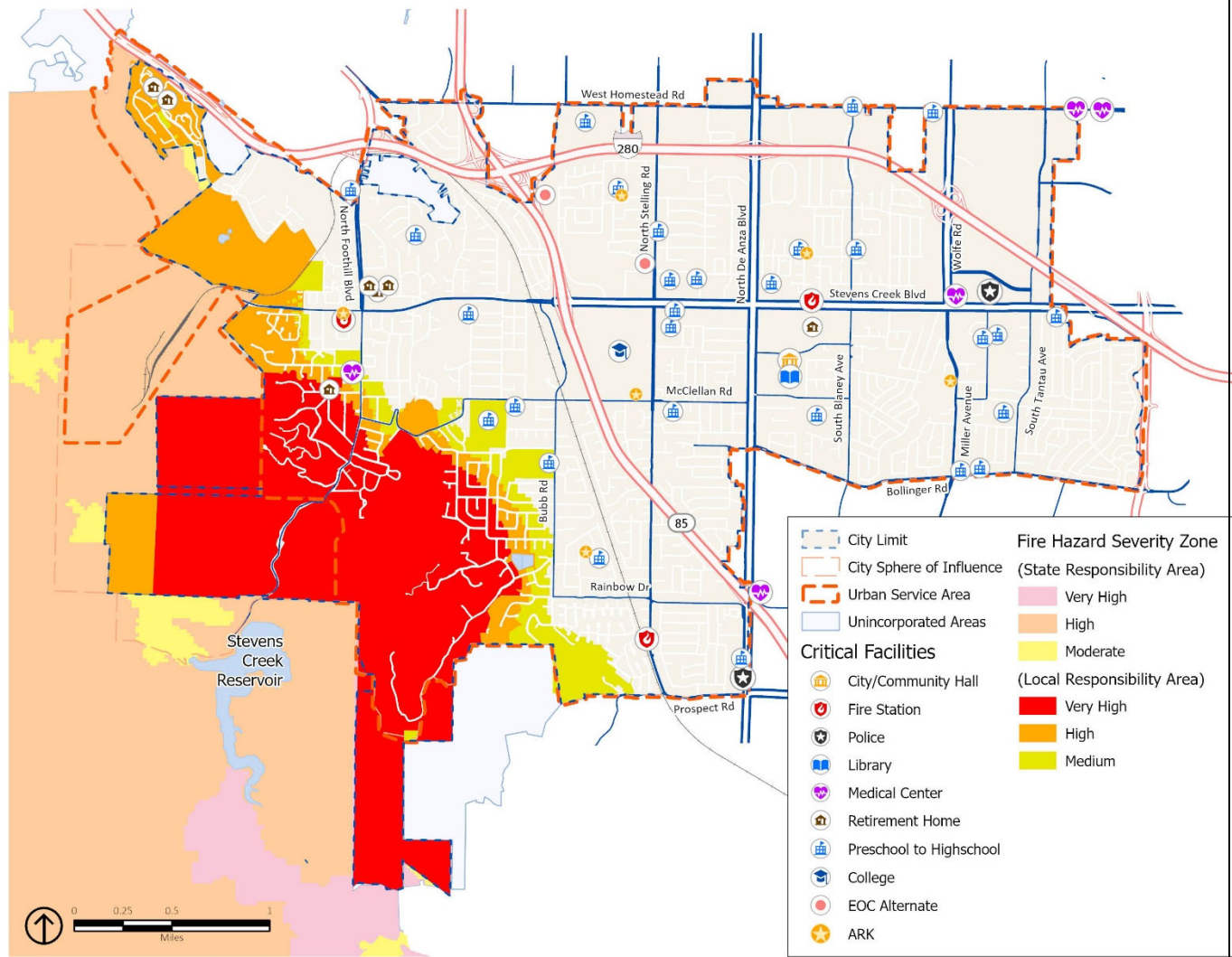
The California Department of Forestry and Fire Protection (CAL FIRE) establishes Fire Hazard Severity Zones (FHSZs) in both state responsibility area (SRA) and local responsibility areas (LRA), designating each as moderate, high, or very high severity. These zones evaluate *hazard*, instead of *risk*, and are based on fuel loading, slope, fire weather, and other relevant factors, such as areas where winds have been identified as a major cause of wildfire spread. *Hazard* is based on the physical conditions that create a likelihood and expected fire behavior over a 30 to 50-year period without considering hazard reduction measures such as home hardening, whether a wildfire has recently occurred, or fuel reduction efforts. Development in Very High FHSZs, and where applicable within Moderate or High FHSZs as determined by local fire code adoption, must comply with additional State requirements for building and site design, including the latest provisions of the California Building Code, California Residential Code, and California Fire Code. Figure HS-4 shows the FHSZs in and around Cupertino.

In June 2025, the City adopted the updated Local Responsibility Area FHSZ map into Cupertino Municipal Code Chapter 16.74, *Wildland Urban Interface Fire Area*. During the review and adoption process, the FHSZ was revised to ensure that only one FHSZ applied to each applicable parcel. Where CAL FIRE identified multiple FHSZs on a single parcel, the City upgraded the designation to the higher of the zones, to ensure consistency in implementation of fire hazard reduction measures.

~~In 2009, based on vegetation data, topography and potential fire behavior, the California Department of Forestry and Fire Protection (CalFire) identified approximately three acres of the City to be in the High and Very High Fire Hazard Severity Zone. The City adopted this area as its Wildland Urban Interface Fire Area (WUIFA). Properties in the WUIFA are subject to building and property maintenance standards intended to prevent and manage community safety due to brush and forest fires (Figure HS-1). Planning for such areas also requires attention to the availability of access roads and water for firefighting and evacuation efforts.~~

~~The City regulates building construction and site planning through the Uniform Fire Code and the California Building Code. The City and the SCCFD inspect commercial and industrial buildings for compliance with the applicable codes. In addition, the County Fire Marshal and the Fire Department regulate activities, including weed abatement and brush clearance, in the Wildland Urban Interface Fire Area (WUIFA).~~

FIGURE HS-4
FIRE HAZARD SEVERITY ZONES



Source: City of Cupertino, 2023; Cal FIRE, 2022

Santa Clara County lists the Montebello Road/Stevens Canyon area as the fourth-highest risk area in the county for fire hazards. The road linking Montebello and the Palo Alto Sphere of Influence ~~to~~on the ~~bottom-south end~~ of Stevens Canyon has been improved to acceptable standards for a fire access road. ~~A fire trail extends from Skyline Boulevard on Charcoal Road to Stevens Canyon.~~ The City requires that all emergency roads be constructed in accordance with locally adopted Fire Code and Standards. It also requires a private emergency access connection between public streets ~~with~~ in Lindy Canyon and Regnart Canyon areas. Presently, there are no water systems serving the Montebello Road and upper Stevens Canyon area, ~~with the exception of~~except for Stevens Creek itself. ~~Because there is no water service to these areas,~~ The County requires homes to provide individual water tanks and fire sprinkler systems private fire protection water supply tanks and hydrants since there is no water service to these areas. ~~(Figure HS-5 illustrates the water service areas in the city).~~

The urbanized portions of Cupertino are not ~~exposed to~~in areas considered a risk of fire designated fire hazard severity zones. The ~~City~~city is served by ~~a~~ well-managed ~~fire protection service~~all hazard emergency response services with a robust ~~as well as a~~ fire prevention program. ~~Buildings in the City are relatively new.~~ Moreover, ~~and~~ there is a strong code enforcement program, an adequate water supply, and a well-maintained delivery system. State, regional, and local standards also ensure that new buildings and facilities adequately address issues of fire safety, access, evacuation, and fire-fighting requirements.

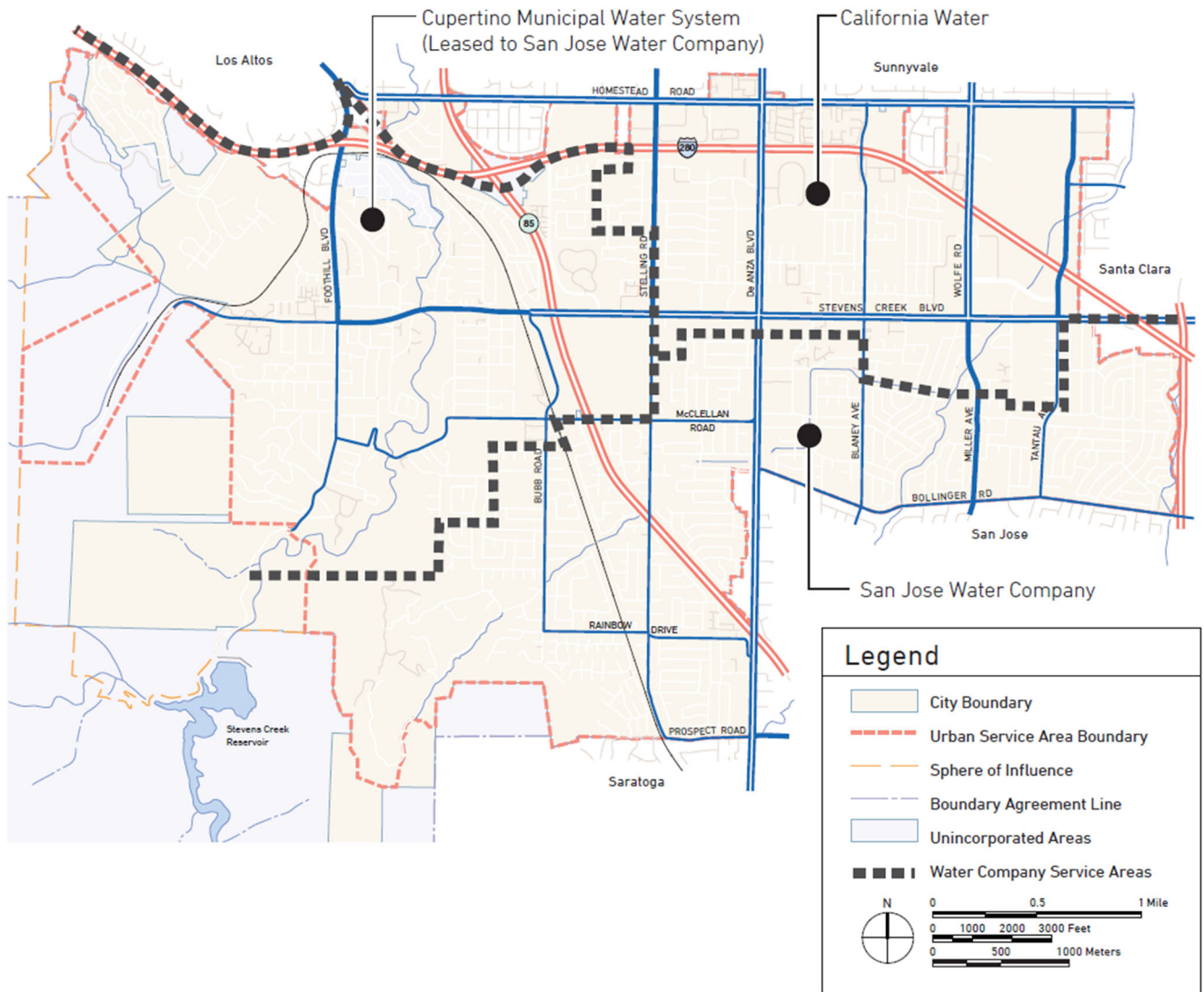
STRUCTURAL FIRES

Cupertino is also at risk from structural fires. Structural fires are often due to hazardous conditions, faulty wiring, mechanical equipment, or combustible construction materials in the built environment. The absence of fire alarms and fire sprinkler systems often exacerbates the damage associated with a structural fire. Structural fires are largely caused by human accidents, although deliberate fires (arson) may cause some events. Older buildings lacking modern fire safety features may face greater risk of fire damage. To minimize fire damage and loss, the City's Fire Code, based on California Code of Regulation Title 24, sets standards for building and construction. It requires adequate water supply for firefighting, and minimum street widths, among other things.

FIRE PROTECTION

Santa Clara County Fire Department provides fire protection in Cupertino through three fire stations (Cupertino, Monta Vista, and Seven Springs stations). For existing commercial buildings, the Fire Department conducts periodic inspections to ensure compliance with the general and specific fire safety regulations for each occupancy type as specified in the adopted Fire and Building Codes. The Santa Clara County Fire Department also implements a hazardous brush inspection program for hillside areas within its jurisdictional boundaries, including inspections of hillside properties by fire crews beginning in early April each year.

FIGURE HS-5
WATER SERVICE



HAZARDOUS WASTE AND MATERIALS

Hazardous materials are materials that pose a significant risk to public safety, or human and environmental health. Hazardous materials are a part of our everyday life in the form of batteries, light bulbs, and household chemicals such as pesticides, motor oil, cleaners, and paints. They are also used in many commercial and industrial operations. The use, storage, and disposal of hazardous materials, including management of contaminated soils and groundwater, is regulated by Federal, State, and local laws. A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud, or direct contamination of water, people, and property. The release or spill could involve a local site or many square miles, depending on its severity.

Santa Clara County Fire Department, County of Santa Clara Office of Emergency Management, and County of Santa Clara Hazardous Materials Compliance Division are responsible for hazardous materials accidents at all locations within the city. The City has adopted a Hazardous Materials Storage Ordinance that regulates the storage of these materials in solid, and liquid and gas forms. ~~The City's Regulation of Facilities Where Materials Which Are Or May Become Toxic Gases Are Found Ordinance regulates the storage of hazardous materials in gaseous form.~~ Several State agencies, which have jurisdiction over hazardous materials sites, oversee the monitoring of hazardous materials and waste facilities. Potential and known contamination sites are monitored and documented by the California Department of Toxic Substances Control and the Regional Water Quality Control Board. **Figure HS-6** identifies potential sites within the city that may contain hazardous materials. The California Department of Toxic Substances Control typically acts as the lead agency for sites involving toxic substances and remediation, while the Regional Water Quality Control Board leads issues concerning water quality. Additionally, the County of Santa Clara Department of Environmental Health serves as the oversight agency for sites within the city. It is important to note that the City is not the lead agency for cleanup or mitigation of these sites under the California Environmental Quality Act.

A review of hazardous materials sites in Cupertino,¹ produced by the California Department of Toxic Substances Control EnviroStor database indicates two active voluntary cleanup sites, a voluntary cleanup site requiring no further action, one certified school cleanup site, and three closed hazardous waste sites, three inactive sites, and five sites referred to local or regional agencies. The two active cleanup sites are Cupertino Village Cleaners at 10989 North Wolfe Road and Delia's Cleaners at 7335 Bollinger Road. Neither site requires action by the City, as the California Department of Toxic Substances Control oversees hazardous waste cleanup efforts at these locations. A review of leaking underground storage tanks in Cupertino, produced by the State Water Resources Control Board,² indicates 14 open cleanup program sites in the assessment, remediation, and long-term management phases. These sites can be accessed for further details via the following links:

¹ The City conducted a review of hazardous materials sites on December 26, 2025.

² The City conducted a review of leaking underground storage tank sites on December 26, 2025

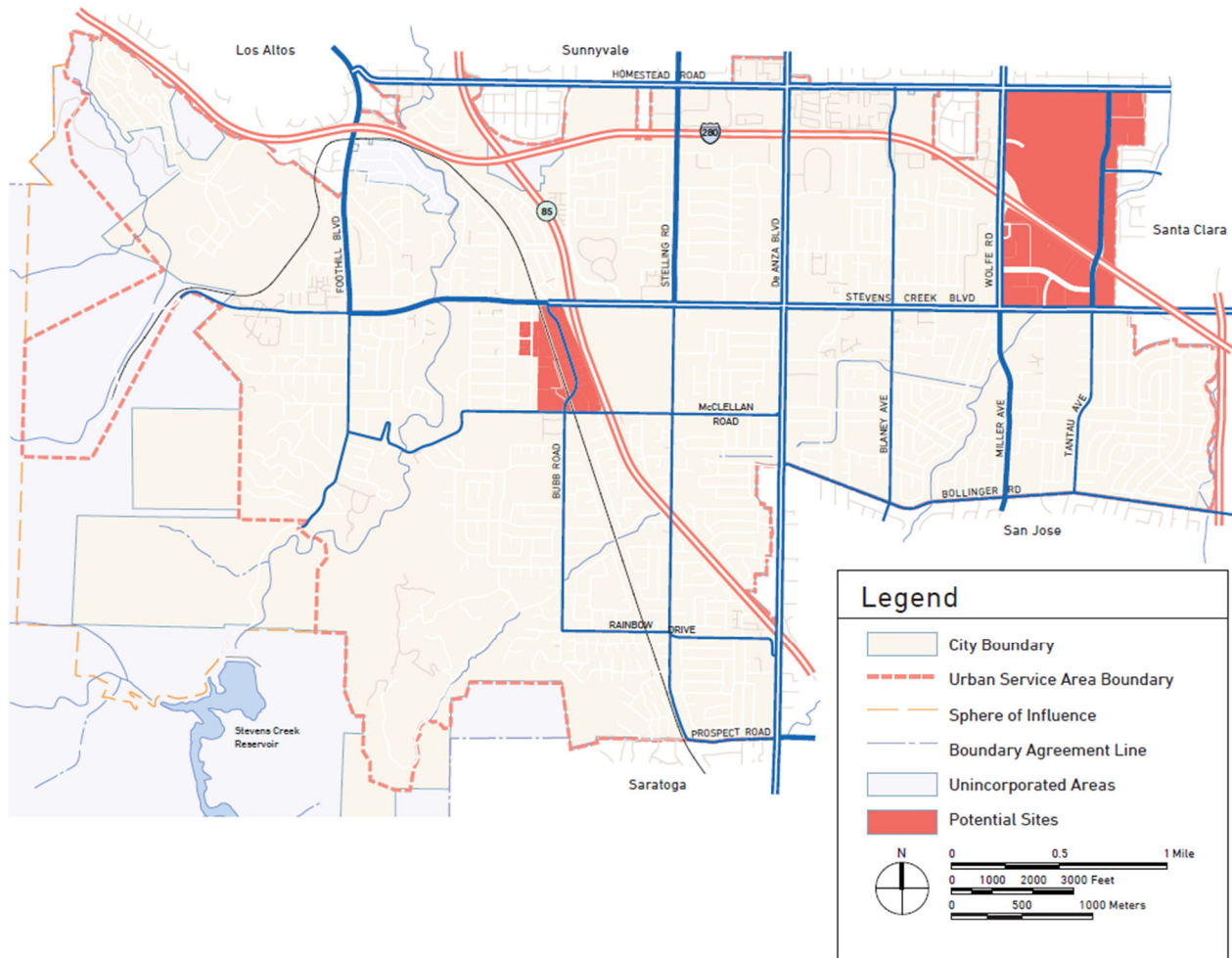
- [California Department of Toxic Substances Control EnviroStor database:](https://www.envirostor.dtsc.ca.gov/public/map/)
- [State Water Resources Control Board GeoTracker database:](https://geotracker.waterboards.ca.gov/map/)

Since 1990, State law has required that hazardous waste be properly disposed of in approved hazardous waste treatment or disposal facilities. To accomplish this, new treatment methods and facilities have been developed and approved to pre-treat hazardous waste before its final disposal. Under authority of the 1986 “Tanner” Bill ([Assembly Bill 2948](#)), Cupertino, along with 13 other cities [in Santa Clara County](#), joined the County to develop a comprehensive and coordinated planning approach to hazardous waste disposal. In 1990, a countywide Household Hazardous Waste (HHW) Program was created [to provide residents with accessible options for safely disposing of hazardous materials, such as paints, batteries, and chemicals, thereby reducing environmental and public health risks.](#) In order to supplement the County HHW Program and make the collection of HHW more convenient for residents, the City currently provides a door-to-door hazardous waste retrieval service through its solid waste franchise agreement.

ELECTROMAGNETIC FIELDS

Electromagnetic fields (s) are a physical field produced by electrically charged objects, such as high-voltage transmission power lines. The potential health effects of the very low-frequency [electromagnetic fields](#) (EMFs) surrounding power lines and electrical devices are the subject of on-going research and a significant amount of public debate. The U.S. National Institute for Occupational Safety and Health (NIOSH) has issued some cautionary advisories but stresses that the data is currently too limited to draw [solid](#) ~~good~~ conclusions. Currently, electromagnetic fields from transmission lines, electrical and wireless facilities, and appliances are heavily regulated through ~~F~~ederal and State requirements.

**FIGURE HS-6
POTENTIAL HAZARDOUS SITES**



~~GEOLOGIC AND SEISMIC HAZARDS~~ SEISMIC AND GEOLOGIC HAZARDS

Seismic and geologic hazards are risks caused by the movement of different parts of the earth's crust or surface. Seismic hazards include earthquakes and hazardous events caused by them. Geologic hazards are other hazards involving land movements that are not linked to seismic activity and can inflict harm to people or property.

SEISMIC HAZARDS

Seismic activity occurs along boundaries in the earth's crust, called faults. Pressure along the faults builds over time and is ultimately released, resulting in ground shaking commonly referred to as an earthquake. Earthquakes can also trigger other hazards, including surface rupture (cracks in the ground surface), liquefaction (causing loose soil to lose its strength), landslides, and subsidence (sinking of the ground surface).

Earthquakes

While Cupertino is at risk from many natural and human-caused hazards, the event with the greatest potential for loss of life or property and economic damage is an earthquake. This risk is true for most of the San Francisco Bay Area region, which has several active faults. Earthquake risk is very high in Santa Clara County, including the City of Cupertino, due to the presence of three major active faults³ in the region, the Hayward Fault, Calaveras Fault, and San Andreas Fault. All of these faults have the potential for major earthquakes. **General Plan Appendix E** provides additional detail about seismic hazards, magnitude and occurrence, acceptable exposure risk, and technical investigations required based on acceptable risk.

Earthquakes are likely to continue to occur on an occasional basis. Most are expected to cause no substantive damage and may not even be felt by most people. Major earthquakes are rare but have occurred and remain a possibility in the region. The Hayward Fault is emerging as a significant hazard throughout the Bay Area due to its heightened likelihood of activity and its intersection with densely populated areas and critical infrastructure. In a worst-case scenario, a rupture on the Hayward Fault could extend through the Calaveras Fault to its junction with the San Andreas Fault. According to the Uniform California Earthquake Rupture Forecast, there is a 14.3 percent probability of a magnitude 6.7 or greater earthquake occurring along the Hayward Fault by 2044. For the Calaveras Fault, the probability is 7.4 percent, while the San Andreas Fault has a 6.4 percent chance of experiencing a similar event in the same timeframe. Although infrequent, a major earthquake along any of the nearby faults could result in substantial casualties and damage, although the greatest risk in Cupertino is from the San Andreas Fault due to its proximity and high potential to cause a severe earthquake. A major earthquake along any of these faults could damage or destroy transportation infrastructure, such as Interstate 280, State Route 85, or bridges, limiting access in and out of the community.

³ Active faults are defined by their current movement and deformation and their potential to cause earthquakes or other types of ground deformation in the future.

~~Cupertino is located in the seismically active San Francisco Bay region, which has several active seismic faults.~~ The San Andreas ~~F~~fault, one of the longest and most active faults in the world, is ~~located~~ west of Cupertino. Two additional faults closely associated with the San Andreas ~~F~~fault include the Sargent-Berrocal and Monta Vista-Shannon ~~F~~fault systems that also crossintersect the western portion of the city. There are no Alquist-Priolo Earthquake Fault Zones in the city; the nearest Alquist-Priolo Earthquake Fault Zone is along the San Andreas Fault, west of the city. Figure HS-7 shows the location of regional faults and Alquist-Priolo Earthquake Fault Zones, which outlines the areas at risk for potential surface fault rupture.

Movement on the San Andreas ~~F~~fault is predominantly right-lateral strike-slip, where the earth ruptures in a horizontal fashion, with the opposite sides of the fault moving to the right with respect to each other. Movement on the Sargent-Berrocal and Monta Vista-Shannon ~~F~~faults is more variable in style. ~~Both of these~~Both faults are characterized by “thrust” faulting, where a significant amount of vertical “up-down” ~~(so-called dip-slip)~~ displacement occurs on an inclined plane, and one side of the fault is elevated (i.e., thrust over) the other side.

~~Primary geologic hazards in Cupertino are related to landslides and seismic impacts. Seismically induced ground shaking, surface fault rupture, and various forms of earthquake-triggered ground failure are anticipated within the city during large earthquakes. These geologic hazards present potential impacts to property and public safety. Tables HS-1 through HS-4 briefly explain seismic hazards, magnitude and occurrence, acceptable exposure rise, and technical investigations required based on acceptable risk. Figure HS-5 identifies the areas in Cupertino susceptible to the greatest risk. Also see Technical Appendix E for additional information on geologic and seismic hazards and risks.~~

~~Following the 1983 Coalinga and 1994 Northridge earthquakes, scientists became increasingly aware of earthquakes generated by faults not previously observed at the earth’s surface. These types of faults are called “blind faults,” and represent a type of thrust fault that does not rupture completely to the surface. It is possible that one or more “blind faults” are present in the Monta Vista-Shannon fault system.~~

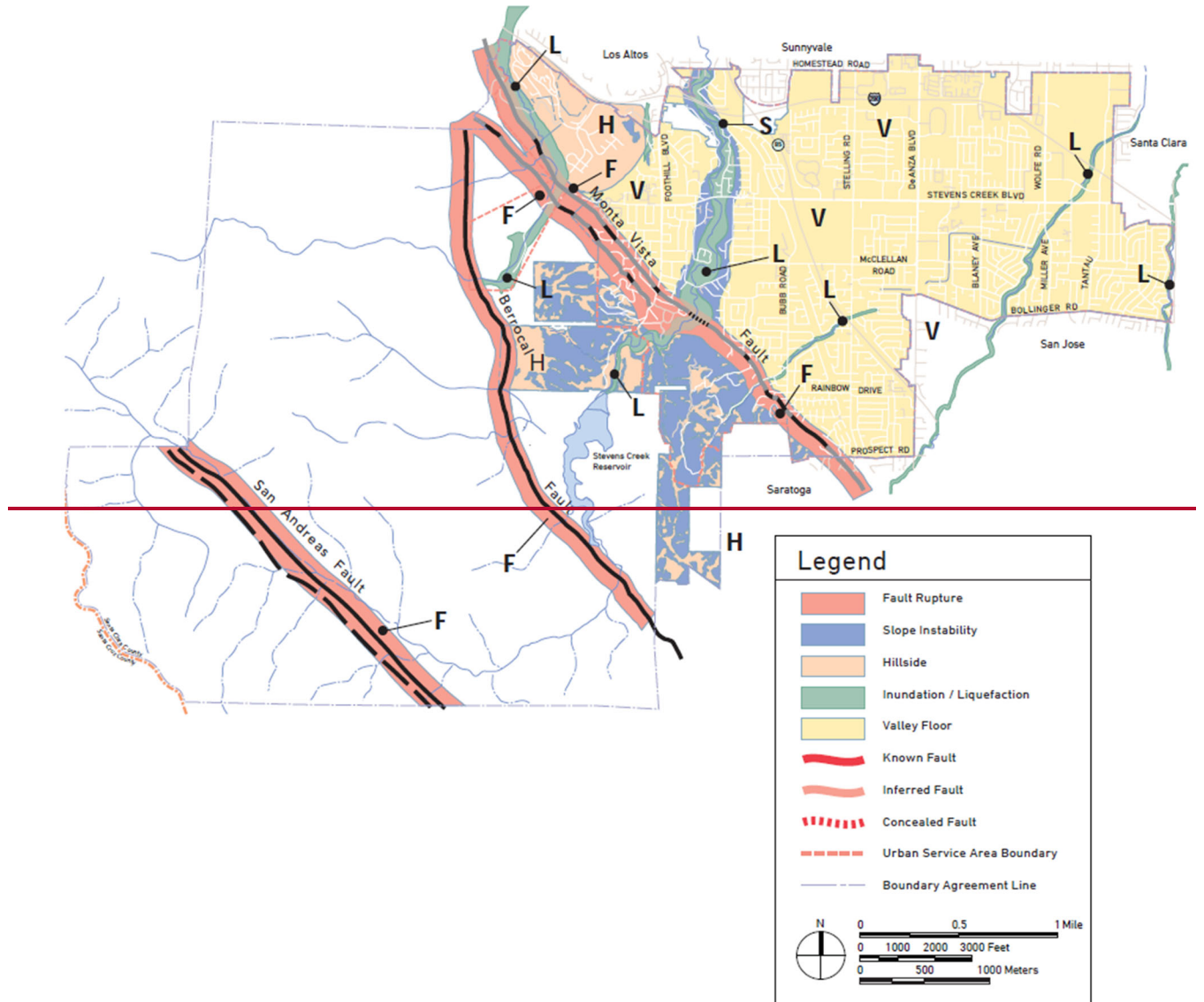
Other Seismic Hazards

In addition to the direct physical damage that can result from the motion of an earthquake, damage can result from liquefaction. Soils susceptible to liquefaction are typically found in low-lying, ⁷ current, ⁷ or former, floodplains. Portions of the city near the floodplains of Permanente Creek, Stevens Creek, Regnart Creek, and Calabazas Creek are likely to face liquefaction during an earthquake. Figure HS-8 shows the areas facing an elevated liquefaction risk in Cupertino, based on geological, geotechnical, and groundwater conditions.

Earthquake-induced landslides pose a significant risk due to the presence of landslide-prone areas in western Cupertino and proximity of earthquake faults. Ground shaking from seismic activity can cause rocks, debris, and hillside soils to loosen and fall downslope, harming facilities and infrastructure in its path. Sinkholes, which are depressions or holes in the ground that form when the surface collapses into

an underground space, are also a hazard in Cupertino. Sinkholes can occur suddenly and can be very dangerous if they form underneath buildings, roads, or other structures.

**FIGURE HS-5
GEOLOGIC AND SEISMIC HAZARDS**



Faults within the Cupertino planning area are characterized by (A) Horizontal and (B) Vertical displacements.

Table HS-1 Explanations of Geologic and Seismic Hazards

Zone	Description
(F) Fault Rupture	<u>Regional Fault Lines, Area of potential surface fault rupture hazard within 300 feet east and 600 feet west of the Monta Vista and Berrocal faults, and within 600 feet of the San Andreas fault.</u>
(S) Slope Instability	<u>As shown on Figure HS-9, Landslide Susceptibility Areas, or the California Geological Survey, Areas includes all recognized landslide deposits, and steep walls of Stevens Creek canyon, with a moderate to high landslide potential under static or seismic conditions. Area also reflects the mapped zone of potential earthquake-induced landsliding prepared by the California Geological Survey (2002).</u>
(H) Hillside	<u>Area contains moderate to steep slope conditions not included in the above categories, with an undetermined potential for slope instability. This area falls under the Residential Hillside Development (RHS) overlay zone, which regulates single-family residential development to preserve the natural hillside setting. Compliance with the RHS ordinance, including required geotechnical and arborist reports, is necessary for development approval.</u>
(L) Liquefaction/Inundation	<u>As shown on Figure HS-8, Liquefaction Areas, or the U.S. Geological Survey, Area areas where local geological, geotechnical, and groundwater conditions indicate a potential for liquefaction under seismic conditions. Much of this area also has the potential for periodic flood inundation. The Liquefaction/Inundation Zone is stippled where covered by an overlying Fault Zone.</u>
(V) Valley	<u>Area includes all relatively level valley floor terrain not included in the above categories with relatively low levels of geologic hazard risk.</u>

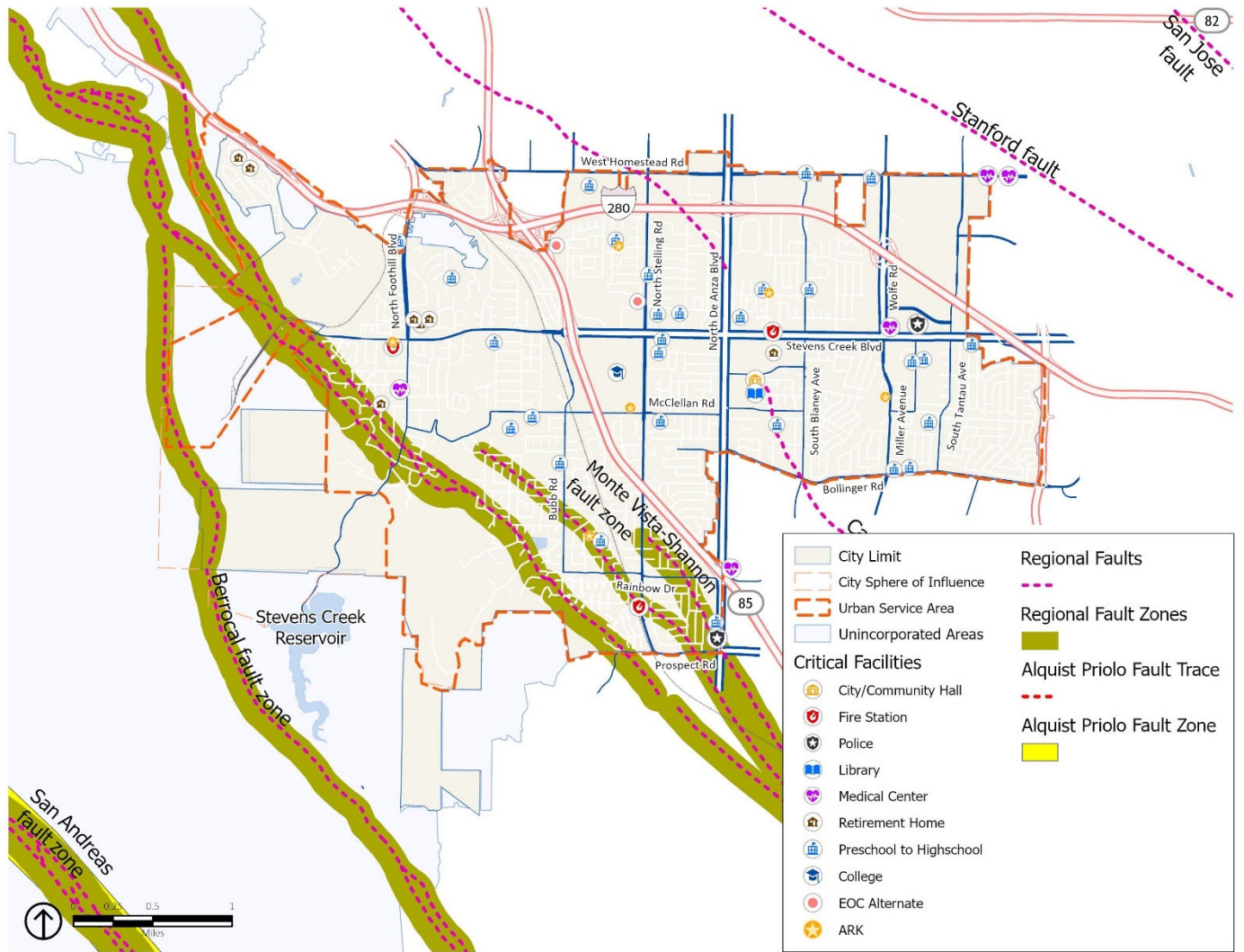
Table HS-2 Maximum Earthquake Magnitudes and Recurrence Intervals

	Causative Faults	Distance from De Anza/SCB Intersection	Maximum Historic Moment Magnitude	Maximum Probable Moment Magnitude	Est. Recurrence Interval of Max. Prob. Earthquake
San Andreas System	San Andreas	5.5 miles	7.9	7.9	220 years
	Hayward (South)	10 miles	7.0	7.0	236 years
	Calveras (Central)	14 miles	6.3	7.0	374 years
Sargent-Berrocal System	Sargent-Berrocal	3.5 miles	3.7-5.0	6.8	330 years
	Monta Vista-Shannon	2 miles	2.0-3.0	6.8	2,400 years

Table HS-3 Acceptable Exposure to Risk Related to Various Land Uses

Acceptable Exposure to Risk	Land Use Group		Extra-Project Cost to Reduce Risk to Acceptable Level
Extremely Low	Group 1	Vulnerable structures (nuclear reactors, large dams, plants manufacturing/ storing hazardous materials)	As required for maximum attainable safety
	Group 2	Vital public utilities (electrical transmission interties/substations, regional water pipelines, treatment plants, gas mains)	Design as needed to remain functional after max. prob. earthquake on local faults
	Group 3	Communication/transportation (airports, telephones, bridges, freeways, evac. routes)	5% to 25% of project cost Design as needed to remain functional after max. prob. earthquake on local faults
		Small water retention structures	
Moderately Low	Group 4	Emergency Centers (hospitals, fire/ police stations, post-earthquake aide stations, schools, City Hall and Service Center, De Anza College)	Design as needed to remain functional after max. prob. earthquake on local faults
		Involuntary occupancy facilities (schools, prisons, convalescent and nursing homes)	
Ordinary Risk Level	Group 5	High occupancy buildings (theaters, hotels, large office/apartment bldgs.)	5% to 25% of project cost Design to minimize injury, loss of life during maximum probable earthquake on local faults; need not design to remain functional
		Public utilities (electrical feeder routes, water supply turnout lines, sewage lines)	
Ordinary Risk Level	Group 6	Minor transportation (arterials and parkways)	2% of project cost; to 10% project cost in extreme cases
		Low moderate occupancy buildings (small apartment bldgs., single fam. resid., motels, small commercial/office bldgs.)	
	Group 7	Very low occupancy buildings Open space and recreation (farmland, landfills, wildlife areas)	Design to resist minor earthquakes (warehouses, farm structures) without damage; resist moderate earthquakes without structural damage, with some nonstructural damage; resist major earthquake (maximum probability on local faults without collapse, allowing some structural and non-structural damage)

