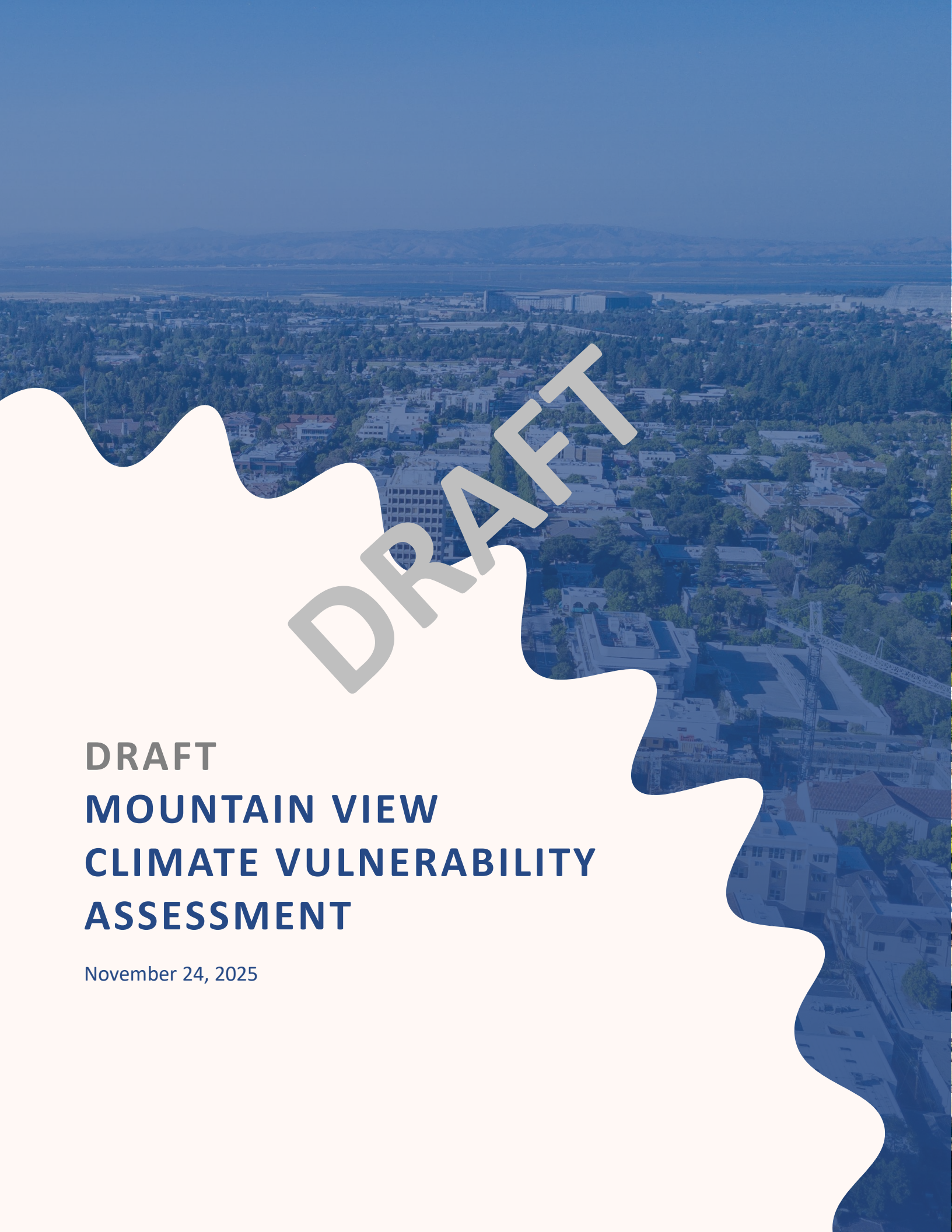


DRAFT

MOUNTAIN VIEW CLIMATE VULNERABILITY ASSESSMENT

November 24, 2025

Contents

1. Executive Summary

Climate change is already affecting Mountain View through hotter temperatures, declining air quality, shifting rainfall patterns, and increasing wildfire smoke. By late century, the city is projected to experience more frequent and intense extreme heat days and warm nights, raising health risks for residents without access to cooling. Shorter but heavier rainstorms could increase localized flooding in low-lying and paved areas, while regional wildfires burning in nearby areas are expected to cause more prolonged smoke events that worsen air quality. Together, these trends will place greater strain on public health, housing, and City services, highlighting the need for coordinated resilience and community preparedness efforts.

The staff and consultant project team have developed a draft Climate Vulnerability Assessment to understand the impacts of four climate hazards, Extreme Heat and Air Quality, Extreme Precipitation and Flooding, Wildfire, and Wildfire Smoke, as shown below in Figure 1.

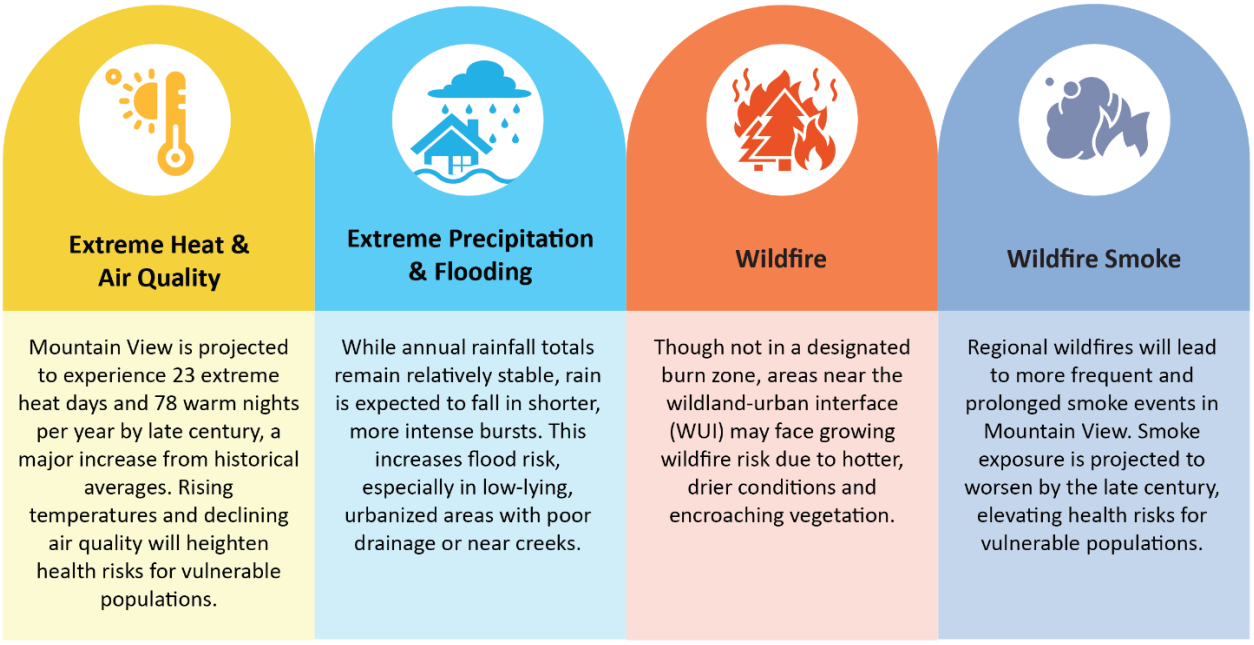


Figure 1. Summary of climate impacts in Mountain View.

1.1. Climate-Sensitive Populations

The CVA evaluates how climate hazards affect four key sectors: Health and Wellbeing, Emergency Management, the Economy, and Housing and Infrastructure, with a particular focus on climate-sensitive populations, as shown in Figure 2 below.

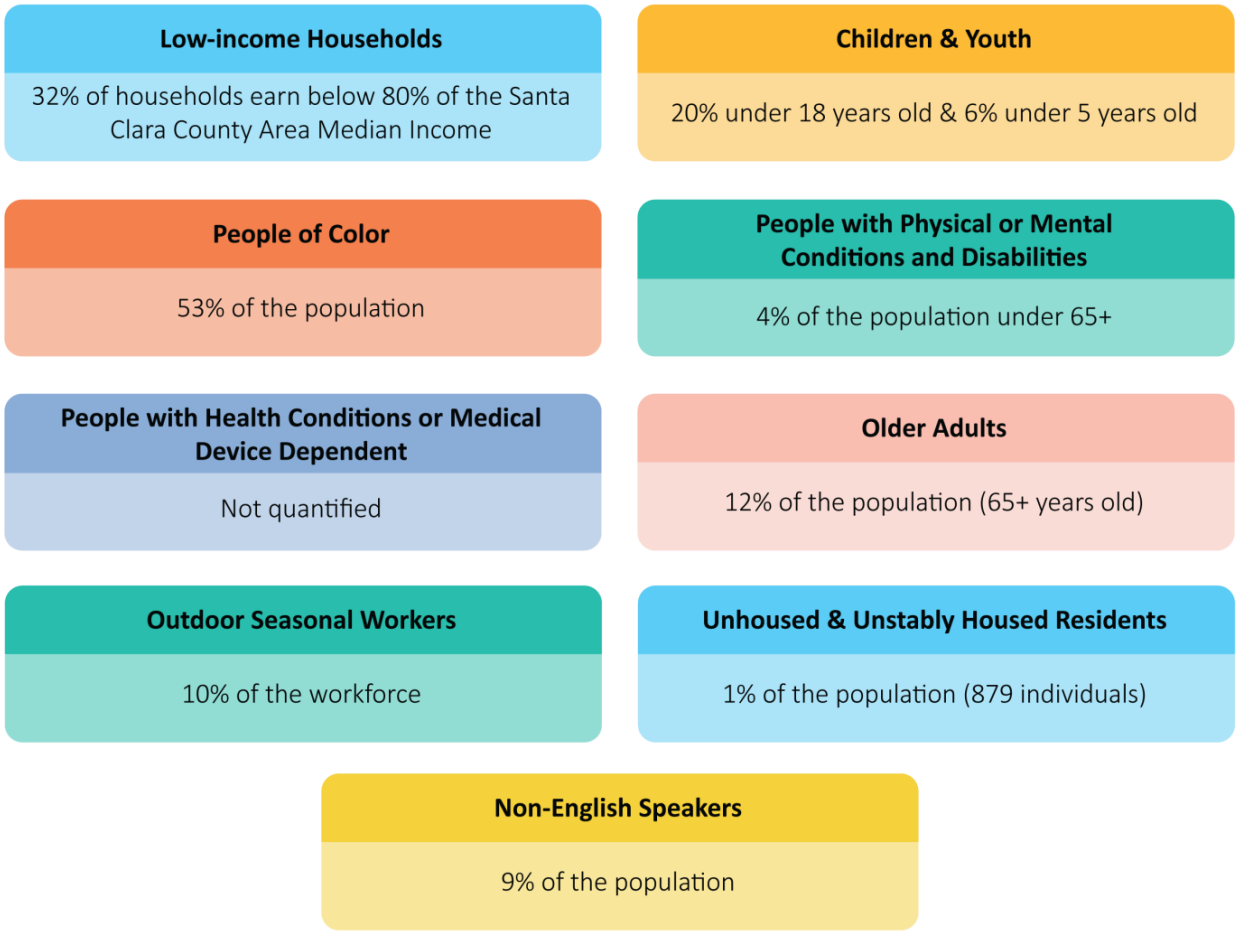
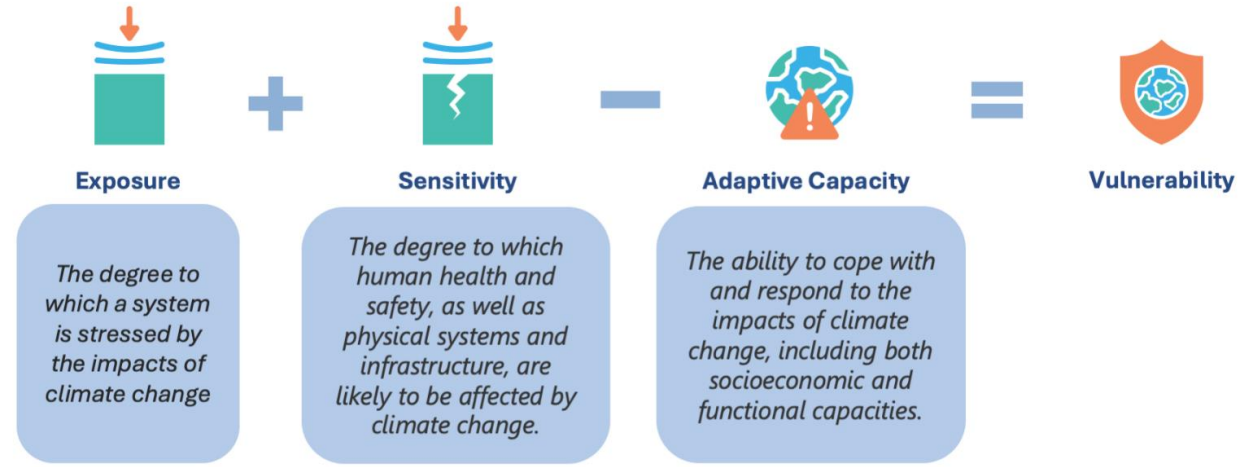