Table HS-4 Technical Investigations Required Based on Acceptable Risk	
Land Use Activity	Hazard Map Symbol FSH LV Evaluation Required Evaluation Required
Groups 1 to 4	UBC
	UBC
	Soils
	Soils
	Geology
	Seismic Hazard
Groups 5 to 7	Seismic Hazard
	UBC
	UBC
	Soils
FIGURE HS-7 FAULT ZONES	Geology

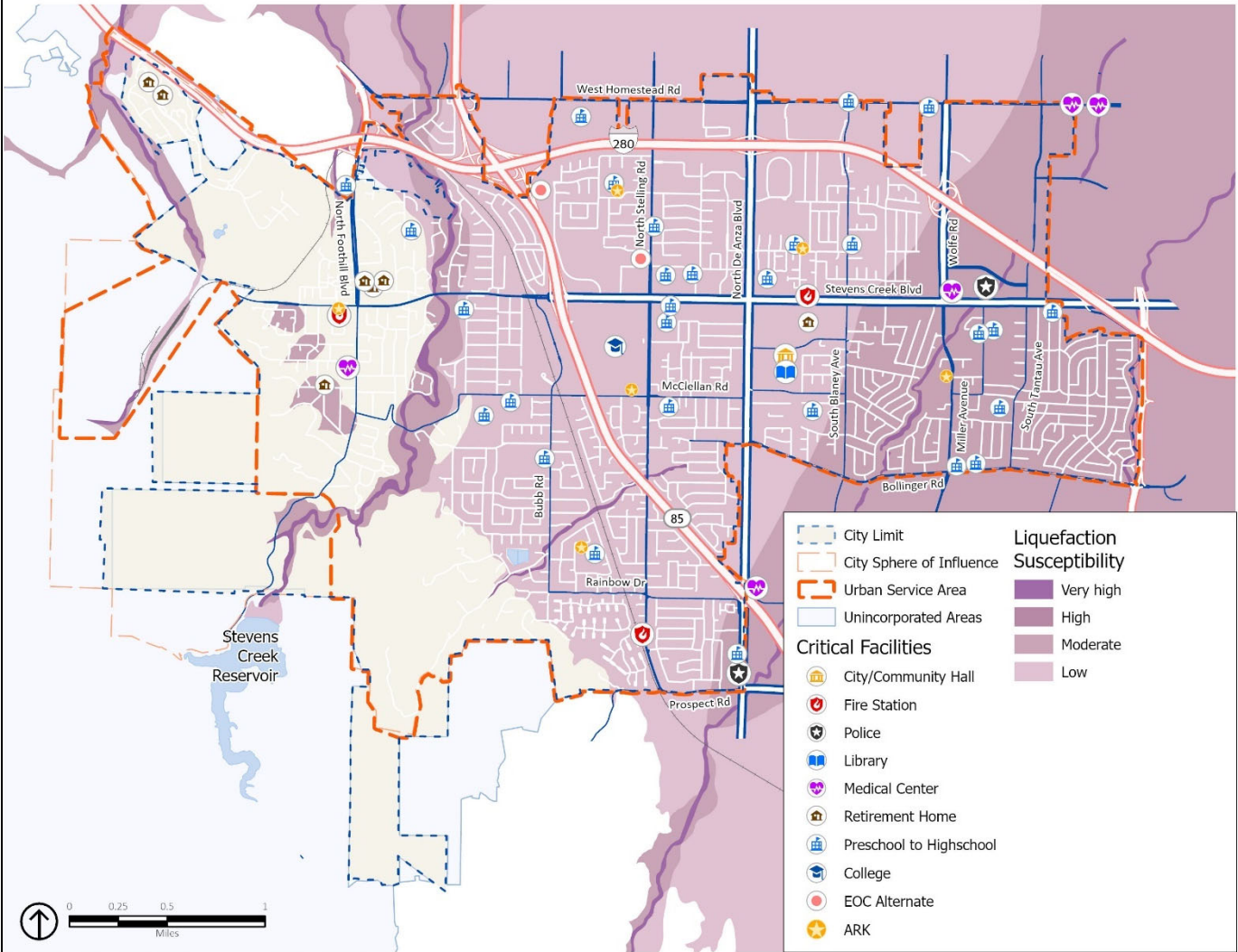


Descriptions of Technical Evaluations:

UBC	Current, adopted version of the California Building Code
Soils	Soils and foundation investigation to determine ability of local soil conditions to support structures
Geology	Determine subsidence potential, faulting hazard, slope stability (See Geologic Map for additional detail)
Seismic Hazard	Detailed Soils/Structural evaluation to certify adequacy of normal UBC earthquake regulations or to recommend more stringent measures



FIGURE HS-8
LIQUEFACTION AREAS



Source: City of Cupertino, 2023; US Geological Survey, 2022

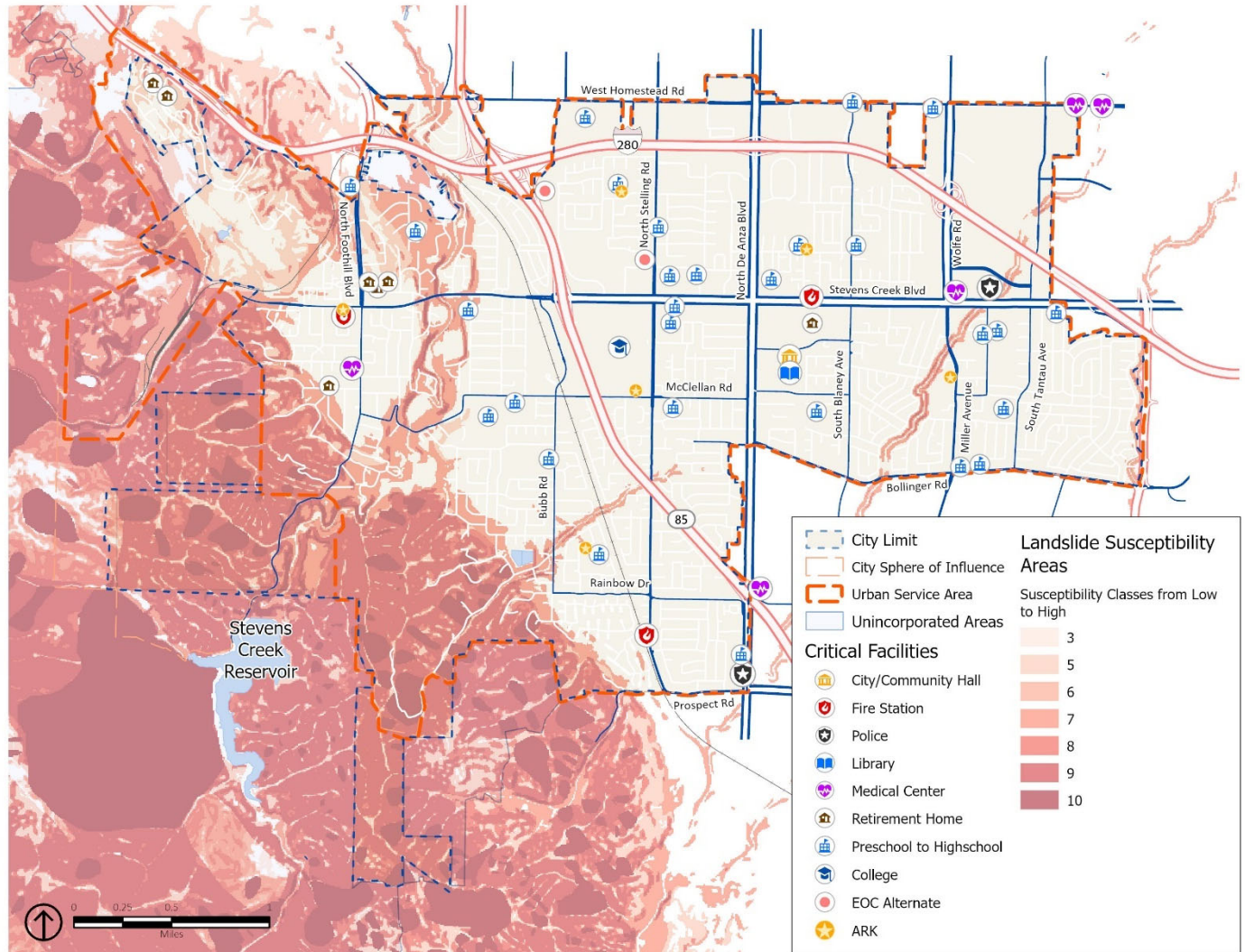
GEOLOGIC HAZARDS

Geologic hazards in Cupertino include landslides and erosion. Landslides and rock falls may occur in sloped areas, especially areas with steep slopes, and usually in areas of loose and fragmented soil. Landslides, rockfalls, and debris flows occur continuously on all slopes; some processes act very slowly, and others occur very suddenly, often with disastrous results. Landslides are often triggered by other natural hazards, such as earthquakes, heavy rain, floods, or wildfires, so landslide frequencies are often related to the frequency of these other hazards. Landslides have occurred on hillsides throughout the city and generally occur in winter during high rainfall years. Due to the hilly terrain, the southwestern portion of the city is in a very high landslide susceptibility class, as shown on **Figure HS-9. Appendix E, Geologic and Seismic Hazards**, -further describes these landslide susceptibility areas, noting that they include all recognized landslide deposits and steep walls of Stevens Creek canyon, which have a moderate to high landslide potential under static or seismic conditions.

Climate change is expected to result in more precipitation extremes, including more frequent periods of heavy rainfall, which could cause an increase in the number of landslides or make landslides larger than normal. Increased wildfire frequency can also destabilize hillsides due to loss of vegetation and changed soil composition, which can contribute to greater runoff and erosion. Climate change will also cause more frequent and extreme droughts, which dries out soil. Accordingly, when precipitation -occurs, the soil cannot absorb as much water, which creates higher levels of runoff, potentially leading to landslides and mudflows. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour, is, therefore, likely to cause more mudslides and landslides.

Cupertino is also susceptible to hazards related to erosion, or the geological process in which earthen materials are worn away and transported by natural forces such as water or wind, causing the soil to deteriorate. Eroded topsoil can be transported into streams and other waterways. Water erosion is the removal of soil by water and transportation of the eroded materials away from the point of removal. The impact of soil erosion on water quality becomes significant, particularly as soil surface runoff increases. Highly erosive soil can damage roads, bridges, buildings, and other structures by causing foundational instability, erosion around supports, washouts during heavy rains, and increased maintenance costs. The shifting or loss of soil over time can undermine the structural integrity of these infrastructures, leading to potential failures and safety hazards.

FIGURE HS-9
LIQUEFACTION AREAS
LANDSLIDE
SUSCEPTIBILITY AREAS



Source: City of Cupertino, 2023; California Geological Survey, 2018

FLOOD AND INUNDATION HAZARDS

Flooding is the rising and overflowing of water onto normally dry land. Floods are one of the most frequent natural hazards impacting Santa Clara County and among the costliest natural disasters in terms of human hardship and economic loss nationwide, causing substantial damage to structures, landscapes, and utilities, as well as life-safety issues. Floods are surface hydrological hazards that can have a significant, and sometimes, long-lasting effect on a community. Floods can originate from various sources, including heavy rainstorms, landslides, ~~and/or~~ dam failure. Sediment deposits also increase flood risks because they clog the drainage system and may induce upstream flooding. Rain-related floods are the most common type of floods ~~in Cupertino~~, and usually occur during periods of extended heavy rainfall.

The watersheds in the Santa Cruz Mountain Range feed into four major streambeds that traverse the ~~C~~city: Permanente Creek, Stevens Creek, Regnart Creek, and Calabazas Creek ~~(Figure HS-7)~~. Stevens Creek and its streamside are among the natural elements that have the most influence on Cupertino's character. These creeks collect surface runoff and ~~channel it to the Bay~~ drain into channels leading to the San Francisco Bay. During heavy rainfall, these creeks create a potential flooding risk in the city as water levels may exceed the top of the creekbank. Historically, Cupertino has been at risk of flooding primarily during the winter and spring when stream systems swell with heavy rain. Occasionally, flash flooding from short-duration, high-intensity precipitation (often during atmospheric river events) may occur. In urban areas, flash flooding is an increasingly serious problem due to removal of vegetation and replacement of groundcover with impermeable surfaces such as roads, driveways, and parking lots. Other hazards connected with flooding and stormwater runoff include erosion, degradation of water quality, and loss of environmental resources.

Areas at an elevated risk of flooding are divided into 100- and 500-year flood zones. A 100-year flood zone has a 1-percent chance of experiencing a major flood in any given year, and a 500-year flood zone has a 0.2-percent chance of flooding in any given year. The 100-year floodplain in Cupertino is primarily along Permanente Creek, Stevens Creek, Regnart Creek, and Calabazas Creek. A majority of the city is within the 500-year floodplain. Figure HS-10 shows the 100- and 500-year flood zones in and around Cupertino.

The City participates in the Community Rating System ~~(CRS)~~ program, which is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed minimum National Flood Insurance Program ~~NFIP~~ requirements. Flood insurance premium rates for property owners ~~within~~ the city may be discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the ~~C~~Community Rating System, which are to: (1) reduce flood damage to insurable property; (2) strengthen and support the insurance aspects of the National Flood Insurance Program ~~NFIP~~; and (3) encourage a comprehensive approach to floodplain management.

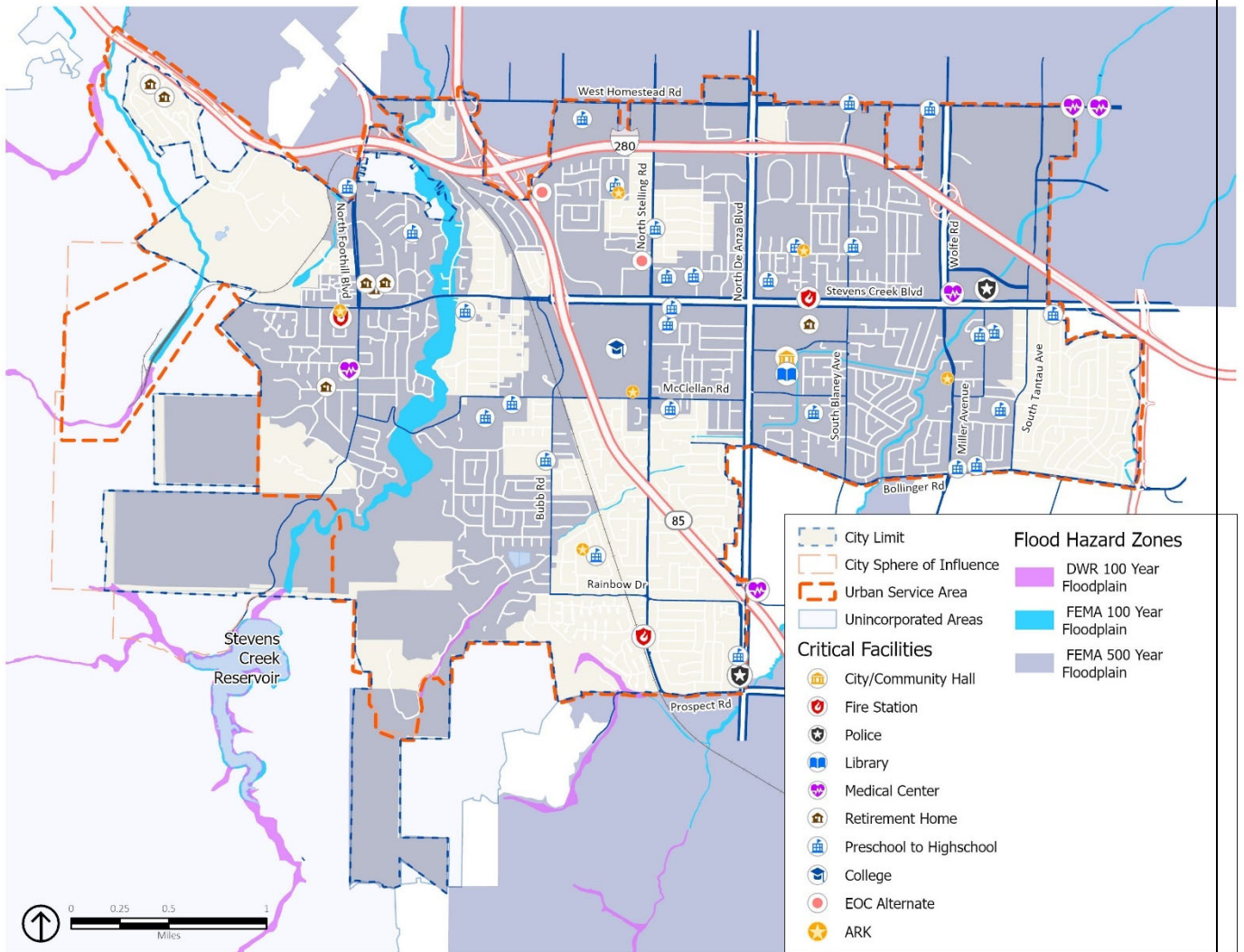
The City and the Santa Clara Valley Water District are actively involved in programs to minimize the risk of flooding. The City developed an approach to land use for the non-urbanized flood-plain of Stevens Creek south of Stevens Creek Boulevard in the Land Use Element. This ensures the preservation of the 100-year flood-plain and the protection of the riparian corridor along this portion of Stevens Creek. The City and the Water District also developed a flood management program for the flood-plain of Stevens Creek between Interstate 280 and Stevens Creek Boulevard while preserving the natural environment of Stevens Creek. Structural improvements, while not preferred, may be necessary to protect properties from a 100-year flood [event](#).

[Although heavy precipitation events are a regular feature in California, atmospheric rivers, which are narrow corridors of concentrated moisture in the atmosphere and capable of transporting large amounts of water vapor that condenses and falls as intense precipitation, have caused major flooding in recent years. In winter and spring of 2023, a series of atmospheric rivers impacted the Bay Area, resulting in significant rainfall and widespread flooding across the San Francisco Bay Area.](#)

[While climate change may not change average precipitation levels significantly, scientists expect that it will cause more years with extreme precipitation events. This means that more years are likely to see intense storm systems that drop substantial volumes of precipitation over a short period and cause flooding. Because of this, floods are expected to happen more often in Cupertino, and climate change may expand the parts of the city that are considered prone to flooding.](#)

FIGURE HS-1210
FLOOD HAZARD ZONES

FIGURE HS-10
FLOOD HAZARD ZONES



Source: City of Cupertino, 2023; Federal Emergency Management Agency, 2021; Department of Water Resources, 2021

DAM AND PIPELINE FAILURE

A dam failure is an uncontrolled release of water from a reservoir through a dam because of structural failures or deficiencies. Pipeline failures are a similar uncontrolled release from a water pipeline or aqueduct. The primary danger from dam or pipeline failure is the high-velocity flooding downstream of the dam and the limited warning times that can be given for evacuation.

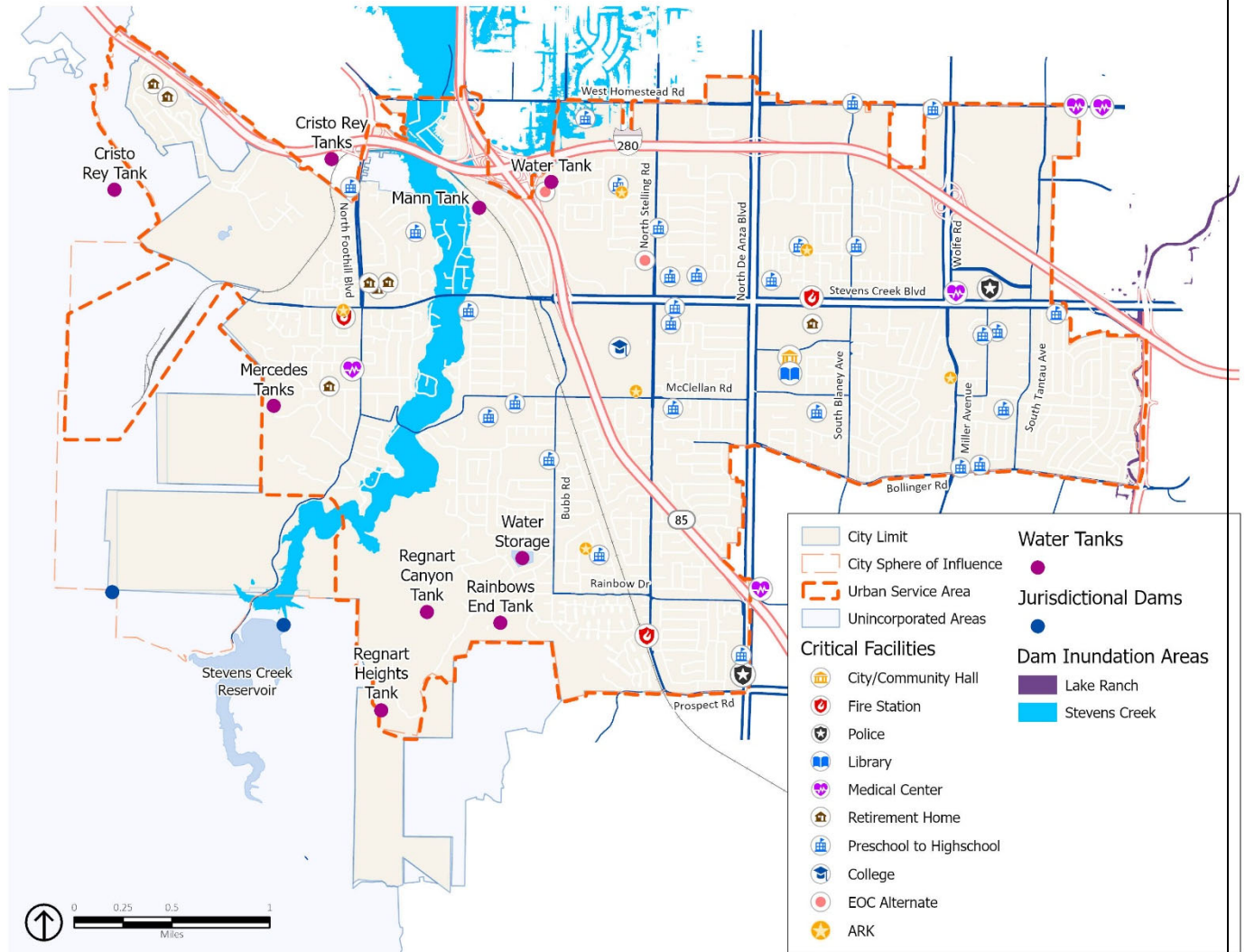
Dam or pipeline failures can range from minor to catastrophic, potentially harming human life and property downstream from the failure. In addition, ecosystems and habitats can be destroyed by fast-moving floodwaters, debris, and sedimentation from the inundation. Failures are rare but not unprecedented; they can be caused by overtopping, foundation defects, piping and seepage failures, or conduit and valve failures. Many dam or pipeline failures are the secondary result of other natural disasters, such as earthquakes, landslides, and extreme storms.

The largest body of water ~~with~~in the area is the Stevens Creek Reservoir. Stevens Creek ~~Reservoir Dam~~ meets current dam safety standards and the probability of its failure is minimal. The Stevens Creek Reservoir, owned by the Santa Clara Valley Water District, is outside of city limits, immediately to the southwest, as shown in **Figure HS-11**. In the event of a dam failure at the Stevens Creek Reservoir, land surrounding Stevens Creek would flood, including residential areas adjacent to Stevens Creek and a portion of Interstate 280.

The Santa Clara Valley Water District has a comprehensive Dam Safety Program, which includes proactive inspection of upgrades and improving its dams and water supply structures as needed and in consultation with regulatory agencies. Engineers monitor dams using instruments, monthly visual inspections, and periodic dam safety reviews to prevent loss of life, personal injury, and property damage from the failure of dams. The safety of each dam is re-evaluated with advances in geotechnical, structural, and earthquake engineering and for evidence of seepage or ongoing ground movement.

The potential for a dam failure in Cupertino is likely to remain a risk in future years, although the probability of such events is expected to remain very low.

FIGURE HS-113
DAM INUNDATION AREAS



Source: City of Cupertino, 2023; Department of Water Resources, 2023

**FIGURE HS-6
FACILITY FAILURE**

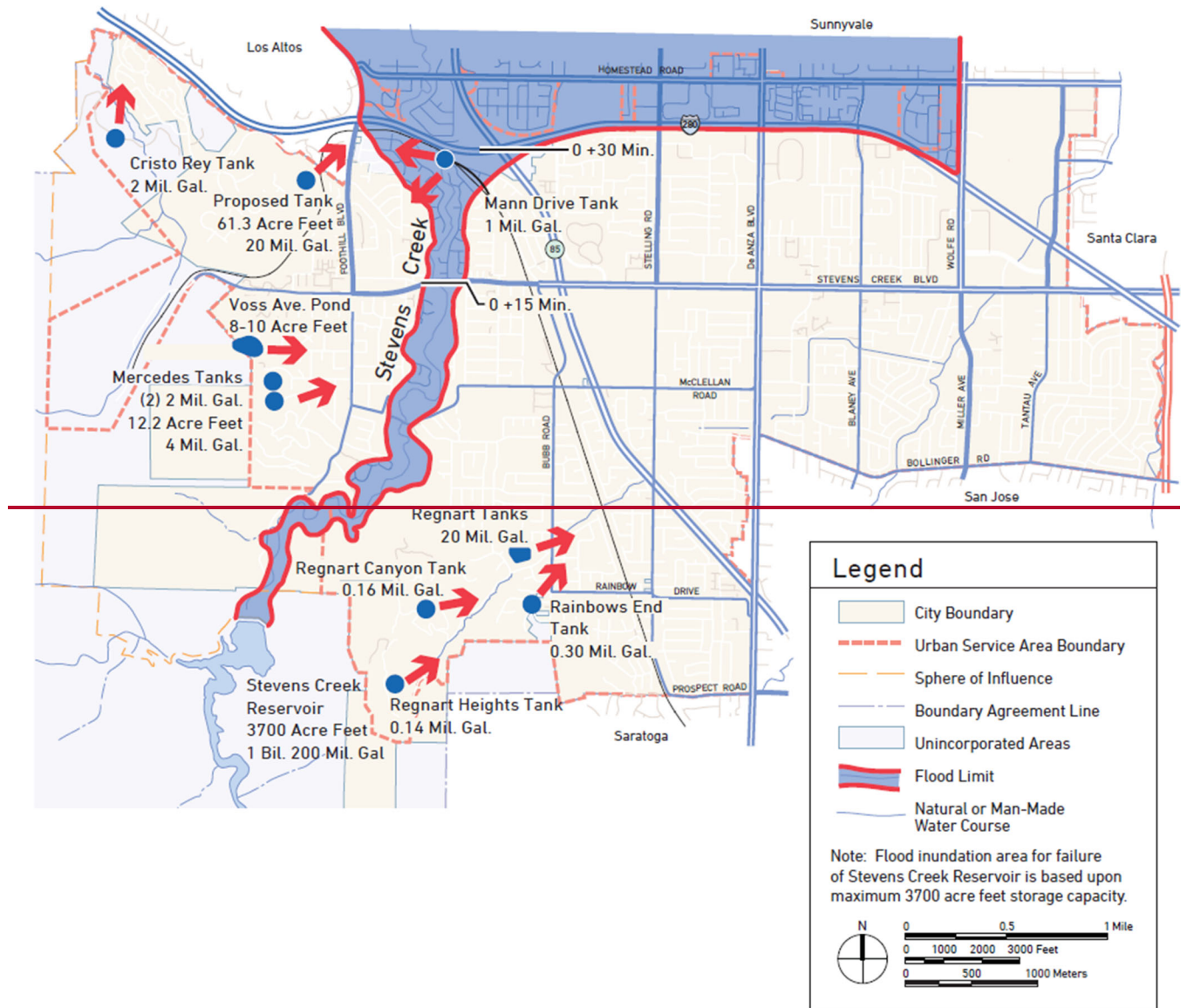
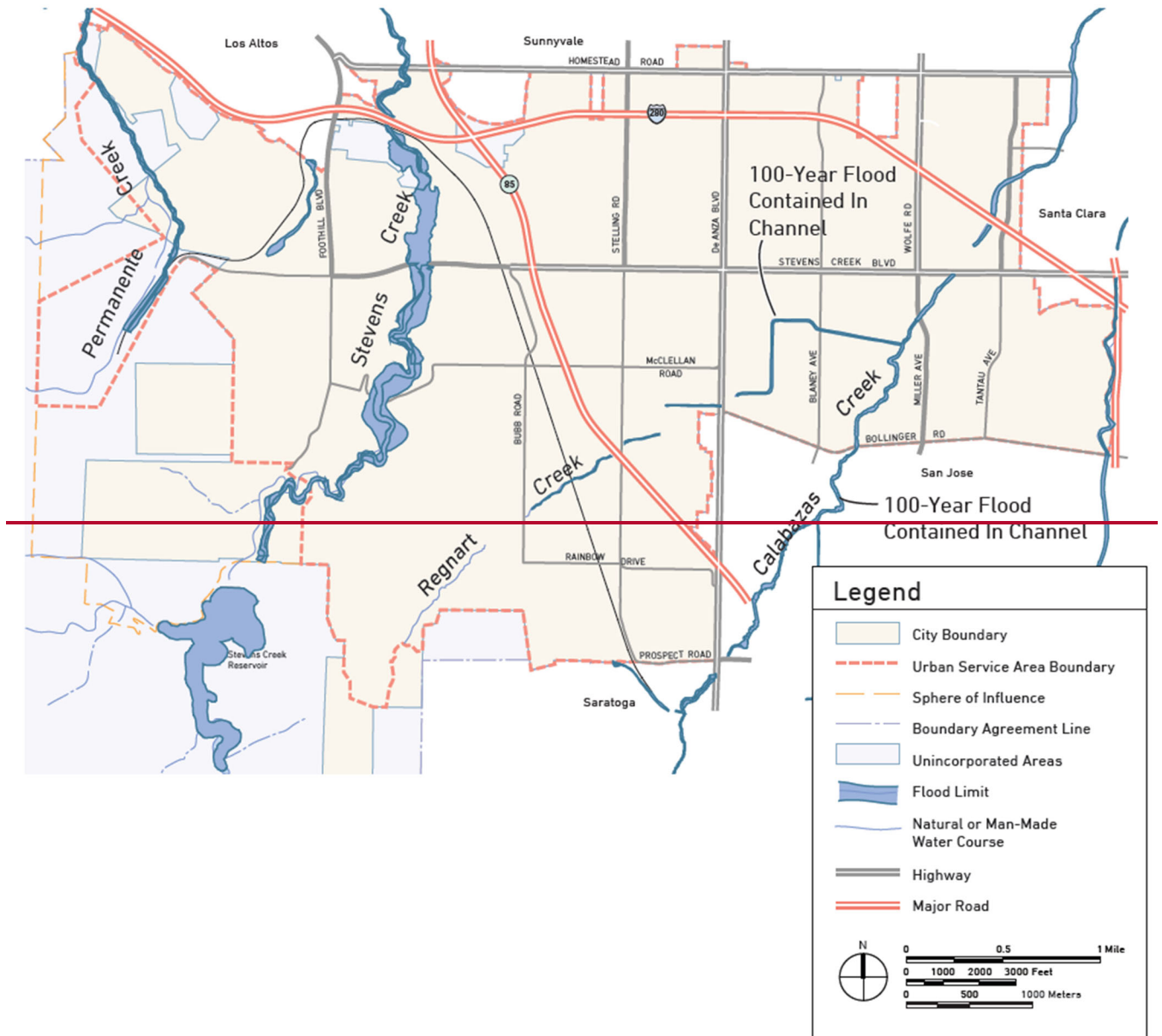


FIGURE HS-7
100-YEAR FLOOD



CLIMATE CHANGE RESILIENCE

Climate change is the long-term shift in average weather patterns globally, characterized by significant alterations in temperature and precipitation patterns over extended periods. As global temperatures continue to rise, communities experience more frequent and intense natural hazards, including heatwaves, storms, floods, droughts, and wildfires. These events often occur simultaneously, creating cascading effects that can amplify impacts to Cupertino. Climate change hazards affecting Cupertino include poor air quality, drought, extreme heat, flooding, human health hazards, landslides, severe weather, and wildfire. When multiple climate hazards occur simultaneously, such as droughts amplifying wildfire risk, or extreme heat exacerbating water shortages, the impacts on the Cupertino community, infrastructure, and natural systems can be particularly severe. These changes will continue to affect the frequency, intensity, and distribution of hazards throughout the city in the coming decades.

AIR QUALITY

Air quality refers to the condition of the air within our surroundings, particularly regarding its cleanliness and the presence of pollutants. Air quality is determined by the composition of gases and particles in the atmosphere, and it is a critical aspect of environmental health. Air pollution comes from both mobile sources (e.g., cars, trucks, airplanes) and stationary sources (e.g., agricultural and industrial uses). Cupertino is highly susceptible to poor air quality due to major highways and quarry activity adjacent to the city. Wind patterns and geographical features move air pollution from other areas, such as the San Joaquin Valley, and trap pollution in the Santa Clara Valley. From 2015 to 2019, Cupertino experienced 31 days where ozone or fine particulate matter (PM_{2.5}) levels exceeded State standards. Because of Cupertino's proximity to major highways, quarry activity, and Santa Clara Valley's geographical features, air quality will continue to be a concern.

Increasing statewide fire frequency can create recurring air quality degradation events, leading to respiratory health effects. Wildfire smoke consists of a mix of gases and fine particulate matter from burning vegetation and materials. The pollutant of most concern from wildfire smoke is PM_{2.5}, which is damaging to human health because of its ability to deeply penetrate lung tissue and affect the heart and circulatory system. Although wildfire smoke presents a health risk to everyone, sensitive groups, such as children (particularly younger children), older adults, people with chronic respiratory or cardiovascular disease, and low-resourced persons, may experience more severe acute and chronic symptoms from exposure to wildfire smoke.

In many regions of the United States, climate-driven changes in weather conditions, including temperature and precipitation, are expected to increase ground-level ozone and particulate matter, such as windblown dust from droughts or smoke from wildfires. Increased frequency of wildfires will release greater amounts of particulate matter and other pollutants into the air and drier conditions increase airborne dust. Possible changes in wind patterns may also trap a greater amount of air pollutants in the Santa Clara Valley, increasing exposure to air pollution.

DROUGHT

A drought is an extended period when precipitation levels are well below normal. Drought may affect domestic water supply, energy production, public health, and wildlife, or contribute to wildfire. Like most of California and the western United States, Cupertino chronically experiences drought cycles.

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)
- D4 (exceptional drought)

According to the U.S. Drought Monitor, the most intensive drought in recent years occurred during most of 2014, when all of Santa Clara County was classified as “extreme” drought. More recently, in 2022, from January through the end of the year, the county was also classified as being in “severe” drought. As of July 2024, Santa Clara County, including Cupertino, was not classified as drought. During severe drought conditions, water shortages are common, and water restrictions may be imposed to meet essential community needs. The Santa Clara Valley Water District’s 2020 Water Shortage Contingency Plan contains actions to implement and enforce regulations and restrictions for managing a water shortage when it declares a water shortage emergency under the authority of the California Water Code.

Cupertino’s water supply comes from local and imported water. Local rainfall and runoff flow into reservoirs for storage and blend with imported water. Approximately 50 percent of Santa Clara County’s water supply comes from hundreds of miles away – first as snow or rain in the Sierra Nevada range of northern and eastern California, then as water in rivers that flow into the Sacramento-San Joaquin River Delta or directly to water conveyance systems. Imported water is brought into the county through the complex infrastructure of the State Water Project, the federal Central Valley Project, and San Francisco’s Hetch-Hetchy system.

Although droughts are a regular feature of California’s climate, scientists expect climate change will lead to more frequent and intense droughts statewide. Reduced winter precipitation levels and warmer temperatures have greatly decreased the size of the Sierra Nevada snowpack (the volume of accumulated snow), making less fresh water available for communities throughout California, including the imported water supply for Cupertino. A continued decline in the Sierra Nevada snowpack volume is expected, which may lead to lower volumes of available imported water.

EXTREME HEAT

According to the California Extreme Heat Action Plan, extreme heat days are defined as temperatures exceeding 98 percent of historical highs, and these events are becoming more frequent and intense due

to climate change. Extended periods of extreme heat, known as heat waves, threaten community safety and raise energy costs. An extreme heat day in Cupertino is one where the maximum temperature rises above 93.2 degrees Fahrenheit.

The Center for Disease Control and Prevention recognizes extreme heat as a substantial public health concern. Seniors, persons with chronic illnesses and/or disabilities, persons experiencing homelessness, outdoor workers, low-resourced people of color, immigrant/linguistically isolated communities, and households in poverty are the most vulnerable to extreme heat.

According to the U.S. Census, approximately 66 percent of all housing in the city was built prior to 1980, some of which are unlikely to have air conditioning and may lack effective insulation to regulate indoor temperatures. During extreme heat days, temperatures in poorly insulated homes may reach unhealthy temperatures. Therefore, people living in these homes, especially vulnerable populations, are at higher risk for heat-related illnesses from extreme heat events.

Very high temperatures can also harm plants and animals that are not well adapted to these events, including natural ecosystems. Extreme heat can increase water temperature in lakes, streams, creeks, and other water bodies, especially during drought conditions when water levels are lower.

The warmer temperatures brought on by climate change are likely to cause an increase in extreme heat events locally. Depending on the location and emissions levels, the state Cal-Adapt database indicates the number of extreme heat days is expected to rise from a historical annual average of 5 to 14 days by the middle of the century (2035 to 2064), and an average of 24 days by the end of the century (2070 to 2099).

SEVERE WEATHER

Severe weather is generally any destructive weather event, but it usually occurs in Cupertino 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. Severe weather often produces high winds and lightning that can damage structures and cause power outages. Lightning from these storms can ignite wildfires and structure fires that can cause damage to buildings and endanger people.