Figure 2. Climate-sensitive populations and their prevalence in Mountain View.

1.2. Climate Vulnerability Assessment

Climate vulnerability is defined as a function of exposure, sensitivity, and adaptive capacity. This definition serves as the guiding principle that underpins the analysis used for all sectors across multiple climate hazards. The City of Mountain View's CVA uses the following framework and key terminology:



Overall climate vulnerability scores, from zero to 10, were calculated considering exposure and sensitivity to the particular climate hazard, offset by the adaptive capacity to the hazard. The resulting scores are categorized as low (0-2), moderate (3-4), high (5-6), and very high (7-10).

Summarized below are the vulnerability ratings, key takeaways, and most at-risk populations for each of the four sectors.

Health and Wellbeing

Sectors and hazard	Exposure	Human sensitivity	System sensitivity	Adaptive capacity	Overall vulnerability
Physical health					
Extreme heat	High	High	Moderate	Low	**High**
Wildfire smoke	High	High	Moderate	Low	**High**
Air quality (non-smoke)	Moderate	Moderate	Moderate	Moderate	**Moderate**
Extreme precipitation and flooding	Moderate	Low	Moderate	Moderate	**Moderate**
Wildfire (local burn)	Low	Low	Low	High	**Low**
Mental health					
Extreme heat	High	High	Low	Low	**High**
Wildfire smoke	High	High	Moderate	Low	**High**
Extreme precipitation and flooding	Moderate	Moderate	Moderate	Low	**Moderate**
Wildfire (local burn)	Low	Low	Very low	Moderate	**Low**

Key Takeaways

- **Extreme heat and wildfire smoke are top health threats.** Days above 91°F and warm nights are increasing, and Heat Health Events (HHEs), which are periods of unusually hot weather that lead to more emergency room (ER) visits or deaths, are projected to more than double by 2050. At the same time, wildfire smoke events are becoming more frequent and severe, leading to spikes in poor air quality that worsen asthma, heart disease, and other respiratory illnesses.
- **Heat plus humidity intensifies risk.** “Feels like” temperatures can exceed 100°F, increasing the likelihood of heat-related illness for older adults, young children, pregnant people, and those without cooling.
- **Air quality is deteriorating.** Rising ozone and particulate matter ($PM_{2.5}$) levels during wildfire smoke events drive ER visits and worsen asthma and cardiovascular disease.
- **Localized pollution adds cumulative exposure.** Diesel particulate matter concentrations are high near major roadways and industrial areas.

- **Unhoused residents face direct exposure.** Those living outdoors or in vehicles have limited access to shade, cooling, and clean indoor air.
- **Flooding disrupts access to care.** It can block medical transport, contaminate homes, and increase mold-related illnesses.
- **Stress affects mental health.** Heat, smoke, and displacement contribute to anxiety, depression, and sleep disruption, particularly for residents already experiencing behavioral health challenges.
- **Existing resources help but remain limited.** Cooling and clean-air centers, resilience kits, and Safe Parking programs improve adaptive capacity, but face barriers related to access, awareness, and capacity.
- **Heat "hot spots" overlap with schools and paved areas.** Students and outdoor workers face increased exposure where shade is limited.

WHO IS MOST AT RISK?

- **Older adults**, especially those living alone or dependent on electricity for medical devices.
- **Young children and pregnant people,** with greater sensitivity to heat and air quality changes.
- **Unhoused and unstably housed residents**, including those living in vehicles without access to cooling or filtration.
- **People with disabilities or chronic conditions,** such as asthma, COPD, or cardiovascular disease.
- **Low-income households and renters, who** may lack reliable cooling, air filtration, or flood protection.
- **Residents in high-heat, low-canopy neighborhoods** with extensive pavement or limited shade.
- **Communities of color** who face higher cumulative burdens from pollution, infrastructure gaps, and underinvestment.

Neighborhood-Level Heat Exposure and Sensitive Populations

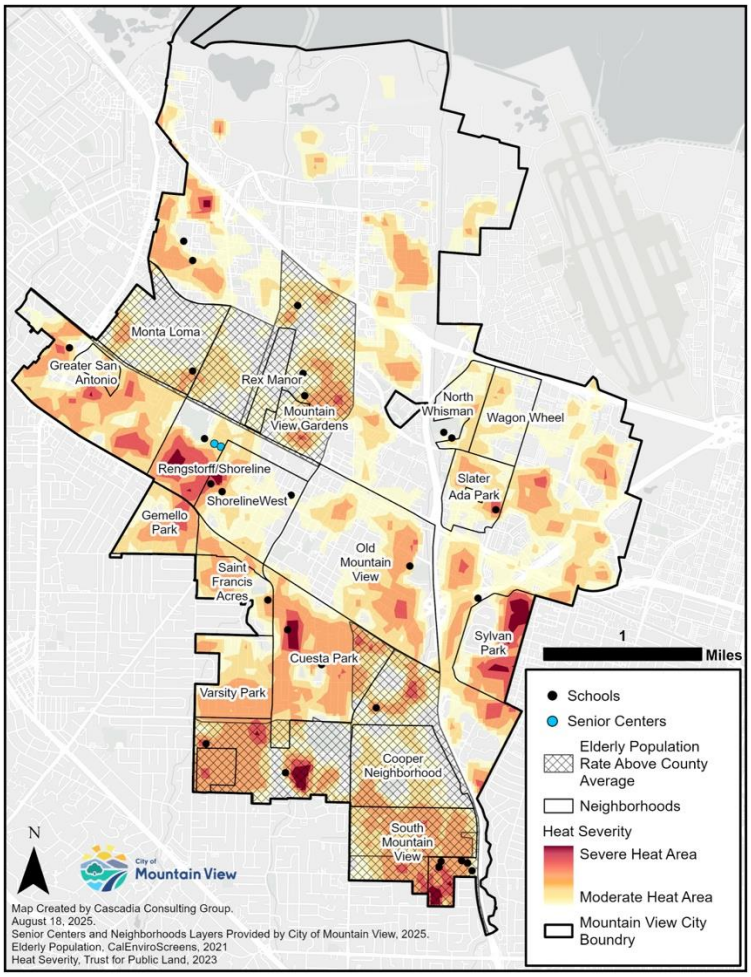


Figure 3. Areas of Mountain View where higher populations of older adults (age 65 and over) and youth overlap with moderate to severe heat conditions, including nearby schools located in higher heat zones.

This map shows areas of moderate to severe heat exposure across Mountain View, highlighting where hotter surface temperatures overlap with schools, senior centers, and neighborhoods with higher concentrations of older adults. The most intense heat areas, particularly in South Mountain View, Rengstorff/Shoreline, and Sylvan Park, tend to coincide with older housing, limited tree canopy, and more low-income or elderly residents. Several schools, including Gabriella Mistral Elementary, Mariano Castro Elementary, Benjamin Bubb Elementary, Graham Middle, Mountain View High, and Alta Vista High, fall within or near these zones, elevating risks for outdoor activity. These overlaps illustrate where targeted cooling infrastructure, shade expansion, and accessible heat relief programs can most effectively reduce vulnerability for sensitive populations

Emergency Management

Sectors and hazard	Exposure	Human sensitivity	System sensitivity	Adaptive capacity	Overall vulnerability
Critical facilities					
Extreme heat	High	High	High	Moderate	**High**
Wildfire smoke	High	High	High	Moderate	**High**
Extreme precipitation and flooding	Moderate	High	High	Moderate	**Moderate**
Wildfire (local burn)	Low	Moderate	Moderate	Moderate	**Low**

Key Takeaways

- **Extreme heat and wildfire smoke are the most disruptive hazards for emergency operations.** Increasing temperatures and more frequent smoke events can reduce air quality inside facilities, strain power and HVAC systems, and limit the capacity of first responders to work safely.
- **Multiple critical facilities sit in high-heat areas.** El Camino Health – Mountain View Hospital and Fire Stations No. 2 and No. 4 are located in some of the city's hottest zones, where surface temperatures are well above the city average. During prolonged heat events, these facilities face higher energy demand, reduced indoor comfort, and increased risk of heat-related illness among staff.
- **Flooding threatens emergency access routes and key buildings.** Fire Station No. 5, El Camino Hospital, and several public schools are located within or near mapped flood hazard zones, where heavy rainfall could temporarily block roads or reduce access to emergency services.
- **Smoke from regional wildfires drives spikes in emergency calls.** Even when fires burn outside city limits, smoke exposure increases respiratory distress and hospital visits, creating surges that challenge 911 dispatch and medical systems.
- **Neighborhood-level preparedness adds important redundancy.** More than a dozen organized Community Emergency Response Team (CERT) groups operate throughout Mountain View, helping neighbors share information, conduct drills, and coordinate support when communication systems are down.
- **The city has strong coordination systems but limited backup capacity.** The Emergency Operations Center (EOC), mutual aid agreements, and multilingual emergency alerts provide a solid foundation, but many facilities still need reliable backup power, upgraded air filtration, and more robust cooling systems to maintain operations during prolonged events.

WHO IS MOST AT RISK?

- **Older adults and patients dependent on medical equipment** who need continuous power and access to emergency care.
- **First responders and outdoor emergency staff** who face high exposure to heat and poor air quality.
- **Students and childcare providers,** especially at older campuses without modern cooling or ventilation.
- **Residents in flood-prone neighborhoods,** where road closures or power outages can delay emergency services.
- **Unhoused and low-income residents,** who rely on public facilities for safe shelter, cooling, and clean air during crises.

Citywide Heat Exposure and Critical Facilities

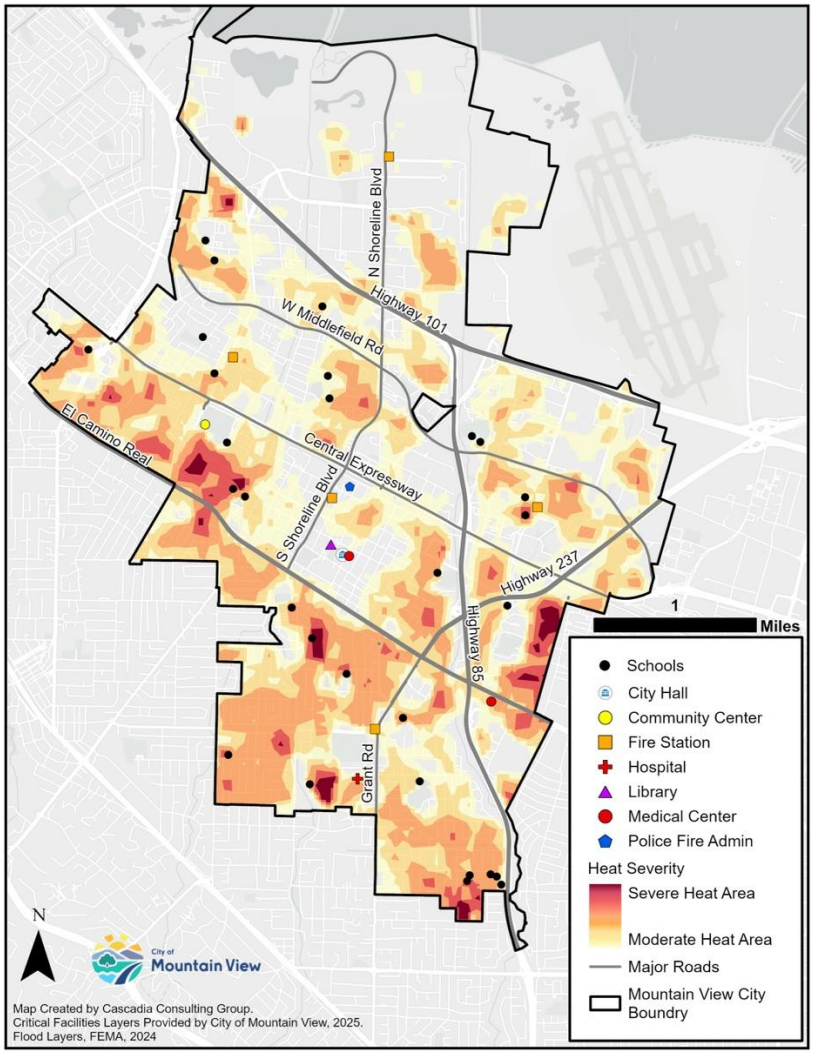


Figure 4. Locations of critical facilities and areas of moderate to severe heat exposure.

This map shows areas of moderate to severe heat exposure across Mountain View, highlighting where hotter surface temperatures overlap with critical facilities such as fire stations, the hospital, police and fire administration buildings, schools, and community centers. Facilities such as El Camino Health, Mountain View Hospital and Fire Stations No. 2 and No. 4 are located in some of the city's hottest zones, where prolonged heat can strain cooling systems and affect staff and patient safety. Schools and childcare centers in these same areas may also experience overheating and indoor air quality challenges during extreme heat or smoke events. Understanding where critical services coincide with high-heat exposure helps the City prioritize investments in backup power, ventilation upgrades, and shade or cooling infrastructure to ensure operations remain reliable during future climate emergencies.

Citywide Flood Exposure and Critical Facilities

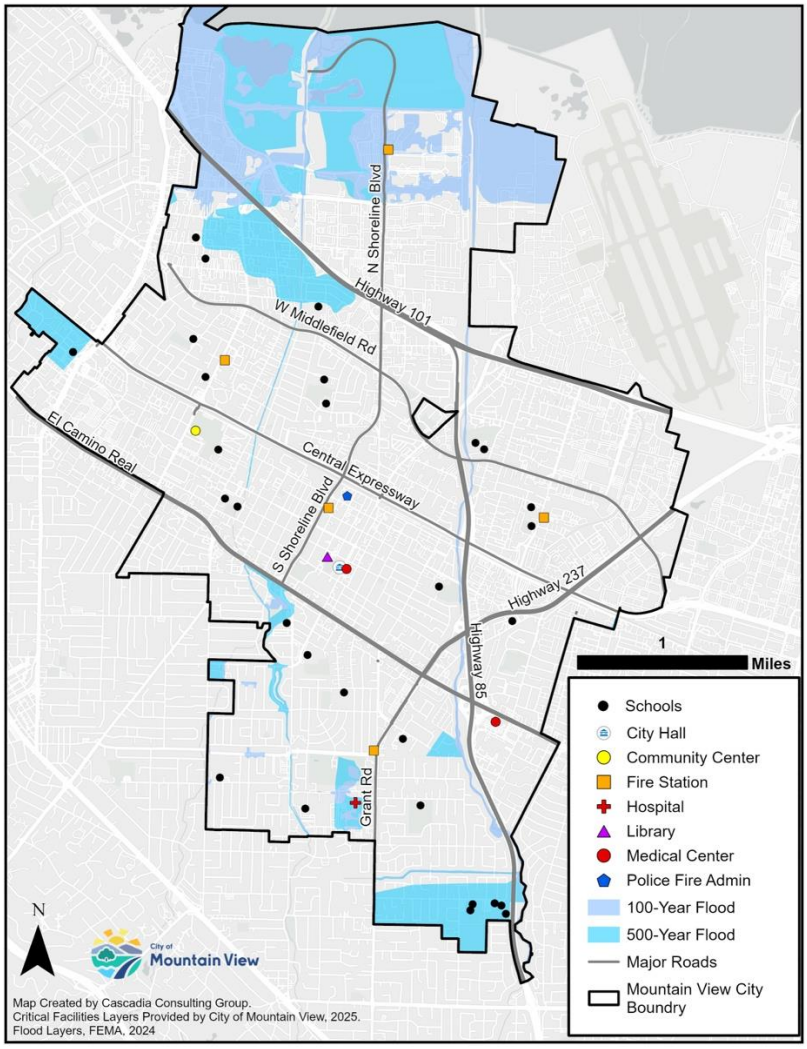


Figure 5. Locations of critical facilities within or near the 100-year and 500-year flood hazard zones.

This map shows where critical facilities in Mountain View, including fire stations, schools, medical centers, and other community-serving sites, overlap with areas identified as 100-year and 500-year flood hazard zones. Several key facilities, such as El Camino Health, Mountain View Hospital and Fire Station No. 5, are located within or adjacent to these zones, where heavy rainfall or stormwater surges may limit access or cause minor flooding on surrounding streets. Public schools, including Monta Loma Elementary, Mountain View High School, Alta Vista High School, and several district facilities, are also situated in these areas, raising concerns about delayed emergency response and reduced shelter availability during major storm events. Understanding where essential services coincide with flood hazard zones helps the City plan upgrades, maintain access routes, and prioritize long-term resilience investments for community safety.

Economy

Sectors and hazard	Exposure	Human sensitivity	System sensitivity	Adaptive capacity	Overall vulnerability
Local businesses					
Extreme heat	High	Moderate	Moderate	Moderate	**High**
Wildfire smoke	High	Moderate	Low	Moderate	**High**
Extreme precipitation and flooding	High	Moderate	Low	Moderate	**Moderate**
Wildfire (local burn)	Low	Moderate	High	Moderate	**Moderate**

Key Takeaways

- **Extreme heat and flooding are the primary economic risks.** Rising temperatures and heavier rain events threaten business operations, especially in areas where buildings, roadways, or utilities may be exposed to heat stress or flooding.
- **Outdoor and service workers face growing vulnerability.** Construction, landscaping, and maintenance workers are at higher risk for heat-related illness and reduced productivity during hot weather, which can lead to lost income and workforce shortages.
- **High-heat days will have measurable economic impacts.** By mid-century, projected increases in hot days could result in lost wages exceeding $120,000 annually across climate-exposed occupations, growing to nearly $500,000 by late century if greenhouse gas emissions remain high.
- **Flood-prone business zones contain valuable assets.** Commercial, industrial, and office areas near Highway 101, including parts of Charleston Road, Landings Drive, and Marine Way, lie within mapped flood hazard zones with over $670 million in structural assets at risk from storm flooding.
- **Data centers and technology infrastructure face growing climate exposure.** Flooding, power outages, and extreme heat can disrupt cooling systems and data operations, resulting in financial losses and service interruptions.
- **Wildfire smoke has indirect but significant economic costs.** Regional smoke events reduce outdoor activity, consumer spending, and worker attendance, which can lower quarterly earnings and strain small businesses dependent on foot traffic.
- **Small businesses are least equipped to recover.** Limited capital reserves, high operational costs, and the region's affordability challenges make recovery from extreme weather and disaster-related closures especially difficult for local entrepreneurs.

- **Larger employers are beginning to integrate climate resilience.** Tech companies like Google have started designing new campuses with flood protection, energy efficiency, and climate-adaptive infrastructure, offering models for broader public-private coordination.

WHO IS MOST AT RISK?

- **Outdoor workers** in construction, maintenance, and landscaping exposed to extreme heat and poor air quality.
- **Service industry employees** in restaurants, retail, and hospitality who face unstable work hours or income loss during extreme weather events.
- **Small business owners** with limited financial capacity to repair, retrofit, or relocate**.**
- **Lower-wage and hourly workers** who may lose wages or employment opportunities during climate disruptions.
- **Businesses in flood-prone industrial and commercial zones near** Highway 101 and North Bayshore.
- **Tech and data-driven industries** reliant on uninterrupted power, cooling, and digital connectivity.