A relatively common weather pattern that brings southwest winds and heavy rain to California is often referred to as an atmospheric river. High winds, often accompanying severe storms, can cause significant property damage, threaten public safety, and have adverse economic impacts, including business closures and widespread power loss. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events, such as thunderstorms.

Electricity utilities throughout California, including PG&E, have begun to occasionally “de-energize,” or turn off the electricity for power lines that run through areas with an elevated fire risk. Public Safety

Power Shutoff (PSPS) events are intended to reduce the risk of power lines sparking or being damaged and starting a wildfire. A Public Safety Power Shutoff event may occur at any time of the year, particularly during high wind events and dry conditions, and may be limited to specific communities or affect broad swaths of the state. While Public Safety Power Shutoff events have been smaller and less frequent recently, these events still pose a risk to PG&E customers across Santa Clara County, including Cupertino.

Climate change is expected to cause an increase in intense rainfall and strong storm systems, such as atmospheric rivers. This increase means that Cupertino could see more intense weather resulting from these storms in the coming years and decades, although such an increase may not affect all forms of severe weather. Heavy rainfall can increase the frequency and severity of other hazards, including flooding and landslides.

HUMAN HEALTH HAZARDS

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 -are often -carried by animals, such as mice and rats, ticks, and mosquitoes. Warmer temperatures and high precipitation levels can lead to increased populations of these disease-carrying animals, creating a greater risk of disease and increased rates of infection.

Populations most vulnerable to human health hazards are those who spend a disproportionate amount of time outdoors (such as outdoor workers or persons experiencing homelessness), those with fragile immune systems or existing illnesses (which may include persons with chronic illnesses and seniors), and those who may live in sub-standard housing or not have access to health insurance and medical care (households in poverty, low-resourced people of color, immigrant/linguistically isolated communities, and cost-burdened/low-income/overcrowded households). While many vector-carrying organisms thrive in warm and wet environments, regional climate trends toward hotter and drier conditions may reduce some vector populations, such as mosquitoes, in certain areas. However, the increasing frequency of extreme weather events, including periods of heavy rainfall and flooding, can still create episodic conditions conducive to vector breeding, particularly during cooler seasons. As a result, the overall risk of human health hazards may still increase, especially for already vulnerable populations.

NOISE

The noise environment is an accumulation of many different sources, ranging from human voices to major noise sources, such as freeway traffic. The degree to which noise becomes an annoyance depends on a variety of factors, including noise level, duration, time of day, background sounds, and surrounding land uses, including proximity to more sensitive populations.

COMMUNITY NOISE FUNDAMENTALS

The three elements of community noise are noise level, noise spectrum, and variation in noise level with time. Noise level is measured in decibels (dB). Noise is composed of various frequencies within a noise spectrum that defines the character of the noise. Since human hearing is more sensitive to the higher speech frequencies, the A-weighted frequency network is applied, in accordance with national and international standards, to adjust the measured noise level to more closely relate to human perception of loudness.

Noise environments have different characteristics that vary with duration and time of day; for instance, a freeway may emit a fairly constant noise level for long periods while an airport may emit many short-term high-level noise events punctuated by extended periods of quiet. To provide a standard measure for community noise exposure that takes into account the time-varying characteristics, the State of California adopted the Community Noise Equivalent Level (CNEL) as the standard metric. The CNEL is a 24-hour energy average metric that penalizes evening and nighttime noise, and provides a uniform measure for time-varying noise environments.

NOISE ENVIRONMENT

The noise environment can generally be divided into two categories: transportation-related and non-transportation-related noise. Traffic noise is the greatest contributor to noise pollution in Cupertino and one of the most difficult to control through local efforts. Two major freeways (Interstate 280 and ~~Highway~~ State Route 85) and four major corridors (Stevens Creek Boulevard, De Anza Boulevard, Homestead Road, and Foothill Boulevard) cross Cupertino. These roadways are ~~us~~tilized not only by local residents and employees, but also by commuters to destinations beyond Cupertino. Heavy-duty trucking operations to and from the ~~Hanson Permanente~~Heidelberg Cement Plant and Stevens Creek Quarry ~~located~~ in the western foothills near Stevens Creek Boulevard and Foothill Boulevard are also a significant transportation-related noise contributors.

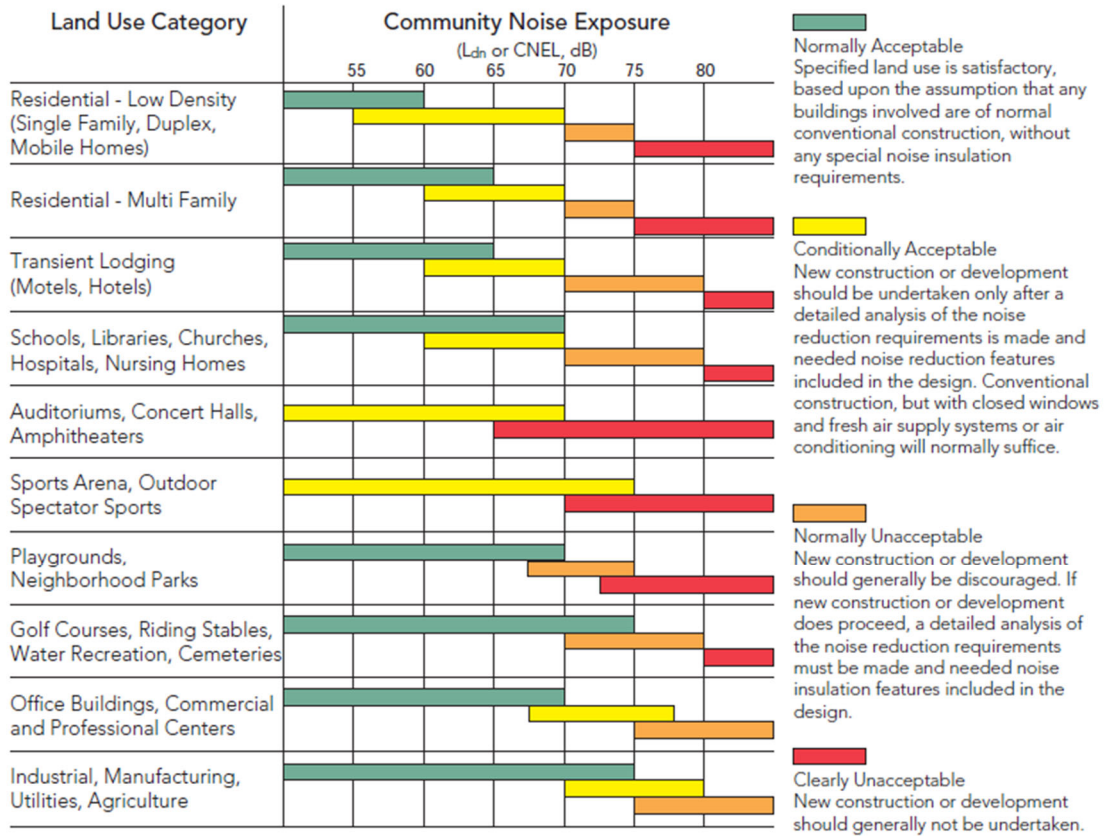
Cupertino receives some aircraft noise from facilities ~~with~~in the region, including San Jose International Airport, Moffett Federal Airfield, and Palo Alto Airport; however, the Cupertino city limit does not fall within the identified noise contours of any of these airports. One railroad line passes through the Monta Vista neighborhood and connects with the ~~Hanson Permanente~~Heidelberg Cement Plant. ~~This freight railway operates at very low frequencies, with approximately three train trips in each direction per week, usually during the daytime or early evening.~~

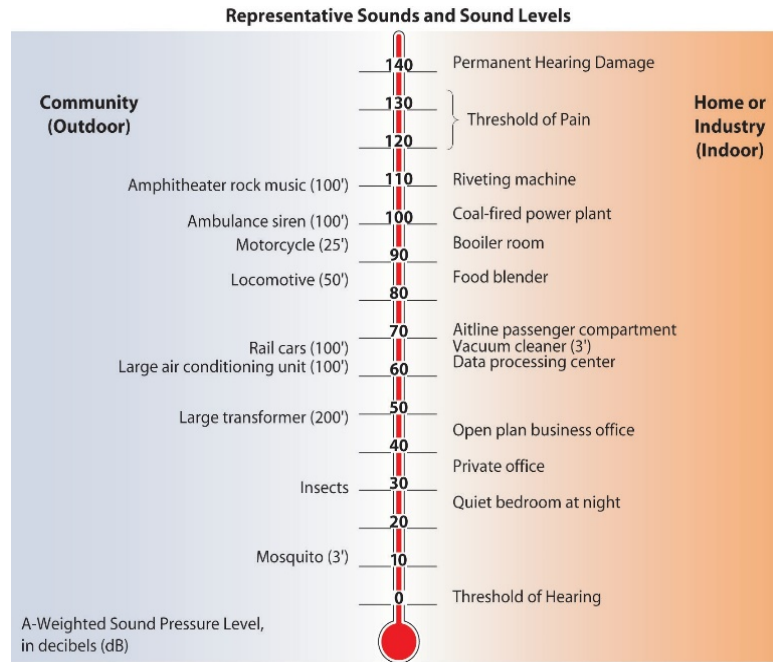
Non-transportation noise varies from stationary equipment (e.g., air conditioning units) to construction activity. Regulation to minimize excessive noise from non- transportation sources includes compliance with the City's noise standards that limit certain noise-generating activities during evening and early morning, when ambient noise levels tend to be lower. Advancements in technology to muffle sound also reduce noise from construction equipment and stationary equipment such as compressors and generators.

LAND USE COMPATIBILITY

The Cupertino Municipal Code, Title 10, outlines the maximum noise levels on receiving properties based upon land use types (Figure HHS-812). Land use decisions and the development review process play a large role in minimizing noise impacts on sensitive land uses. Noise compatibility may be achieved by not avoiding the location of conflicting land uses adjacent to one another and incorporating buffers and noise control techniques, including increased building setbacks, installation and maintenance of landscaping, building transitions, site design, and building construction techniques. Selection of the appropriate noise control techniques will vary depending on the level of noise that needs to be reduced as well as the location of the and intended noise-generating land use and the character of its surrounding uses.

FIGURE HHS-8-12 LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS





LOOKING FORWARD

As Cupertino's resident and employee population grows, the City must identify ways to ensure public safety and support the community's high quality of life. Innovative site design and construction techniques are needed to reduce noise in developments near major corridors and where uses are mixed to ensure compatibility. ~~Fire protection and public safety should be enhanced in a manner that provides a high quality of service while continuing to be fiscally responsible.~~ The following are ways the City will address key challenges and opportunities facing Cupertino:

1

NOISE.

As State, regional, and local policies encourage mixed-use development near corridors, the City should look to ways to reduce noise impacts on residences near and in such developments through site design, landscaping, and construction techniques. Additionally, the City should review locations and site design for sensitive uses, including schools, childcare facilities, and hospitals to ensure that they are not negatively impacted by noise.

2

PROJECT DESIGN AND OPERATIONS.

Measures such as project and building design, emergency access, operations, and maintenance of property, can help developments promote public [safety](#) and fire safety. Such measures will also allow the providers to maintain a high service level, while accommodating future growth.

3

COMMUNITY PARTICIPATION.

The City and service providers should enhance community participation through new and existing programs such as neighborhood watch, emergency preparedness, and school programs.

4

SHARED RESOURCES.

The City can enhance emergency, fire safety, and public safety services by coordinating programs with service providers and neighboring cities through shared services, mutual aid, and agreements.



GOALS, POLICIES, AND STRATEGIES

GOAL HS-1

Reduce hazard risks through regional coordination and mitigation planning

REGIONAL COORDINATION

The City seeks to coordinate its local requirements and emergency planning efforts with ~~F~~federal, State, and regional resources to ensure a consistent, integrated, and efficient approach to emergency planning.

POLICY HS-1.1: REGIONAL HAZARD RISK REDUCTION PLANNING

Coordinate with Santa Clara County and local agencies to implement the Multi-Jurisdictional ~~Local~~ Hazard Mitigation Plan for Santa Clara County.

STRATEGIES:

HS-1.1.1. Monitoring and Budgeting.

Monitor and evaluate the success of the [Multi-Jurisdictional Hazard Mitigation Plan](#), including local strategies provided in the Cupertino Annex ~~(Section 11)~~. Working with Santa Clara County, ensure that strategies are prioritized and implemented through the Capital Improvement Program and provide adequate

budget for on-going programs and department operations.

HS-1.1.2. [Hazard Mitigation Incorporation](#).

Ensure that mitigation actions identified in the [Multi-Jurisdictional Hazard Mitigation Plan](#) are being incorporated into upcoming City-sponsored projects, where appropriate.

HS-1.1.3. Hazard Mitigation Plan Amendments and Updates.

Support Santa Clara County in its role as the lead agency that prepares and updates the Local Hazard Mitigation Plan.

[POLICY HS-1.2: HAZARD MITIGATION PLAN INCORPORATION](#)

[Incorporate the Santa Clara County Multi-Jurisdictional](#)

Hazard Mitigation Plan and the City of Cupertino Annex, as approved by the Federal Emergency Management Agency, into this Health and Safety Element by reference, as permitted by California Government Code Section 65302.6.

POLICY HS-1.3: PUBLIC AGENCY COOPERATION

Continue to cooperate with other public agencies to ensure adequate medical and other emergency services, including assessing and projecting future emergency service needs and maintaining clear communication protocols among jurisdictions and regional agencies to support unified decision-making, real-time information sharing, and coordinated emergency response.

STRATEGIES:

HS-1.3.1: Multiagency Emergency Response.

Coordinate with local and State emergency management agencies using the Standardized Emergency Management System (SEMS) and National Incident Management System (NIMS) to facilitate multiagency emergency response.

HS-1.3.2: Inter-jurisdictional Coordination.

Maintain inter-jurisdictional cooperation and coordination, including mutual aid agreements with fire protection and suppression agencies in Santa Clara County.

HS-1.3.3: Coordinated Disaster Response.

Continue to maintain agreements with other local, State, and federal agencies to ensure coordinated emergency and disaster response.

HS-1.3.4: New Facilities.

Coordinate with Santa Clara County Fire Department and Santa Clara County Sheriff's Department through capital improvement planning to establish fire and sheriff stations to serve Cupertino. New additions to public safety infrastructure will be determined by evaluating increased localized demand and proposed growth. Evaluate whether a combined facility is possible to reduce infrastructure costs and/or improve operational efficiency, when a need is determined.

POLICY HS-1.4: REGIONAL COORDINATION FOR FIRE PREVENTION

Coordinate wildland fire prevention efforts with adjacent jurisdictions. Work with the County and the Midpeninsula Open Space District to implement measures to reduce fire hazards, continuing efforts in fuel management, and considering the use of "green" fire break uses for open space lands.

POLICY HS-1.5: REGIONAL COORDINATION FOR FLOOD CONTROL

Consult with the Santa Clara Valley Water District as well as surrounding jurisdictions regarding regional approaches to the planning, construction,

operation, and maintenance of drainage and flood-control facilities.

POLICY HS-1.6: COORDINATION FOR ADEQUATE WATER SUPPLY

Coordinate with California Water Service and San José Water on effective management of water infrastructure systems.

POLICY HS-1.7: COORDINATION FOR ADEQUATE WASTEWATER CAPACITY

Coordinate with the Cupertino Sanitary District and San José-Santa Clara Regional Wastewater Facility to ensure wastewater infrastructure is effectively serving existing customers and has adequate capacity to provide for new demands on the infrastructure system.

POLICY HS-1.28: SEA LEVEL RISE PROTECTION

Ensure all areas in Cupertino are adequately protected ~~for~~ from the anticipated effects of sea level rise.

STRATEGIES:

HS-1.28.1. Monitor Rising Sea Level.

Regularly coordinate with regional, Sstate, and federal agencies on rising sea levels in the San Francisco Bay and major tributaries to determine if additional adaptation strategies should be implemented to address flooding hazards. This includes monitoring for updates to the Federal Emergency Management Agency's FEMA flood map ~~updates~~ to identify areas in the city susceptible to sea level rise, addressing changes to sState and regional sea and bay level rise estimates, and coordinating with adjacent municipalities on flood control improvements as appropriate.

HS-1.28.2. Flood Insurance Rate Maps.

Provide to the public, as available, up-to-date Flood Insurance Rate Maps (FIRM) -that identify rising sea levels and changing flood conditions.



GOAL HS-2

Ensure a high level of emergency preparedness for natural and human-caused disasters.

EMERGENCY PREPAREDNESS AND RESPONSE

The City seeks to focus on planning and education to prepare and enlist the community in the management of disasters and emergencies.

POLICY HS-2.1: BUILDING AND FIRE CODE COMPLIANCE

Ensure that all new development and redevelopment complies with the most current version of the California Building Code, California Fire Code, local ordinances, and local fire department standards to ensure improved public safety.

POLICY HS-2.2: PROMOTE EMERGENCY PREPAREDNESS

Distribute multi-hazard emergency preparedness information for all threats identified in the ~~emergency plan~~ City's Emergency Operations Plan. Information will be provided through Cardiopulmonary Resuscitation (CPR), First Aid and Community Emergency Response Team (CERT) training, lectures and seminars on emergency preparedness, publication of monthly safety articles in the Cupertino Scene, posting of information on the City's

Emergency Preparedness website, and coordination of video and printed information at the library. Efforts will be made to provide information in multiple formats to accommodate persons of all abilities.

POLICY HS-2.3: EMERGENCY OPERATIONS AND TRAINING

Ensure ~~ongoing training of identified~~ City staff are trained on their functions/-responsibilities in the Emergency Operations Center (EOC) and in disaster preparedness, first aid, and CPR, as applicable.

STRATEGIES:

HS-2.3.1: Emergency Operations Center (EOC).

Review options to provide functional, resilient, and seismic upgrades to the EOC facility at City Hall or explore alternative, resilient locations for the EOC, and include necessary upgrades

in the City's budget and Capital Improvement Program, as applicable.

HS-2.3.2: City Employee Training.

Conduct regular emergency training exercises and participate in regional

training exercises to ensure that employees are adequately trained in emergency response and recovery operations.

POLICY HS-2.4.3:

VOLUNTEER GROUPS

Continue to

encourage the ongoing use of volunteer groups, such as Cupertino Emergency Response Team (CERT), to augment the City's emergency services, and clearly define responsibilities during a local emergency.

STRATEGIES:

HS-2.4.3.1: Cupertino Citizens Corps.

Continue to support the Cupertino Amateur Radio Emergency Services (CARES), Community Emergency Response Team (CERT), and Medical Reserve Corps (MRC) programs to ensure the development of neighborhood-based emergency preparedness throughout the City. Encourage ongoing cooperation with CERTs in other cities.

HS-2.4.3.2: Community Groups.

Continue pre-disaster agreements with appropriate community groups to provide specified post-disaster

assistance, through the Emergency Services ~~Coordinator~~ Manager and with the advice of the City Attorney.

HS-2.4.3.3: American Red Cross.

Continue to implement the American Red Cross agreements under the direction of the ~~Director of Emergency Services~~ Emergency Services Division during a disaster.

HS-2.4.3.4: Emergency Shelter Providers.

Continue the agreements with designated emergency shelter sites to provide space for emergency supply containers.

HS-2.4.5: Community Areas for Refuge and Keep-safes (ARKs).

Maintain and expand the availability of City ARKs through Block Leadership and volunteer efforts to adopt an ARK.

HS-2.4.3.5: Amateur Radio Operators.

Continue to support training and cooperation between the City and Cupertino Amateur Radio Emergency Service (CARES) to prepare for emergency communications needs.

POLICY HS-2.5.4: EMERGENCY PUBLIC INFORMATION

Maintain Cupertino's Alert, Warning, and Notification (AWN) Program ~~an Emergency Public Information program~~ to be used during emergency situations.

STRATEGIES:

HS-2.5.4.1: Communication Methods.

Use ~~the local~~ Cupertino TV channel, Cupertino Radio 1670 AM, AlertSCC, the City's website, ~~City Internet~~ social media accounts, and other communication methods to transmit information to the public in multiple formats and languages appropriate to

The City maintains storage containers, called ARKs, strategically located around the City that contain emergency response supplies used by Community Emergency Response Teams, Medical Reserve Corps, and Cupertino Amateur Radio Emergency Service.

the demographics of
Cupertino citizenry.

HS-2.5.4.2: Public Information Office. Activate the ~~Public~~ Joint Information System in coordination with the Sheriff and the Fire Department to provide accurate information to the public as needed.

POLICY HS-2.6: FIRE PREVENTION AND EMERGENCY PREPAREDNESS

Promote fire prevention and emergency preparedness through City-initiated public education programs, the City Channel, the City's website, the Cupertino Scene, and other social media platforms.

POLICY HS-2.7: HAZARD PREPAREDNESS

Ensure that members of the community are adequately prepared for potential hazard scenarios, including geologic and seismic hazards, wildfire hazards, flooding hazards, extreme heat, and hazardous materials releases. Leverage the Neighborhood Block Program to advertise and incorporate its members into training efforts to expand outreach and engagement.

STRATEGIES:

HS-5.2.22.7.1: Emergency Preparedness. Publish and promote emergency preparedness tips, activities, and drills for the community. Use the City social media accounts and the website to provide safety tips and actively assist in neighborhood drills and safety exercises to increase participation and build community support. ~~that may include identifying and correcting household hazards, knowing how and when to turn off utilities, helping family members protect themselves during and after an~~

~~earthquake, recommending neighborhood preparation activities, and advising residents to maintain an emergency supply kit containing first-aid supplies, food, drinking water, and battery-operated radios and flashlights.~~

~~HS-5.2.32.7.2: Neighborhood Response Groups.~~

~~Encourage participation in Community Emergency Response Team (CERT) training by neighborhood groups and community-based organizations. Train neighborhood groups to care for themselves during disasters. Activity assist in neighborhood drills and safety exercises to increase participation and build community support.~~

~~HS-5.2.42.7.3: Dependent~~ Vulnerable Populations.

~~As part of community-wide efforts, actively cooperate with State agencies that oversee facilities for persons with disabilities and those with access and functional needs to ensure that such the facilities conform to all health and safety requirements, including emergency planning, training, response exercises, and employee education.~~

~~HS-5.2.52.7.4: Foreign Language Multilingual~~ Emergency Information. ~~Obtain translated~~ Prepare emergency preparedness materials in English, Spanish, and other languages commonly spoken in the community and make them available ~~distribute to~~ appropriate foreign language populations.

POLICY HS-2.8: EDUCATIONAL AND OUTREACH MATERIALS

Distribute relevant educational and outreach materials to the public to help residents understand appropriate fire mitigation activities, such as vegetation management, defensible space, evacuation routes, and emergency evacuation procedures during a fire hazard.

POLICY HS-2.9: POOR AIR QUALITY EVENT ASSISTANCE

Work with local agencies and community-based organizations to provide resources to help residents respond to poor air quality events (e.g., transportation to resilience centers and supply free N95 masks).

POLICY HS-2.105: DISASTER MEDICAL RESPONSE

Continue to coordinate with the appropriate County agencies and local

emergency medical clinics to ensure preparedness and provide disaster medical response.

Coordinate with the CERT members throughout the City to ensure that they are

prepared to provide emergency support and first aid at the neighborhood level.

STRATEGY:

HS-2.105.1: Memorandum of Understanding (MOU) with Emergency Medical Clinics.
Work with Santa Clara County to develop an MOU with local emergency clinics to provide services in the event of an emergency. The County's role and involvement in emergencies should be considered in development of the MOU.

POLICY HS-2.16: MILITARY FACILITIES AND READINESS

Consider the impact of development on neighboring military facilities, and maintain military airspace to ensure military readiness.

POLICY HS-2.11: EVACUATION ROUTES

Ensure that evacuation routes into and out of the city have adequate capacity, safety, and viability in the event of an emergency. Ensure evacuation route designations are reviewed and updated, as needed.

STRATEGIES:

HS-2.11.1: Evacuation Route Coordination.

Coordinate with emergency responders, the County, and Caltrans to ensure evacuation routes are designed and maintained to remain accessible during emergency evacuations.

HS-2.11.2: High-Hazard Day Parking Management.

In coordination with the Santa Clara County Sheriff's Office and Santa Clara County Fire Department, update the Emergency Operations Plan to establish a master list of streets with parking restrictions on designated evacuation corridors during Red Flag

Red Flag Warnings

A red flag warning is issued by the National Weather Service before and during fire weather conditions. These conditions include strong winds, low humidity, and warm temperatures, increasing the risk of wildfires starting and spreading quickly.

Warnings and other high-hazard days to preserve lane width, sight distance, and emergency access.

HS-2.11.3: Managed Traffic Control During Evacuations.

Coordinate with the Santa Clara County Fire Department, Santa Clara County Sheriff's Office, and Caltrans to implement managed traffic control measures during evacuations, including turn restrictions, signal timing adjustments, lane conversions, and route or ramp closures as needed to maximize outbound flow from evacuation areas.

POLICY HS-2.12: EVACUATION AWARENESS

Ensure the public is aware of evacuation zones, evacuation routes, and how to access emergency alerts and evacuation orders. Provide information to members of the public about evacuation concerns, including designated evacuation routes and evacuation plan details, through multiple formats and in multiple languages.

POLICY HS-2.13: INGRESS AND EGRESS

Require new subdivisions or multiple unit developments of five more lots or units to have at least two ingress and egress routes that account for existing and proposed traffic evacuation volumes at buildout.

POLICY HS-2.14: SECONDARY INGRESS AND EGRESS FOR EXISTING DEVELOPMENT.

Encourage secondary means of ingress and egress in areas with evacuation constraints, as shown in **Figure HS-3, Evacuation-Constrained Residential Areas**, and slopes of less than 30%

when new subdivisions of five lots or more or developments with five units or more are proposed.

POLICY HS-2.15: SECONDARY INGRESS AND EGRESS FOR NEW DEVELOPMENT.

Require secondary means of ingress and egress in areas with evacuation constraints and slopes of 30% or greater when new subdivisions of five lots or more or developments with five units or more are proposed.

POLICY HS-2.16: EMERGENCY ACCESS

Ensure compliant emergency access is provided for all new hillside development.

STRATEGIES:

HS-2.16.1: Roadway Design.

Create an all-weather emergency road system to serve hillside and wildfire-prone areas.

HS-2.16.2: Hillside Access Routes.

Require new hillside development to have frequent grade breaks in access routes, which must comply with applicable fire access and egress standards, to ensure a timely response from fire personnel.



Goal HS-3

Protect the community from hazards associated with wildland and urban fires

FIRE SAFETY

The City seeks to provide direction to the Santa Clara County Fire Department (~~SCCFD~~) on ways to better protect the community from natural and human-made ~~caused~~ fire disasters, and to implement local policies to improve building and site design.

~~POLICY HS-3.1: REGIONAL COORDINATION~~

~~Coordinate wildland fire prevention efforts with adjacent jurisdictions. Encourage the County and the Midpeninsula Open Space District to implement measures to reduce fire hazards, including putting into effect the fire reduction policies of the County Public Safety Element, continuing efforts in fuel management, and considering the use of “green” fire break uses for open space lands.~~

~~POLICY HS-3.2~~1: EARLY PROJECT REVIEW

Involve the Santa Clara County Fire Department in the early design stage of all development projects ~~requiring public review~~ to ensure Fire

~~Department~~ input and modifications as needed.

POLICY HS-3.2: FIRE RESPONSE TIMES

Ensure Santa Clara County Fire Department maintains required response time standards for emergency response in Cupertino.

STRATEGY:

HS-3.2.1: Response Times.

Work with Santa Clara County Fire Department to establish citywide response time standards, accounting for time for call, turnout time, travel time, and on scene time for both fire and emergency medical response.

POLICY HS-3.3: ADEQUATE FIRE PROTECTION

In coordination with the Santa Clara County Fire Department, require that

new development be located where fire and emergency services have sufficient capacity to meet project needs and require that the developer provide infrastructure or equipment necessary, proportional to the project's fire service demand, to maintain adequate fire protection to comply with critical response time standards, proportional to the project's fire service demand. Increased population density and new building types will impact fire life safety, capacity of water supply, traffic flow, and -will contribute to greater demand on public safety resources.

STRATEGIES:

HS-3.3.1: Development Review for Adequate Service.

Review development projects, in coordination with the Santa Clara County Fire Department, to evaluate fire response times and ensure adequate service to new development. Evaluation should consider both on-site and off-site conditions that may affect emergency response, including roadway width, access to water supply, and visibility of street signage. When development projects do not meet fire response times, require that project applicants provide infrastructure, equipment, or improvements necessary to ensure adequate fire protection and compliance with critical response time standards.

HS-3.3.2: City Fire Code.

To the extent feasible, conduct periodic fire safety inspections to

ensure compliance with adopted codes.

POLICY HS-3.4: NEW DEVELOPMENT IN MODERATE, HIGH AND VERY HIGH FIRE HAZARD SEVERITY ZONES.

Require review by the Community Development Department and Santa Clara County Fire Department of proposed construction projects and conceptual landscaping plans in the designated Fire Hazard Severity Zones.

STRATEGIES:

HS-3.4.1: Review in High and Very High Fire Hazard Severity Zones.

High and Very High Fire Hazard Severity Zones identified by CAL FIRE prior to the issuance of the first permit, whether ministerial or discretionary, (see **Figure HS-4**, Fire Hazard Severity Zones). Plans for proposed development in such areas shall include, at a minimum:

- Site plan, planting plan, planting palette, and irrigation plan with designs to reduce the risk of fire hazards and with consideration to site conditions, including slope, structures, and adjacencies.
- Development and maintenance of defensible space.
- More than one point of ingress and egress to improve evacuation, emergency response, and fire equipment access and adequate water infrastructure for water supply and fire flow that meets or exceeds the standards in the California State Minimum Fire Safe Regulations (commencing with Section 1270, SRA Fire Safe Regulations); and Subchapter 3, Article 3, commencing with Section 1299.01, Fire Hazard Reduction Around Buildings and Structures Regulations).

- Class A roofing assemblies for new and replacement roofs.
- Location and source of anticipated water supply.

HS-3.4.2: Review in Moderate Fire Severity Hazard Zones.

In the event, the California Fire and Building Codes require the implementation of different building standards in the Moderate Fire Severity Hazard Zones, ensure these are included in all permit plans prior to issuance of the first permits whether ministerial and discretionary.

POLICY HS-3.5: RESIDENTIAL DEVELOPMENT IN HIGH FIRE RISK AREAS

Avoid new subdivisions or residential development of multiple units in High Fire Hazard Severity Zone in order to protect public safety, reduce wildfire risks, and enhance emergency response capabilities.

POLICY HS-3.6: LAND USE AND ZONING CHANGES IN VERY HIGH FIRE RISK AREAS

Prohibit additional developments of multiple units and/or subdivisions in Very High Fire Hazard Severity Zone on properties with primary access from private roads and slopes greater than 30% that would increase residential density or intensity of the existing land use.

POLICY 3.7: FIRE-RESISTANT MATERIALS.

Ensure improvements and new structures within a High or Very High Fire Hazard Severity Zone comply with California Building Code Chapter 7A, California Fire Code, and California Fire Safe Regulations, or equivalent standards, to ensure fire-resistant roof

coverings and exterior building materials. The Chief Building Official shall enforce these standards in alignment with Health and Safety Code Section 13143.4, making necessary findings as required.

POLICY 3.8: FIRE PROTECTION PLANS.

Require fire protection plans for all new development projects in the High and Very High Fire Hazard Severity Zone, including plans for long-term, comprehensive, fuel reduction and management. The main components of a fire protection plan shall be consistent with California Fire Code, Chapter 49, and include:

1. Risk Analysis
2. Fire Response Capabilities
3. Fire Safety Requirements – Defensible Space, Infrastructure, and Building Ignition Resistance
4. Mitigation Measures and Design Considerations for Non-Conforming Fuel Modification
5. Wildfire Education Maintenance and Limitations

POLICY HS-3.9: ACCESS FOR FIRE AND EMERGENCY VEHICLES AND EQUIPMENT

Require proposed development to provide adequate access for fire and emergency vehicles and equipment that meets or exceeds the California State Fire Safe Regulation standards. These standards are found in two parts of the California Fire Safe Regulations (California Code of Regulations, Title 14, Division 1.5, Chapter 7): Subchapter 2, Articles 1-5 (commencing with Section 1270, SRA Fire Safe Regulations); and Subchapter 3, Article 3 (commencing with Section 1299.01, Fire Hazard Reduction Around Buildings and Structures Regulations). Developments must also

comply with the applicable provisions of the California Fire Code (California Code of Regulations, Title 24, Part 9) to ensure fire safety measures, including emergency access, fire protection systems, and defensible space requirements, align with statewide fire prevention standards.

STRATEGIES:

HS-3.9.1: Fire Hazards Response Support

Support measures that help firefighting crews and emergency response teams respond to fire hazards or work under low-visibility conditions, such as high-visibility signage for streets and building addresses that meet or exceed the standards in the California Fire Safe Regulations (Title 14 of the California Code of Regulations, Division 1.5, Chapter 7, Articles 2 and 3, Sections 1273 and 1274).

POLICY HS-3.3: EMERGENCY ACCESS

Ensure adequate emergency access is provided for all new hillside development.

STRATEGIES:

HS-3.3.1: Roadway Design.

Create an all-weather emergency road system to serve rural areas.

HS-3.3.2: Dead-End Street Access.

Allow public use of private roadways during an emergency for hillside subdivisions that have dead-end public streets longer than 1,000 feet or find a secondary means of access.

HS-3.3.3: Hillside Access Routes.

Require new hillside development to have frequent grade breaks in access routes to ensure a timely response from fire personnel. **HS-3.37.24:**

Hillside Road Upgrades. Require new

hillside development to upgrade existing access roads to meet State Minimum Fire Safe Regulations, California Fire Code, and City Municipal Code standards.

POLICY HS-3.410: PRIVATE RESIDENTIAL ELECTRONIC SECURITY GATES

Discourage the use of private residential electronic security gates and selectively permit them only if they do not ~~that~~ act as a barrier to emergency personnel.

STRATEGIES:

HS-3.410.1: Location.

Strongly discourage electric gates in high fire and very high fire hazard zones. Allow electric gates only in locations permitted by the Municipal Code. Require a fence exception for electric security gates in ~~certain areas~~ areas as outlined in the Municipal Code.

HS-3.410.2: Access to Gates.

Where electronic security gates are allowed, require the installation of an approved key switch to ~~be~~ accessed enable vehicle access by the Fire ~~District~~ Department.

POLICY HS-3.5: COMMERCIAL AND INDUSTRIAL FIRE PROTECTION GUIDELINES

Coordinate with the Fire Department to develop new guidelines for fire protection for commercial and industrial land uses.

POLICY HS-3.6: FIRE PREVENTION AND EMERGENCY PREPAREDNESS

Promote fire prevention and emergency preparedness through city-initiated public education programs, the government television channel,

~~the InternetCity's website, and the Cupertino Scene.~~

~~POLICY HS-3.7: MULTI-STORY BUILDINGS~~

~~Ensure that adequate fire protection is built into the design of multi-story buildings and require on-site fire suppression materials and equipment.~~

POLICY HS-3.11: EXTENSION OF WATER SERVICE

~~Encourage the water companies to extend water service into the hillside and canyon areas and encourage cooperation between water utility companies and the Fire Department in order to keep water systems in pace with growth and firefighting service needs.~~ Require new subdivisions and development within High and Very High Fire Hazard Severity Zones to obtain a water service extension letter, to include fire flow capacity, from water service providers prior to receiving development permit approval to ensure adequate water services for both fire protection and daily use.

POLICY HS-3.12: LONG-TERM WATER SUPPLY

Ensure long-term water supply for fire suppression and maintaining fire-flows.

POLICY HS-3.13: COORDINATION OF LONG-TERM WATER SUPPLY

Coordinate with water utility providers and the Santa Clara County Fire Department to keep water supply systems in pace with growth and firefighting service needs.

STRATEGIES:

HS-3.12.1: Adequate Water Service. Identify and improve areas lacking adequate water service for firefighting, including capacity for peak load under

a reasonable worst-case wildland fire scenario determined by the Santa Clara County Fire Department.

HS-3.13.2: Sufficient Water Flow. Work with San Jose Water, California Water Service, and Santa Clara County Fire Department to ensure that fire hydrants are adequately distributed throughout Cupertino and have sufficient water flow.

POLICY HS-3.14: FIRE SAFE ROADWAYS

Require existing public and private roadways in Fire Hazard Severity Zones to comply with current fire safety regulations for new subdivisions and development.

STRATEGY

HS-3.14.1: Roadways Repair and Maintenance.

Prepare and implement plans to repair and -maintain City-owned roadways as needed to meet current standards and require private property owners to do the same and given the absence of other site constraints. At time of development review, ensure maintenance agreements are recorded running with the land to ensure that street maintenance is the shared responsibilities of the owners. These standards include road standards for evacuation and emergency vehicle access, vegetation clearance, and other requirements of the California Fire Safe Regulations, Title 14 of the California Code of Regulations, Division 1.5, Chapter 7): specifically, Subchapter 2, Articles 1-5 (commencing with Section 1270, SRA Fire Safe Regulations); and Subchapter 3, Article 3 (commencing with Section 1299.01, Fire Hazard Reduction

Around Buildings and Structures Regulations).

POLICY HS-3.15: ROADSIDE VEGETATION MANAGEMENT

Collaborate with Santa Clara County Fire Department to provide roadside fuel reduction, defensible space, and vegetation management, particularly along evacuation routes.