Commercial and Industrial Areas Within Flood Hazard Zones

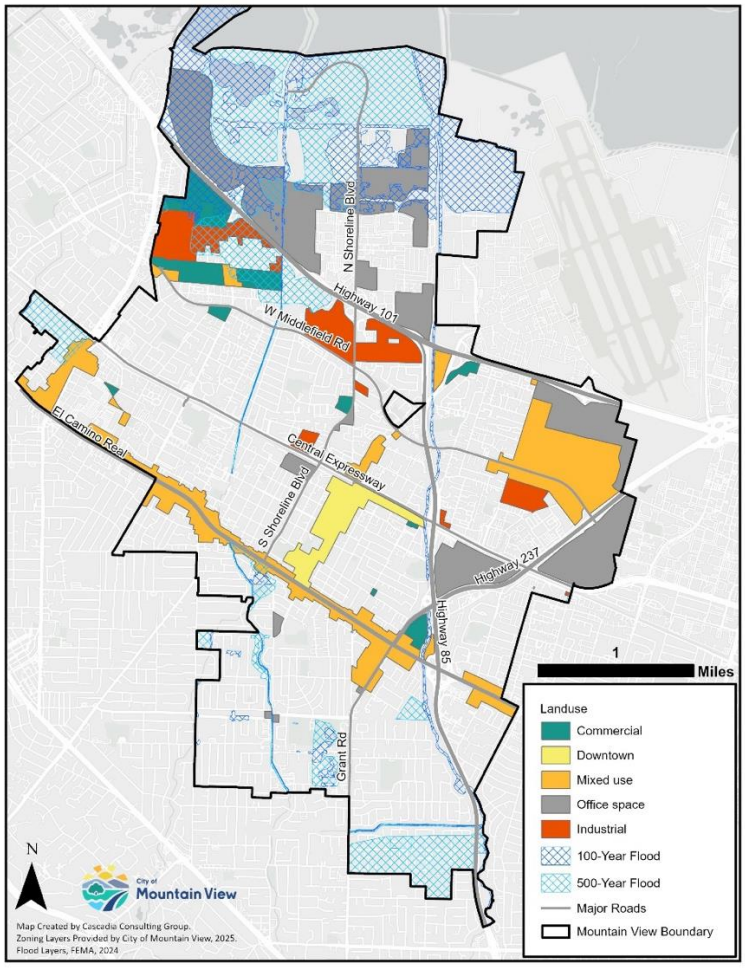


Figure 6. Commercial and industrial zones in the 100-year and 500-year flood hazard zones.

This map highlights commercial, downtown, mixed-use, office, and industrial zones across Mountain View that overlap with 100-year and 500-year flood hazard zones, where floodwater could damage buildings, disrupt operations, and restrict access to key job centers. The North Bayshore area, including parts of Charleston Road, Landings Drive, and Marine Way, contains major corporate campuses and data centers located within these flood hazard zones. These sites represent some of the city's most valuable economic assets, with structures collectively valued at more than $670 million. Commercial corridors along El Camino Real and Central Expressway are also near flood-prone areas that could affect small businesses and local services during major storm events. Understanding where economic activity and flood risk overlap helps the City prioritize future investments in resilient infrastructure, stormwater upgrades, and business continuity planning.

Extreme Heat and Lost Wages for Outdoor Occupations

This table shows how increasing extreme heat days are expected to affect workers in climate-exposed jobs such as construction, landscaping, maintenance, and outdoor service roles. As temperatures rise, more work hours may be reduced, cut short, or postponed to protect worker safety. By mid-century, the projected increase in hot days could lead to more than $120,000 in total annual wage losses across all climate-exposed occupations in Mountain View. By late century, this impact could grow to nearly $500,000 per year, reflecting the combined effects of more frequent heat events and longer periods when outdoor work becomes unsafe. These losses illustrate how extreme heat directly affects worker income, business productivity, and economic stability in sectors that rely on outdoor labor.

Table 1. Temperature impacts outdoor occupation wages for individuals and the city.

Time period	Extreme Heat Days (90°F+ degree days)	Lost wages for all climate-exposed occupations per worker	Lost wages for all climate-exposed occupations per year
Mid-century (2035-2064)	12 extreme heat days, +7 days from baseline	$36.14	$124,092.43
Late century (2070-2099)	23 extreme heat days, +18 from baseline	$144.81	$497,280.34

Housing and Infrastructure

Sectors and hazard	Exposure	Human sensitivity	System sensitivity	Adaptive capacity	Overall vulnerability
Housing					
Extreme heat	High	Very High	High	High	**High**
Wildfire smoke	Low	Very High	Low	Moderate	**Moderate**
Extreme precipitation and flooding	Low	Low	Very High	Moderate	**Moderate**
Wildfire (local burn)	Low	Moderate	Very High	High	**Moderate**
Transportation					
Extreme heat	Moderate	High	High	Moderate	**High**
Wildfire smoke	Low	High	Very Low	Moderate	**High**
Extreme precipitation and flooding	Moderate	Moderate	Very High	High	**Moderate**
Wildfire (local burn)	Low	Moderate	Very Low	Moderate	**Low**
Stormwater Systems					
Extreme precipitation and flooding	High	Low	High	Moderate	**Moderate**

Key Takeaways

- **Extreme heat is the most widespread housing risk.** Large portions of multifamily rentals and all six mobile home parks are in above-average heat areas, with several mobile home parks in severe heat zones. Older buildings without insulation, ventilation, or cooling trap heat and can reach unsafe indoor temperatures.
- **Air quality pressures are concentrated near highways.** Northern neighborhoods close to Highway 101 already see higher diesel and ozone exposure, and many planned affordable units are sited in these areas, raising equity and health concerns.
- **Flood risk intersects with existing homes and planned growth areas.** About 12 percent of the city lies in flood hazard zones. Housing near Permanente Creek, Stevens Creek, and the Bay faces higher risk, and sea level rise may lift groundwater and reduce drainage even outside mapped flood hazard zones.

- **Transportation reliability is vulnerable during heat and storms.** Over time, extended periods of high heat can buckle rails and slow Caltrain and Valley Transportation Authority (VTA) service. Short, intense storms can close key underpasses and arterials, delaying emergency response and daily travel.
- **Stormwater capacity is a critical constraint.** Heavier downpours can exceed pipe and pump capacity. Several pump stations are past recommended replacement years and need upgrades and backup power. Frequent flooding has been reported near the Shoreline Golf Course, Santiago Villa Mobile Home Park, and intersections along Plymouth Street, Higdon Avenue, and Cuesta Drive.
- **Planned investments create a strong starting point.** The City's Storm Drain Master Plan identifies $47 million in priority drainage projects, and North Bayshore plans include sea level rise and flood protection measures.

WHO IS MOST AT RISK?

- **Renters and residents in older multifamily buildings** with limited control over weatherization or repairs.
- **Mobile home park residents** in hot zones or flood hazard zones who face higher displacement risk after disasters.
- **Low-income households and residents near major roadways** who experience higher pollution and have fewer resources to adapt.
- **Transit-dependent riders, cyclists, and pedestrians** who face service interruptions, unsafe heat, or poor air quality during extreme weather events.
- **Residents living in low-lying neighborhoods** near creeks and the Bay where flooding or high groundwater can damage homes and roads.

Housing Exposure to Extreme Heat

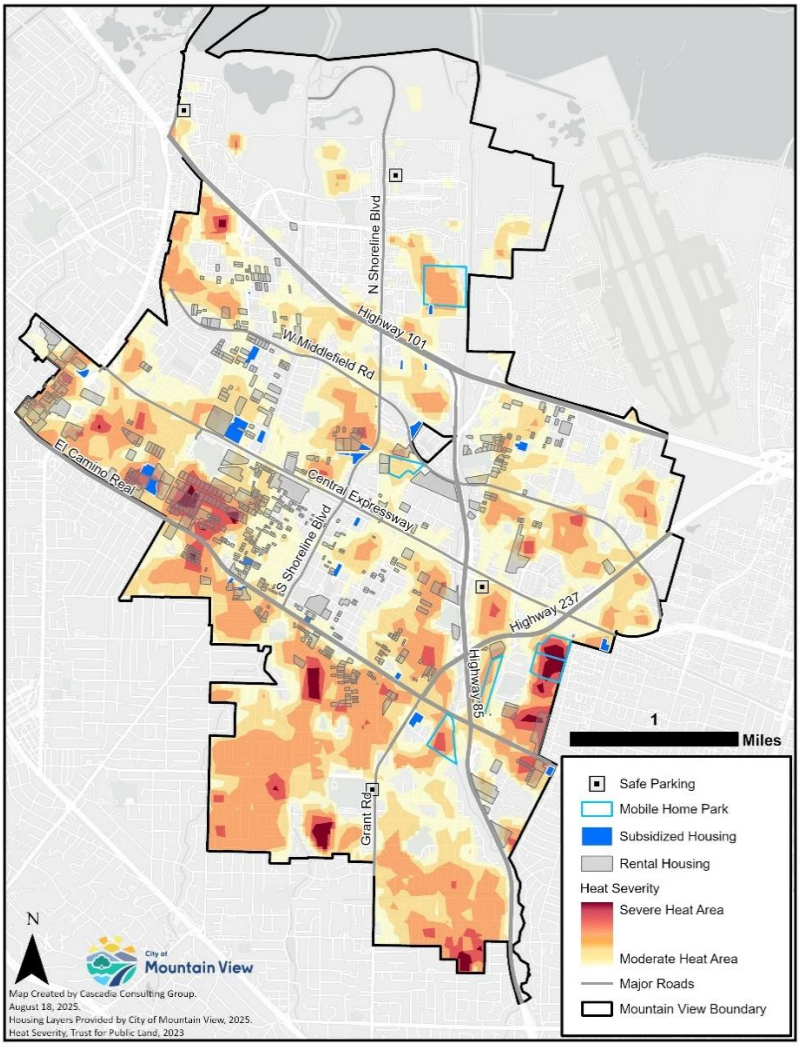


Figure 7. Areas of moderate to severe surface heat that overlap with rental housing, mobile home parks, subsidized housing, and safe parking sites.

This map shows areas of moderate to severe surface heat across Mountain View, highlighting where hotter neighborhoods overlap with rental housing, mobile home parks, subsidized housing, and safe parking sites. Many multifamily and affordable housing buildings are located in above-average heat zones, while mobile home parks such as Sunset Estates, New Frontier, and Sahara Mobile Village fall within the city's hottest areas. People living in vehicles and residents in these communities face greater health risks from extreme heat due to limited access to cooling, shade, and reliable indoor environments. Identifying where vulnerable housing types coincide with high-heat conditions helps the City prioritize cooling strategies, tree canopy expansion, and targeted resilience programs for residents most affected by rising temperatures.

Housing Within Flood Hazard Zones

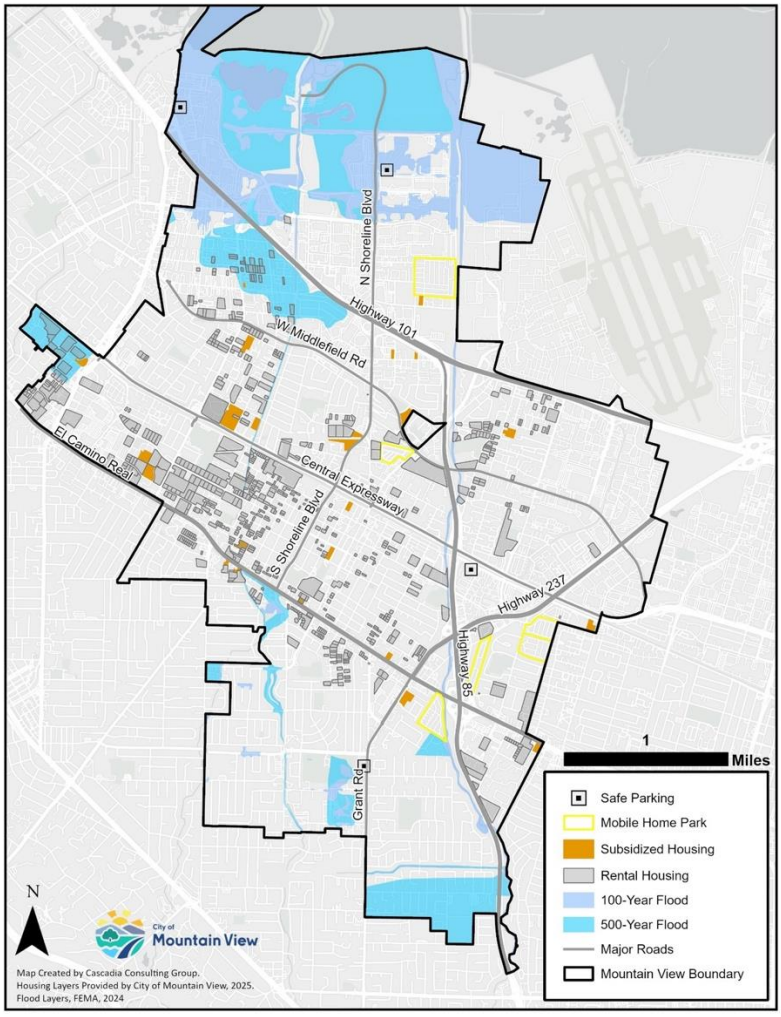


Figure 8. Residential areas and vulnerable housing types in Mountain View located within or near 100-year and 500-year flood hazard zones

This map shows where homes in Mountain View overlap with 100-year and 500-year flood hazard zones, highlighting areas where flooding, rising groundwater, and heavier rainstorms may pose risks to housing stability. Several mobile home parks, including those near Highway 101 and Grant Road, fall within these hazard zones and face a higher likelihood of flood-related damage and long-term displacement. Subsidized and naturally affordable housing, much of it located in northern neighborhoods, also lies near flood hazard areas where stormwater can overwhelm older buildings or lead to basement flooding. Safe parking sites and nearby rental housing may also be affected during major storms, creating challenges for residents with limited resources or alternative shelter options. Understanding where vulnerable housing types coincide with flood hazard zones helps the City prioritize mitigation, maintenance, and support programs for communities that may have the hardest time recovering after a flood.

Transit and Active Transportation Exposure to Extreme Heat

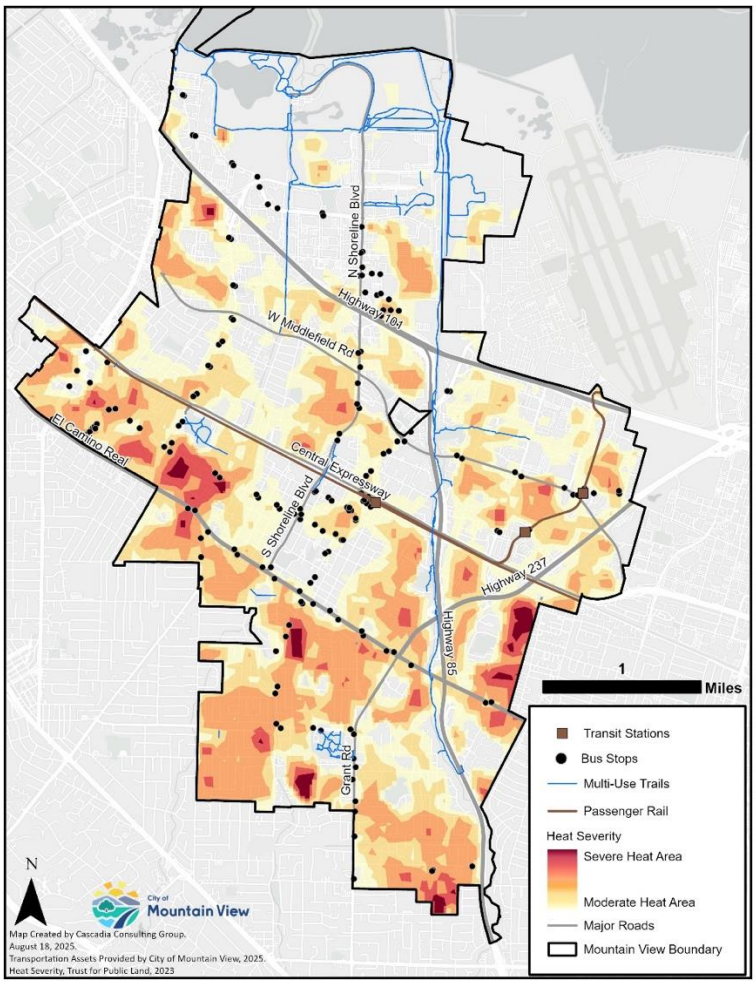


Figure 9. Transit and active transportation assets located within areas of moderate to severe surface heat.

This map highlights areas of moderate to severe heat exposure across Mountain View, showing where hotter surface temperatures overlap with bus stops, transit stations, passenger rail lines, and multi-use trails. Many transit facilities and active transportation routes run through high-heat areas along El Camino Real, Central Expressway, and Grant Road, where limited shade can make travel uncomfortable or unsafe during hot weather. Transit-dependent riders, cyclists, and pedestrians, especially those without access to air-conditioned vehicles, face greater risk of heat stress and reduced mobility during extreme heat events. Understanding where transportation infrastructure and heat exposure coincide can help the City prioritize shaded bus stops, tree planting, and cooling features to maintain safe and reliable travel options for all residents.

Transit and Active Transportation Within Flood Hazard Zones

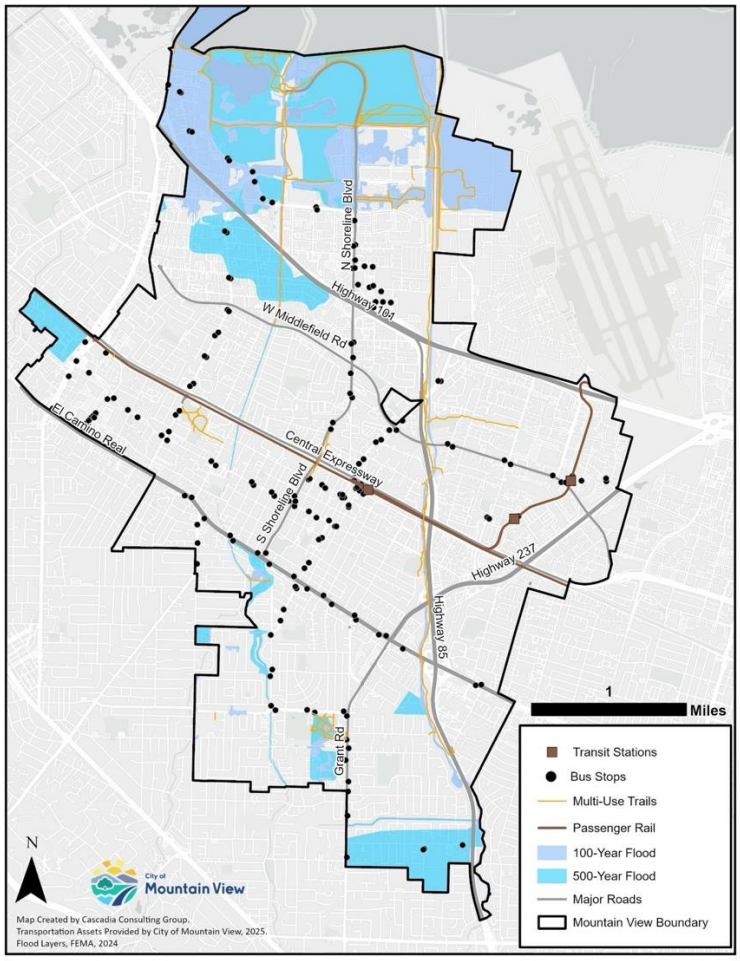


Figure 10. Transportation assets in Mountain View located within 100-year and 500-year flood hazard zones.

This map shows where bus stops, transit stations, roadways, rail lines, and multi-use trails in Mountain View intersect with 100-year and 500-year flood hazard zones. Key corridors such as Shoreline Boulevard, Charleston Road, Central Expressway, and Grant Road run through areas that may experience temporary flooding during high-intensity storms. Several bus stops in northwest Mountain View, including those served by MVgo Route D, are located in flood-prone areas where access could be disrupted during major storm events. In total, 15.5 miles of roadway and 7.6 miles of multi-use trail fall within the 100-year flood hazard zone, raising concerns about reduced mobility, safety, and emergency response during extreme weather. Understanding where transportation infrastructure and flood exposure overlap helps the City plan drainage improvements, strengthen detour options, and maintain reliable travel for residents who depend on transit, walking, and biking.

2. Overview

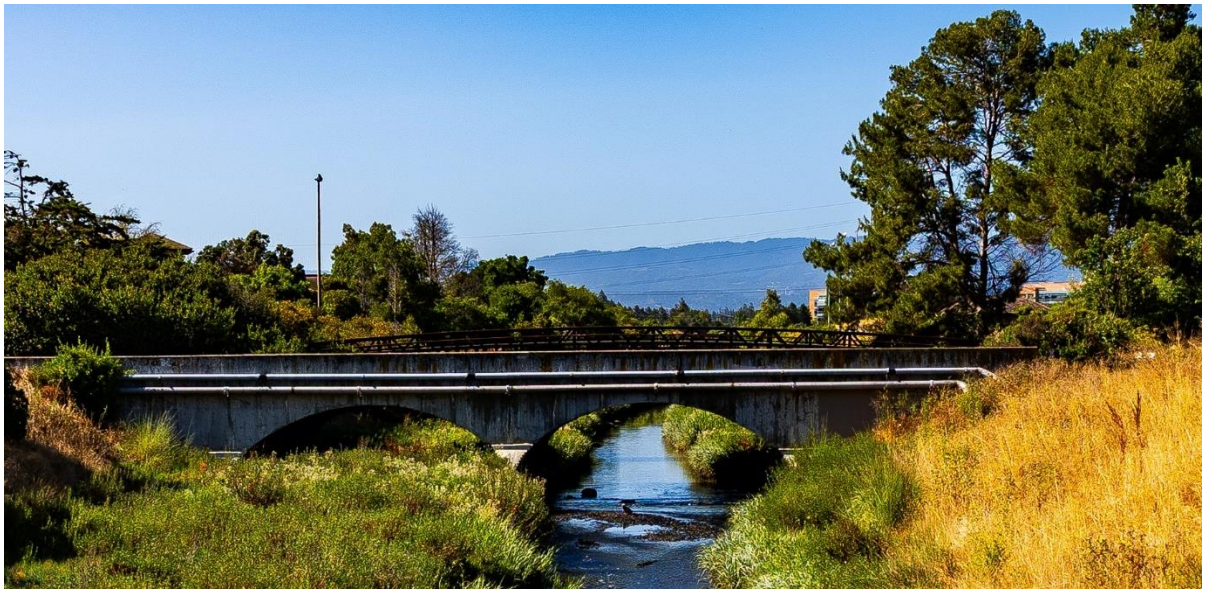
2.1. Goals and Objectives

The Climate Vulnerability Assessment (CVA) is intended to evaluate how climate-related hazards may impact people, infrastructure, and services in Mountain View. This analysis serves as a foundation for future planning efforts aimed at strengthening the community's ability to adapt to a changing climate.