POLICY HS-3.16: FIRE-RESISTANT LANDSCAPING

Promote the use of fire-resistant landscaping in public and private developments. In High and Very High Fire Severity Zones, fire-resistant landscaping shall be required.

POLICY HS-3.17: FUEL BREAKS AND EMERGENCY ACCESS ROUTES

Coordinate with CAL FIRE and Santa Clara County Fire Department to maintain existing fuel breaks and emergency access routes for effective fire suppression.

POLICY HS-3.18: RECOVERY AND REDEVELOPMENT AFTER A LARGE FIRE.

Develop and update programs as needed that ensure recovery and redevelopment after a large fire and that reduce future vulnerabilities to fire hazard risks through site preparation, redevelopment layout design, fire-resistant landscape planning, and home hardening building design and materials.

POLICY HS-3.179: LAND USE AND ZONING CHANGES IN VERY HIGH FIRE RISK AREAS

Prohibit additional developments of multiple units and/or subdivisions in Very High Fire Hazard Severity Zone on properties with primary access from

private roads and slopes greater than 30% that would increase residential density or intensity of the existing land use.



Goal HS-4

Ensure high levels of community safety with police services that meet the community's needs

~~PUBLIC SAFETY~~ POLICE SERVICES

The City seeks to support public safety through improved police services and better site design.

POLICY HS-4.1: NEIGHBORHOOD AWARENESS PROGRAMS

Continue to support the Neighborhood Watch Program, [Block Leader Program](#), and other similar programs intended to help neighborhoods prevent crime through social interaction.

POLICY HS-4.2: CRIME PREVENTION THROUGH BUILDING AND SITE DESIGN

Consider appropriate design techniques to reduce crime and vandalism when designing public spaces and reviewing development proposals.

STRATEGIES:

HS-4.2.1: Perimeter Roads for Parks.
Encircle neighborhood parks with a public road to provide visual accessibility whenever possible.

HS-4.2.2: Development Review.
Continue to request County Sheriff review and comment on [new](#) development ~~applications~~ [to ensure](#)

[new development provides](#) ~~for~~ [appropriate](#) security and public safety measures.

POLICY HS-4.3: FISCAL IMPACTS

~~Recognize~~ [Require](#) that [new development accounts for](#) fiscal impacts to the County Sheriff, [Santa Clara County Fire](#), and City of Cupertino when approving various land use mixes.

POLICY HS-4.4: RESPONSE TIMES

[Ensure that fire and emergency response times consistently meet the standards of the Santa Clara County Fire Department. Santa Clara County Fire Department aims for the first unit to arrive to 90 percent of all emergent structural fires and emergency medical service incidents within seven minutes and forty seconds. For the purpose of this standard, response times are measured from when the call location is verified by the dispatcher, to the arrival](#)

of the first unit at the scene of the incident. For all other emergent incidents, the benchmark is for the first unit to arrive to 90 percent of emergent incidents within eight minutes and forty seconds.

STRATEGY:

HS-4.4.1: Response Time Review.

Include requirements to conduct regular reviews of response time data for police service to identify trends, patterns, and areas for improvement in contracts for Sheriff services.

Conduct regular reviews of response time data for fire services to identify trends, patterns, and areas for improvement for Fire District services.



GOAL HS-5

Reduce risks associated with geologic and seismic hazards

GEOLOGIC AND SEISMIC HAZARDS

POLICY HS-5.1: SEISMIC AND GEOLOGIC REVIEW PROCESS

Evaluate new development proposals and subdivisions within mapped ~~potential~~ seismic and geologic hazard zones using a formal seismic/geologic review process. Use ~~Table HS-3~~ General Plan Appendix E of this ~~Element~~ to determine the level of review required.

STRATEGIES:

HS-5.1.1: Geotechnical and Structural Analysis.

Require any site with a slope exceeding 10 percent to reference the Landslide Hazard Potential Zone maps of the State of California for all required geotechnical and structural analysis.

HS-5.1.2: Residential Upgrades.

Require that any residential facility, that is being increased more than 50 percent assessed value or physical size, conform to all provisions of the current building and residential codes throughout the entire structure. Owners of residential buildings with known structural defects, such as un-

reinforced garage openings, “soft first story” construction, unbolted foundations, or inadequate sheer walls are encouraged to take steps to remedy the problem and bring their buildings up to the current building and residential codes.

HS-5.1.3: Geologic Review. Continue to implement, ~~and~~ update and maintain geologic review procedures for ~~g~~Geologic ~~r~~Reports required by ~~the~~ Municipal Code General Plan Appendix E through the development review process.

POLICY HS-5.2: PUBLIC EDUCATION ON SEISMIC SAFETY

Reinforce the existing public education programs to help residents minimize hazards resulting from earthquakes.

STRATEGIES:

HS-5.2.1: Covenant on Seismic Risk.

Require developers to record a covenant to disclose risks to ~~tell~~ future residents in high-risk all fault zones ~~areas about the risk~~ and inform them that more information is in City Hall

records. This [requirement](#) is in addition to the State requirement that information on the geological report is recorded on the face of subdivision maps.

~~HS-5.2.2: Emergency Preparedness.~~ Publish and promote emergency preparedness activities and drills. Use the City social media, and the website to provide safety tips that may include identifying and correcting household hazards, knowing how and when to turn off utilities, helping family members protect themselves during and after an earthquake, recommending

~~neighborhood preparation activities, and advising residents to maintain an emergency supply kit containing first-aid supplies, food, drinking water and battery operated radios and flashlights.~~

~~HS-5.2.3: Neighborhood Response Groups.~~

~~Encourage participation in Community Emergency Response Team (CERT) training. Train neighborhood groups to care for themselves during disasters. Actively assist in neighborhood drills and safety exercises to increase participation and build community support.~~

~~HS-5.2.4: Dependent Populations.~~ As part of community-wide efforts, actively cooperate with State agencies that oversee facilities for persons with disabilities and those with access and functional needs, to ensure that such facilities conform to all health and safety requirements, including

~~emergency planning, training, exercises and employee education.~~

~~HS-5.2.5: Foreign Language Emergency Information.~~

~~Obtain translated emergency preparedness materials and make them available to appropriate foreign language populations.~~

POLICY HS-7.5.3: HILLSIDE GRADING

Establish standards and procedures to limit grading on hillside properties, particularly those that change natural flows or flatten existing slopes. Restrict the extent and timing of hillside grading operations to April through October, except as otherwise allowed by the City. Require performance bonds during the remaining time to guarantee the repair of any erosion damage. Require planting of graded slopes as soon as practical after grading is complete.



GOAL HS-6

Protect people and property from the risks associated with hazardous materials and exposure to electromagnetic fields

HAZARDOUS MATERIALS

The City is committed to protecting its citizens from hazardous materials through improved disposal practices, better site design, and more public education.

POLICY HS-6.1: HAZARDOUS MATERIALS STORAGE AND DISPOSAL

Require the proper storage and disposal of hazardous materials to prevent leakage, potential explosions, fire, or the release of harmful fumes as required by the Santa Clara County Fire Department and/or the Santa Clara County Department of Environmental Health. Maintain information channels to the residential and business communities about the illegality and danger of dumping hazardous material and waste in the storm drain system or in creeks.

POLICY HS-6.2: PROXIMITY OF RESIDENTS TO HAZARDOUS MATERIALS

Assess future residents' exposure to hazardous materials when new residential development or sensitive populations are proposed in existing industrial and manufacturing areas.

Do not allow residential development or sensitive populations (such as childcare uses or elder care) ~~or sensitive populations~~ if such hazardous conditions cannot be mitigated to an acceptable level of risk.

STRATEGIES:

HS-6.2.1: Environmental Site Assessment (ESA) required.

Continue to implement requirements in the Municipal Code to ensure environmental site assessment is completed prior to project approval.

HS-6.2.2: Soil Remediation required.

Ensure that conditions of approval are incorporated to require soil remediation with the appropriate regulatory agency with any ministerial or discretionary project approvals. Continue to implement the requirement that soil remediation be conducted prior to issuance of any permits involving ground/soil disturbing activity.

HS-6.2.3: Other Hazardous Materials Review required.

If there is sufficient evidence about the presence or storage of hazardous materials in properties within 500 feet of property on which new residential or uses for sensitive populations are proposed, review by the authority controlling the presence of the hazardous materials is required to ensure that any requirements from that authority are included in any approvals, whether ministerial or discretionary.

POLICY HS-6.3: ELECTROMAGNETIC FIELDS (EMF) RADIOFREQUENCY STUDIES

Continue to require radiofrequency studies for wireless developments during ~~Ensure that projects meet Federal and State standards for EMF emissions through the~~ development review process to confirm that projects meet federal and State standards.

POLICY HS-6.4: EDUCATIONAL PROGRAMS

Continue to encourage residents and businesses to use non- and less-hazardous products, especially less toxic pest control products, to slow the generation of ~~new-and~~ reduce hazardous waste requiring disposal through the county-wide program.

POLICY HS-6.5: HAZARDOUS WASTE DISPOSALS

Continue to support and facilitate ~~for residences and businesses,~~ a convenient opportunity to properly

dispose of hazardous waste for residences and businesses.

STRATEGIES:

HS-6.5.1: Partner on Hazardous Waste Collection and Disposal.

Continue to explore efficient, economical, and convenient ways to offer Household Hazardous Waste and electronic waste collection for residents in partnership with the ~~s~~Solid wWaste contractor or the County.

HS-6.5.2: Educational Materials.

Publish educational materials about the Household Hazardous Waste program in the Cupertino Scene, City website, and brochures that are distributed throughout the community.

POLICY HS-6.6: RADIOFREQUENCY AWARENESS AND TRANSPARENCY

Continue to address public concerns about radiofrequency exposure and promote science-based awareness by educating residents, ensuring regulatory compliance, and fostering transparency through effective community outreach and communication led by the Technology, Information, and Communications Commission (TICC) as needed.



GOAL HS-7

Protect people and property from risks associated with floods

FLOODING

The City seeks to ensure community protection from floods through the design of projects, municipal operations, and public education.

POLICY HS-7.1: EVACUATION MAP

~~Prepare and update periodically~~ Maintain an evacuation map for the flood hazard areas in Cupertino on ~~and distribute it to the general public~~ the City's website.

POLICY HS-7.2: EMERGENCY RESPONSE TO DAM FAILURE

Ensure that Cupertino is prepared to respond to a potential dam failure.

STRATEGIES:

HS-7.2.1: Emergency and Evacuation Plan.

Coordinate with the Santa Clara Valley Water District to ~~m~~ Maintain and update the Stevens Creek Dam Failure Plan ~~a Stevens Creek Dam Failure Plan,~~ including an alert, warning, and notification systems and appropriate signage.

HS-7.2.2: Inter-agency Cooperation.

Continue to coordinate dam-related evacuation plans and alert/notification systems with the City of Sunnyvale,

the Santa Clara Valley Water District, and Santa Clara County to ensure that traffic management between the agencies facilitates life safety. ~~Also~~ Work with other neighboring cities to enhance communication and coordination during a dam-related emergency.

POLICY HS-7.3: EXISTING NON-RESIDENTIAL USES IN THE FLOOD-PLAIN

Allow commercial and recreational uses that are now exclusively within the flood-plain to remain in their present use or to be used for agriculture or open space, provided the use it ~~does not~~ conflict with ~~F~~ederal, State, ~~and or~~ regional requirements.

POLICY HS-7.4: CONSTRUCTION IN FLOOD-PLAINS

Continue to implement land use, zoning, and building and residential code regulations limiting new construction in the already urbanized

flood hazard areas recognized by the Federal Flood Insurance Administrator.

STRATEGIES:

HS-7.4.1: Dwellings in Flood Plains.

~~Discourage-Prohibit~~ new residential development or subdivisions in regulated flood plains the 100-year floodplain or regulatory floodway which increases the density or intensity of the existing land use. Regulate all types of redevelopment in ~~natural~~ flood-plains to prevent increased density. This includes discouraging fill materials and obstructions that may increase flood potential or modify the natural riparian corridors.

HS-7.4.2: Description of Flood Zone Regulation.

Continue to maintain and update a map of potential flood hazard areas and a description of flood zone regulations on the City's website.

HS-7.4.3: National Flood Insurance Program Community Rating System.

Continue to participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS).

HS-7.4.4 Land Uses in Flood Plains.

Encourage the development of compatible open space/recreational uses in regulatory floodways and the 100-year floodplain that are consistent with the provisions of the Federal Emergency Management Agency for floodway uses.

HS-7.4.5 Update Flood Damage Prevention Ordinance.

Review and update Municipal Code Section 16.52, *Prevention of Flood Damage*, to maintain compliance with the National Flood Insurance Program and ensure development standards

consider changes to the flood plain due to climate change. **POLICY HS-7.5:**

~~HILLSIDE GRADING~~

~~Restrict the extent and timing of hillside grading operations to April through October except as otherwise allowed by the City. Require performance bonds during the remaining time to guarantee the repair of any erosion damage. Require planting of graded slopes as soon as practical after grading is complete.~~

POLICY HS-7.6: STABILITY OF EXISTING WATER STORAGE FACILITIES

~~Assure~~ Ensure the structural integrity of water storage facilities.

STRATEGY:

HS-7.6.1: Coordination with other Agencies.

Work closely with the San Jose Water Company and owners of other water storage facilities to develop and implement a program to monitor the stability of all existing water storage facilities and related improvements, such as distribution lines, connections, and other system- components.

POLICY HS-7.7: REDUCE FLOOD RISK

Reduce flood risk by maintaining effective stormwater drainage systems, regulating construction, and updating stormwater infrastructure design requirements, and retrofitting storm drainage systems as needed.



GOAL HS-8

Minimize noise impacts on the community and maintain a compatible noise environment for existing and future land use

NOISE

The City seeks to ensure that the community continues to enjoy a high quality of life through reduced noise pollution, effective project design, and noise management operations.

POLICY HS-8.1: LAND USE DECISION EVALUATION

Use the Land Use Compatibility for Community Noise Environments chart, the Future Noise Contour Map (see **Figure D-1 in Appendix D**), and the City Municipal Code to evaluate land use decisions.

POLICY HS-8.2: BUILDING AND SITE DESIGN

Minimize noise impacts through appropriate building and site design.

STRATEGIES:

HS-8.2.1: Commercial Delivery Areas.

Locate delivery areas for new commercial and industrial developments away from existing or planned homes.

HS-8.2.2: Noise Control Techniques.

Require analysis and implementation of techniques to control the effects of noise from industrial equipment and

processes for projects near ~~low-intensity~~ residential uses. Ensure that indoor and outdoor noise levels established in the Municipal Code are implemented during the review and approval of construction permits.

HS-8.2.3: Sound Wall Requirements.

Exercise discretion in requiring sound walls to be sure that all other measures of noise control have been explored before permitting or installation of a sound wall, and, if the installation is permitted, ensure that the sound wall ~~blends with the neighborhood~~ is architecturally enhanced with veneer or other decorative cladding, maintained at the expense of the sponsors of the sound wall or, if a landscape screen is permitted, that the landscaping is continuously maintained and replaced as necessary to ensure a green screen, maintained at the expense of the

sponsors of the sound wall. Sound walls should be designed and landscaped to fit into the environment.

POLICY HS-8.3: CONSTRUCTION AND MAINTENANCE ACTIVITIES

Regulate construction and maintenance activities. Establish and enforce reasonable allowable periods of the day, during weekdays, weekends, and holidays for construction activities. Require construction contractors to use the best available technology to minimize excessive noise and vibration from construction equipment such as pile drivers, jack hammers, and vibratory rollers. Implement the noise requirements of the Municipal Code in Titles 10 and 17.

POLICY HS-8.4: FREEWAY DESIGN AND NEIGHBORHOOD NOISE

Ensure that roads and development along ~~Highway~~State Route 85 and Interstate 280 are designed and improved in a way that minimizes neighborhood noise, including the installation of rubberized asphalt paving.

POLICY HS-8.5: NEIGHBORHOODS

Review residents' needs for convenience and safety and prioritize them over the convenient movement of commute or through traffic, where practical.

POLICY HS-8.6: TRAFFIC-CALMING SOLUTIONS TO STREET NOISE

Evaluate solutions to discourage through traffic in neighborhoods through enhanced paving and modified street design.

STRATEGY:

HS-8.6.1: Local Improvement.

Modify street design to minimize noise impact to neighbors.

POLICY HS-8.7: REDUCTION OF NOISE FROM TRUCKING OPERATIONS

Conduct interagency coordination with Santa Clara County~~Work~~ to carry out noise mitigation measures to diminish noise along Foothill and Stevens Creek Boulevards from the quarry and cement plant trucking operations. These measures include regulation of truck speed, the volume of truck activity, and trucking activity hours to avoid late evening and early morning. Alternatives to truck transport, specifically rail, are strongly encouraged when feasible.

STRATEGIES:

HS-8.7.1: Restrictions in the County's Use Permit.

Coordinate with the County to restrict the number of trucks, their speed, and noise levels along Foothill and Stevens Creek Boulevards, to the extent allowed in the Use Permit. Ensure that restrictions are monitored and enforced by the County.

HS-8.7.2: Road Improvements to Reduce Truck Impacts.

Consider road improvements such as medians, landscaping, noise attenuating asphalt, and other methods to reduce quarry truck impacts.

HS-8.7.2: Street Signage.

Consider whether restrictions on the movement of quarry related trucks between certain quiet hours on thoroughfares, such as Stevens Creek Boulevard and Foothill Boulevard can be implemented.

**POLICY HS-8.8: NOISE GENERATING
USES**

Prior to approving noise generating uses, including public or private recreational uses, within or adjacent to established residential areas, ensure the proposed noise generating use includes adequate noise mitigation measures, including, but not limited to, posted rules and regulations which limit hours of operation, to meet the City's adopted noise standards.



GOAL HS-9

Increase community resilience to climate change hazards

CLIMATE CHANGE RESILIENCE

The City seeks to ensure that the community adapts to the impacts of climate change through sustainable practices, innovative design techniques, public outreach and education, and agency collaboration.

POLICY HS-9.1: EQUITABLY LOCATED RESILIENCE CENTERS

Establish one or more community resilience centers in Cupertino. Ensure that resilience centers are not in areas at risk from hazard impacts to the extent possible, are equitably located, offer refuge from extreme heat and extreme weather events as well as poor air quality and disasters, and are equipped with renewable energy generation and backup power supplies. Such facilities should be in easily accessible locations and available to all community members.

STRATEGY:

HS-9.1.1: Evacuation Shelter Planning and Siting.

Update the Emergency Operations Plan to identify and maintain a network of temporary evacuation shelters and community refuge sites outside the Fire Hazard Severity Zones

to reduce travel demand on primary evacuation corridors.

POLICY HS-9.2: RESILIENCE CENTER TRANSIT SERVICES

Work with transit, dial-a-ride, and paratransit service providers to provide transit services to and from community resilience centers for seniors, people with disabilities, and residents with access and functional needs.

POLICY HS-9.3: SUSTAINABLE WATER SUPPLIES

Maintain a sustainable, long-term water supply to meet community needs with consideration of the effects of more frequent and severe drought events. Work with water providers to implement extensive water conservation measures and ensure sustainable water supplies, including for fire suppression needs.

STRATEGY:**HS-9.3.1: Water Conservation.**

Promote water conservation measures in all public and private development, in landscaping and potable water use.

POLICY HS-9.4: EXTREME HEAT

Recognize extreme heat as a significant hazard in Cupertino, integrating extreme heat into emergency preparedness and response procedures.

STRATEGIES**HS-9.4.1: Shading and Heat-Mitigating Materials.**

Coordinate with the Santa Clara Valley Transportation Authority to increase shading and heat-mitigating materials on pedestrian walkways and at transit stops, including the planting and maintenance of trees for shade.

HS-9.4.2: Enhanced Shading.

Work with existing property owners and new developments to enhance shading on properties by promoting the installation of shade structures and features. As part of this effort, encourage the inclusion of vegetation and trees and/or shade structures in existing parking lots. Require the inclusion of vegetation and shade trees and/or shade structures in existing parking lots where a change of use is proposed or more than 25% of the site is being modified or when a new parking lot is proposed in

compliance with the Municipal Code to reduce the urban heat island effect.

HS-9.4.3: Heat Action Plan.

Develop a citywide Heat Action Plan, which would include the identification of cooling centers, in coordination with emergency service and utility providers.

POLICY HS-9.5: SUSTAINABLE, ENERGY-EFFICIENT, AND ENVIRONMENTALLY REGENERATIVE FEATURES

Encourage new developments and existing property owners to incorporate sustainable, energy-efficient, and environmentally regenerative features into their facilities, landscapes, and structures to reduce energy demands and improve on-site resilience. Support financing efforts to increase community access to these features.

HS-9.5.1: Electrification.

Continue to discourage the installation of natural gas appliances and utilities in new installations or replacement projects. To the extent allowed by state law, require the installation of all electric appliances and utilities.

HS-9.3.2: Permeable Pavement.

Require permeable pavement (not installed on any impervious materials) in areas used for surface parking and/or driveways, such as driveways in single family homes and in at least 25% of open parking spaces in other types of projects.

POLICY HS-9.6: DROUGHT-TOLERANT GREEN INFRASTRUCTURE

Promote the use of drought-tolerant green infrastructure, including landscaped areas, as part of cooling strategies in public and private spaces.

HS-9.6.1: Drought-tolerant Green Infrastructure in Public Projects.

Identify opportunities for and install green infrastructure in conjunction with street improvement projects and other capital improvement projects.

HS-9.6.2: Drought-tolerant Green Infrastructure in Private projects.

Identify opportunities for and encourage the installation of green infrastructure in conjunction with private development.

POLICY HS-9.7: NATURAL RESOURCES AND INFRASTRUCTURE

Encourage public and private projects to use natural resources and nature-based solutions to absorb the impacts of climate-related hazards and associated natural hazards, as feasible.

POLICY HS-9.8: SEVERE WEATHER RESILIENCY

Increase the resiliency of City-owned structures to severe weather events, including high wind events, and support homeowners and business owners to increase the resilience of their buildings and properties through retrofits, weatherization, and other improvements.

POLICY 9.9: NATURE-BASED SOLUTIONS.

Where feasible, encourage the use of nature-based solutions, existing natural features, and/or ecosystem processes, or the restoration thereof, when considering alternatives for the

conservation, preservation, or sustainable management of open space. This may include, but is not limited to, aquatic or terrestrial vegetated open space, systems and practices that use or mimic natural processes, and other engineered systems, to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people and wildlife.

Environmentally regenerative features refer to design or operational features of buildings, infrastructure, and systems that help to restore, renew, or regenerate the natural environment. Examples include green roofs and living walls, permeable pavement, on-site renewable energy generation, rainwater harvesting and reuse, or use of low-impact materials and construction techniques.



Appendix E: Geologic and Seismic Hazards

E

CONTENTS:

- E-2 Fault Rupture
- E-3 Ground Shaking
- E-5 Seismic Ground Deformation
- E-5 Liquification
- E-6 Seismically Induces Landslide
- E-6 Landslide Hazard
- E-7 Development Review



The following definitions provide a more comprehensive discussion of the hazards that are described in the main body of the text of Chapter 7: Health and Safety Element.

FAULT RUPTURE

Surface fault rupture is the breaking of the ground along a fault trace usually during a large magnitude earthquake. Although the risk of damage associated with surface fault rupture is high, it can be avoided by not placing structures across active fault traces. Thus, an important element in community planning involves knowing the locations of active fault traces. The State of California has produced maps depicting the general locations of known active fault traces. These maps, referred to in the past as the Alquist-Priolo Special Studies Zones Maps and more recently as Earthquake Fault Maps, provide location information about the most widely known active faults. Such as the San Andreas fault. However, the scale and resolution of these maps are not sufficient to accurately identify the location of faults with respect to individual properties and building sites. In addition, other significant local faults, such as the Monta Vista-Shannon and Sargent-Berrocal faults, are not covered by the State maps. The City has updated its [Geologic and Seismic Hazards map](#) ([Figure E-1](#)) ~~Geology Map and Geologic Hazards Map~~ to reflect the most recent data concerning local fault trace alignments. Within the ~~City Fault-Rupture~~[Regional Fault Zones](#) “Zone F”, as illustrated on ~~Figure HS-5E-1~~: [Geologic and Seismic Hazards](#), property owners must retain professional geologic consultants to determine whether ~~or not~~ specific fault traces impact proposed building sites for habitable or critical structures.

GROUND SHAKING

Buildings and other structures located in seismically active regions such as the San Francisco Bay area are exposed to the hazard of severe ground shaking during earthquakes. Ground shaking is the vibration caused by rupture of a fault segment during an earthquake, and it can be felt over a wide area when the magnitude of the earthquake is very strong. The shaking intensity ~~also is~~ also stronger in the area close to the earthquake epicenter and weaker in areas further away from the earthquake. In addition, the level of ground shaking

is influenced by underlying rock formations, soil conditions and the depth to groundwater. A widely used shaking intensity scale is the Modified Mercalli Intensity Scale (**Table E-1**), which describes the amount of damage occurring at any geographical location in response to seismic shaking.

The intensity of an earthquake ground shaking is related to the size or magnitude of the earthquake. Each magnitude represents 10 times the amount of ground motion and approximately 31 times the amount of energy as the next lower numeral. Thus, an earthquake of magnitude 8 releases about 1,000 times more energy (31×31) than a magnitude 6 earthquake. A large-magnitude earthquake on nearby faults could cause considerable local damage, depending on the distance from the epicenter and characteristics of the ground. In general, structures on less well-consolidated bedrock and soil will experience greater shaking intensities than structures situated on hard rock.

The City of Cupertino adopted the current California Code of Regulations, Title 24, or Buildings and Standards Code, with certain amendments, which applies to new and existing buildings and structures in the city. ~~The 1997~~ Title 16 Buildings and Construction of the City's Municipal Code includes Chapter 16.04 Building Code, which incorporates the current California Building Code, Volumes 1 and 2 and specified appendices, and Chapter 16.06 Residential Code, which incorporates the California Residential Code with specified appendices. The City's Building Code and Residential Code ~~Uniform Building Code (UBC)~~ incorporates ~~new~~ seismic design parameters that ~~take into account~~ consider various types of faults, soil profile types and near-source acceleration factors. The majority of the ~~C~~city located west of Highway 85 is located within 2 kilometers of known seismic sources (per California Division of Mines and Geology Near-Source Zones Map E-19).

Proposed new development located within two kilometers of a known seismic source receives the most stringent near-source design factor, which is required

for use with ~~1997 Uniform Building Code~~ current Cupertino Building Code (CBC)
and Cupertino Residential Code (CRC) structural design calculations. **Figure E-
21** generally depicts the location of the various faults and hazard zones within
the Cupertino planning area.

Table E-1 General Comparison Between Earthquake Magnitude and the Earthquake Effects Due to Ground Shaking

Earthquake Category	Richter Magnitude	Modified Mercalli Intensity Scale (After Huser, 1970)	Damage to Structure
Minor	2.00	I Detected only by sensitive instruments	No Damage
		II Felt by few persons at rest, esp. on upper floors; delicate suspended	
	3.00	III Felt noticeably indoors, but not always recognized as an earthquake; standing cars rock slightly, vibration like passing trucks	
		IV Felt indoors by many, outdoors by a few; at night some awoken; dishes, windows, doors disturbed;	
	4.00	V Felt by most people; some breakage of dishes, windows and plaster; disturbance to tall objects	Architectural Damage
		VI Felt by all; many are frightened and run outdoors; Falling plaster and chimneys; damage small	
	5.00		
	5.3	VII Everybody runs outdoors. Damage to buildings varies depending on quality of construction; noticed by driver of cars	
Moderate	6.00	VIII Chimneys fall; sand and mud ejected; drivers of cars disturbed	Structural Damage
	6.9	IX Building shifted off foundations, cracked, thrown out plumb; ground cracked, underground pipes broken; serious damage to reservoirs/embankments	
Major	7.00	X Most masonry and frame structures destroyed; ground cracked; rails bent slightly; landslides	
	7.7	XI Few structures remain standing; bridges destroyed; fissures in ground; pipes broken; land slides; rails bent	
Great	8.00	XII Damage total; waves seen on ground surface; lines of sight and level distorted; objects thrown into the air; large rock masses displaced	Total Destruction

SEISMIC GROUND DEFORMATION

Ground located in relatively close proximity to active fault traces may experience some level of ground deformation beyond the primary surface fault rupture zones. The distribution of this anticipated deformation is illustrated on [Figure E-1: Geologic and Seismic Hazards, “Zone F”](#). ~~by the updated City Geologic Hazard Map — “Zone D”~~. Ground deformation away from the primary rupture zones may include broad bowing or warping of the surface, ground cracking and secondary ground fissuring. The general magnitudes of such deformation could be up to several inches, whereas ground impacted by primary surface fault rupture could experience offsets of several feet.

Adjacent to local thrust faults (Berrocal and Monta Vista faults), relatively broad zones of ground deformation should be anticipated immediately west of the mapped fault trace alignments. These zones of deformation are anticipated to result from seismic displacement at depth along inclined fault planes descending to the west. The potential for such ground deformation should be considered during the design of new structures near active fault traces, [as shown by Regional Fault Zones on Figure E-1: Geologic and Seismic Hazards](#).

LIQUEFACTION

Soil liquefaction is the phenomenon in which certain water-saturated soils lose their strength and flow as a fluid when subjected to intense shaking. With loss of soil strength, lateral spreading or sliding of soil toward a stream embankment can occur. Liquefaction can also result in the formation of sand boils, which represent conduits of pressure release from within the liquefied layer (at depth) to the ground surface. Liquefaction can also lead to local settlement of the ground surface and a reduction of bearing support for building foundations. The potential exists for tilting or collapse of structures due to liquefaction of underlying earth materials.

Currently identified lands subject to a moderate or higher level of risk for liquefaction are essentially coincident with areas of potential flood inundation adjacent to local creek channels. Relatively deep, unconsolidated granular soil materials potentially prone to liquefaction may occur in these areas. The ~~combined liquefaction and flood inundation hazard~~ [high liquefaction susceptibility areas and flood hazard zones](#) ~~are~~ is depicted by Hazard “Zone I” on [Figure E-1: Geologic and Seismic Hazards](#) ~~the City Geotechnical Hazards Map~~.

SEISMICALLY INDUCED LANDSLIDING

Reactivation of existing landslides or generation of new slope failures (as discussed in the following section on landslides) may be initiated under intense seismic ground shaking conditions. As a result of the 1989 Loma Prieta earthquake, many large pre-existing landslides demonstrated lurching or other signs of movement and partial reactivation within the local Santa Cruz Mountains to the southwest of the City. Intense seismic ground shaking from a nearby earthquake could trigger new slope failures or movement of pre-existing landslides. Steep to precipitous banks adjacent to the floodplain-plane of Stevens Creek may be particularly susceptible to seismically induced land sliding.

These areas, and other mapped landslides high landslide susceptibility areas within the City, are included within “Zone L” on [Figure E-1: Geologic and Seismic Hazards](#) the City Geotechnical Hazard Map.

LANDSLIDE HAZARDS

Landslides present the greatest geologic hazards to the foothills and low mountains in the planning area. The sliding of a slope is the normal geologic process that widens valleys and flattens slopes. The rate ranges from rapid rock fails to very slow soil and bedrock creep. Landslides are caused by inter-related natural factors, such as weak soil and rock over hillsides made steeper by rapid stream erosion, adverse geologic structure, groundwater levels and high rainfall rates. Landslides can be caused by improper grading, excessive irrigation, removal of natural vegetation and altering surface and subsurface drainage.

[Figure E-21 on page 5](#) shows mapped landslide deposits within Cupertino. Geologic mapping in the hillsides shows that landslide deposits cover as much as 20 to 30 percent of the hillsides in the planning area. Landslides range from small, shallow deposits made up of soil and weak bedrock materials to large, deep landslides involving a large amount of bedrock.

Extensive geologic characterization and engineering analyses are necessary to determine the long-term stability of a landslide deposit. Old deposits are the most difficult to judge. Experience shows that old landslide deposits are far more likely to move again than areas that have not had landslides before.

Areas in these old landslides that are next to steep, new stream channels are more likely to have new landslides than areas further from the new channels. This would be especially true with severe shaking during a major earthquake on any of the three faults in Cupertino. The historic account of the 1906 earthquake shows many landslides occurred throughout the Santa Cruz Mountains. Some of these were catastrophic, causing loss of life, personal injury, and severe damage to buildings.

Landslides are expected along the high, steep embankments that bound the Stevens Creek floodplain, confined to local sites along the stream channel alignment extending from the front the hillsides across the valley floor. This hazard can be reduced significantly by restrictive building at the base and top of the embankments.

DEVELOPMENT REVIEW

These geologic and seismic hazards present risks to property and public safety. Tables E-2 through E-5 briefly explain geologic and seismic hazards in Cupertino, magnitude and occurrence, acceptable exposure rise, and technical investigations required based on acceptable risk. Figure E-1 identifies the areas in Cupertino susceptible to the greatest risk.

During the development review process, Figure E-1 identifies which seismic or geologic hazard zone a proposed project is in, and Table E-3 defines the acceptable exposure level based on the development type. These two factors should then be used to determine the required geologic and seismic technical investigations in Table E-5 for a proposed development project. Tables E-2 and E-3 provide supporting information and definitions for this process.

Table ~~HS-4~~ E-2 Explanations of Geologic and Seismic Hazards

<u>Hazard</u> Zone	Description
(F)– Fault Rupture	Area of potential surface fault rupture hazard within 300 feet east and 600 feet west of the Monta Vista and Berrocal faults, and within 600 feet of the San Andreas fault.
(S)– Slope Instability	Area includes all recognized landslide deposits, and steep walls of Stevens Creek canyon, with a moderate to high landslide potential under static or seismic conditions. Area also reflects the mapped zone of potential earthquake-induced landsliding prepared by the California Geological Survey (2002).
(H)– Hillside	Area contains moderate to steep slope conditions not included in the above categories, with an unde- <u>undetermined</u> potential for slope instability.
(L)– Liquefaction / Inundation	Area where local geological, geotechnical and groundwater conditions indicate a potential for lique- <u>liquefaction</u> under seismic conditions. Much of this area also has the potential for periodic flood inundation. The Liquefaction/Inundation Zone is stippled where covered by an overlaying Fault Zone.
(V)– Valley	Area includes all relatively level valley floor terrain not included in the above categories with relatively low levels of geologic hazard risk.