2.2. Structure of the CVA

The CVA is structured to provide a clear, data-informed understanding of how climate change may affect Mountain View. The document is structured as follows:

- **Climate Vulnerability Framework:** Introduces the overall approach and methodology used to assess vulnerability, including definitions of exposure, sensitivity, and adaptive capacity.
- **Climate-Sensitive Populations:** Describes demographic, socioeconomic, and health factors that influence vulnerability to climate hazards across the community.
- **Climate Vulnerability Assessment:** Presents sector-based analyses of how key climate hazards such as extreme heat, flooding, wildfire, and poor air quality affect people, infrastructure, and services in Mountain View.
- **Best Practices for Building Resilience** Summarizes cross-cutting findings and outlines potential areas for the City to strengthen its resilience to climate impacts.
- **Appendices:** Provide supporting data, maps, and technical documentation used to inform the assessment.



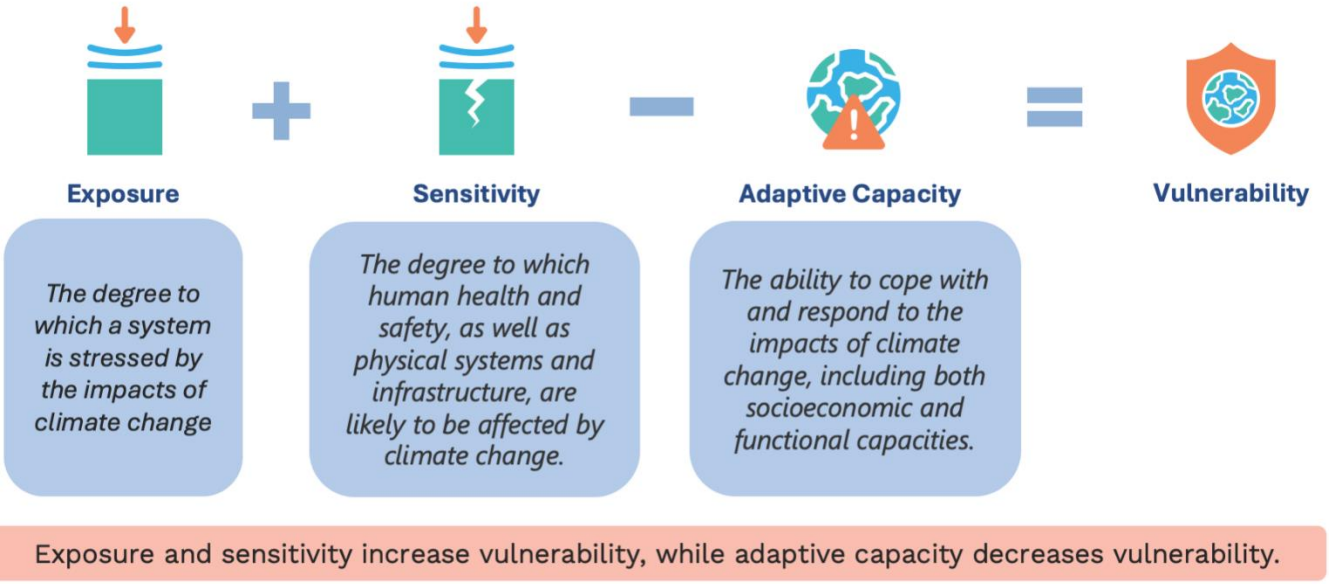
The core of the document is the Climate Vulnerability Assessment. Vulnerability assessments can be organized by climate impact or by the sector impacted, and both approaches can be valuable. A climate-impact approach offers a full picture of the implications of a specific climate impact, providing a more comprehensive understanding of a given climate risk. This CVA employs a sector-based approach, which helps identify all the climate risks and adaptation needs within each sector. This approach enables more comprehensive resiliency planning tailored to specific sectors. The CVA explores how climate hazards may impact that sector and discusses current capacity for addressing those impacts.

The CVA identifies climate risks across the following sectors and subsectors:

SECTORS	SUBSECTORS	
 **Health & Wellbeing**	**Physical Health** Climate-related illness, injury, and mortality risks, including heat stress, respiratory diseases from wildfire smoke, and vector-borne illnesses.	**Mental Health** Psychological and emotional impacts of climate stressors, including disaster-related trauma, anxiety, and economic strain, particularly for frontline communities and vulnerable populations.
 **Emergency Management**	**Critical Facilities** Hospitals and healthcare centers that serve as essential resources for community safety, medical care, and emergency coordination.	
 **Economy**	**Local Businesses** Major technology and retail businesses, as well as small businesses, which provide employment, goods and services, and tax revenue, that may be impacted by climate-related disruptions such as heat, flooding, and power outages.	
 **Housing & Infrastructure**	**Housing** Residential buildings and populations experiencing housing instability who are particularly vulnerable to extreme weather and displacement risks.	**Transportation** City roads, public transportation, and transit-dependent populations who may face mobility challenges during climate events.
	Stormwater Systems Pipes, culverts, pump stations, and green infrastructure that manage runoff, reduce flooding, and protect water quality, with vulnerabilities to more frequent and intense rainfall events.	

2.3. Climate Vulnerability Framework

The CVA aligns with the Intergovernmental Panel on Climate Change framework, which provides guidance on how to develop a CVA and focus areas to consider, such as environmental, social, and economic factors (Cardona et al., 2012). Climate vulnerability is defined as a function of exposure, sensitivity, and adaptive capacity. This definition serves as the guiding principle that underpins the analysis used for all sectors across multiple climate hazards. The City of Mountain View's CVA uses the following framework and key terminology:



A vulnerability scoring matrix was developed to compare risks across sectors and hazards. For each subsector, the CVA team identified relevant indicators of exposure, sensitivity, and adaptive capacity, using both spatial analysis (e.g., location within flood hazard zoness or heat severity zones) and qualitative data (e.g., facility design standards, community resources).

The scores reflect relative levels of exposure, sensitivity, and adaptive capacity, with sensitivity and adaptive capacity considered in two dimensions: Human Health and Safety Impact (effects on people) and System Impact (effects on systems and infrastructure). For example, a severe or highest sensitivity score on Human Health and Safety Impact indicates that the climate hazard is highly likely to cause serious or compounding health effects such as heat-related illness or hospitalization, smoke-triggered asthma, or displacement from flooding. A higher System Impact score means that a hazard could make it harder for critical services such as hospitals, fire response, or power systems to keep operating normally.

Adaptive capacity scores reflect the City's ability to plan for, respond to, and recover from these impacts. A lower adaptive capacity score indicates limited backup systems, funding, or coordination mechanisms, while a higher score reflects stronger planning, redundancy, and response networks.

See Appendix C. Vulnerability Scoring Matrix for more information on how numerical values are assigned to each factor (exposure, sensitivity, and adaptive capacity), how these values are used to calculate overall vulnerability using the formula above, and how the results are categorized into ratings from low to very high.

2.4. Climate-Sensitive Populations

Climate change does not affect all Mountain View residents equally. Certain populations are more vulnerable to climate-related hazards due to underlying health conditions, socioeconomic barriers, or limited access to protective infrastructure and services (EPA, 2021a).

Figure 1 below summarizes key climate-sensitive populations and their share of Mountain View's population (see Appendix D: Climate-Sensitive Populations for more information).

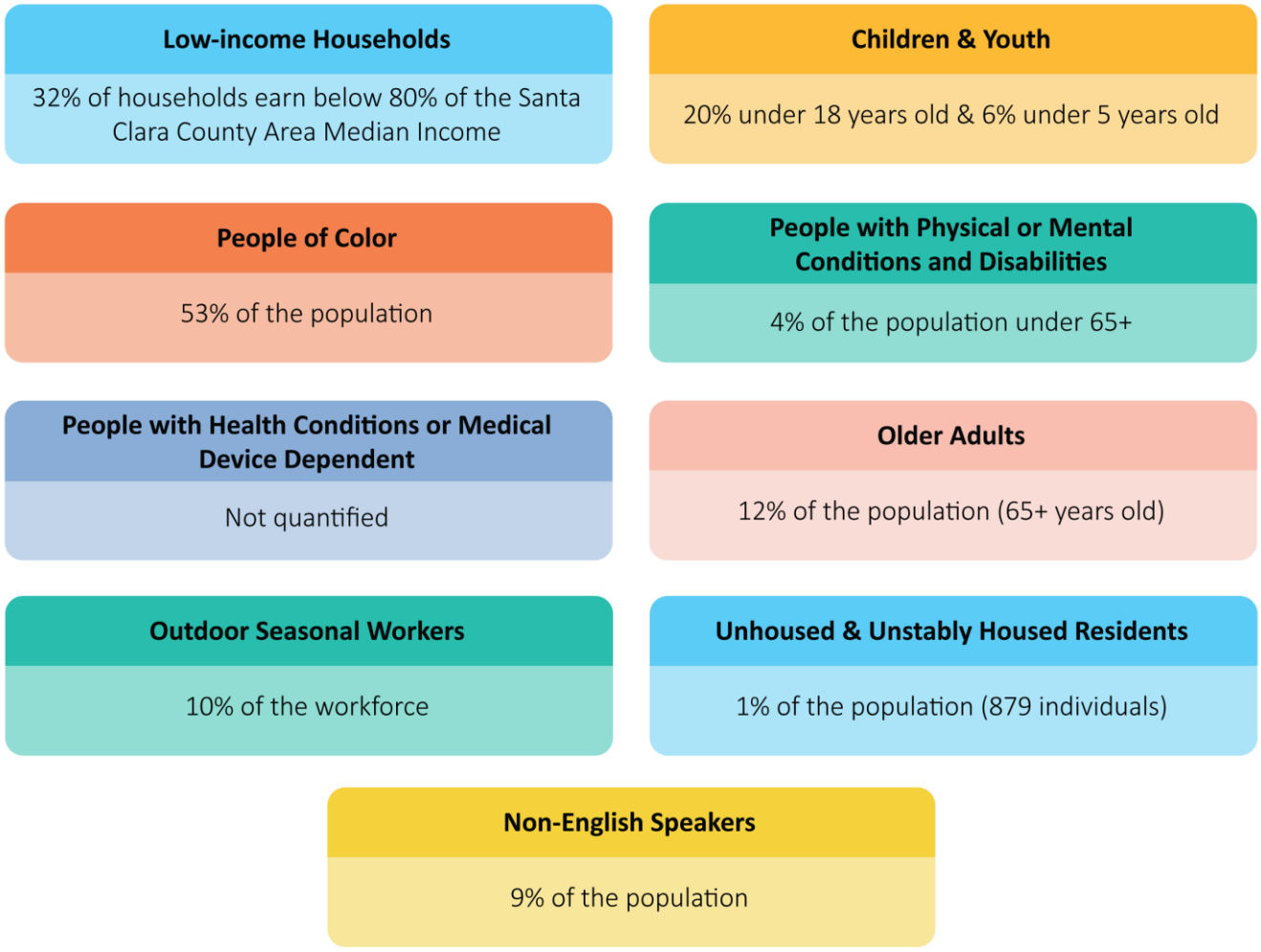


Figure 11. Climate-sensitive populations and their prevalence in Mountain View.