Table ~~HS-2~~ E-3 Maximum Earthquake Magnitudes and Recurrence Intervals

	Causative Faults	Distance from De Anza/SCB Intersection	Maximum Historic Moment Magnitude	Maximum Probable Moment Magnitude	Est. Recurrence Interval of Max. Prob. Earthquake
San Andreas System	San Andreas	5.5 miles	7.9	7.9	220 years
	Hayward (South)	10 miles	7.0	7.0	236 years
	Calveras (Central)	14 miles	6.3	7.0	374 years
Sargent-Berrocal System	Sargent-Berrocal	3.5 miles	3.7-5.0	6.8	330 years
	Monta Vista-Shannon	2 miles	2.0-3.0	6.8	2400 years

Table HS-3 E-4 Acceptable Exposure to Risk Related to Various Land Uses

Acceptable Exposure to Risk	Land Use Group		Extra Project Cost to Reduce Risk to Acceptable Level
Extremely Low	Group 1	Vulnerable structures (nuclear reactors, large dams, plants manufacturing/ storing hazardous materials)	As required for maximum attainable safety
	Group 2	Vital public utilities (electrical transmission interties/substations, regional water pipelines, treatment plants, gas mains)	Design as needed to remain functional after max. prob. earthquake on local faults
	Group 3	Communication/transportation (airports, telephones, bridges, freeways, evacuation routes) Small water retention structures Emergency Centers (hospitals, fire/ police stations, post-earthquake aide aid stations, schools, City Hall and Service Center, De Anza College)	5% to 25% of project cost Design as needed to remain functional after max. prob earthquake on local faults
	Group 4	Involuntary occupancy facilities (schools, prisons, convalescent and nursing homes) High occupancy buildings (theaters, hotels, large office/apartment blgds buildings)	Design as needed to remain functional after max. prob. earthquake on local faults
Moderately Low	Group 5	Public utilities (electrical feeder routes, water supply turnout lines, sewage lines) Facilities important to local economy	5% to 25% of project cost Design to minimize injury, loss of life during maximum probable earthquake on local faults; need not design to remain functional
Ordinary Risk Level	Group 6	Minor transportation (arterials and parkways) Low-moderate occupancy buildings (small apartment blgds buildings., single-family resid residential, motels, small commercial/office buildin lds.)	2% of project cost; to 10% project cost in extreme cases
	Group 7	Very low occupancy buildings Open space and recreation (farm-land, landfills, wildlife areas)	Design to resist minor earthquakes (ware- houses, farm structures) without /o damage; resist mod. Earthquakes w/o without structural. damage , with damage, with some non struct structural. damage; resist major earth- quake (max. prob. on local faults w/o collapse, allowing some structural. & non- structural. damage

Table ~~HS-4~~E-5
Technical Investigations Required based on Acceptable Risk

Land Use Activity	Hazard Map Symbol	
	<u>Hazard Zone F, S, H</u>	<u>Hazard Zone L, V</u>
	Evaluation Required	Evaluation Required
Groups 1 to 4	UBC CBC/CRC	UBC CBC/CRC
	Soils	Soils
	Geology	Seismic Hazard
	Seismic Hazard	
Groups 5 to 7	UBC CBC/CRC	UBC CBC/CRC
	Soils	
	Geology	

Descriptions of Technical Evaluations:

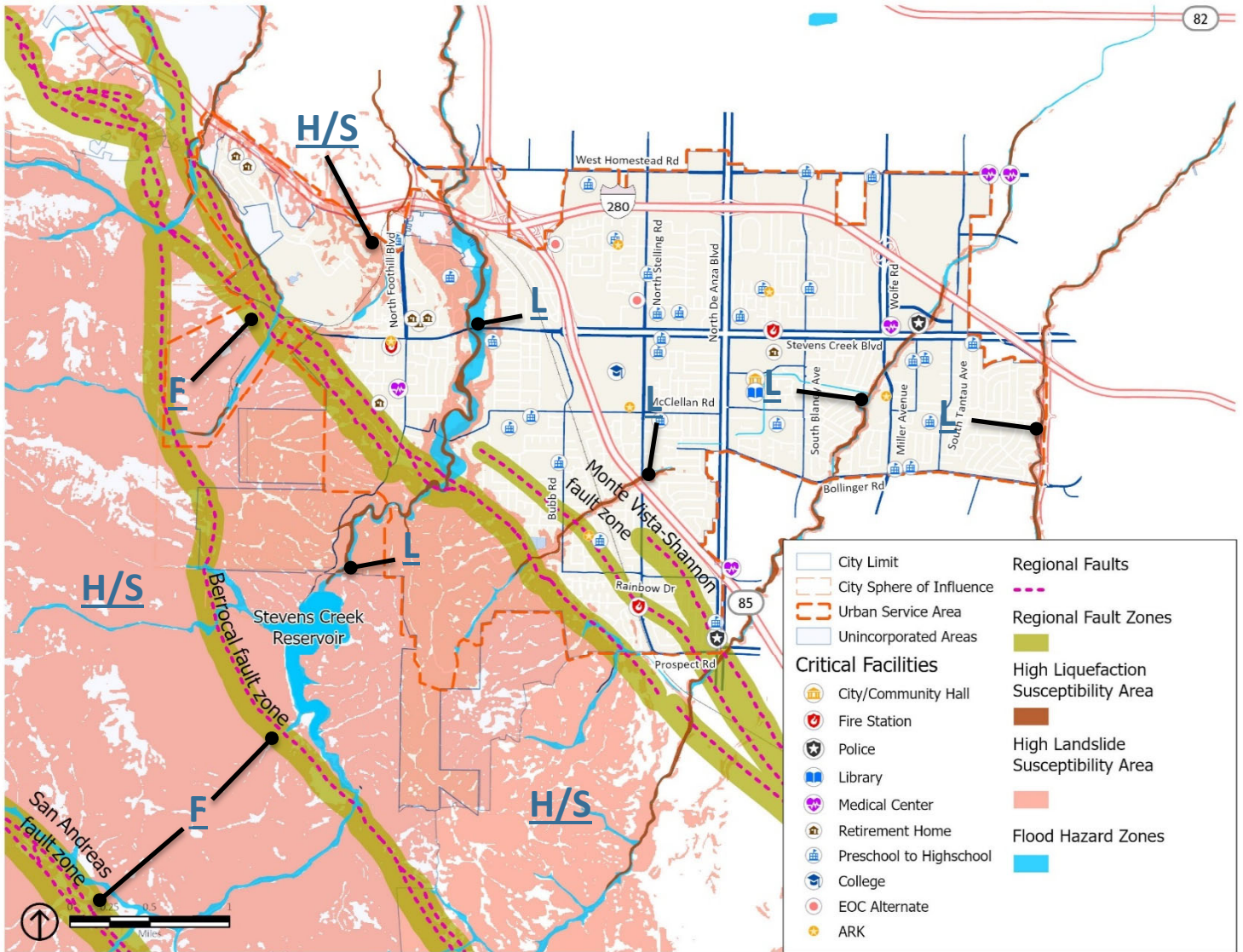
~~CBC/CRC~~: Current, adopted version of the current Cupertino Building Code (CBC) and Cupertino Residential Code (CRC), as applicable~~California Building Code.~~

Soils: Soils and foundation investigation to determine ~~ability~~the ability of local soil conditions to support structures.

Geology: Determine subsidence potential, faulting hazard, slope stability (See Geologic and Seismic Hazard Map for additional detail).

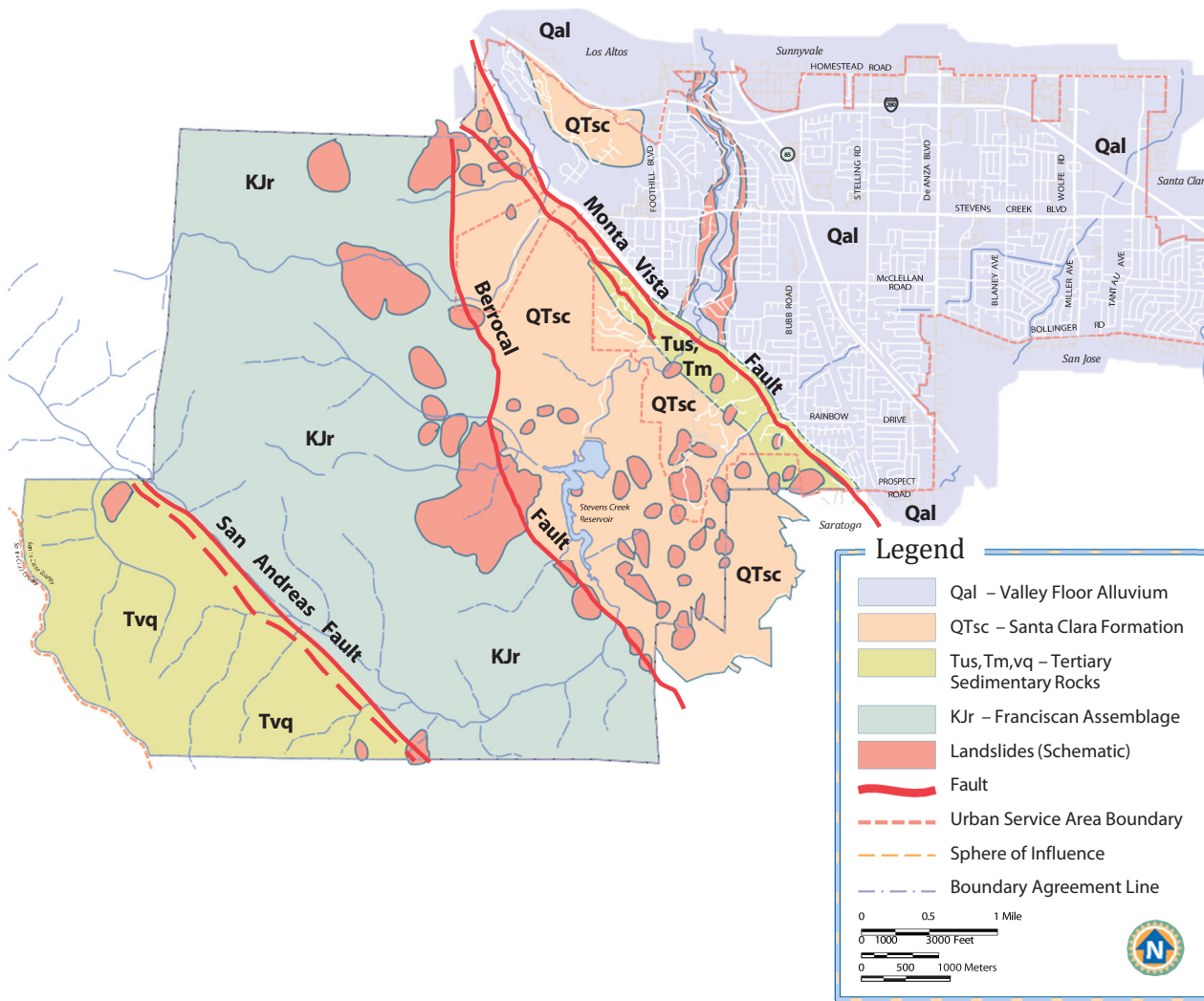
Seismic Hazard: Detailed Soils/Structural evaluation to certify adequacy of normal CBC/CRC~~UBC~~ earthquake regulations or to recommend more stringent measures.

FIGURE E-1
GEOLOGIC AND SEISMIC HAZARDS



Source: City of Cupertino, 2023; US Geological Survey, 2020; California Geological Survey, 2022; Federal Emergency Management Agency, 2021; Department of Water Resources, 2021

FIGURE E-24
CUPERTINO GEOLOGY





Appendix H: Health and Safety Element Background Report

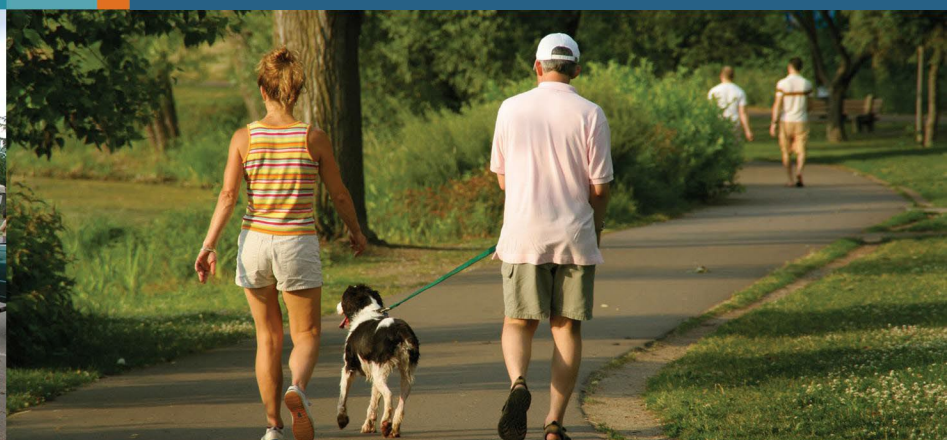


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1. OVERVIEW

1.1 PURPOSE AND CONTENT

The Cupertino Health and Safety Element is a State-mandated General Plan element that must identify potential natural and human-caused hazards that could affect the City of Cupertino's (City's) residents, businesses, and services. The Health and Safety Element establishes a framework that anticipates these hazards and prepares the community to minimize exposure to these risks.

The Health and Safety Element conveys the City's goals, policies, and strategies to minimize the hazards to safety in and around Cupertino. It identifies the natural and human-caused hazards that affect existing and future development, describes present and expected future conditions, and sets policies and standards for improved public safety. This document includes efforts to minimize physical harm to the buildings and infrastructure in and around Cupertino to reduce damage to local economic systems, community services, and ecosystems.

The Safety Element serves the following functions:

- Develops a framework by which safety considerations are introduced into the land use planning process.
- Facilitates identifying and mitigating hazards for new development, thus strengthening existing codes, project review, and permitting processes.
- Presents policies directed at identifying and reducing hazards in existing development.
- Strengthens earthquake, flood, dam inundation, and wildfire preparedness planning and post-disaster reconstruction policies.
- Identifies how natural and climate-related hazards are likely to increase in frequency and intensity in the future and provides policies to increase community resilience through preparedness and adaptation.

Section 65302(g) of the California Government Code requires that the Health and Safety Element contains background information and policies to address multiple natural hazards, analyze the vulnerabilities from climate change, contain policies to improve climate change resilience and assess residential areas with evacuation constraints. The public safety issues in Cupertino include the following:

- Emergency preparedness and response
- Flood and inundation hazards
- Seismic and geologic hazards
- Fire hazards
- Hazardous waste and materials
- Drought
- Extreme heat
- Severe weather

The Health and Safety Element includes a discussion for each hazards and identifies goals and policies. The policies in the Health and Safety Element guide the actions of City staff, developers, and policy makers necessary to achieve the goal. These policies are carried out by corresponding strategies, which are specific tasks the City will undertake.

1.2 RELATIONSHIP TO OTHER LOCAL PLANS

Cupertino General Plan's Health and Safety Element is one of several plans that address community safety and related topics. Other plans include the Santa Clara County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), the Santa Clara County Community Wildfire Protection Plan (CWPP), and the Cupertino Climate Action Plan (CAP), and various local regulations. The General Plan Health and Safety Element should be consistent with these other plans to minimize conflicts between documents and ensure that the City has a unified strategy to address public safety and resilience issues. The Health and Safety Element incorporates information, technical analyses, and policies from these other documents where appropriate to help support this consistency.

1.2.1 General Plan Elements

The 2014 Cupertino General Plan, also known as the *Community Vision 2015-2040*, includes two introductory chapters (Introduction and Planning Areas) and seven "element" chapters addressing different community issues:

- Land Use and Community Character
- Housing
- Mobility
- Environmental Resources and Sustainability
- Health and Safety
- Infrastructure
- Recreation, Parks, and Community Services

The Health and Safety Element provides policy direction and designs safety improvements that complement the intent and policies of other General Plan elements. Crucial relationships exist between the Health and Safety Element and the other General Plan elements. How land uses are determined in areas prone to natural hazards, what regulations limit development in these areas, and how hazards are mitigated for existing development, are all among issues that tie the elements together. For instance, the Recreation, Parks, and Community Services Element must consider how hazards will affect the park and recreation infrastructure and facilities in Cupertino, but also recognizes that parks can provide strategies to reduce flood risks throughout the city. The Housing Element is also closely tied to the Health and Safety Element. Future potential development in the city must be protected from hazards and able to adapt to climate change hazards to ensure homes and the people living in them remain safe. Health and Safety Element policies, especially those concerning evacuation routes and critical facilities, must also be consistent with those of the Mobility Element. Interstate (I-) 280 and State Route (SR-) 85 are Cupertino's primary evacuation routes, supported by routes designated as arterials in the City's Mobility Element. This Health and Safety Element is consistent with the other elements of the Cupertino General Plan.

1.2.2 Santa Clara County Multi-Jurisdictional Hazard Mitigation Plan

In collaboration with the City and other local agencies and special districts, Santa Clara County prepared the 2023 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) in accordance with the federal Disaster Mitigation Act of 2000 and the Federal Emergency Management Agency's (FEMA's) hazard mitigation assistance guidance. Santa Clara County's MJHMP is a plan that assesses hazard vulnerabilities from natural and human-caused hazards, including risk to people and facilities, and identifies short-term (five-year) mitigation actions to reduce or eliminate hazard risks in Santa Clara County, including in incorporated communities. The MJHMP includes a dedicated annex for the City of Cupertino, which discusses Cupertino's characteristics and history, development trends, hazard mitigation capabilities, integration with other hazard mitigation planning efforts, and vulnerabilities of specific facilities and infrastructure. The mitigation actions in the MJHMP include both short-term and long-term strategies and

involve planning, policy changes, programs, projects, and other activities. These mitigation actions are identified based on assessments of hazards, vulnerabilities, and risks and the participation of a wide range of stakeholders and the public in the planning process. Local governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

The MJHMP and Health and Safety Element address similar issues, but the Health and Safety Element provides a higher-level, long-term framework and set of policies that pertain to the safety of the city, while the MJHMP focuses on more specific mitigation, often short-term actions, to enable jurisdictions to better protect lives, property, and natural systems. The MJHMP, as its name implies, focuses on mitigation-related actions, while the Health and Safety Element also includes policies related to emergency response, recovery, and preparation activities. The current MJHMP, including Cupertino's annex, as certified by FEMA, is incorporated into this Health and Safety Element by reference, as permitted by California Government Code Section 65302.6. It is available online at: <https://www.cupertino.org/our-city/departments/public-safety-programs/emergency-management/plans-4523>.

1.2.3 Santa Clara County Community Wildfire Protection Plan

In collaboration with the CWPP Core Team, made up of representatives of Santa Clara County organizations, the Santa Clara County Fire Department prepared and published the 2023 Santa Clara County Community Wildfire Protection Plan (CWPP). The Santa Clara County CWPP is the result of an area-wide planning effort. It provides a snapshot of current wildfire protection challenges and capabilities, identifies and prioritizes areas for hazardous fuel reduction, and recommends types and methods of vegetation management that may help protect the affiliated communities from wildfire losses. The goal of the plan is to reduce hazards through increased information and education about wildfires, hazardous fuels reduction, actions to reduce structure ignitability, and other recommendations to assist emergency preparedness and fire-suppression efforts. Most notably, it is intended to help facilitate a coordinated effort between the various stakeholders. The Santa Clara County CWPP complements local agreements and existing plans for wildfire protection to coordinate efforts in determining appropriate fire management actions. The fire protection agencies in Santa Clara County are predominately responsible for implementing the CWPP. The CWPP is available online at: <https://www.cupertino.org/our-city/departments/public-safety-programs/emergency-management/plans-4523>.

1.2.4 City of Cupertino Climate Action Plan

In January 2015, the Cupertino City Council adopted the City's first Climate Action Plan (CAP) to address climate change challenges. The City met its 2020 greenhouse gas (GHG) reduction goal of 15 percent below 2010 levels two years ahead of schedule, even with population and economic growth. Since the City met their 2020 targets, the City Council authorized the creation of CAP 2.0, which was adopted by the City Council on August 16, 2022. Cupertino's goal is to reduce the City's GHG emissions to net zero by the year 2040. The City is following the goals and development path of the Paris Climate Agreement and supports regional, State, and national policies that help reduce global emissions.

The CAP describes a series of measures and actions that will aid the municipal operations and the City in reducing GHG emissions and meet community goals. Guiding principles are key to achieving the vision for the CAP. These principles include equity, innovation, urgency and flexibility, and resilience and adaptation. The CAP includes topics such as energy, transportation, waste, water, biodiversity, and natural systems, as well as an adaptation chapter that is intended to help residents prepare for extreme weather events and the impacts of a changing climate. Each topic has several measures broken into actions that reflect a holistic approach to achieving the goal given that they consider structural changes, funding sources, equity, education, studies, etc.

CAP 2.0 is viewed as a strategic framework that will be re-evaluated regularly. If the City's 2025 GHG emissions reductions are on track to reach the 2030 conclusion targets, it is anticipated that no additional CAP measure adjustments would be necessary. If the City has not made sufficient progress on GHG emissions-reduction goals by 2025, a CAP update may be required at that time to maintain status as a California Environmental Quality Act (CEQA)-qualified GHG emissions-reduction plan. Such a CAP update could require additional actions, such as shifting incentive programs to mandatory requirements. If there has been sufficient progress towards meeting GHG emissions targets, the next CAP update will be completed by 2030. The CAP is available online at: <https://engagecupertino.org/climate-action>.

1.3 COMMUNITY PROFILE

The City of Cupertino is situated on the western edge of Silicon Valley against the foothills of the Santa Cruz Mountains in the northwestern portion of Santa Clara County. Cupertino's land use pattern is largely built on a conventional suburban model, which is heavily influenced by the topography of the area. Cupertino's hillsides are an irreplaceable resource shared by the entire Santa Clara Valley. They provide important habitat for plants and wildlife; watershed capacity to prevent flooding in downstream areas; a wide vegetative belt that cleanses the air of pollutants; creates recreational opportunities for residents; and a natural environment that provides a contrast to the built environment. Several streams run through Cupertino, including Permanente Creek, Stevens Creek, San Tomas Aquino Creek, Regnart Creek, Prospect Creek, and Saratoga Creek. I-280, SR-85, and the Union Pacific Railroad tracks bisect the city. The city is bordered by San Jose, Santa Clara, Saratoga, Sunnyvale, and Los Altos.

Cupertino has a Mediterranean climate, with winter rain and warm to hot, dry summers. Winter rains fall from about November to March. On average, annual high temperatures in Cupertino range from 58 degrees Fahrenheit (°F) in January to 81°F in August. Low temperatures range from 41°F in January to 57°F in August.¹ The city receives an average of approximately 23.7 inches of rainfall annually.² Most rain falls during the winter months, with rare occurrences of summer storms. Cupertino ranges from the urban environment in the flatlands to semi-rural and rural environment in the western foothills of the Santa Cruz Mountains. Ecosystems within the city include riparian habitat, grasslands, brushlands, and foothill woodlands and forests. Cupertino's rural plant and animal resources are located in the relatively undeveloped western foothills and mountains, near the Rancho San Antonio Open Space Preserve and along Stevens Creek. Each ecosystem of vegetation provides food and shelter to support a variety of wildlife.

Cupertino is home to approximately 60,381 residents or 20,963 households and supports about 28,415 jobs.³ The City of Cupertino is a community with a high quality of life, a renowned school system, and a robust high-technology economy as Apple Inc. is the largest employer in the city. De Anza College, one of the largest single-campus community colleges in the country, is another major employer and magnet for attracting local and international students. In 2020, the median age of all people in Cupertino was approximately 40.³ The largest ethnic groups in Cupertino are Asian, Asian Pacific Islander (Non-Hispanic) (67.7 percent); White (Non-Hispanic) (25.2 percent); Hispanic or Latinx (3.3 percent); other races or multiple races (Non-Hispanic) (3.0 percent), and American Indian or Alaskan Native (Non-Hispanic) (0.8 percent).⁴

Fire fighting and emergency medical services are provided to the City by the Santa Clara County Fire Department (SCCFD). Mutual aid agreements with the neighboring jurisdictions augment SCCFD's fire response capabilities. The City contracts with the Santa Clara County Sheriff's Office, West Valley Division, for law enforcement services.

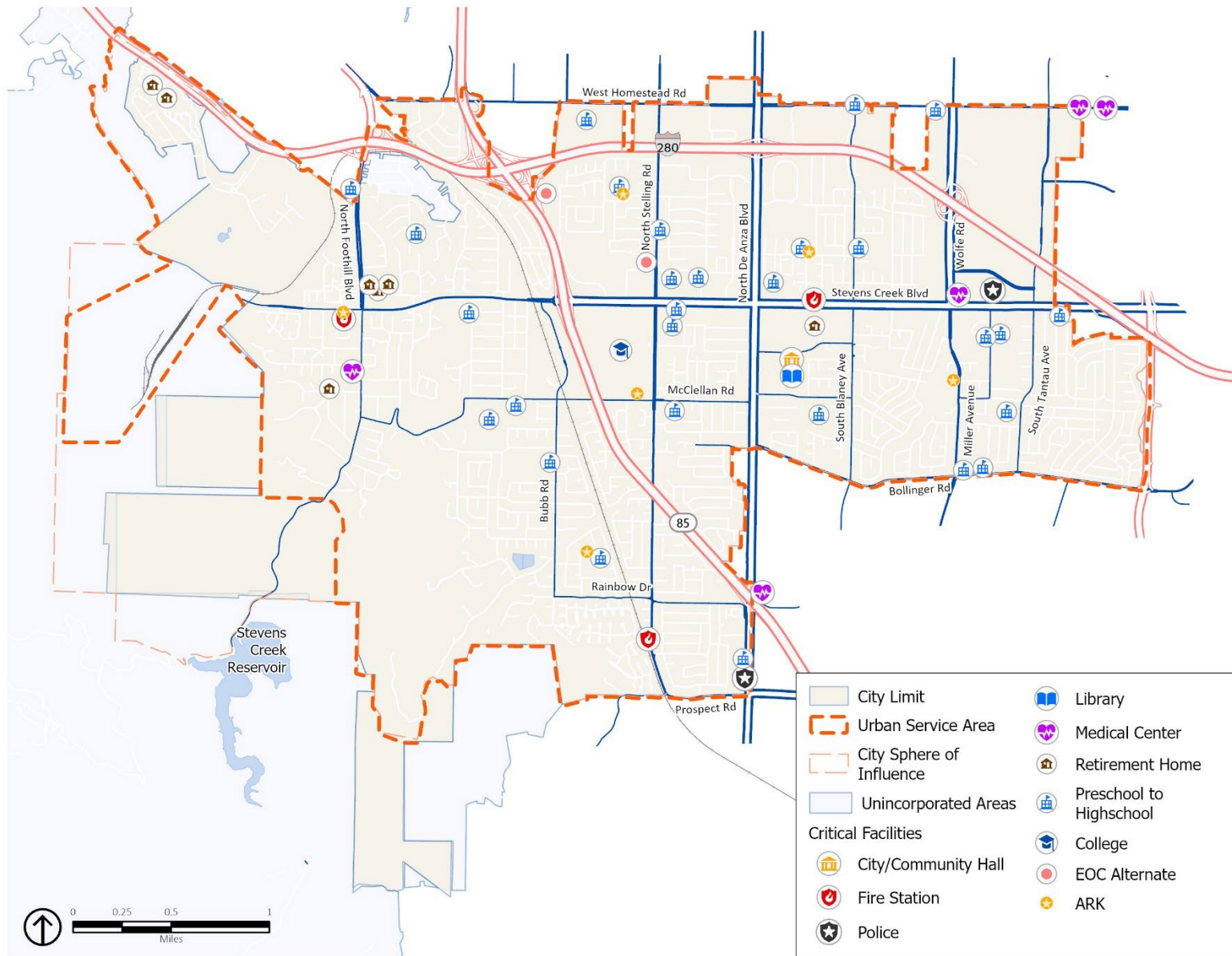
Santa Clara Valley Water District (SCVWD) is the primary wholesale water supplier for Cupertino. Water is provided to residents and businesses by the California Water Service (North of Stevens Creek Boulevard)

and San Jose Water (South of Stevens Creek Boulevard). Groundwater and local surface water is the SCVWD's original source of water supply. The treated water is sold to [local water retailers](#) such as San Jose Water Company, who use their own distribution systems to serve customers in Cupertino. Approximately 50 percent of SCVWD's water supply is imported. Groundwater (approximately 40 percent of supply) is pumped from over 100 wells in the Santa Clara Groundwater Basin. Imported surface water (approximately 50 percent of supply) is provided by the SCVWD, the wholesale supplier, via the State Water Project, federal Central Valley Project, and San Francisco's Hetch Hetchy system. Local mountain surface water (approximately 10 percent of supply) is collected from San Jose Water's watershed in the Santa Cruz Mountains. Wastewater services are provided by the Cupertino Sanitary District. San Jose Water receives its water supplies from three main sources including groundwater, imported surface water, and local surface water.

Silicon Valley Clean Energy (SVCE) is the primary electricity provider for Cupertino. SVCE is a public, non-profit agency that provides clean electricity to 270,000 residential and business customers across 13 Silicon Valley communities, including Cupertino. While SVCE generates the electricity, Pacific Gas and Electric (PG&E) is responsible for delivering it via PG&E's existing power lines and infrastructure. Most of Cupertino is served by the Cupertino Union School District. Cupertino Union School District serves approximately 18,000 students in 19 elementary schools, one K through eighth-grade school, and five middle schools throughout Cupertino and parts of five other cities. The northeast area of Cupertino is served by the Santa Clara Unified School District's Laurelwood Elementary School, which has approximately 700 students; Peterson Middle School, which has approximately 900 students; and Wilcox High School, which has approximately 1,900 students. The Fremont Union High School District serves nearly 11,000 students, covering 42 square miles and encompassing Cupertino plus portions of five other cities.

Cupertino currently has approximately 165 acres of City-owned public parks and open space areas. The City's park system is supplemented by a network of over 220 acres of local and regional interconnected trails that stretch from local open space preserves to the San Francisco Bay. In addition, there are many acres of open space preserves surrounding the city that are operated and maintained by regional agencies and districts, including over 40 acres of open space negotiated through public access agreements. As shown in **Figure S-1**, Cupertino's primary transportation access is from I-280, which connects Cupertino to I-880 and San Jose to the east, as well as SR-85, which connects Cupertino to Highway 101 to the north and SR-17 to the south. Cupertino is served by the Santa Clara Valley Transportation Authority, which provides local bus transit options.

Figure S-1 Critical Facilities



Source: City of Cupertino 2023

1.4 CLIMATE CHANGE VULNERABILITY

Changes to the global climate system are expected to affect future occurrences of natural hazards in and around Cupertino. Many hazards are projected to become more frequent and intense in coming years and decades, and in some cases, these trends have already begun. Key climate change considerations that affect Cupertino include increasing temperatures and changes in precipitation. Overall, precipitation levels are expected to increase slightly, with more years of extreme precipitation events and droughts that last longer and are more intense. According to California's *Fourth Climate Change Assessment*, Cupertino can expect to experience various changes from climate-related hazard events.⁵

What is vulnerability?

Vulnerability is the degree to which natural, built, and human systems are susceptible to harm from exposure to stresses associated with environmental and social change and from the absence of a capacity to adapt.

Source: California Governor's Office of Emergency Services. 2020. *California Adaptation Planning Guide*.
<https://www.caloes.ca.gov/climate>.

- Wildfire risk in Cupertino is and will continue to be a concern for the community. Climate change is expected to lead to an increase in wildfires in the surrounding area and across Santa Clara County due to hotter and drier conditions. Dry conditions are anticipated earlier in the year, leaving most of the region in moderate to extreme drought conditions prior to summer. These continued dry conditions with above-normal temperatures through spring will leave fuel moisture levels lower than normal, increasing the potential for wildfire activity. Across the region, more frequent and intense wildfires may also create poor air quality for Cupertino. As the climate changes, warmer temperatures will create more pollutants, such as ozone, wildfire smoke, dust, and pollen, contributing to poor air quality.
- Warmer temperatures are projected to cause an increase in extreme heat events. The number of extreme heat days, defined in Cupertino as a day when the high temperature is at least 93.2°F, is expected to rise from a historical annual average of 5 to 14 days by the middle of the century (2035 to 2064), and an average of 24 days by the end of the century (2070 to 2099). In addition to the increases in extreme heat events, Cupertino is expected to see an increase in the average daily high temperatures. The number of warm nights, defined in Cupertino as a day in April through October when the minimum temperature is above 60.5°F, is expected to rise from a historical annual average of 5 to 33 nights by the middle of the century (2035 to 2064), and to an average of 89 nights by the end of the century (2070 to 2099).
- Both droughts and floods are expected to become more frequent as rainfall is expected to occur in fewer, more intense storms due to climate change. Although Cupertino is likely to experience minimal change in overall annual rainfall levels from climate change, the region is also expected to see an increase in the number of extreme rainfall events. As a result, floods are expected to occur more often in Cupertino, primarily along Stevens Creek, and climate change may expand the parts of the city that are considered prone to flood. Climate change is also expected to increase the frequency and severity of droughts that cause soil to dry out and condense. When rainfall does return, dry ground means more water runs off the surface rather than being absorbed into the ground, which can lead to flooding downstream and result in debris flows along slopes and hillsides.
- Severe weather events, such as strong atmospheric river events¹ and high winds, may become more frequent and intense due to climate change. Climate change is expected to cause an increase

¹ Atmospheric rivers are long, narrow regions in the atmosphere that transport water vapor carried away

in heavy rainfall, which may also contribute to an increased risk of landslides in the hills around Cupertino. In Cupertino, the most severe weather consists of atmospheric rivers, high winds, or thunderstorms. The types of dangers posed by severe weather vary widely, including injuries or deaths, damage to buildings and structures, fallen trees, roads blocked by debris, and fires sparked by lightning.

- Climate change can increase infection rates from various diseases because many of the animals that carry diseases are more active during warmer weather. Several diseases linked to climate change that can harm the health of Cupertino community members, such as hantavirus pulmonary syndrome, Lyme disease, and West Nile virus. Many of these diseases are carried by animals, such as mice and rats, ticks, and mosquitos, which are usually seen as pests even if they do not cause infections. Warmer temperatures earlier in the spring and later in the winter can cause these animals to be active for extended periods, increasing the time these diseases can be transmitted.

1.4.1 Vulnerability Assessment Results

Under California law, the Health and Safety Element is required to include a vulnerability assessment that looks at how people, buildings, infrastructure, and other key community assets may be affected by climate change. In the past few years, the City prepared a vulnerability assessment and supporting documents that were used to inform the Climate Change Vulnerability Assessment for this Safety Element update. The City conducted the Climate Change Vulnerability Assessment in the fall of 2023 to analyze Cupertino's susceptibility to climate-related hazards. Cupertino's vulnerability assessment, prepared in accordance with the most recent available guidance in the *California Adaptation Planning Guide*, assesses how eight different climate-related hazards (air quality and smoke, drought, extreme heat, flooding, human health hazards, landslides, severe storms, and wildfire) may affect 45 different population groups and community assets. Each population or asset received a score of low, medium, or high vulnerability for each climate-related hazard. The Climate Change Vulnerability Assessment indicates that Cupertino's populations and assets are most vulnerable to flooding, extreme heat, and wildfire. Overall, residents in Cupertino tend to be most vulnerable to extreme heat, human health hazards, and flooding, which directly affect health outcomes. The most vulnerable population groups include persons with chronic illness and/or disabilities, seniors living alone, households in poverty, and persons experiencing homelessness.

Citywide energy delivery and communication infrastructure and services are vulnerable to multiple hazards, including severe storms, such as high winds that can trigger Public Safety Power Shutoff (PSPS) or scheduled power outage events, extreme heat that reduces the capacity and strains the systems, and landslides that damage the systems, ultimately disrupting energy and communication services. Extreme heat can lead to power outages by causing mechanical failure of grid equipment, heat damage to power lines, and by creating a high demand for electricity to power air conditioners, all of which place stress on the network. There may be a higher demand for communication services during severe storms, potentially putting stress on the network and increasing the risk of service interruptions. This higher demand is likely to lead to greater service disruptions.

from the tropics. These columns of vapor move with the weather, carrying large amounts of water vapor and strong winds. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow, often causing heavy rains that can lead to flooding and mudslide events.

PSPS events, or interruptions in energy service, can create vulnerabilities for Cupertino community members. A loss of electricity can cause a loss of refrigeration for food and medical supplies, limit cooking, cause loss of cooling (particularly dangerous during extreme heat events), lighting, and limited or no access to the Internet or other information systems. Many businesses are forced to close during a power outage, causing economic hardships and depriving community members of important services, such as grocery stores, gas stations, and banks/ATMs. Power outages may also be harmful to people who depend on electrically powered medical devices. For those who work from and participate in online school activities, a power outage means a loss of access to an internet connection and other essential tools needed to carry out work-related tasks. With the increasing reliance on virtual meetings and online classes, power outages can disrupt these activities.

Flood hazards are expected to expand parts of the city currently considered prone to flooding. As a result, transportation infrastructure within and adjacent to the 100-year floodplain will likely experience more frequent inundation from floodwaters in future years. This expansion can, in turn, interrupt the City's public transit services, reducing the mobility of transit-dependent community members. Increases in damaging flood events will cause greater property damage, public health and safety concerns, displacement, and loss of life.

Climate change could affect the transportation network and associated economic activity within Cupertino by creating strain on transportation infrastructure, impacting travel behavior, goods movement, and supply chain business continuity. Transportation infrastructure, such as roadways and bridge supports, are all potentially at increased risk due to severe storms, floods, and higher temperatures. When parts of the transportation infrastructure network fail, typical travel routes for both passenger travel and goods movement may be affected, including I-280, SR-85, and other major roadways. Regional disruption of these local transportation roadways due to hazards such as flooding, landslides, or wildfire could significantly impact the transportation of goods and services provided in the city, the economic vitality of the community, and the livelihood of many businesses.

Water and wastewater services are vulnerable to the impacts of climate change. Drought conditions may cause stress on Cupertino's water suppliers and reduce the overall water supply available. In some cases, water storage infrastructure may not provide adequate storage to provide water during drought periods. Water and wastewater services can be disrupted by flooding associated with sea level rise if the San José-Santa Clara Regional Wastewater Facility is not functioning properly. Failure of the treatment plant could cause sewer systems to backup and potentially contaminate streams and water systems with raw sewage. Saltwater intrusion into the Santa Clara Valley groundwater basin can also reduce water supply availability. Moreover, water and wastewater lines in the city could be damaged by landslides. Regionally, the State Water Project, federal Central Valley Project, and San Francisco's Hetch-Hetchy systems could also be damaged and disruption from landslides has the potential to severely impair water services provided by SCVWD. Wildfires in the greater region could impact the reservoir water sources, such as the San Luis Reservoir. Water quality can be degraded due to ash content or fire retardants that make their way into surface water storage. This may reduce the overall quantity of water that Cal Water and San Jose Water Company must supply.

The Health and Safety Element includes goals, policies, and strategies to increase community resilience and help lower vulnerability, particularly for the populations and assets that received a score of high in the Vulnerability Assessment. A description of the Vulnerability Assessment process, items included, and a list of the results can be found at the end of this Background Report in Section 3, Vulnerability Assessment Results.

2. PUBLIC SAFETY ISSUES

This section outlines the existing and likely future hazardous conditions and other public safety issues in Cupertino and policy responses to these issues. The public safety issues in Cupertino that are covered in the following sections include:

- Section 2.1: Emergency Preparation and Response
- Section 2.2: Flood and Inundation Hazards
- Section 2.3: Seismic and Geologic Hazards
- Section 2.4: Fire Hazards
- Section 2.5: Hazardous Waste and Materials
- Section 2.6: Climate Change Resilience (air quality, drought, extreme heat, severe weather, and human health hazards)

This section provides details pertaining to probable locations each hazard or issue is likely to occur (per availability of data), past notable events in and around Cupertino, agencies responsible for providing protection from these public safety issues, and other background information required by California Government Code Section 65302(g)(4). The results of the Vulnerability Assessment are integrated into the discussion of hazards and public safety issues.

Of particular concern to Cupertino, as in many other communities, is the possibility of cascading and compounding hazard events. These are instances where one hazard event triggers one or more others, which may occur over a very short timeframe (minutes or hours) or weeks or months apart. These linked events are often the most damaging because of the wider range of impacts. When cascading and compounding events occur closely together, emergency response operations must be flexible enough to respond to rapidly changing conditions and have access to sufficient resources to meet community needs. Examples of cascading and compounding events include a heavy rainstorm that causes flooding and mudslides, or extreme and high winds that lead to wildfires.

2.1 EMERGENCY PREPARATION AND RESPONSE

2.1.1 Local Emergency Response

The City of Cupertino's Office of Emergency Management, Santa Clara County Sheriff's Office, and Santa Clara County Fire Department conduct emergency preparedness activities in Cupertino. Additionally, the American Red Cross and Santa Clara Collaborating Agencies' Disaster Relief Effort (CADRE) collaborate on emergency preparedness training and exercising.