2.5. Climate Impacts Assessment

Climate Drivers and Variability

Climate change refers to long-term shifts in average climate conditions caused primarily by human activities, especially the combustion of fossil fuels, which increase concentrations of greenhouse gases (GHGs) in the atmosphere and intensify the natural greenhouse effect (Jay et al., 2023). This has led to unprecedented warming of the atmosphere and oceans, contributing to more frequent and intense extreme heat events, wildfires, sea level rise, and other hazards across California (Ackerly et al., 2018; Bedsworth et al., 2018).

In the San Francisco Bay Area, climate change is already altering environmental conditions in ways that threaten public health, infrastructure, and ecosystems. The region is experiencing rising average temperatures, more frequent extreme heat events, longer wildfire seasons, and greater precipitation variability (Bedsworth et al., 2018). Both inland and urban communities are especially vulnerable to flooding from more intense storms, while sea level rise increases risks along the shoreline. These impacts are expected to intensify over the coming decades, disproportionately affecting communities with limited resources and adaptive capacity.

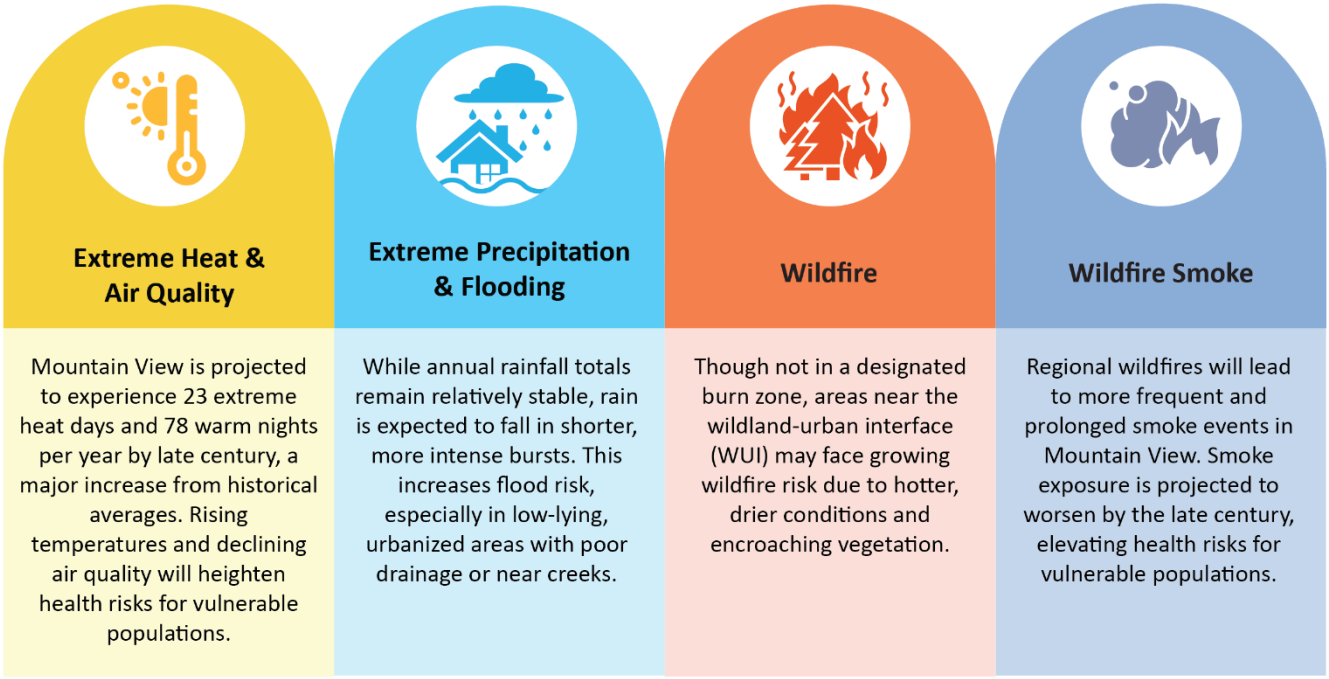
CLIMATE SCENARIOS AND PROJECTIONS

Climate change impacts in Mountain View were assessed using Cal-Adapt, which draws from downscaled global climate models to provide localized projections. This analysis focused on mid-century (2035–2064) and late-century (2070–2099) timeframes under the high emissions scenario, and followed guidance from the California Adaptation Planning Guide (Ghilarducci et al., 2020). [1] The projections used in this CVA reflect local estimates for Mountain View but originate from regional and global models, which means that while the data are downscaled to the city level, some neighborhood-scale variation may not be fully captured.

[1] This analysis focuses on mid-century (2035–2064) and late-century (2070–2099) timeframes under the high emissions scenario, also known as "representative concentration pathway" (RCP 8.5), following guidance from the California Adaptation Planning Guide (Ghilarducci et al., 2020). Representative Concentration Pathways (RCPs) are different scenarios for the future severity of climate change. RCP 8.5 assumes continued increases in greenhouse gas emissions and represents a conservative, worst-case scenario.

Summary of Climate Impacts

This analysis considered primary climate impacts such as rising temperatures, changing precipitation patterns, and rising sea level, which contribute to secondary impacts such as more frequent extreme heat events, drought, and wildfires. The figure below summarizes how these climate hazards will likely impact Mountain View.



To avoid duplicative work, the CVA will not focus on climate risks and vulnerabilities that are already being comprehensively addressed through other City initiatives, such as:

- **Ecosystems and natural resources,** as these are prioritized in the City's Biodiversity and Urban Forest Plan, which is currently being developed. The Biodiversity and Urban Forest Plan will inform future resiliency planning.
- **Sea level rise adaptation and coastal flood risk management**, which are covered under the City's existing plans and initiatives, including the 2021 Shoreline Sea Level Rise Study Update. Staff have integrated relevant findings from these plans and initiatives into the CVA to provide complementary information that supports and informs existing sea level rise adaptation efforts.
- **Drought and potable water supply**, which are covered in the City of Mountain View's Urban Water Management Plan, which is updated every five years.

Note on Air Quality:

This hazard is assessed only in the Health & Wellbeing sector, as it primarily impacts human health outcomes rather than infrastructure or environmental systems. To distinguish between Wildfire Smoke and Air Quality as separate hazards:

- Wildfire Smoke refers specifically to episodic, seasonal exposure to fine particulate matter (PM2.5) from regional wildfire events. It is tied to specific fire seasons and atmospheric conditions (e.g., wind transport).
- Air Quality reflects broader, chronic exposure to pollutants from non-wildfire sources, such as diesel particulate matter (PM), ozone (O_3), and NO_2 from transportation and industrial activity. These pollutants may exacerbate respiratory and cardiovascular health conditions, particularly for climate-sensitive populations.

This delineation allows the CVA to address both acute wildfire-related smoke events and ongoing ambient pollution burdens that disproportionately affect health outcomes year-round.

Additional Stressors

In addition to the climate impacts identified above, Mountain View faces other stressors that can compound risks and reduce resilience. These include weather-related events and other events such as:

- **Atmospheric rivers:** "Rivers in the sky" that deliver prolonged, intense rainfall, which are related to extreme precipitation and flooding but occur as distinct weather events. While they provide water supply benefits, they can also overwhelm stormwater systems, cause localized flooding, and increase pollutant runoff into creeks and the Bay (NOAA, 2024; The Water Desk, 2024).
- **Windstorms:** High winds can down trees, damage power lines, and block roads. When coupled with heavy rainfall, these events often lead to power outages and delayed emergency response (Zhang et al., 2022).
- **Air pollution and traffic emissions:** Persistent local air quality issues from traffic and industry already impact respiratory health, which can worsen when compounded with wildfire smoke or extreme heat (Jaffe et al., 2020).
- **Energy system reliability during extreme weather events:** Power outages linked to PG&E's grid, whether from wind, fire-safety shutoffs, or heat-related strain, can reduce adaptive capacity for critical facilities, cooling centers, and households (Fuentes, 2025).

These additional stressors may not be directly driven by climate change, but they can interact with and amplify climate hazards, making it important to address them in any Mountain View resilience strategy.

3. Climate Vulnerability Assessment

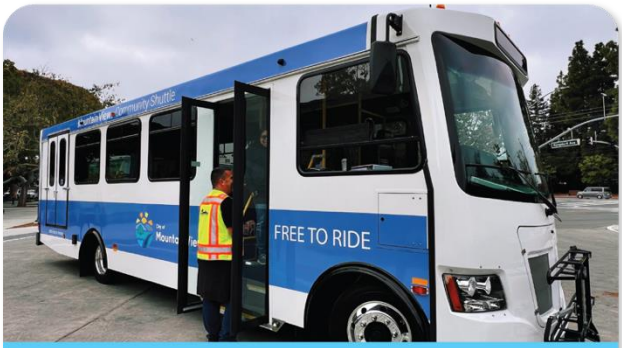
The Mountain View Climate Vulnerability Assessment (CVA) evaluates how climate hazards such as extreme heat, flooding, wildfire, and poor air quality may affect people, infrastructure, and services across the city. It provides a clear, localized understanding of where risks are highest and which communities, assets, or systems may need focused support as climate impacts intensify.

The CVA is organized into four sectors: Health and Wellbeing, Emergency Management, Economy, and Housing and Infrastructure. Each sector section includes an overview, a summary table of exposure, sensitivity, adaptive capacity, and vulnerability scores, and a narrative of how each hazard affects the sector. An equity lens is applied throughout to identify populations and neighborhoods that may face disproportionate climate impacts.