City of Cupertino's Office of Emergency Management

The City of Cupertino's Office of Emergency Management works to mitigate risks, to prepare, respond, and recover from emergencies impacting the city. The Office of Emergency Management works with the Santa Clara County Sheriff's Office and Santa Clara County Fire Department conduct emergency response activities in Cupertino and to support emergency preparedness training, including day-today management of the Community Emergency Response Team (CERT) Academy in coordination with the Fire Department.

Santa Clara County Sheriff's Office

Local police services are provided by contract with the Santa Clara County Sheriff's Office. Law enforcement services include police patrols, criminal investigations, traffic enforcement, accident investigation, and tactical teams. The City's commitment to public safety encompasses two broad areas

of responsibilities: (1) providing public safety services and the planning necessary for the prevention of crime; and (2) planning for a safe environment in which the public is not exposed to unnecessary risks to life and property.

Santa Clara County Fire Department

The Santa Clara County Fire Department provides fire prevention and protection services to Cupertino. The Santa Clara County Fire Department is a full-service department that provides similar services to seven other West Valley cities and adjacent county areas. The Fire Department has 339 budgeted staff positions, including sworn and civilian personnel. Daily emergency response staffing consists of 66 firefighters and officers on 24-hour shifts operating out of 15 fire stations, with 31 front-line fire apparatus and 3 battalion chief command vehicles. Mutual-aid agreements with the neighboring jurisdictions augment Santa Clara County Fire Department's fire response capabilities. The Santa Clara County Fire Department provides first response Advanced Life Support paramedic level services to Cupertino. The Department maintains a Santa Clara County Emergency Medical Service (EMS) Multi-Casualty Incident supply trailer for large-scale emergency medical incidents and is a participant in Master Mutual Aid in the event of major disasters. Santa Clara County EMS has a contract with a third party ambulance transport provider for the ground transport of all patients. In the event of a wildfire or an emergency, the Santa Clara County Fire Department can issue evacuation warnings or evacuation orders for impacted areas.

The Santa Clara County Fire Department also conducts fire prevention inspections and educational programs, including the CERT Academy, cardiopulmonary resuscitation (CPR), and first aid certification. The CERT Academy educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. In the event of a disaster or public safety emergency, CERT volunteers will be able to assist their family and neighbors when first responders are not immediately available to help. The

Santa Clara County Emergency Medical Services Agency

The County's EMS regulates the Exclusive Operating Area and currently contracts Global Medical Response which is a private provider that provides emergency medical transport.

Standardized Emergency Management System

The County of Santa Clara is required to use a Standardized Emergency Management System (SEMS) to be eligible for funding of their response-related personnel costs under State disaster assistance programs.⁶ State law establishes SEMS to standardize the response to emergencies involving multiple jurisdictions. SEMS is intended to be flexible and adaptable to the needs of all emergency responders in California. It requires emergency response agencies to use basic principles and components of emergency management, including the Incident Command System, multiagency or interagency coordination, the operational area concept, and established mutual-aid systems.

Emergency Plans

The State of California requires all State, regional, and local agencies, including PG&E and SCVWD, to maintain their own emergency plans relating to the infrastructure that they install and maintain. In the event of an emergency, the City would rely on these agencies to implement their emergency plans, with the City supporting as needed. When an incident occurs anywhere in Cupertino, the Santa Clara County Sheriff's Office and/or the Santa Clara County Fire Department is typically the first to arrive at the scene, where they secure the area and then determine which other agencies need to be involved.

2.1.2 Alert, Warning, and Notification

The City of Cupertino's Alert, Warning, and Notification (AWN) Program provides critical alert and warning to the public while supporting information sharing among City departments and partner agencies before, during, and after an emergency. Effective dissemination of information, including alerts and warnings, are critical emergency management tools to help prevent hazards from becoming disasters. The AWN Program serves as a supplemental tool designed to help the City's departments effectively coordinate information sharing and provide alerts and warnings to the public for the entire cycle of an incident.

The AWN Program provides the framework for alert, warning, and notifications before, during, and after any emergency or situation. In a community-wide emergency, alerts, warnings, and notifications play a critical role in keeping people out of harm's way and providing info on the status and resolution of the situation. To reach as many people as possible with crucial information, the City's emergency alert, warning, and notification plan includes several information methods: the Emergency Alert and Warning System (AlertSCC), Cupertino.org, the City Channel (TV), Radio Cupertino, and social media sites such as Facebook and Twitter. The City also uses volunteers to disseminate public information about extreme weather events through an outreach program called Raising Awareness of Community Hazards, or REACH. The REACH program is used to share public information ahead of a threat when there is time to act.

Cupertino uses AlertSCC to notify anyone who lives or works within Cupertino that is impacted by, or is in danger of being impacted by, an emergency. AlertSCC is the County's official emergency alert and notification system. AlertSCC can provide information and instructions in a variety of emergency situations, which may include flooding, wildfire, earthquake, subsequent evacuations, public safety incidents, including crimes, that immediately affect someone's neighborhood, and post-disaster information about shelters, transportation, or supplies. Depending on the urgency, severity, and certainty of the threat, some combination of the following alerting devices may be activated to registered users with as much notice as possible:

- Cupertino's Emergency Radio Station (Radio Cupertino 1670 AM).
- Cupertino's Emergency Notification TV Channel (Channel 26 on Comcast Cable or Channel 99 on AT&T).
- Integrated Public Alert and Warning System, including Wireless Emergency Alerts (WEA) and Emergency Alert System (EAS)
- National Oceanic and Atmospheric Administration (NOAA) weather radios
- Twitter, NextDoor, Instagram, and Facebook
- Raising Emergency Awareness of Community Hazards (REACH) Program

Alerts are distributed through AlertSCC via voice or text messages to cell phones, home phones, personal digital assistants, laptops, desktop computers, and TTY/TDD devices for the hearing impaired.

Cupertino has access to other State and national systems, including the Wireless Emergency Alert (WEA), Emergency Alert Systems (EAS), and the Emergency Digital Information System (EDIS). EAS is a national public warning system commonly used by State and local authorities to deliver important emergency information, such as weather and AMBER alerts, to affected communities. EAS participants include radio and television broadcasters, cable systems, satellite radio and television providers, and wireline video providers. FEMA, the Federal Communications System, and the NOAA's National Weather Service work collaboratively to maintain the EAS and Wireless Emergency Alerts, which are the two main components of the national public warning system and enable authorities at all levels of government to send urgent emergency information to the public. EDIS is a wireless emergency and disaster information service operated by Cal OES and is an enhancement to the EAS. These systems are available in multiple languages.

2.1.3 Emergency Evacuation

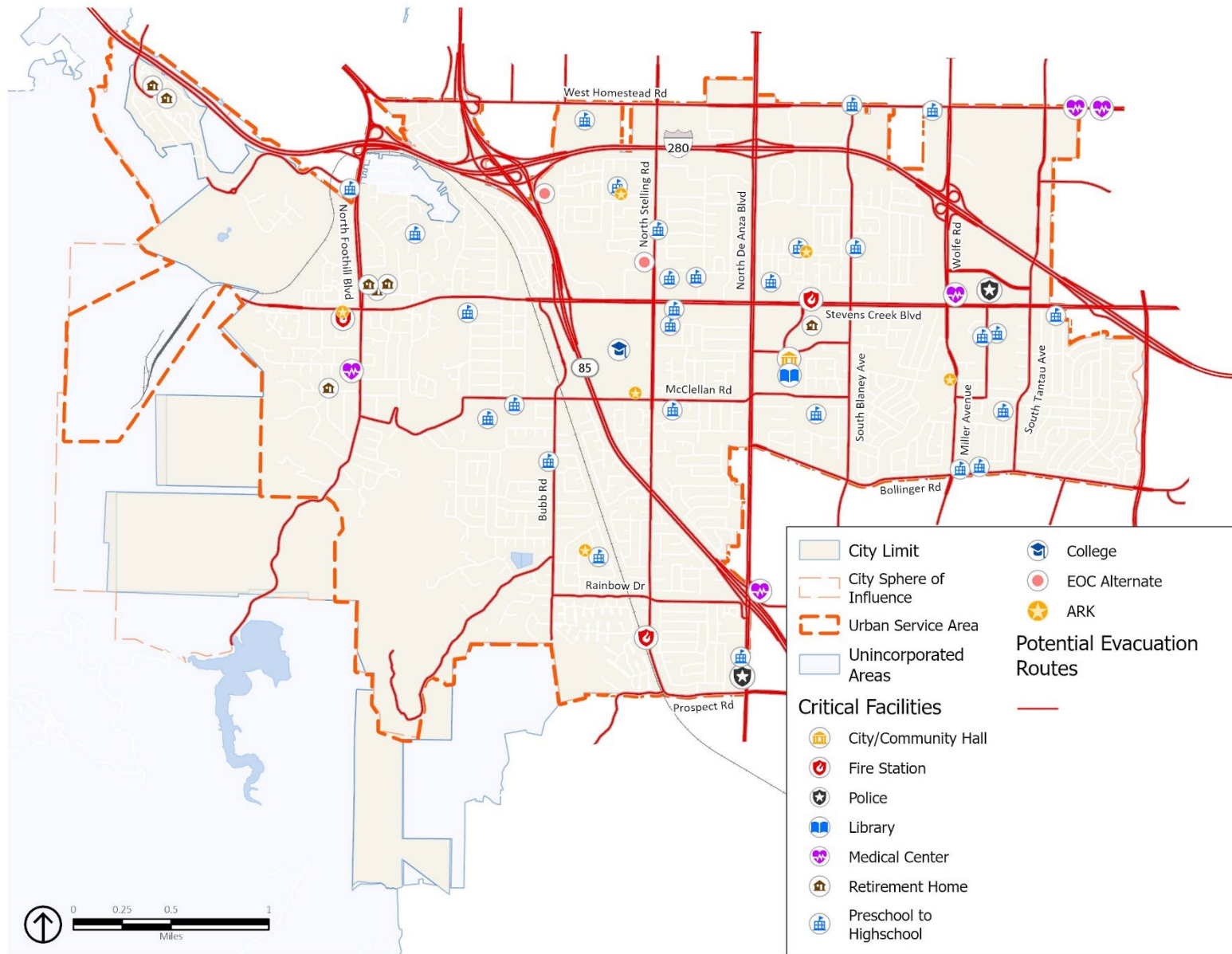
With advanced warning, evacuation can effectively reduce injury and loss of life during a catastrophic event. Primary emergency access and evacuation routes include I-280, which intersects the city from northwest to east along the northern portion of the city; SR-85, which intersects the city from north to southeast through the central portion of the city, and other local roadways that connect to these primary evacuation routes. All evacuation routes in Cupertino face a potential disruption from flooding or earthquake, which may block roadways, damage the roadway surface, or collapse bridges and overpasses. In the event of widespread disruption to local evacuation routes, remaining evacuation routes may become congested, slowing down evacuation of the community or specific neighborhoods. This issue may be compounded since evacuation routes for Cupertino will also likely serve as evacuation routes for surrounding communities, and so potential disruptions may have regional effects.

In preparation for wildfires and other disasters, the City leverages evacuation planning data through the Genasys platform, formerly known as Zonehaven. The City of Cupertino worked with public safety partner agencies to identify and plan for evacuation from 34 contiguous evacuation zones within the city. Maps of each zone are available through the City website. In the event of a wildfire or an emergency, the City and public safety partners (Santa Clara County Sheriff's Office and Santa Clara County Fire Department) can issue evacuation warnings or evacuation orders for impacted areas. Evacuation orders and warnings will be sent to residents using the AlertSCC platform.

The City's website has an interactive hazard awareness map tool that shows residents and visitors the location and status of all evacuation zones in Cupertino. The map shows zones that are under warnings and orders for all types of hazards. The map is intended to inform members of the public before an emergency. **Figure S-2** shows the potential evacuation routes throughout the city, although the recommended evacuation routes in any given situation will depend on the specifics of the emergency. The City Annex to the Santa Clara County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) and the Community Wildfire Protection Plan (CWPP) address evacuation routes' capacity, safety, and viability. Addressing evacuation considerations this way meets updated evacuation planning requirements reflected in Gov. Code § 65302.15.

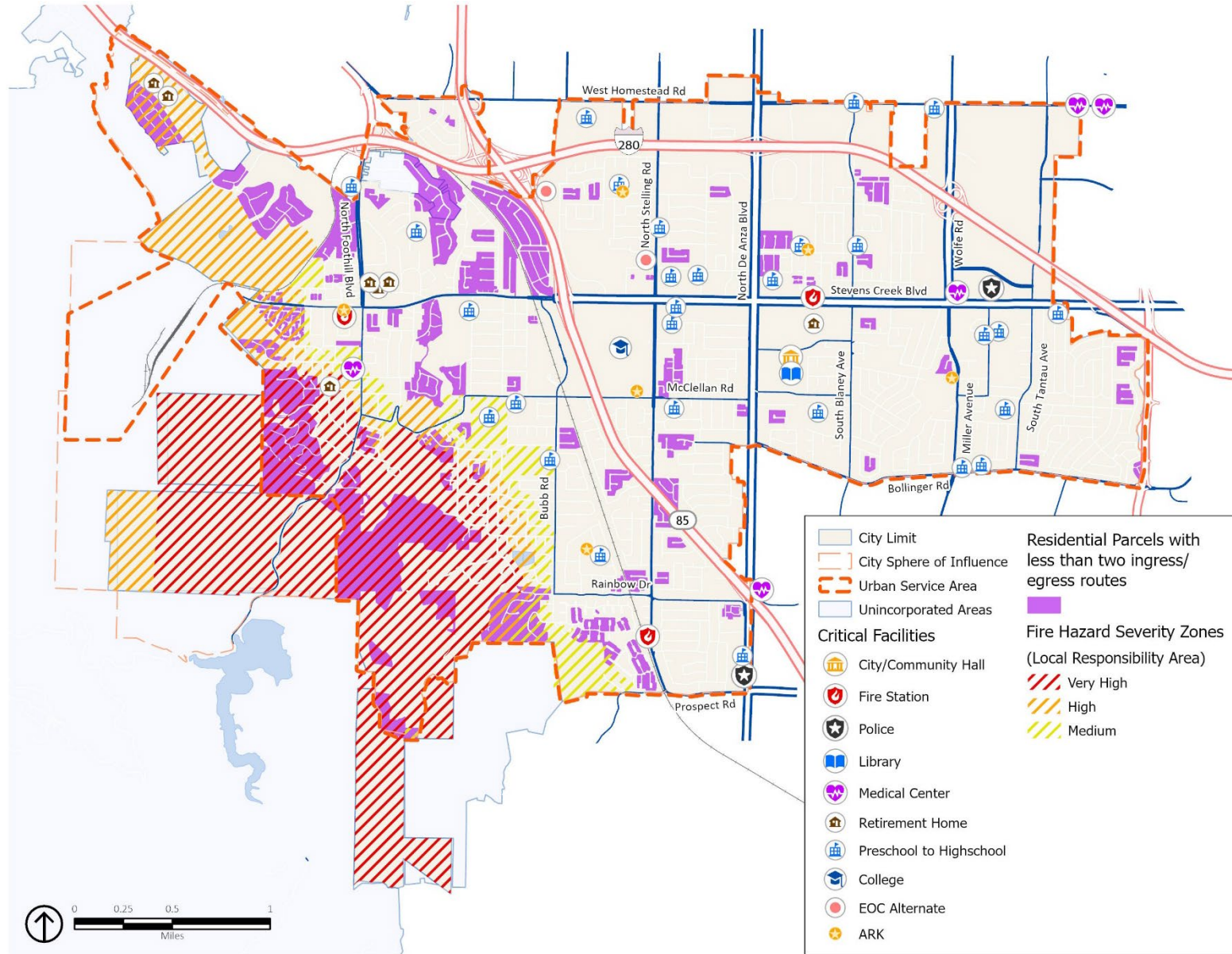
Figure S-3 shows residential parcels with evacuation constraints. All of these parcels are at least a half mile from a major roadway and have access to only one emergency evacuation route. The lack of multiple emergency access points limits roadway access for these properties, which may create difficulties if there is a need to evacuate.

Figure S-2 Potential Evacuation Routes



Source: City of Cupertino, 2023; OpenStreetMaps, 2023

Figure S-3 Evacuation-Constrained Residential Parcels



Source: US Geological Survey; National Aeronautics and Space Administration: OpenStreetMaps; City of Cupertino, 2023; Cal FIRE, 2015

2.2 FLOOD AND INUNDATION HAZARDS

Flooding is the rising and overflowing of water onto normally dry land. Floods are one of the most frequent natural hazards impacting Santa Clara County and among the costliest natural disasters in terms of human hardship and economic loss nationwide, causing substantial damage to structures, landscapes, and utilities, as well as life-safety issues. Flooding can be extremely dangerous; even six inches of moving water can knock a person over. Floodwaters can transport large objects downstream, damaging or removing stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage that breaks utility lines and interrupts services. Objects can also be buried or destroyed through sediment deposition from heavy flooding. 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 losses of environmental resources.

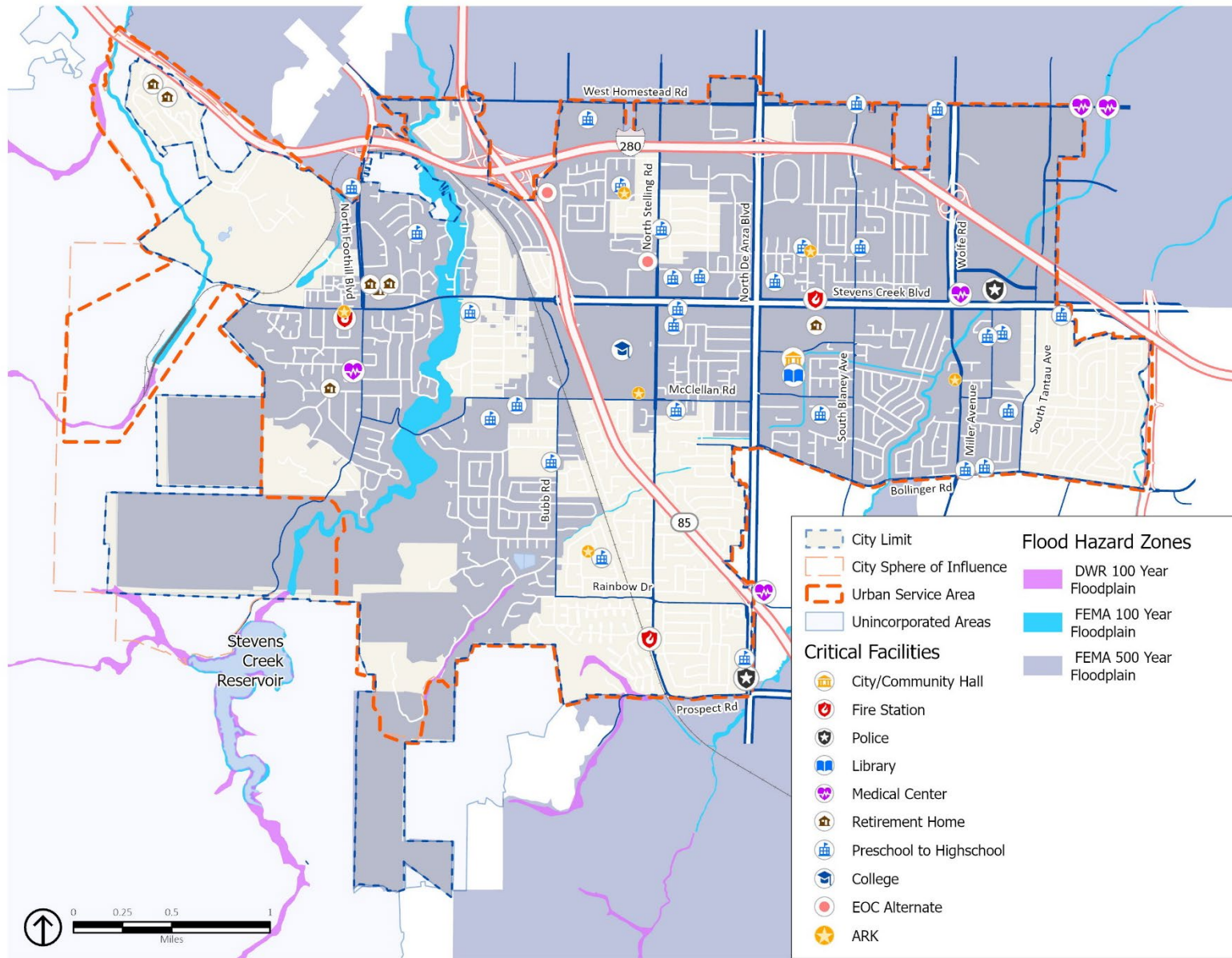
Floods are usually caused by large amounts of stormwater, either from a period of very intense rainfall or a long period of steady rain. Historically, Cupertino has been at risk of flooding primarily during the winter and spring when stream systems swell with heavy rain. This type of flood results from prolonged, heavy rainfall and typically occurs due to high peak flows of moderate duration and a large volume of runoff. Flooding is more severe when prior rainfall has saturated the ground. The watersheds in the Santa Cruz Mountains feed into four major streambeds that traverse the city, Permanente Creek, Stevens Creek, Regnart Creek, and Calabazas Creek. These creeks collect surface runoff and drain into channels leading to the San Francisco Bay. During heavy rainfall, these creeks create a potential flooding risk in the city as water levels may exceed the top of the creekbank.

Occasionally, flash flooding from short-duration, high-intensity precipitation events (often during atmospheric river events) may occur. Atmospheric rivers are a relatively common weather pattern that brings southwest winds and heavy rain to California. Atmospheric rivers are long, narrow regions in the atmosphere that transport water vapor carried away from the tropics. These columns of vapor move with the weather, carrying large amounts of water vapor and strong winds. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow, often causing heavy rains that can lead to flooding and mudslide events. Flash floods can occur even during a drought. Such events can tear out trees, undermine buildings and bridges, and scour creek channels. In urban areas, flash flooding is an increasingly serious problem due to removing vegetation and replacing groundcover with impermeable surfaces such as roads, driveways, and parking lots. The greatest risk from flash floods is occurrence with little to no warning.

Areas at an elevated risk of flooding are divided into 100- and 500-year flood zones. A 100-year flood zone has a 1-percent chance of experiencing a major flood in any given year, and a 500-year flood zone has a 0.2-percent chance of flooding in any given year. The 100-year floodplain in Cupertino is primarily along Permanente Creek, Stevens Creek, Regnart Creek, and Calabazas Creek. A majority of the city is within the 500-year floodplain. **Figure S-4** shows the 100- and 500-year flood zones in and around Cupertino.

The City of Cupertino and SCVWD are actively involved in programs to minimize the risk of flooding. The City developed an approach to land use for the non-urbanized floodplain of Stevens Creek south of Stevens Creek Boulevard that ensures the preservation of the 100-year floodplain and the protection of the riparian corridor along this portion of Stevens Creek. Furthermore, the City and SCVWD developed a flood management program for the floodplain of Stevens Creek between I-280 and Stevens Creek Boulevard, while preserving the natural environment of Stevens Creek.

Figure S-4 Flood Hazard Zones



Source: City of Cupertino, 2023; Federal Emergency Management Agency, 2021; Department of Water Resources, 2021

Agencies responsible for flood control in Cupertino include the United States Army Corps of Engineers, SCVWD, Federal Insurance Administration, and the California Department of Water Resources (DWR).

- United States Army Corps of Engineers identifies the need for and constructs major flood-control facilities. It also develops flood and dam inundation maps and reports.
- SCVWD supplies water for Santa Clara County and owns the Stevens Creek Reservoir. While this reservoir was constructed in 1935 for water conservation, it does provide incidental flood protection by containing runoff early in the rainfall season, serves recreational needs, and benefits the environment by storing water to maintain flow in the creeks. SCVWD routinely inspects and monitors the condition of Stevens Creek Reservoir and provides an annual surveillance report to DWR's Division of Safety of Dams (DSOD).
- FEMA manages the National Flood Insurance Program (NFIP), providing insurance to the public in communities that participate in the program. FEMA is the primary federal government agency contact during natural disasters and publishes the Flood Insurance Rate Maps, which identify the extent of flood potential in flood-prone communities based on a 100-year flood (or base flood) event.
- The City of Cupertino is a member of FEMA's NFIP. The City of Cupertino's Public Works Department is responsible for administering the NFIP and providing flood protection and insurance information to Cupertino residents and businesses.
- Federal Insurance Administration is the primary agency that delineates potential flood hazard areas and floodways through the Flood Insurance Rate Maps and the Flood Boundary and Floodway Map. Flood insurance is required by all homeowners who have federally subsidized loans.
- DWR is responsible for managing and protecting California's water. DWR works with other agencies to benefit the state's people, and to protect, restore, and enhance the natural and human environments. DWR also works to prevent and respond to floods, droughts, and catastrophic events that would threaten public safety, water resources and management systems, the environment, and property. DWR is responsible for inspecting the Stevens Creek Reservoir on an annual basis to ensure it is safely operating.

Floodplains can change over time; the floodplain and watercourse of a stream can also be affected by human activities, such as land development and replacing permeable surfaces with hardscapes, the construction of bridges or culverts, or the creation of levees or other impoundment structures that control the flow in the watercourse.

2.2.1 Dam and Pipeline Failure

A dam failure is an uncontrolled release of water from a reservoir through a dam because of structural failures or deficiencies in the dam, usually associated with intense rainfall or prolonged flooding. Water pipeline or aqueduct failures can create a similar sudden flood. Dam and pipeline failures can range from minor to catastrophic, potentially harming 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 and pipeline failures are very rare, these events are not unprecedented. There are four major causes of failures:

- **Overtopping:** These failures occur when a reservoir fills too high with water, especially in times of heavy rainfall, leaving water to rush over the top of the dam. Other causes of this type of failure include settling of the crest of the dam or spillway blockage.
- **Foundation defects:** These failures occur as a result of settling in the foundation of the dam, instability of slopes surrounding the dam, uplift pressures, and seepage around the foundation. All these failures result in structural instability and potential dam failure.

- **Piping and seepage failures:** These failures occur as a result of internal erosion caused by seepage and erosion along hydraulic structures, such as the spillways of a dam, or failures in the walls of a water pipeline. Animal burrows and cracks in the dam structure may also cause erosion.
- **Conduit and valve failure:** These failures occur as a result of problems with valves and conduits in a dam or pipeline's systems.

Many dam and pipeline failures are also the secondary result of other natural disasters, such as earthquakes, landslides, and extreme storms. Other causes include equipment malfunction, structural damage, and sabotage. Dams are constructed with safety features known as “spillways” that allow water to overtop the dam if the reservoir fills too quickly. Spillway overflow events, often referred to as “design failures”, result in increased discharges downstream and increased flooding potential. 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.

SCVWD has a comprehensive Dam Safety Program, which includes proactive inspection of upgrades and improving its dams and water supply structures as needed and in consultation with regulatory agencies. Engineers monitor dams using instruments, monthly visual inspections, and periodic dam safety reviews to prevent loss of life, personal injury, and property damage from the failure of dams. The safety of each dam is re-evaluated with advances in geotechnical, structural, and earthquake engineering and if there is evidence of seepage or ongoing ground movement.

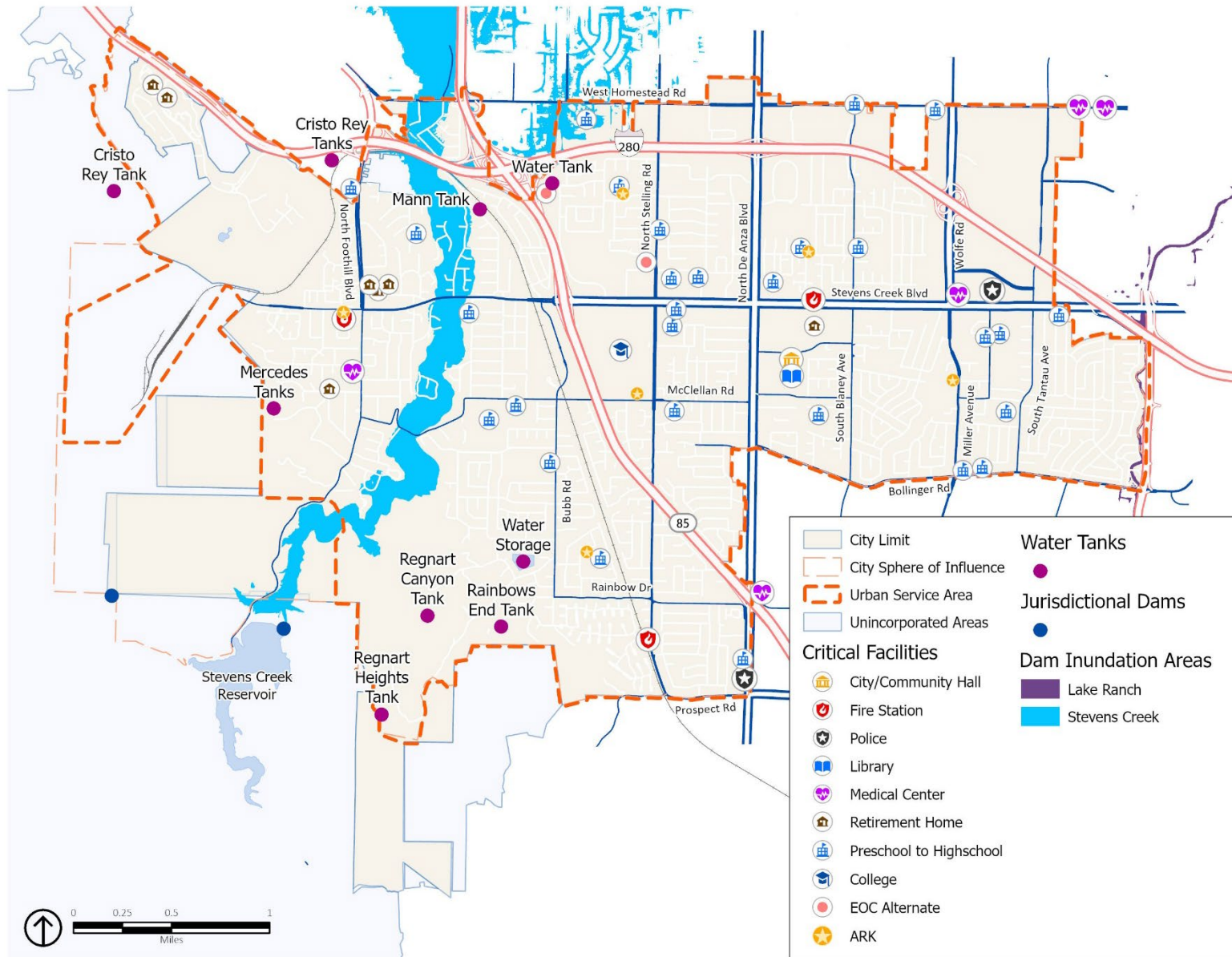
The Federal Energy Regulatory Commission, as required by federal law, reviews and approves comprehensive emergency action plans (EAPs) for each of these dams. The EAP minimizes the threat to public safety and the response time to an impending or actual sudden release of water from project dams. The EAP is also designed to provide emergency notification when floodwater releases may present the potential for major flooding. The EAP is used primarily to notify partner agencies; however, it may also be used to notify the public in unique situations.

The Stevens Creek Reservoir, owned by SCVWD, is outside of city limits, immediately to the southwest, as shown in **Figure S-5**. In the event of a dam failure at the Stevens Creek Reservoir, land surrounding Stevens Creek would flood, including residential areas adjacent to Stevens Creek and a portion of I-280.

As mandated by the National Dam Inspection Act, the United States Army Corps of Engineers has the authority and responsibility for conducting inspections of all dams. The purpose of these inspections is to check the structural integrity of the dam and associated appurtenant structures, ensuring the protection of human life and property. The National Dam Inspection Act requires all states to establish dam safety programs and sets minimum standards for dam design, construction, maintenance, and inspection. The California Dam Safety Program is responsible for implementing the National Dam Inspection Act in California and ensuring that all non-federal dams in the state comply with federal safety standards. The program also works to promote dam safety awareness, provides technical assistance to dam owners and operators, and conducts regular inspections and evaluations of California's dams.

DWR's DSOD oversees the California Dam Safety Program which regulates approximately 1,250 dams in California. DSOD inspects dams on an annual basis to ensure they are safe and performing as intended. DSOD also conducts independent reviews of applications for dam construction, removal, alteration, or repair; has inspection oversight over dam construction projects; and periodically reviews the stability of dams and their critical related structures, considering improved design approaches and requirements. DSOD works closely with dam owners to identify and correct issues on an ongoing basis.

Figure S-5 Dam Inundation Areas



Source: City of Cupertino, 2023; Department of Water Resources, 2023

2.2.2 Past Occurrences

Floods are a regular feature in California and cause the second-greatest number of disaster declarations in the state. Cupertino has had several flooding events, including the following:⁷

- A series of storms from December 17, 2005, to January 12, 2006, caused extensive flooding throughout Northern California. Widespread county flooding occurred after two to four inches of rain fell on the area in about 24 hours.
- In 2015, a strong winter storm impacted California following nearly a month and a half of no rain and the driest January on record. The storm brought heavy rain, gusty winds, and damage to trees and power lines along with some minor flooding of urban areas. Rainfall amounts were heaviest in the mountains with 5 to 10 inches or more occurring. Several small mudslides in Santa Clara County were reported with the largest occurring in the Santa Cruz Mountains, north of Boulder Creek on Highway 9. Multiple offramps from I-280 reported flooding.
- In 2019, an atmospheric river with an associated cold front moved through the region from February 12 to February 15 bringing widespread flooding and debris flows. Multiple mainstem rivers flooded, prompting evacuations from local officials. Strong wind gusts caused downed trees, power outages, and structural damage.
- In Winter and Spring of 2023, a series of atmospheric rivers impacted the Bay Area, resulting in significant rainfall and widespread flooding across the San Francisco Bay Area.

2.2.3 Potential Changes to Flood Risk in Future Years

Likelihood of Future Occurrence

Historically, extended heavy rains have resulted in floodwaters that exceed normal high-water boundaries and cause damage in Cupertino. Flooding has occurred within the 100- and 500-year floodplains and localized in other areas throughout the city. As land uses and climate conditions shift, and improvements are made to flood-control channels, the size of these flood zones is likely to change. The potential for a dam failure event in Cupertino is likely to remain a risk in future years, although the odds of such events are expected to remain very low.

Climate Change and Flooding

Floods are among the most damaging natural hazards in Santa Clara County, and climate change is expected to make flood events worse. Although climate change may not change average precipitation levels significantly, scientists expect that it will cause more years of extreme precipitation events. This means that more years are likely to see particularly intense storm systems that drop enough rainfall over a short period to cause flooding. Because of this, floods are expected to occur more often in Cupertino, and climate change may expand the parts of the city that are considered prone to flood. Climate change is also likely to increase the frequency and severity of droughts that cause soil to dry out and become hard. When precipitation does return, more water runs off the surface than is absorbed into the ground, which can increase flooding downstream.

While the risk and associated short- and long-term impacts of climate change are uncertain, experts in this field tend to agree that the most significant impacts include those resulting from increased heat and rainfall events that cause increased frequency and magnitude of flooding. Increases in damaging flood events will cause greater property damage, public health and safety concerns, displacement, and loss of life. Displacement of residents can include both temporary and long-term displacement, an increase in insurance rates, or restriction of insurance coverage in vulnerable areas.

2.3 SEISMIC AND GEOLOGIC HAZARDS

Seismic and geologic hazards are risks caused by the movement of different parts of the earth's crust or surface. Seismic hazards include earthquakes and hazardous events caused by them. Geologic hazards are other hazards involving land movements that are not linked to seismic activity and can inflict harm to people or property. Additional information about seismic and geologic hazards is in Cupertino, including development review coordination is in General Plan **Appendix E, Geologic and Seismic Hazards**.

2.3.1 Seismic Hazards

Seismic activity occurs along boundaries in the earth's crust, called faults. Pressure along the faults builds over time and is ultimately released, resulting in ground shaking commonly referred to as an earthquake. Earthquakes can also trigger other hazards, including surface rupture (cracks in the ground surface), liquefaction (causing loose soil to lose its strength), landslides, and subsidence (sinking of the ground surface). Earthquakes and other seismic hazards often damage or destroy property and public infrastructure, including utility lines, and falling objects or structures pose a risk of injury or death.

Earthquakes

While Cupertino is at risk from many natural and human-caused hazards, the event with the greatest potential for loss of life or property and economic damage is an earthquake. This risk is true for most of the San Francisco Bay Area region since damaging earthquakes affect widespread areas and trigger many secondary effects that can overwhelm the ability of local jurisdictions to respond. Earthquakes in the Bay Area result from strain energy constantly accumulating across the region because of the motion of the Pacific Plate, relative to the North American Plate.

Earthquake risk is very high in Santa Clara County, including the City of Cupertino, due to the presence of three major active faults² in the region, the Hayward Fault, Calaveras Fault, and San Andreas Fault. Both the San Andreas and the Hayward Faults have the potential for experiencing major to great events.

The San Andreas fault, one of the longest and most active faults in the world is located west of Cupertino. Two additional faults closely associated with the San Andreas Fault include the Sargent-Berrocal and Monta Vista-Shannon fault systems that intersect the western portion of the city.

The following three major faults are considered active faults within the region:

- **Calaveras Fault:** The Calaveras Fault is a major branch of the San Andreas Fault, to the east of the Hayward Fault. It extends 76 miles from the San Andreas Fault near Hollister to Danville at its northern end. The Calaveras Fault is one of the most geologically active and complex faults in the Bay Area.⁸ According to the 2023 Santa Clara County MJHMP, the probability of experiencing a magnitude 6.7 or greater earthquake along the Calaveras Fault in the next 30 years (beginning from 2023) is 7.4 percent.⁹ The Calaveras Fault is approximately 14 miles to the east of the city.
- **San Andreas Fault:** The San Andreas Fault extends 810 miles from the East Pacific rise in the Gulf of California through the Mendocino fracture zone off the shore of northern California. The fault is estimated to be 28 million years old. The probability of experiencing a Magnitude 6.7 or greater earthquake along the San Andreas Fault within the next 30 years (beginning from 2023) is 6.4 percent.⁹ The San Andreas Fault is approximately 5.5 miles to the west of the city.
- **Hayward Fault:** The Hayward Fault runs parallel to and east of the San Andreas Fault. It extends from San José about 74 miles northward along the base of the East Bay Hills to San Pablo Bay. The

² Active faults are defined by their current movement and deformation and their potential to cause earthquakes or other types of ground deformation in the future.

Hayward Fault is increasingly becoming a hazard priority throughout the Bay Area because of its increased chance for activity and its intersection with highly populated areas and critical infrastructure. According to the Uniform California Earthquake Rupture Forecast, Volume 3, released in March 2015, the probability of experiencing a Magnitude 6.7 or greater earthquake along the Hayward Fault in the next 30 years (starting from 2014) is 14.3 percent.¹⁰ An earthquake of this magnitude has regional implications for the entire Bay Area, as the Hayward Fault crosses transportation and resource infrastructure, including multiple highways, regional gas and water pipelines, electrical transmission lines, and the Hetch-Hetchy Aqueduct. Disruption of the Hetch-Hetchy system has the potential to severely impair water service to Santa Clara County. The Hayward Fault is approximately 10 miles to the east of the city.

Alquist-Priolo Earthquake Fault Zones are California Geological Survey-designated zones in California that are subject to special regulations for development and construction in the presence of certain active faults. These faults have surface traces, or a line on the earth's surface, defining a fault. During an earthquake, the ground's surface can move along these traces, damaging buildings or other structures built on top of them. However, no Alquist-Priolo Earthquake Fault Zones are in the city. The nearest Alquist-Priolo Earthquake Fault Zone is along the San Andreas Fault, west of the city. **Figure S-6** shows the location of regional faults and Alquist-Priolo Earthquake Fault Zones.

Other Seismic Hazards

In addition to the direct physical damage that can result from the motion of an earthquake, damage can result from liquefaction. Liquefaction occurs primarily in saturated, loose, fine- to medium-grained soils in areas where the groundwater table is within approximately 50 feet of the surface. Shaking causes the soils to lose strength and behave as a liquid. Excess water pressure is vented upward through fissures and soil cracks and can result in a water-soil slurry flowing onto the ground surface. This subsurface process can lead to near-surface or surface ground failure that can result in property damage and structural failure. Groundwater that is less than 10 feet to the surface can cause the highest liquefaction susceptibility, with lower groundwater levels causing lower liquefaction risks.

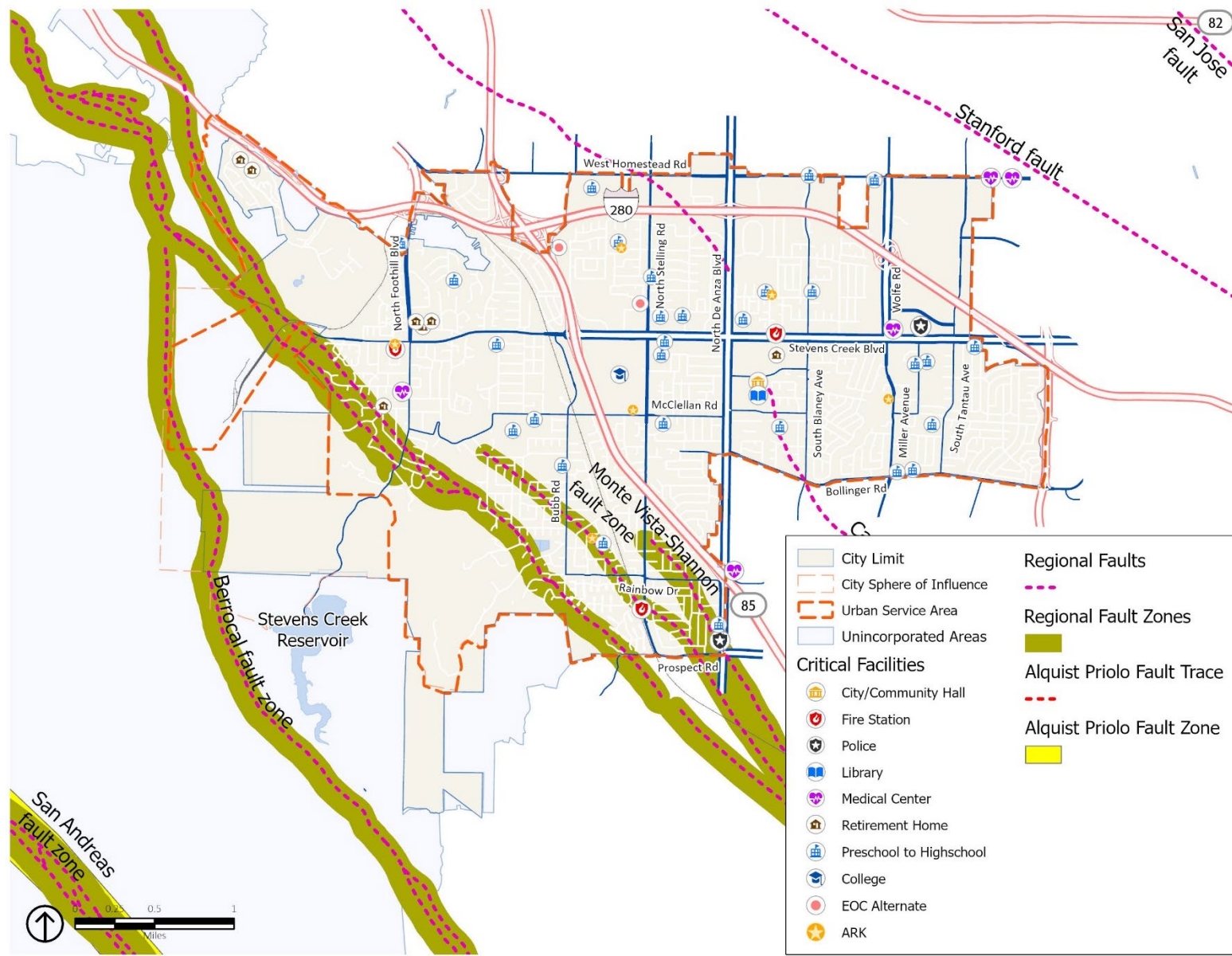
Soils susceptible to liquefaction are typically found in low-lying, current, or former floodplains. Portions of the city near the floodplains of Permanente Creek, Stevens Creek, Regnart Creek, and Calabazas Creek are likely to face liquefaction during an earthquake. **Figure S-7** shows the areas facing an elevated liquefaction risk in Cupertino.

Site-specific geotechnical studies are the only practical and reliable way of determining the specific liquefaction potential of a site. However, a determination of general risk potential can be provided based on soil type and depth of groundwater. In most cases, proper design and construction of subgrade soils and building foundations provides a mechanism to mitigate the risk of seismic hazards to an acceptable level in conformance with the California Code of Regulations and the City's Municipal Code. Identifying areas having a liquefaction potential is only intended as notification to seek further site-specific information and analysis of this potential hazard as part of future site development. It should not be solely relied on, without site-specific information and analysis, for design or decision-making purposes.

Earthquake-induced landslides pose a significant risk due to the presence of landslide-prone areas in western Cupertino and proximity of earthquake faults. Ground shaking from seismic activity can cause rocks, debris, and hillside soils to loosen and fall downslope, harming facilities and infrastructure in its path. Sinkholes, which are depressions or holes in the ground that form when the surface collapses into an underground space, are also a hazard in Cupertino. They can be formed by natural processes, such as earthquakes or subsidence, which is when the ground surface sinks as a result of underlying soil or rock

being compressed, compacted, or eroded. Sinkholes can occur suddenly and can be very dangerous if they form underneath buildings, roads, or other structures.

Figure S-6 Regional Fault Lines



Source: City of Cupertino, 2023; US Geological Survey, 2020; California Geological Survey, 2022

2.3.2 Geologic Hazards

Geologic hazards, such as landslides and erosion, depend on the geologic composition of the area. Landslides and rock falls may occur in sloped areas, especially areas with steep slopes, and usually in loose and fragmented soil areas. Slope stability depends on many factors and interrelationships, including rock type, pore water pressure, slope steepness, and natural or human-made undercutting. Landslides, rockfalls, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results.

Landslides are often triggered by other natural hazards, such as heavy rain, floods, or wildfires, so landslide frequency is often related to the frequency of these other hazards. In Santa Clara County, landslides typically occur during and after severe heavy rainfall, so the risk of landslides often rises during and after sequential severe storms that saturate steep, loose soils. Landslides and mudslides are a common occurrence and have caused damage to homes, public facilities, roads, parks, and sewer lines.

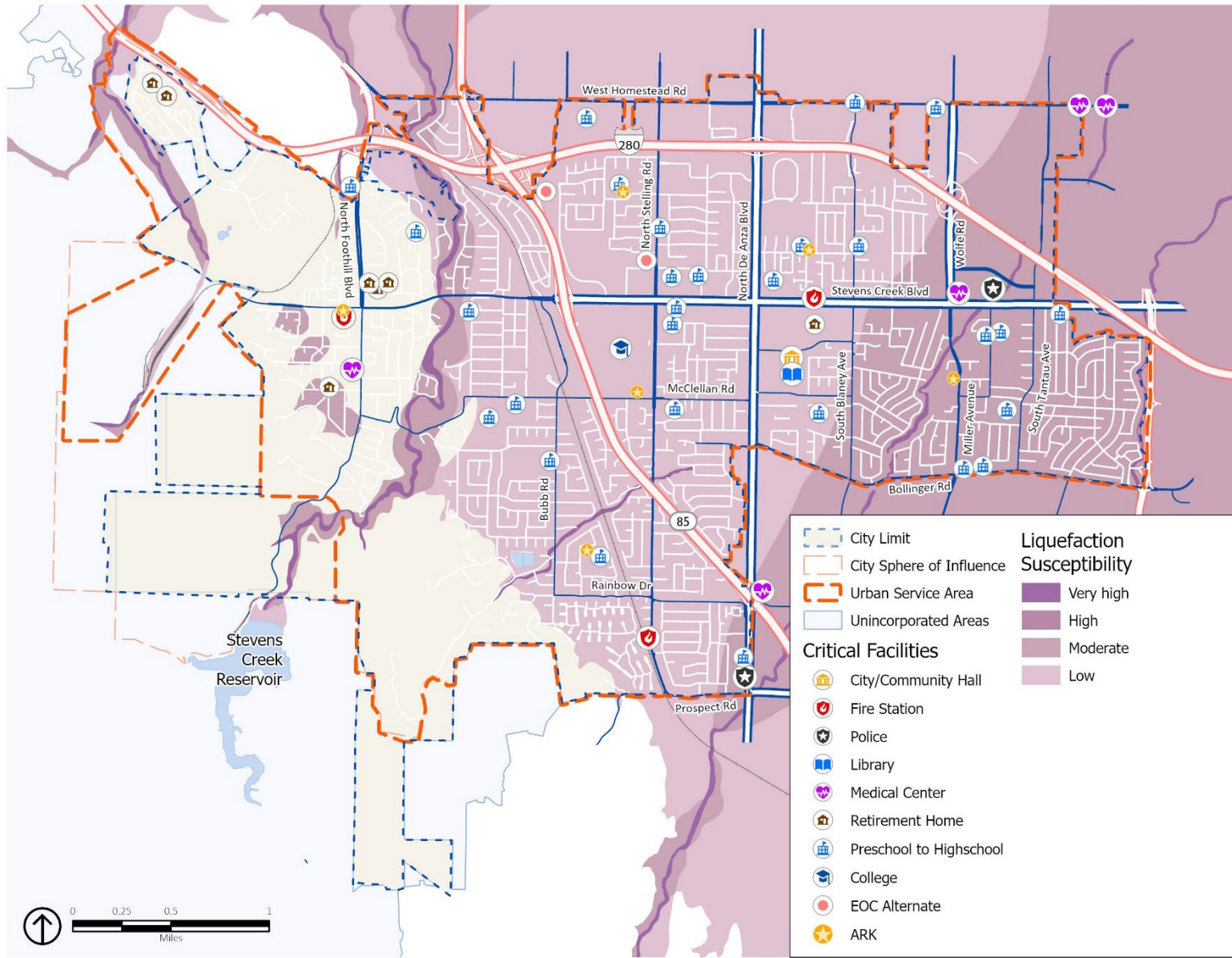
Due to the hilly terrain, the western portion of the city is within a very high landslide susceptibility class. Landslides present the greatest geologic hazards in the city and generally occur in winter during high precipitation years. Landslides range from small, shallow deposits of soil and weak bedrock materials to large, deep landslides involving a large amount of bedrock. Landslides are also likely along the steep embankments that bound the Stevens Creek floodplain. **Figure S-8** illustrates areas in Cupertino that are most susceptible to landslides.

Cupertino is also susceptible to hazards related to erosion, or the geological process in which earthen materials are worn away and transported by natural forces, such as water or wind, causing the soil to deteriorate. Eroded topsoil can be transported into streams and other waterways. Highly erosive soils can damage roads, bridges, buildings, and other structures. Sinkholes can also be formed by the erosion of soil or sediment by water flowing through the ground. This hazard can happen in areas with sandy or porous soils or in areas with a high-water table. Sinkholes can pose a hazard to infrastructure and human safety. They can cause damage to buildings, roads, and other structures and pose a risk to people and animals if they are not properly identified and managed.

2.3.3 Past Occurrences

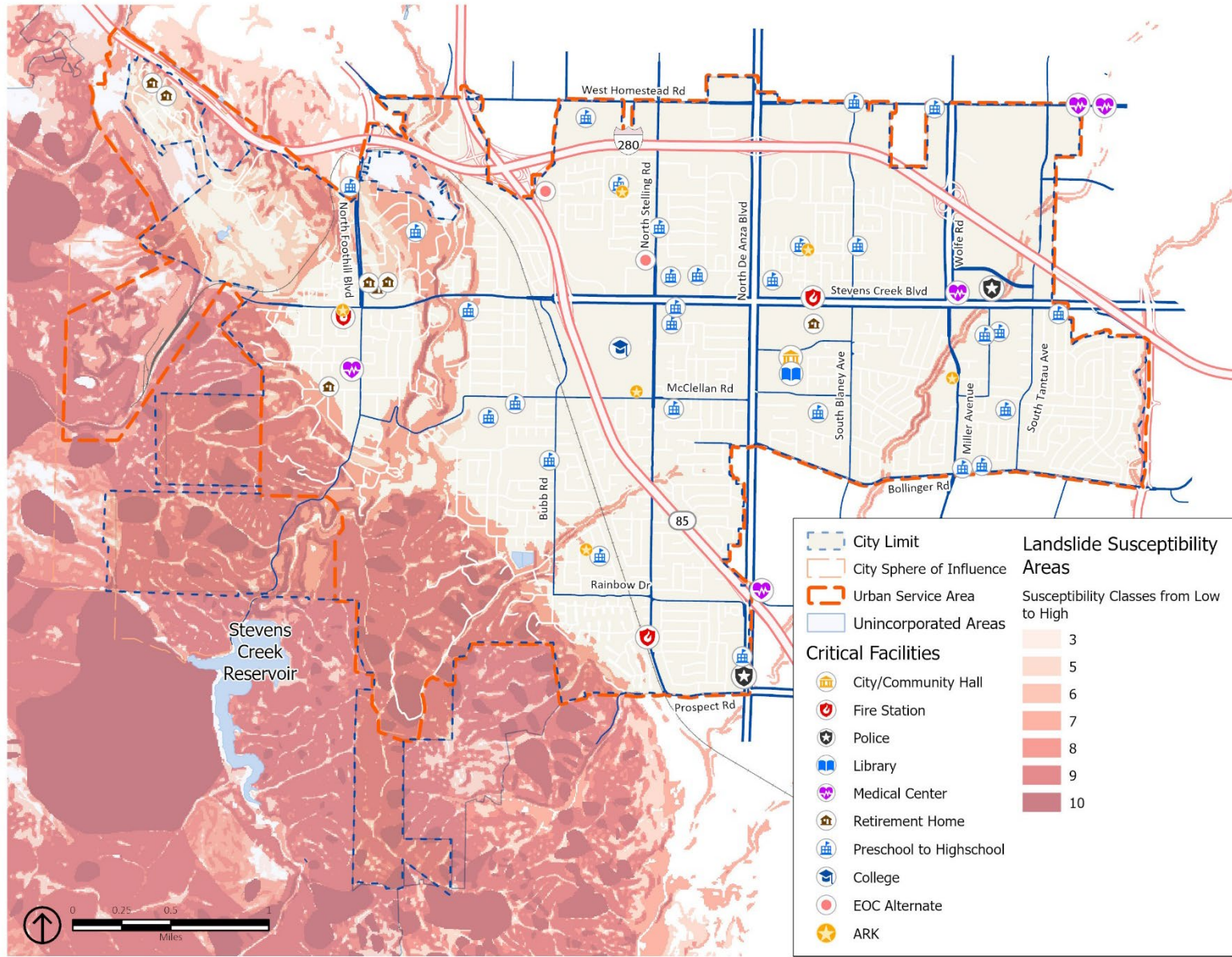
Cupertino is in a region of high seismicity with numerous local faults nearby. While major earthquakes are rare in Cupertino, minor earthquakes occur more often. The San Andreas Fault, the fastest-slipping fault along the Pacific and North American Plate boundary, has caused earthquakes of magnitude 7.8 and 7.9 in the past, including the 1906 San Francisco earthquake. In 1989, the Loma Prieta earthquake, which also originated along the San Andreas Fault, produced a magnitude 6.9 earthquake.¹¹ The earthquake caused extensive damage and created a seven-county major disaster area, including Santa Clara County. Landslides have occurred on hillsides throughout the city and generally occur in winter during high rainfall years.

Figure S-7 Liquefaction Areas



Source: City of Cupertino, 2023; US Geological Survey, 2022

Figure S-8 Landslide Susceptibility Areas



Source: City of Cupertino, 2023; California Geological Survey, 2018

2.3.4 Potential Changes to Geologic and Seismic Risk in Future Years

Likelihood of Future Occurrence

Seismic Risk

Earthquakes are likely to continue to occur on an occasional basis. Most are expected to cause no substantive damage and may not even be felt by most people. Major earthquakes are rare but a possibility in the region. A major earthquake along any of the nearby faults could result in substantial casualties and damage, although the greatest risk in Cupertino is from the San Andreas Fault due to its proximity and high potential to cause a severe earthquake. A major earthquake on the Hayward Fault could damage or destroy transportation infrastructure, such as I-280, SR-85, or bridges, limiting access in and out of the community.

Based on historical data and the location of Cupertino relative to active and potentially active faults, the city will likely experience a significantly damaging earthquake. If serious shaking occurs, newer construction is generally more earthquake-resistant than older construction because of improved building codes.

Geologic Risk

Geologic risks, such as landslides, are common occurrences in Cupertino. With significant rainfall, additional failures are likely in the community's landslide hazard areas, and minor to moderate landslides will likely continue to impact the area when heavy precipitation occurs, as they have in the past.

Climate Change and Geologic and Seismic Hazards

While climate change is unlikely to increase earthquake frequency or strength, the threats from seismic and geologic hazards are expected to continue. Climate change may result in precipitation extremes (i.e., wetter rainfall periods and drier dry periods). While total average annual rainfall may not change significantly, rainfall may be concentrated in more intense precipitation events. Heavy rainfall could cause an increase in the number of landslides or make landslides larger than normal. Increased wildfire frequency can destabilize hillsides due to loss of vegetation and change soil composition, contributing to greater runoff and erosion. The combination of a generally drier climate in the future, which will increase the chance of drought, wildfires, and the occasional extreme downpour, is likely to cause more mudslides and landslides. Impacts from these conditions would compound landslide potential for the most susceptible locations.

2.4 FIRE HAZARDS

Fire hazards include both wildfires and urban fires. The combination of complex terrain, climate, vegetation and development patterns contribute to an elevated risk of wildfire. The Community Wildfire Protection Plan 2023 (CWPP) describes how each of these variables contributes to fire risk, and describes how fire risk varies throughout the city. 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.

Three types of fires are of concern to Cupertino: (1) wildfires, (2) wildland-urban interface fires, and (3) structural fires.

2.4.1 Wildfires

Wildfires occur on mountains, hillsides, and grasslands. Fuel, weather, and topography are primary factors that affect how wildland fires spread. In and around Cupertino, grassland and woodland habitat provide highly flammable fuel that is conducive to wildfires. These plant species are capable of regeneration after a fire, making periodic wildfires a natural part of the ecology of these areas. The climate of Cupertino and the surrounding area keeps the grass dry and more readily combustible during fire season.

Wildfire potential for Santa Clara County is typically greatest in the months of August, September, and October, when dry vegetation coexists with hot, dry winds. During these times, controlling a fire becomes far more difficult. Areas adjacent to the city that are susceptible to wildfires are also of concern as these conditions could exacerbate vulnerabilities within the city. Grassland fires are easily ignited, particularly in dry seasons. These fires are relatively easily controlled if they can be reached by fire equipment, although after a fire, the burned slopes are highly subject to erosion and gulying. While brushlands are naturally adapted to frequent light fires, fire suppression in recent decades has resulted in heavy fuel accumulation on the ground. Wildland fires, particularly near the end of the dry season, tend to burn fast and very hot, threatening homes and leading to serious destruction of vegetative cover. In woodland and forested areas, a wildland fire can generate a destructive crown fire, which is a fire that burns materials at the top of trees, spreading from treetop to treetop. They can be very intense and difficult to contain.

Because areas of the city with natural vegetation are extremely flammable during late summer and fall, wildfire is a serious hazard in undeveloped hillside areas in the western portion of the city, as well as open space areas adjacent to the city. These areas include State Responsibility Area (SRA) lands west of the city, such as the Rancho San Antonio Open Space, Picchetti Ranch Open Space, Stevens Creek County Park, Saratoga Creek County Park, Sanborn County Park, Fremont Older Open Space, as well as Local Responsibility Area (LRA) lands in the hillsides of Saratoga.

2.4.2 Fire Hazard Severity Zone

The California Department of Forestry and Fire Protection (CAL FIRE) establishes Fire Hazard Severity Zones (FHSZs), designating each as moderate, high, or very high severity. Incorporated areas such as Cupertino are considered local responsibility areas (LRAs), within which CAL FIRE only designates Very High FHSZs. In 2009, CAL FIRE designated approximately three acres of the city as in the Very High FHSZ. **Figure S-9** shows the FHSZs in and around Cupertino. Areas adjacent to the city that are susceptible to wildfires are also of concern, as these conditions could exacerbate vulnerabilities within the city.

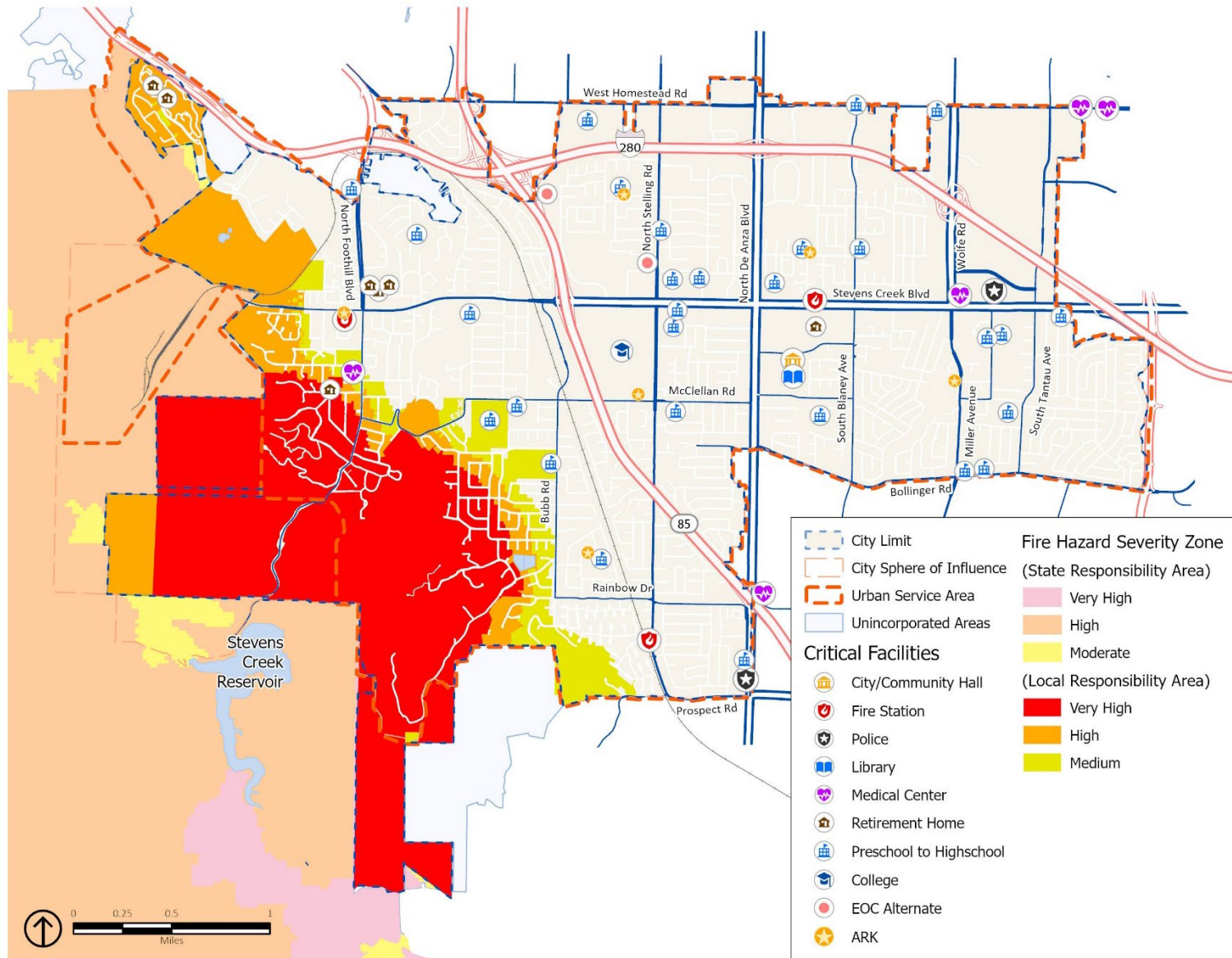
A combination of factors, including weather, topography, and vegetation, creates a higher risk of wildfire hazards, particularly in the Very High FHSZ. CAL FIRE periodically reviews and revises the FHSZ boundaries based on updated modeling and scientific information. Individuals should consult the most recent mapping available from CAL FIRE's Fire and Resource Assessment Program (FRAP) at <https://frap.fire.ca.gov/>. Future updates to the Health and Safety Element will incorporate new mapping data as it becomes available.

2.4.3 Structural Fires

Cupertino is also at risk from structural fires. These fires occur in built-up environments, destroying buildings and other human-made structures. Structural fires are often due to faulty wiring, mechanical equipment, or combustible construction materials. The absence of fire alarms and fire sprinkler systems often exacerbates the damage associated with a structural fire. Structural fires are largely caused by human accidents, although deliberate fires (arson) may cause some events. Older buildings lacking modern fire safety features may face greater risk of fire damage. To minimize fire damage and loss, the

City's Fire Code, based on California Code of Regulation Title 24, sets standards for building and construction. It requires adequate water supply for firefighting, fire-retardant construction, and minimum street widths, among other things.

Figure S-9 Fire Hazard Severity Zones



Source: City of Cupertino, 2023; Cal FIRE, 2022

2.4.4 Fire Protection

As described in Section 1.2.3, the Santa Clara County Fire Department provides fire protection in Cupertino. The Santa Clara County Fire Department operates three fire stations in Cupertino:

- **Cupertino Fire Station** at 20215 Stevens Creek Boulevard
- **Monta Vista Fire Station** at 22620 Stevens Creek Boulevard
- **Seven Springs Fire Station** at 21000 Seven Springs Parkway

The Santa Clara County Fire Department operates an additional twelve fire stations that are slated to provide service throughout the District during a significant event. As development continues in Cupertino, the City and Santa Clara County Fire Department will continue to monitor the changing fire protection needs in the community.

Santa Clara County Fire Department

The Fire Prevention Division provides a comprehensive fire/life safety plan review for land development, new building construction, interior remodel projects, fire suppression, and fire alarm systems. In addition, periodic construction inspections are performed to ensure that completed projects conform to State and local fire safety regulations.

For existing commercial buildings, the Fire Prevention Division provides an annual inspection program that is delivered through both the Prevention Division and fire station personnel. Annual inspections are conducted to ensure reasonable compliance with the general and specific fire safety regulations for each occupancy type as specified in the adopted Fire and Building Codes.

The Santa Clara County Fire Department manages and implements a hazardous brush abatement program for hillside areas within its jurisdictional boundaries. In January of each year, homeowners are reminded that they must remove native brush and vegetation from around their homes to create defensible space. The brush abatement program entails inspections of hillside properties by fire crews beginning in early April each year. The costs associated with the abatement work are then placed on the property tax bill for that parcel.

Santa Clara County lists the Montebello Road/Stevens Canyon area as the fourth-highest risk in the county. This area is adjacent to the city limits, near the southwestern border of Cupertino. Stevens Creek Quarry Road connecting to the southern point of Stevens Canyon has been improved to acceptable standards for a fire access road. A fire trail extends from Skyline Boulevard on Charcoal Road to Stevens Canyon. The City requires that all emergency roads be constructed with an all-weather surface. It also requires a private emergency access connection between public streets within Lindy Canyon and Regnart Canyon areas. Presently, no water systems are serving the Montebello Road and upper Stevens Canyon area, except for Stevens Creek itself. Because there is no water service to these areas, the County requires homes to provide individual water tanks and fire sprinkler systems.

Santa Clara Valley Water District

Santa Clara Valley Water District's (SCVWD) Project F4: Vegetation Management for Access and Fire Safety supports SCVWD's ongoing vegetation management activities that reduce fire risk by maintaining creekside lands. These activities also ensure access to maintenance and emergency personnel and equipment. The project includes vegetation management activities, such as weed abatement, goat grazing, herbicide application, and pruning to provide access and reduce fire risk. Before conducting

maintenance, SCVWD's personnel perform biological preconstruction surveys to minimize environmental impacts.

Santa Clara County Firesafe Council

The Santa Clara County Firesafe Council (SCCFSC) is a nonprofit, grassroots organization providing education and project assistance for homeowners and landowners in communities vulnerable to wildfire. In addition to partnering directly with CAL FIRE, Santa Clara County Fire, and regional fire districts, SCCFSC works with public agencies, other nonprofits, businesses, and private landowners to design and implement protective measures, such as developing shaded fuel breaks, to increase wildfire survivability.

Pacific Gas and Electric Company

PG&E's 2023–2025 Wildfire Mitigation Plan outlines its program to reduce wildfires. Key strategies in this plan include:

- **Undergrounding utility lines:** PG&E has a program to underground 10,000 circuit miles of distribution lines in areas of high fire threats, eliminating the ignition risk for these power lines.
- **Increased safety settings:** Configuring electrical equipment on power lines to automatically shut off power if an object comes into contact with a distribution line.
- **Vegetation management:** Continuing vegetation management activities.
- **Enhanced inspections:** Providing more frequent and detailed inspections of power lines.

PG&E is undergrounding power lines in areas with the greatest impact on reducing wildfire risk and outages for their customers.

2.4.5 Past Occurrences

There is limited information on historic fires in the Cupertino area. However, there is no recorded history of wildfires within the city.¹² The closest known wildfire was the Stevens Fire which occurred on August 30, 2007. This wildfire burned 151 acres in the dry brush-covered hills near Stevens Creek Canyon southwest of Cupertino. The fire burned for three days and was contained on September 2, 2007. This fire was the result of a downed power line, and no injuries or deaths were reported.

The 2020 fire season was the largest wildfire season recorded in California's modern history. It was also the most devastating in recent Santa Clara County history. In eastern Santa Clara County, the SCU Lightning Complex fires burned 396,624 acres spanning from Calaveras Reservoir to the north, to nearly San Luis Reservoir to the south. The SCU Lightning Complex destroyed 222 structures and cause widespread smoke impacts across the region. Near the western border of Santa Clara County and closer to Cupertino, the CZU Lightning Complex fire, started as a series of lightning fires on August 16, 2020, burned across western Santa Cruz and San Mateo counties until September 22, 2020. These fires resulted in a total 86,509 acres burned, with 1,450 structures lost, and one fatality. While this fire was outside of Santa Clara County, it caused severe smoke impacts for Cupertino and surrounding communities.

2.4.6 Potential Changes to Fire Risk in Future Years

Likelihood of Future Occurrence

As noted previously, the risk of wildfires in Santa Clara County is highest in late summer and fall. Extreme weather conditions during periods of low humidity, low fuel moisture, and high winds contribute to the severity of any potential wildfires. Fires occurring during these times typically burn hot and fast and are difficult to control unless initial suppression occurs immediately. Wildfire for Cupertino is a concern given its Very High FHSZ designations, and proximity to surrounding LRA and SRA lands with wildfire risk. Moreover, the community consists of, and is surrounded by, undeveloped hillsides to the west, which makes these areas a high risk for wildfire. Wildfires will continue to be a high-risk hazard for personal safety and property damage in Cupertino, and smoke impacts from local and regional wildfires will likely continue to be problematic. The likelihood of structural fires occurring in the city is low since these fires are usually the result of human accidents or mechanical issues in buildings. New developments are required to incorporate fire protection measures under the Fire Code, including enhanced requirements for structures in the Very High FHSZ.

Climate Change and Wildfire

Changing climate conditions are expected to increase the fire risk in and around Cupertino. Warmer temperatures brought on by climate change can exacerbate drought conditions. Droughts can kill or dry out plants, creating more fuel for wildfires. Warmer temperatures are also expected to increase the number of pest outbreaks, such as the bark beetle, creating more dead trees and increasing the fuel load. Hot, dry spells may also increase disease and insect infestations, resulting in higher fuel loads. Increased winds will result in more erratic fire behavior, making fires harder to contain. Warmer temperatures are also expected to occur later in the year, extending the wildfire season, which is likely to begin earlier in the year and extend later than it has historically.

2.5 HAZARDOUS WASTE AND MATERIALS

Hazardous materials are materials that pose a significant risk to public safety, or human and 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 (e.g., if a flood damages a hazardous material storage tank). Hazardous materials can also be released accidentally during transportation because of vehicle accidents.

The release or spill of bulk 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. Health problems may be immediate, such as corrosive effects on the skin and lungs, or gradual, such as the development of cancer from a carcinogen. Property damage could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material. Most hazardous materials in the region are transported on truck routes along major roadways, such as I-280 and SR-85 that pass through Cupertino. The most vulnerable areas along this route are considered the on-/off-ramps and interchanges. Since 1970, one reported roadway hazardous materials incident occurred in Cupertino.¹³ The City adopted a Hazardous Materials Storage Ordinance that regulates the storage of hazardous materials in solid and liquid form. Since 1990, State law has required that hazardous waste be properly disposed of in approved hazardous waste treatment or disposal facilities. To accomplish this, new treatment methods and facilities have been developed and approved to pre-treat hazardous waste before its final disposal. Under the 1986 Tanner Bill (AB 2948) authority, Cupertino, along with 13 other cities,

joined the County to develop a comprehensive and coordinated planning approach to hazardous waste disposal. In 1990, a countywide Household Hazardous Waste (HHW) Program was created. To supplement the County's HHW Program and make the collection of HHW more convenient for residents, the City currently provides a door-to-door hazardous waste retrieval service through its solid waste franchise agreement.

Hazardous materials and waste within Cupertino are managed by the Certified Unified Program Agency (CUPA), a local administrative agency within the County of Santa Clara Hazardous Materials Compliance Division. 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. The Santa Clara County Fire Department Fire Prevention Division provides hazardous materials inspection, services for building construction, annual building inspection, and hazardous materials regulation.

Several State agencies monitor hazardous materials/waste facilities. Potential and known contamination sites are monitored and documented by the Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC). A review of the leaking underground storage tank (LUST) list³ produced by the RWQCB and the DTSC EnviroStor database¹⁴ indicates two active voluntary cleanup sites, one closed voluntary cleanup site, one certified school cleanup site, and three closed non-operating sites. The two active cleanup sites include the following:

- Cupertino Village Cleaners at 10989 North Wolfe Road
- Delia's Cleaners at 7335 Bollinger Road

If a hazardous material spill poses an imminent public health threat, the City will support local regulating agencies in notifying the public. The transport of hazardous materials/wastes and explosives through the city is regulated by the California Department of Transportation (Caltrans). I-280 and SR-85 are open to vehicles carrying hazardous materials/wastes. Transporters of hazardous wastes are required to be certified by the United States Department of Transportation, and manifests are required to track the hazardous waste during transport. The danger of hazardous materials/waste spills during transport does exist and will potentially increase as transportation of these materials increases on I-280 and SR-85. Santa Clara County Fire Department, County of Santa Clara Office of Emergency Management, and County of Santa Clara Hazardous Materials Compliance Division are responsible for hazardous materials accidents at all locations within the city.

³ A review of LUST sites occurred on December 6, 2023.

2.5.1 Potential Changes to Hazardous Materials in Future Years

Likelihood of Future Occurrence

Given that there has been one hazardous materials incident in transport through the city in the past 53 years and land use activities that would require hazardous materials are not likely to increase in the future, it is unlikely that a hazardous materials incident will occur in Cupertino on a frequent basis. Moreover, according to Caltrans, most incidents are related to releases of fluids from the transporting vehicles themselves and not the cargo, thus the likelihood of a significant hazardous materials release within the city is more limited and difficult to predict.

Climate Change and Hazardous Materials

Climate change is unlikely to substantially affect hazardous materials transportation incidents. However, increases in the frequency and intensity of climate hazards, such as floods, landslides, and severe storms, may create a greater risk of hazardous materials releases during these events. The two active cleanup sites mentioned are both within the 500-year floodplain and are at risk of hazardous materials releases.

2.6 CLIMATE CHANGE RESILIENCE

2.6.1 Air Quality

Air quality is determined by the composition of gases and particles in the atmosphere, and it is a critical aspect of environmental health. Air pollution comes from both mobile sources (e.g., cars, trucks, airplanes) and stationary sources (e.g., agricultural and industrial uses). The Bay Area Air Quality Management District has the responsibility to create strategies and monitor the targets set by State and federal standards for the Bay Area. Due to air quality planning efforts, regional air quality has improved significantly over the past several decades, even though the population, traffic, and industrialization have increased.

Cupertino is highly susceptible to poor air quality due to major highways and quarry activity adjacent to the city. Wind patterns and geographical features move air pollution from other areas, such as the San Joaquin Valley, and trap pollution in the Santa Clara Valley. From 2015 to 2019, Cupertino experienced 31 days where ozone or fine particulate matter (PM_{2.5}) levels exceeded State standards.¹⁵

Poor air quality poses significant health risks and can contribute to respiratory conditions such as asthma, increase the risks of heart attacks and stroke, and has been linked to various cancers. Children and youth, seniors, those with pre-existing conditions, pregnant women, and outdoor workers are especially vulnerable to health impacts from poor air quality and makeup over 41 percent of Cupertino's population. Poor air quality can also limit outdoor recreational opportunities. Poor air quality costs the Bay Area about \$32 billion annually in premature deaths, medical events, decreased activity, and cancer.¹⁶ As reflected in the Vulnerability Assessment, outdoor recreation and key community services, such as public transit access, are highly vulnerable. Outdoor recreation can be curtailed due to poor air quality conditions from lower-level ozone, particulate matter, or wildfire smoke. Residents and visitors may not travel to parks or surrounding recreational areas if poor air quality creates negative health outcomes. Transit riders may be deterred from using public transit during days with poor air quality or high smoke days during wildfires, which could reduce the fares collected from transit riders.

Wildfire Smoke

Increasing statewide fire frequency can create recurring air quality degradation events, leading to respiratory health effects. Wildfire smoke consists of a mix of gases and fine particulate matter from burning vegetation and materials. The pollutant of most concern from wildfire smoke is PM_{2.5}, which is damaging to human health due to its ability to deeply penetrate lung tissue and affect the heart and circulatory system. Although wildfire smoke presents a health risk to everyone, sensitive groups may experience more severe acute and chronic symptoms from exposure to wildfire smoke, such as children (particularly younger children), older adults, people with chronic respiratory or cardiovascular disease, and low-resourced persons.

Potential Changes to Air Quality in Future Years

Likelihood of Future Occurrence

Poor air quality tends to occur annually and is likely to continue. Due to Cupertino's proximity to major highways, quarry activity, and Santa Clara Valley's geographical features, air quality will continue to be a concern.

Climate Change and Air Quality

Climate change will worsen air pollution.¹⁷ Ozone and PM_{2.5} form when other pollutants react in the atmosphere, and warmer temperatures speed up these reactions. Warmer temperatures also lengthen the growing seasons of plants and trees, increasing allergen production. In many regions of the United States, climate-driven changes in weather conditions, including temperature and precipitation, are expected to increase ground-level ozone and particulate matter (such as windblown dust from droughts or smoke from wildfires). These changes worsen existing air pollution. More wildfires will release particulate matter and other pollutants into the air. Drier conditions increase dust. Possible changes in wind patterns may also trap air pollutants in the Santa Clara Valley, increasing exposure.

2.6.2 Drought

A drought is an extended period when precipitation levels are well below normal. Drought may affect domestic water supply, energy production, public health, and wildlife; or contribute to wildfire. Like most of California and the western United States, Cupertino chronically experiences drought cycles. Drought impacts the city's water supply, which may in severe instances make less water available for people, businesses, and natural systems.

Local ecosystems that are not well adapted to drought conditions can be more easily harmed by it. During drought events, the flow of water in creeks and streams is reduced, creating more slow-moving or standing water. This can concentrate sediment and toxins in the low water levels, causing harm to plants and animals. As reflected in the Vulnerability Assessment, riparian habitat is highly vulnerable to the impacts of drought. Drought conditions can cause smaller streams to run dry, subsequently harming the plants and animal habitat within the ecosystem. Trees may not have adequate water during drought periods, which can lead to pests and diseases destroying important habitat. Droughts can also indirectly lead to more wildfires, stressing plants and making them more susceptible to pests and diseases.

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). According to the U.S. Drought Monitor, the most intensive drought in recent years occurred during most of 2014, when all of Santa Clara County was classified as "extreme" drought. More recently, in 2022, from January

through the end of the year, the county was also classified as being in “severe” drought. As of November 2023, Santa Clara County, including Cupertino, was not classified as drought. During severe drought conditions, water shortages are common, and water restrictions may be imposed to meet essential community needs. SCVWD’s 2020 Water Shortage Contingency Plan contains actions to implement and enforce regulations and restrictions for managing a water shortage when it declares a water shortage emergency under the authority of the California Water Code.

Cupertino’s water supply comes from local and imported water. Local rainfall and runoff flow into reservoirs for storage and blend with imported water. The water is released into creeks and ponds to augment natural percolation and maintain groundwater levels. Some local surface water is processed at the Rinconada Water Treatment Plant. The treated water is sold to Cupertino’s two local water suppliers: the California Water Company and the San Jose Water Company. Both local retailers purchase their water supply from SCVWD, which receives water from the Rinconada Water Treatment Plant and wells fed by groundwater.

SCVWD, the groundwater management agency in Santa Clara County, manages groundwater recharge through percolation ponds and in-stream recharge of creeks. The McClellan Pond recharge facility in Cupertino and the Stevens Creek Reservoir, outside the city on its southwest boundary, also contribute to Cupertino’s water supply. Private well owners, farmers, and water retailers use water pumped from the groundwater aquifer through wells.

The Rinconada Water Treatment Plant is the second largest of SCVWD’s water treatment plants. The Rinconada Water Treatment Plant draws water from the South Bay Aqueduct and the San Luis Reservoir. The San Luis Reservoir is a key component of the federal Central Valley Project, while the South Bay Aqueduct is a key component of the State Water Project system. The Sacramento-San Joaquin Delta pumps into the Delta-Mendota Canal and then into the San Luis Reservoir. SCVWD is one of many users that draw water from this reservoir.

Approximately 50 percent of Santa Clara County’s water supply comes from hundreds of miles away – first as snow or rain in the Sierra Nevada range of northern and eastern California, then as water in rivers that flow into the Sacramento-San Joaquin River Delta or directly to water conveyance systems. Imported water is brought into the county through the complex infrastructure of the State Water Project, the federal Central Valley Project, and San Francisco’s Hetch-Hetchy system. As reflected in the Vulnerability Assessment, water and wastewater services are highly vulnerable to the impacts of drought. Drought conditions may cause stress on Cupertino’s water suppliers and reduce the overall water supply available. In some cases, water storage infrastructure, such as the San Luis Reservoir, may not provide adequate storage to provide water during drought periods.

Potential Changes to Drought in Future Years

Likelihood of Future Occurrence

Drought differs from many other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region physically and economically, affecting different sectors in different ways and with varying intensities. Adequate water is the most critical issue for commercial and domestic use. As the population in the city continues to grow, so will the water demand. However, the water supply is currently considered adequate to meet projected water needs through the year 2045. As demonstrated in the 2020 Urban Water Management Plan, SCVWD shows sufficient capacity to

accommodate the demand through 2045 through a diversified and resilient portfolio that includes recycled water and conservation programs.

Based on historical information, drought in California, including Santa Clara County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on comparing observed precipitation with what is normal (climatologic), comparing soil moisture and crop conditions with what is normal (agricultural), or by looking at how much water is contained in snow, the level or flow rate of moving water, water in reservoirs, or groundwater levels (hydrologic). However, how individuals recognize drought depends on how it affects them.

Climate Change and Drought

Although droughts are a regular feature of California's climate, scientists expect climate change will lead to more frequent and intense droughts statewide. Overall, precipitation levels are expected to stay similar to historic levels in Cupertino, potentially increasing by the end of the century. However, there are likely to be more years with extreme levels of rainfall, both high and low, because of climate change. This is expected to cause more frequent and intense droughts, compared to historical norms, which cause soil to dry out and become hard. When precipitation does return, more water runs off the surface than is absorbed into the ground, which can lead to flooding downstream. Higher air temperatures are expected to increase evaporation, causing more water loss from lakes and reservoirs, exacerbating drought conditions.

Reduced winter precipitation levels and warmer temperatures have greatly decreased the size of the Sierra Nevada snowpack (the volume of accumulated snow), making less fresh water available for communities throughout California, including the imported water supply for Cupertino. A continued decline in the Sierra Nevada snowpack volume is expected, which may lead to lower volumes of available imported water. Depending on the location and emissions levels, the state Cal-Adapt database indicates the snowpack (i.e., snow water equivalent) for the Tahoe-Sierra Integrated Regional Water Management Region in the spring is expected to decline from a historical average of 16.1 inches to an average of 7.8 inches (a 52 percent decrease) by the middle of the century (2035 to 2064), and an average of 2.9 inches (an 82 percent decrease) by the end of the century (2070 to 2099).¹⁸

If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier in the year, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent.¹⁸ The loss of snowpack would pose challenges to water managers and hamper hydropower generation.

2.6.3 Extreme Heat

While there is no universal definition of extreme heat, California guidance documents define extreme heat as temperatures 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 Cupertino, the extreme heat threshold is 93.2°F. A heat wave is an event with five extreme heat days in a row.

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 about 175 Americans succumb

to the hazards of summer heat, although this number has increased in recent years.¹⁹ 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.²⁰

In 2019, Santa Clara County reported an extreme heat event from June 9th to the 11th. The combination of high pressure and offshore solid flow resulted in an early season heat wave across the Bay Area. Multiple daily records were broken across the region due to the heat. Three fatalities were reported during the heat event; one person died as a direct result of heat-related illness, while two others drowned while attempting to cool down during the heat wave.

In 2021, Santa Clara County reported an extreme heat event from July 9th to the 11th. Daytime highs rose above 100°F. Overnight lows remained warm, particularly across higher elevations with temperatures between 70°F and 80°F in the early mornings. There were no reported fatalities as a result of this heat event.

Extreme heat events are dangerous because people exposed to extreme heat can suffer several heat-related illnesses, including heat cramps, heat exhaustion, and (most severely) heat stroke. As reflected in the Vulnerability Assessment, seniors, persons with chronic illnesses and/or disabilities, persons experiencing homelessness, outdoor workers, low-resourced people of color, immigrant/linguistically isolated communities, and households in poverty are the most vulnerable to extreme heat. Nursing homes and adult care facilities are especially vulnerable to extreme temperatures if power outages occur, and air conditioning or heating is not available. In addition, households in poverty may be at increased risk of extreme heat if the installation or use of air conditioning and heating is not affordable. 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 very high temperatures. Moreover, extreme heat may be highly damaging to outdoor recreational activities, such as running, bicycling, and hiking. Intense physical exertion is more dangerous during very high temperatures, as people must regularly stay hydrated and not overexert themselves to avoid heat-related illnesses.

Most homes in Cupertino are older and were constructed over 40 years ago. Given that approximately 66 percent of all housing in the city was built prior to 1980,²¹ some of these homes are unlikely to have air conditioning and may lack effective insulation to regulate indoor temperatures. During extreme heat days, temperatures in poorly insulated homes may reach unhealthy temperatures. Therefore, people living in these homes, especially vulnerable populations, are at higher risk for heat-related illnesses from extreme heat events.

Streets and sidewalks are also well-shaded throughout many parts of the city. Trees and vegetation in urban forests are most useful as an extreme heat reduction strategy when planted in strategic locations around buildings or to shade pavement in parking lots and streets. Trees and vegetation help to lower surface and air temperatures by providing shade and evapotranspiration. Evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by 2°F to 9°F.^{22, 23}

Very high temperatures can harm plants and animals that are not well adapted to these events, including natural ecosystems. Extreme heat can increase water temperature 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.

As reflected in the Vulnerability Assessment, energy delivery and communication services are highly vulnerable to extreme heat. Extreme heat can regularly cause power outages due to a combination of mechanical failure of electrical grid equipment, heat damage to the wires themselves, and high demand for electricity as a result of cooling equipment, all of which causes stress on the grid. Indirectly, extreme heat stresses 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.

Potential Changes to Extreme Heat in Future Years

Likelihood of Future Occurrence

Extreme heat tends to occur on an annual basis and is likely to continue occurring. Due to Cupertino's inland location south of San Francisco Bay and relatively low elevation, high temperatures will continue to be a more common than cold temperatures.

Climate Change and Extreme Heat

The warmer temperatures brought on by climate change are likely to cause an increase in extreme heat events locally. Depending on the location and emissions levels, the state Cal-Adapt database indicates the number of extreme heat days is expected to rise from a historical annual average of 5 to 14 days by the middle of the century (2035 to 2064), and an average of 24 days by the end of the century (2070 to 2099).²⁴

Overall, Cupertino is expected to see an increase in the average daily high temperatures. Depending on the future severity of climate change, the state Cal-Adapt database indicates the annual average maximum temperature is expected to increase from a historical annual average of 69.4°F to an average of up to 73.5°F by the middle of the century (2035 to 2064), and an average of up to 76.5°F by the end of the century (2070 to 2099).² Although the temperature increases may appear modest, the projected high temperatures are substantially greater than historical norms. These increases make it more likely that an above-average high temperature will cross the extreme heat threshold. As temperatures increase, Cupertino residents, employees, and visitors will face increased risk of dehydration, heat stroke, heat exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

2.6.4 Severe Weather

Severe weather is generally any destructive weather event, but usually occurs in Cupertino 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 types of dangers posed by severe weather vary widely and may include injuries or deaths, damage to buildings and structures, fallen trees, roads and railways blocked by debris, and fires sparked by lightning. Severe weather often produces high winds and lightning that can damage structures and cause power outages. Lightning from these storms can ignite wildfires and structure fires that can cause damage to buildings and endanger people. Objects such as vehicles, unprotected structures (e.g., bus stops, carports), fences, telephone poles, or trees can also be struck directly by lightning, which may result in an explosion or fire.

A relatively common weather pattern that brings southwest winds and heavy rain to California is often referred to as an atmospheric river. Atmospheric rivers can be associated with severe weather in the following ways:

- **Heavy precipitation:** Atmospheric rivers can bring large amounts of moisture to a region, which can lead to heavy precipitation and flooding. This level of precipitation can be especially problematic in areas with steep terrain or poor drainage, where the water can accumulate quickly and cause damage.
- **Landslides:** Heavy precipitation associated with atmospheric rivers can also increase the risk of landslides and debris flows in areas with steep terrain. This risk is because the excess water can saturate the soil and destabilize slopes, leading to landslides or rockfalls.
- **High winds:** In addition to heavy precipitation, atmospheric rivers can also be associated with strong winds. This risk increase because the strong temperature contrast between the warm, moist air in the atmospheric river and the cold air surrounding it can lead to the formation of strong low-pressure systems and high winds.

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 one or more of the following: hail with a diameter of one inch or greater, wind gusts exceeding 57.5 miles per hour (mph), or tornado. However, tornadoes are uncommon in Santa Clara County; only six have been recorded in the county since 1950.

High winds, often accompanying severe storms, can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the National Weather Service, are sustained wind speeds of 40 mph or greater lasting one hour or longer or wind gusts of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events, such as thunderstorms.

All wind events pose several different types of threats. By themselves, the winds threaten the health of people and structures in Cupertino. Dust and plant pollen blown by the wind can create breathing problems. The winds can blow roofs off buildings and cause tree limbs to fall on structures. High winds also increase the threat of wildfires. Winds may dry out brush and forest areas, increasing the fuel load in fire-prone areas. Winds may spark wildfires by knocking down power lines or causing them to arc, creating sparks. If wildfires do start, high winds can push flames quickly into new areas, contributing to the rapid spread of wildfires and making them harder to control.

As reflected in the Vulnerability Assessment, energy communication infrastructure, energy delivery and communication services, homes and residential structures, and public transit access are highly vulnerable to severe weather. Electricity transmission and distribution lines can be damaged or destroyed by high-velocity winds. This can cause secondary impacts, such as power outages, which would impact Cupertino residents and businesses. Homes, particularly older ones, may be constructed to less rigorous standards and/or may not be well maintained. This can increase their risk of damage during severe weather events, particularly high winds, and hail. High winds could disrupt energy delivery, causing the electrical grid to not function properly. If multiple sections or elements of the system fail (substations, power plants, electricity lines), City residents and businesses could be without power for hours, days, or weeks if severe. Communication services may be knocked out by severe weather that damages communication towers. Public transit access may be delayed or rerouted if roadways become impassable due to storms and other severe weather. If roadways completely fail, the transit services could be suspended for days or weeks.

Public Safety Power Shutoff Events

Electricity utilities throughout California, including PG&E, have begun to occasionally “de-energize”, or turn off the electricity for power lines that run through areas with an elevated fire risk. PSPS events are intended to reduce the risk of power lines sparking or being damaged and starting a wildfire. As previously described, these activities, called PPS events, result in a loss of power for customers served by the affected power lines. A PPS event may occur at any time of the year, usually during high wind events and dry conditions. PPS events may be limited to specific communities or affect broad swaths of the state. In October 2019, PG&E conducted one large-scale PPS event, shutting off power to approximately 740,000 customers in 35 counties across the state, including customers in Cupertino. Several PPS events also occurred in 2020 during widespread wildfires across northern California. While PPS events have been smaller and less frequent recently, these events still pose a risk to PG&E customers across Santa Clara County, including Cupertino.

PPS events can impact emergency management activities. A loss of power can make it more difficult for homes or businesses to receive emergency notifications. PPS events can also create vulnerabilities for community members who lack backup power supplies and depend on electricity for heating or cooling homes and buildings, medical devices, lighting, and the internet. Additionally, community members may face economic hardships and be deprived of important services, such as grocery stores, gas stations, and banks/ATMs. Traffic lights and other traffic-control systems may not work, which can complicate evacuation needs and hinder emergency response. Although critical public health and safety facilities often have backup generators, the loss of power may also disable other key infrastructure systems.

Potential Changes to Severe Weather in Future Years

Likelihood of Future Occurrence

According to historical hazard data, severe weather is an annual occurrence in Santa Clara County. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the county's most frequent type of severe weather occurrences. Wind and lightning often accompany these storms and have caused damage in the past. However, damage associated with severe weather's primary effects has been limited. The secondary hazards caused by severe weather, such as floods and fire, have had the greatest impact on the county. In general, any severe storm that affects Santa Clara County has local effects in Cupertino as well. Thunderstorms, high winds, and lightning can each have localized impacts on infrastructure, properties, and public safety.

Climate Change and Severe Weather

Climate change is expected to cause an increase in intense rainfall and strong storm systems, such as atmospheric rivers. This increase means that Cupertino could see more intense weather resulting from these storms in the coming years and decades, although such an increase may not affect all forms of severe weather. While average annual rainfall may increase only slightly, climate change is expected to cause an increase in the number of years with intense levels of precipitation. Heavy rainfall can increase the frequency and severity of other hazards, including flooding.

2.6.5 Human Health Hazards

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 precipitation levels can lead to increased populations of disease-carrying animals, creating a greater risk of disease and increased rates of infection.

Populations most vulnerable to human health hazards are those who spend a disproportionate amount of time outdoors (such as outdoor workers or persons experiencing homelessness), those with fragile immune systems or existing illnesses (which may include persons with chronic illnesses and seniors), and those who may live in sub-standard housing or not have access to health insurance and medical care (households in poverty, low-resourced people of color, immigrant/linguistically isolated communities, and cost-burdened/low-income/overcrowded households). These persons may be living in conditions that increase their chances of catching vector-borne illnesses, lack the ability to fight off infections that may occur, or lack the financial resources to seek timely medical care. As reflected in the Vulnerability Assessment, several groups within Cupertino's population are vulnerable to human health hazards, such as households in poverty, immigrant communities/linguistically isolated persons, low-resourced people of color, outdoor workers, persons experiencing homelessness, persons with chronic illnesses and/or disabilities, and seniors. According to the 2023 MJHMP,⁹ past occurrences of human health hazards in Santa Clara County since 2018 include COVID-19, Lyme disease, Valley Fever, and West Nile Virus.

Potential Changes to Human Health Hazards in Future Years

Likelihood of Future Occurrence

Human health hazards have occurred in the past and, therefore, will likely occur in the future at various scales and levels of severity.

Climate Change and Human Health Hazards

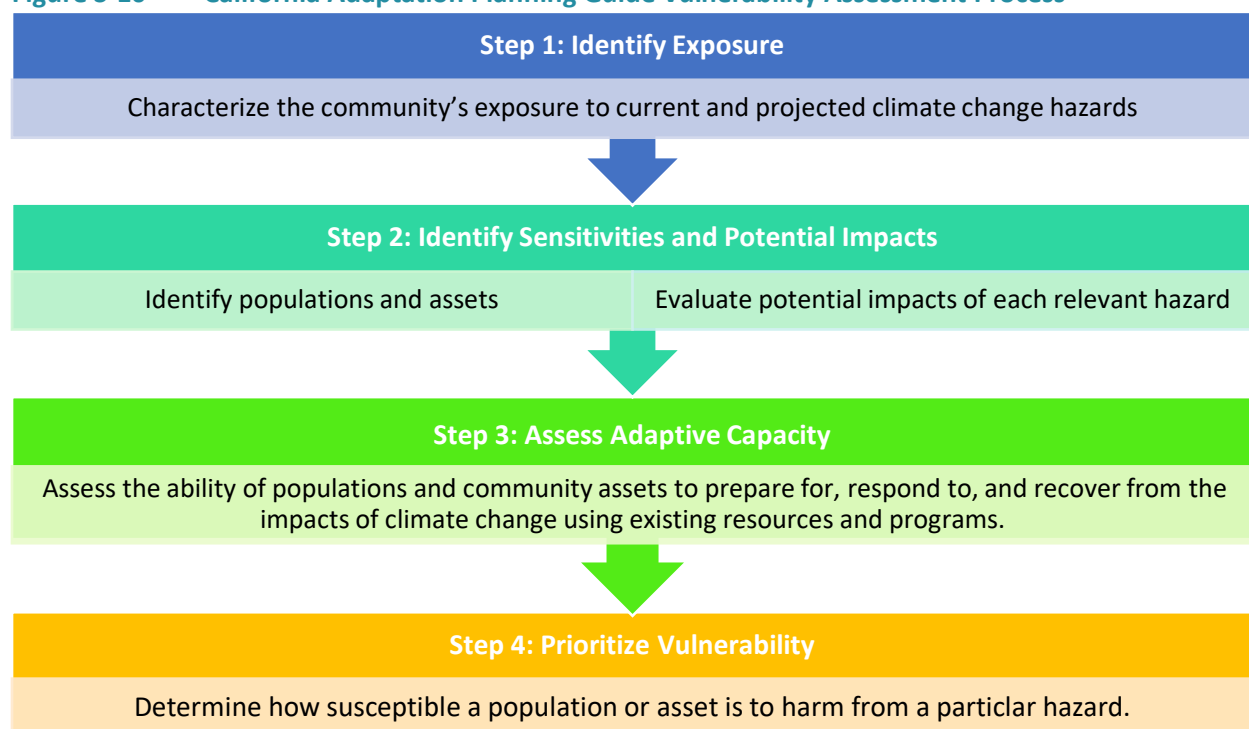
Increases in average temperature and changes in precipitation patterns favoring larger precipitation events may facilitate the growth and activity of disease-carrying vectors. Many of the vector-carrying organisms thrive in warmer and wetter conditions. The overall risk of human health hazards is thus expected to increase.

3. VULNERABILITY ASSESSMENT RESULTS

3.1 OVERVIEW

The Climate Change Vulnerability Assessment analyzes how climate-related hazards may harm the community using the four-step process recommended in the *California Adaptation Planning Guide*. **Figure S-10** illustrates the recommended four-step process. This analysis describes the degree to which natural, built, and human systems are susceptible to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.

Figure S-10 California Adaptation Planning Guide Vulnerability Assessment Process



The Vulnerability Assessment considers the threats from all relevant natural hazards, which are events or physical conditions that have the potential to cause harm or loss and will emphasize changes to hazard frequency and severity due to climate change. The Vulnerability Assessment includes eight climate-related hazards: air quality and smoke, drought, extreme heat, flooding, human health hazards, landslides, severe storms, and wildfire. The Vulnerability Assessment assesses 45 different population groups and community assets facing potential harm from the hazards. This assessment includes the risk of physical damage to buildings and infrastructure, the social vulnerability of persons likely to be disproportionately harmed by hazards, potential disruption to the city's economic engines, and loss of essential services.

3.2 ITEMS INCLUDED IN THE CUPERTINO VULNERABILITY ASSESSMENT

The City included the following populations and other assets in the Vulnerability Assessment. Each list includes a description and source of data needed to support the Vulnerability Assessment.

3.2.1 Populations

The City collected population data from the U.S. Census (American Community Survey and Decennial Census), the California Healthy Places Index, and the Santa Clara County Homeless Point-in-Time Count. The American Community Survey data is an estimate only with some margin of error. The 16 populations evaluated include:

1. Children and youth (under 18).
2. Cost-burdened/low-income/overcrowded households: households paying 30 percent or more of their income towards housing expenses.²⁵ The State identifies \$131,750 as the low-income threshold for a household of four people in Santa Clara County in 2022.²⁶ Six percent of Cupertino residents earn incomes at or below poverty level.²⁷ Overcrowded households include housing units that have 1.0 persons or more per room (excluding bathrooms and kitchens).
3. Households in poverty: households with an income below the poverty line, which is \$27,750 for a household of four.²⁸
4. Immigrant communities/linguistically isolated persons: Communities consisting of foreign-born populations, including immigrants, refugees, and undocumented persons. Linguistically isolated persons include households without a member who is fluent in English. Chinese, Hindi, and Japanese are the primary languages in Cupertino among households that are not fluent in English.²⁹
5. Low-resourced people of color: Persons identifying as a member of a racial and/or ethnic group and facing limited access to resources, such as financial, social, healthcare, or educational assistance.^{30,31}
6. Outdoor workers: Workers in landscaping, construction, outdoor recreation, etc.
7. Persons experiencing homelessness: 2022 Point-in-Time count reported 102 total persons experiencing homelessness (all unsheltered) within the City of Cupertino.³²
8. Persons living on single-access roads (roads with only a single entry or exit point). Single-access roads are generally to the west, near the hillsides of the community.
9. Persons with chronic illnesses and/or disabilities.
10. Persons without a high school degree.
11. Persons without access to lifelines: Persons without reliable access to a car, transit, or communication systems.
12. Renters.
13. Seniors (age 65 and older). Seniors constitute 15 percent of Cupertino's population.³³
14. Seniors living alone.
15. Students.
16. Unemployed persons.

3.2.2 Infrastructure

The City gathered details on infrastructure from State and local GIS data, and the *2023 Santa Clara County Multi-Jurisdictional Hazard Mitigation Plan*. These seven asset groups are:

1. Energy and communication infrastructure:
 - a. Transmission Lines: PG&E
 - b. Natural gas pipelines and structures: PG&E
 - c. Cell towers, radio sites, fiber-optic lines, and internet lines

2. Flood-control and stormwater infrastructure
3. Vehicle fuel stations
 - a. Electric vehicle charging stations: 13 public charging stations
 - b. Gas stations
4. Hazardous materials sites: 13 cleanup sites
5. Transportation infrastructure
 - a. Freeways: I-280
 - b. State highways: SR-85
 - c. Local roads: Stevens Creek Boulevard, North De Anza Boulevard, South De Anza Boulevard, North Wolfe Road, Miller Avenue, North Stelling Road, South Stelling Road, McClellan Road, Steven Canyons Road, South Foothills Boulevard, Rainbow Drive, Bubb Road, Prospect Road, Bollinger Road, North Blaney Avenue, South Blaney Avenue
 - d. Bridges and culverts: Seven local bridges
 - e. Transit facilities: Valley Transportation Authority stops
 - f. Railway: Union Pacific Railroad
6. Parks, Open Space, and Trails
 - a. Community Parks: McClellan Ranch, McClellan Ranch West (Simms Property), Blackberry Farm Park, Blackberry Farm Golf Course, Franco Park, Memorial Park, Sports Center, Mary Avenue Dog Park, Cali Mill Plaza Park, Civic Center Park, Library Plaza, Civic Center Plaza, Main Street Park Easement, Town Square Easement, Little Rancho Park
 - b. Neighborhood Parks: Linda Vista, Varian Park, Monta Vista, Villa Serra, Sommerset Square, Jollyman, Wilson Park, Library Field, Creekside, Sterling Barnhart, Portal Park, Three Oaks, Hoover
 - c. Open Space Areas: Stockmeir Ranch, Stevens Creek Trail, Oak Valley, Canyon Oak Park
7. Bicycling and pedestrian trails.^{34, 35, 36}
8. Water and wastewater infrastructure: California Water Service (north of Stevens Creek Boulevard), San Jose Water (south of Stevens Creek Boulevard), Cupertino Sanitary District, San José-Santa Clara Regional Wastewater Facility.

3.2.3 Buildings

The City collected buildings data from Google Maps, the California School Database, and local agency websites and GIS records. These six assets are:

1. Government and community facilities: Cupertino City Offices, Cupertino Emergency Operations Center, Quinlan Community Center, Cupertino Library, Cupertino Senior Center, and Cupertino Sports Center
2. Commercial centers: Homestead Square Shopping Center, De Anza Shopping Center, Main Street Cupertino, the Crossroads, the Marketplace, and Cupertino Village
3. Medical and care facilities: Kaiser Permanente, Urgent Care Cupertino, Sunshine Health Care Center, Sacred Heart Clinic, Foothill Medical Clinic, Prairie Health, Golden Apple Medical Group, and adult care and senior living facilities
4. Homes and residential structures: Multifamily and single-family residences
5. Public safety buildings: Santa Clara County Sheriff's Office and Santa Clara County Fire Department (Cupertino Fire Station)

6. Schools: Cupertino Union School District (20 elementary schools and 5 middle schools), Fremont Union High School District (Cupertino High School, Homestead High School, and Monte Vista High School), De Anza College, and private schools (Monta Vista Christian School, Stratford School - Cupertino Raynor Campus, St. Joseph of Cupertino School, West Valley Christian School, Villa Montessori)

3.2.4 Economic Drivers

The City determined important economic assets based on the *2021 Comprehensive Annual Financial Report* and land uses within the city. These five assets are:

1. Major employers: Apple Inc., Cupertino Union School District, Corinthian International Parking Services, Synophic Systems Inc., and De Anza Community College District
2. Education services
3. Technology, research, and development
4. Commercial and retail centers
5. Outdoor recreation

3.2.5 Ecosystems and Natural Resources

The City determined the ecosystems and natural resources based on information from the Environmental Resources Element of the General Plan. These four resource types include:

1. Riparian
2. Grasslands
3. Brushlands
4. Foothill Woodlands and Forests

3.2.6 Key Services

These assets are based on typical services provided in cities throughout California, which are supported by the infrastructure and buildings listed previously. Key community services include the operation and functions needed to provide and maintain services. The Vulnerability Assessment assesses the infrastructure and people needed to support them separately. These seven services are:

1. Education services: Cupertino Union School District, Fremont Union High School District, private schools, and childcare.
2. Emergency services: Emergency Operations Center, Santa Clara County Fire Department, and Santa Clara County Sheriff's Office
3. Energy delivery and communication services: Silicon Valley Clean Energy, PG&E, radio, television, cellular and landline phone, and internet
4. Government administration and community services
5. Public transit access: Valley Transportation Authority Bus Routes
6. Solid waste removal: Recology South Bay
7. Water and wastewater: California Water Service (north of Stevens Creek Boulevard), San Jose Water (south of Stevens Creek Boulevard), and Cupertino Sanitary District

3.3 VULNERABILITY ASSESSMENT RESULTS

Table 5-1 shows the results of the Vulnerability Assessment prepared for Cupertino, in accordance with the requirements of Senate Bill 379. For each population or asset that may be vulnerable to each climate-related hazard, the population or asset is scored on a scale of low to high. The vulnerability scores reflect both the severity of climate-related impacts and the ability of populations and assets to resist and recover from these effects. The City assessed 287 different pairings for vulnerability, 89 of which scored as highly vulnerable. The following matrix provides the scores for each population and assets to each relevant hazard. Gray cells with a dash (-) indicate that a specific hazard is not applicable to a specific population or asset, and therefore was not scored. Refer to the “Climate Change” and “Vulnerable Populations and Assets” sections of the Health and Safety Element for additional details on the Vulnerability Assessment method.

Table S-1. Vulnerability Assessment Results

Populations & Assets	Hazards								
	Air Quality and Smoke	Drought	Extreme Heat	Flooding	Human Health Hazards	Sea Level Rise	Landslides	Severe Weather	Wildfire
Populations									
Children and youth (under 18)	High	Low	High	Medium	Medium	-	Medium	Medium	Medium
Cost-burdened/low-income/overcrowded households	Medium	Medium	Medium	Medium	Medium	-	Low	Medium	Medium
Households in poverty	High	Medium	High	High	High	-	Medium	High	High
Immigrant communities/linguistically isolated persons	Medium	Medium	High	Medium	High	-	High	High	High
Low-resourced people of color	Medium	Medium	High	High	High	-	Medium	High	Medium
Outdoor workers	High	Medium	High	Medium	High	-	Medium	Medium	High
Persons experiencing homelessness	High	Medium	High	High	High	-	Low	High	High
Persons living on single access roads (roads with only a single entry or exit point)	Low	Low	Low	High	Low	-	High	High	High
Persons with chronic illnesses and/or disabilities	High	Medium	High	High	High	-	High	High	High
Persons without a high school degree	Low	Low	Low	Medium	Low	-	Low	Low	Low
Persons without access to lifelines	Medium	Low	High	High	Medium	-	Medium	Medium	Medium
Renters	Medium	Low	Medium	High	Low	-	Medium	Low	Low
Seniors (65+)	High	Low	High	High	High	-	Medium	Medium	High
Seniors living alone	High	Low	High	High	High	-	High	High	High
Students	Low	Low	Low	Medium	Low	-	Low	Medium	Medium
Unemployed persons	Low	Low	Medium	Medium	Medium	-	Low	Medium	Medium
Buildings and Infrastructure									
Government and community facilities	-	-	Low	Medium	-	-	-	Low	-
Commercial centers	-	-	Low	Medium	-	-	-	Medium	-
Energy and communication infrastructure	-	-	High	-	-	-	High	High	-
Flood control and stormwater infrastructure	-	-	-	High	-	Low	Medium	Medium	Low
Vehicle fuel stations	-	-	Low	Medium	-	-	-	Low	-
Hazardous materials sites	-	-	-	Medium	-	-	-	Medium	-
Transportation Infrastructure	-	-	Low	High	-	High	Medium	Medium	Medium
Medical care and assisted living facilities	-	-	Low	Low	-	-	Low	Medium	-
Homes and residential structures	-	-	Medium	High	-	-	Medium	High	Medium
Parks, Open Space, and Trails	-	High	Medium	Low	-	-	Medium	Medium	Medium
Public safety buildings	-	-	Low	Medium	-	-	-	Medium	-
Schools	-	-	Medium	High	-	-	Low	Medium	-
Water and wastewater infrastructure	-	Medium	Low	High	-	-	High	Low	Low
Economic Drivers									
Major employers	-	Low	Medium	Medium	Medium	-	-	Low	-
Education services	Medium	Low	Medium	Medium	Medium	-	Medium	Medium	-

Populations & Assets	Hazards								
	Air Quality and Smoke	Drought	Extreme Heat	Flooding	Human Health Hazards	Sea Level Rise	Landslides	Severe Weather	Wildfire
Technology, research, and development	Low	Low	Low	Medium	Medium	-	-	Low	-
Commercial and retail centers	Medium	Medium	Medium	Low	High	-	-	Medium	-
Outdoor recreation	High	Medium	High	Medium	Low	-	Medium	Medium	Medium
Ecosystem and Natural Resources									
Riparian	-	High	Medium	Medium	-	-	Medium	High	High
Grasslands	-	Low	Low	Low	-	-	Low	Low	Medium
Brushlands	-	Medium	Medium	Low	-	-	Low	Low	High
Foothill woodlands and forests	-	Medium	Medium	Low	-	-	Low	Medium	High
Key Services									
Education services	Medium	Low	Medium	Medium	Medium	-	Medium	Medium	-
Emergency services	Medium	-	Low	Medium	High	-	Medium	Medium	Low
Energy delivery and communication services	Low	Low	High	High	Low	-	High	High	High
Government administration & community services	Medium	-	Low	High	Low	-	Low	Low	Low
Public transit access	High	-	High	High	Low	-	Medium	High	Medium
Solid waste removal	Medium	-	Medium	Medium	Medium	-	Medium	-	Medium
Water and wastewater	Medium	High	Medium	-	-	High	High	-	High

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