Health & Wellbeing

Emergency Management

Economy



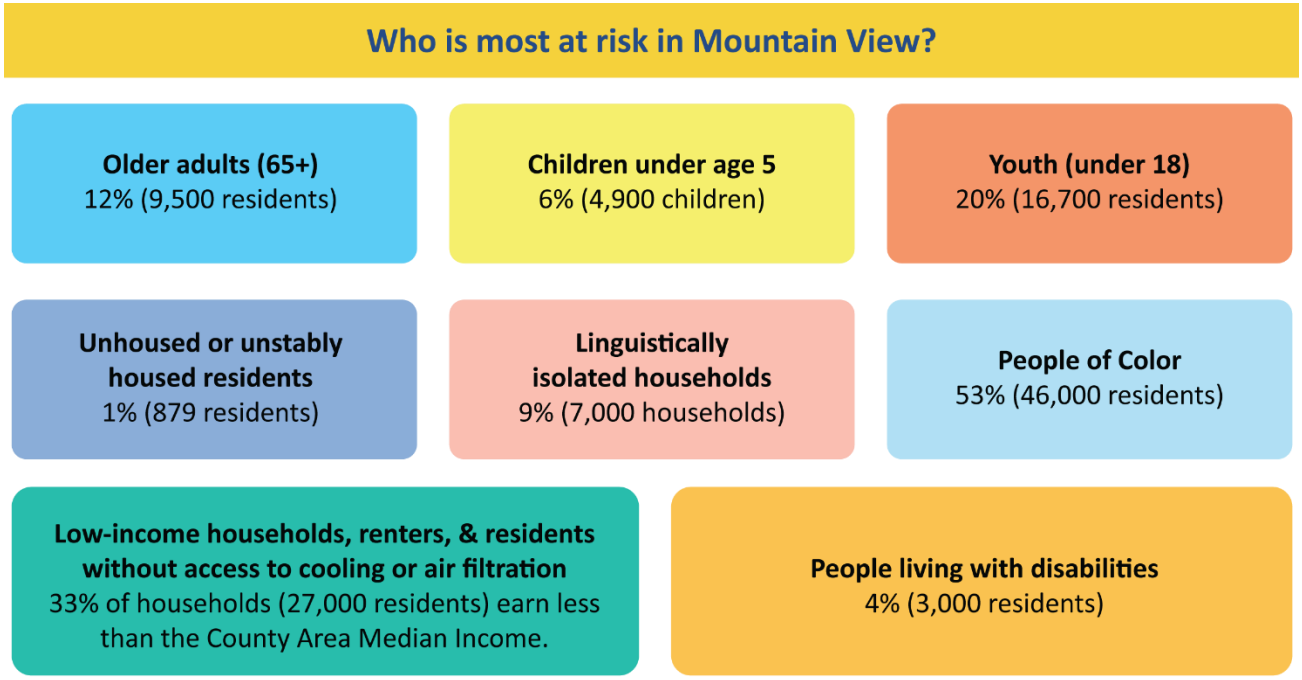
Housing & Infastructure

3.1. Health and Wellbeing

Climate change is increasingly affecting health and wellbeing in Mountain View by intensifying hazards such as extreme heat, wildfire smoke, and flooding. These events can worsen chronic illnesses, disrupt medical care, and increase emotional stress, particularly for older adults, young children, unhoused or unstably housed populations, and those living with disabilities or physical or mental health conditions.

Roughly 11.7% (9,500) of residents are over age 65, a group especially vulnerable to heat-related illness and social isolation during emergencies. They also have higher prevalence of electricity-dependent medical needs, making power outages a health risk. About 4% (3,300) of residents have a disability that may affect mobility or access to shelter and cooling. In 2025, the Point-in-Time Count documented 879 unhoused individuals in Mountain View, many of whom face direct exposure to heat, smoke, and severe weather without access to safe indoor environments (City of Mountain View, 2023b).

About 33% (11,528) of Mountain View households are considered low-income, meaning their annual income is 80% of the County's Area Median Income (AMI) or less. Low-income households often struggle to afford cooling, air filtration, or home retrofits that reduce exposure to climate hazards. Renters and those without stable housing may also face elevated risk of adverse health efforts, displacement or utility shutoffs during heat or flood emergencies. Approximately 53.3% of Mountain View residents identify as people of color, including large Asian (33.3%) and Hispanic or Latino (18.0%) communities. National studies show that these populations may experience disproportionate burdens from environmental pollution and climate-related health impacts due to higher exposure to air pollution, limited access to healthcare or cooling, residence in high-risk areas, and historical inequities in infrastructure investment (EPA, 2021d; Tessum et al., 2021).



PHYSICAL HEALTH

Climate change poses risks to physical health through increased exposure to extreme heat, poor air quality, wildfire smoke, and flooding-related hazards (Ackerly et al., 2018; Jay et al., 2023). These climate-related impacts exacerbate health conditions such as asthma, cardiovascular disease, and respiratory illness, and contribute to increases in emergency room visits and longer-term health burdens.

Climate-sensitive populations, including older adults, young children, low-income households, unhoused or unstably housed individuals, and those living with disabilities or health conditions face greater health risks due to increased sensitivity to heat and/or limited access to cooling, clean indoor air, consistent medical care and in some cases, limited mobility (Jerrett et al., 2024). Climate-related emergencies such as extreme heat events, service disruptions and power outages may further disproportionately burden those who rely on electricity-dependent medical devices or need timely access to healthcare. Table 1 outlines the physical health subsector's exposure, sensitivity, adaptive capacity, and overall vulnerability to each climate hazard.

Table 2. Climate vulnerability of physical health.

Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptative Capacity	Overall Vulnerability
Extreme Heat	High	High	Moderate	Low	**High**
Extreme Precipitation & Flooding	Moderate	Low	Moderate	Moderate	**Moderate**
Wildfire	Low	Low	Low	High	**Low**
Wildfire Smoke	High	High	Moderate	Low	**High**
Air Quality	Moderate	Moderate	Moderate	Moderate	**Moderate**

Climate Risks

Extreme Heat

In Mountain View, an extreme heat day is defined as a day with temperatures above 91°F (CalAdapt, 2025). However, humidity can greatly influence how hot it actually feels. During summer months, humidity levels in Mountain View can reach approximately 75%, which raises the heat index, or "feels like" temperature, well above the air temperature. For instance, when the air temperature is 90°F with 75% humidity, people can experience it feeling closer to 109°F, which can significantly increase the risk of heat-related illnesses (Figure 2).

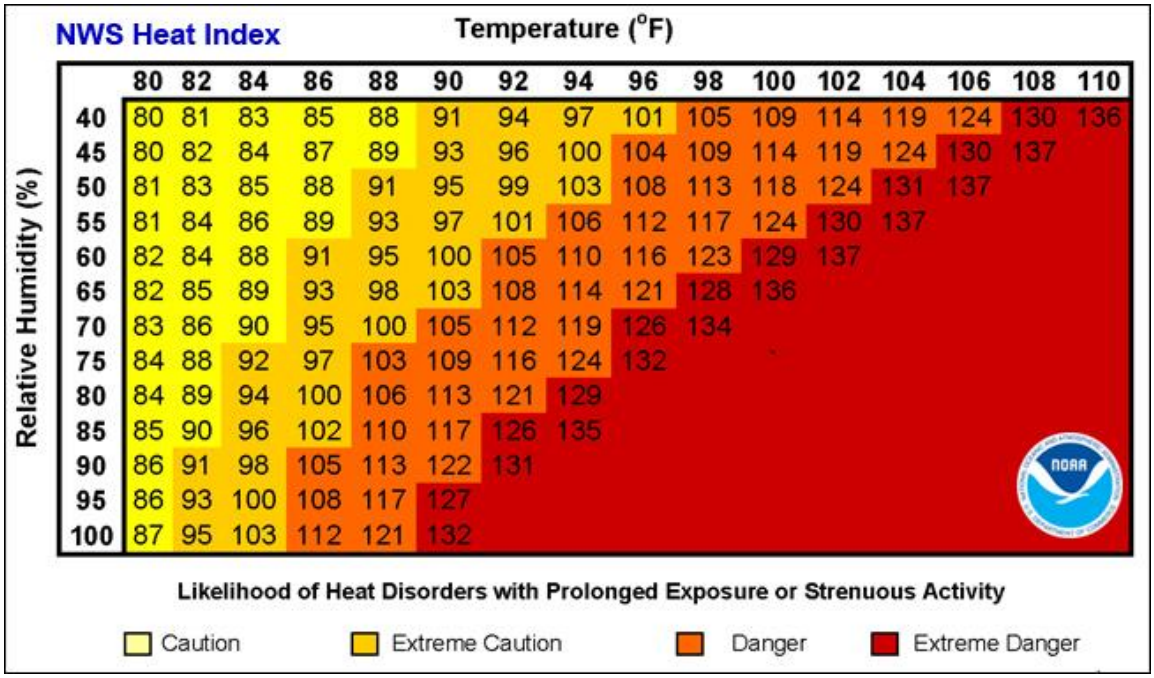


Figure 12. Heat index chart (NWS, 2025).

Exposure to higher temperatures can lead to more frequent heat-related illnesses such as heat stroke and dehydration, especially among older adults, people with cardiovascular conditions, and individuals with disabilities (County of Santa Clara, 2015b). Areas with limited tree cover and extensive paved surfaces can experience significantly higher temperatures than surrounding areas due to the urban heat island effect (UHI) (Ettinger et al., 2024). Residents such as renters, low-income households, older adults, pregnant people, young children, and people with disabilities are generally more sensitive to prolonged extreme heat because of health, economic, or mobility-related factors. For those who also lack air conditioning or reliable cooling at home, the risks are even higher, since they may have fewer options to reduce indoor temperatures during multi-day heat events.

The number of Heat Health Events (HHEs) in Mountain View is expected to more than double by mid-century and increase nearly sixfold by the end of the century compared to the historical average of 2.17 events per year (Table 2). [2] Historically, heat-related deaths in Santa Clara County have averaged fewer than 10 per year, but in 2024, 38 heat-related deaths occurred in Santa Clara County, 3 of which were in Mountain View (Rowan, 2025). This rise reflects the growing health risks associated with more frequent and intense heat events. However, these figures may be undercounting the heat-related illness or deaths, as heat is often coded by doctors as a contributing factor rather than the primary recorded cause of illness or death.

[2] A Heat Health Event (HHE) refers to a day when temperatures reach levels associated with increased emergency department visits, hospitalizations, or deaths due to heat exposure (Cal-Adapt, 2022).

Table 3. Projected annual number of heat health events in Mountain View under a high emissions scenario (Cal-Adapt, (2022).

Time Period	Projected Average Number of Heat Health Events per Year
Historical (2005-2010)	2.2
2041–2060	4.3
2081–2099	12.5

In addition to a greater number of heat health events, Mountain View is projected to experience more frequent extreme heat days and warm nights (Table 3). Historically, the city experienced about five extreme heat days per year and eight warm nights annually (days or nights exceeding 91°F or minimum temperatures above 65°F, respectively). By mid-century, the number of extreme heat days is projected to rise to 12 per year, and by late century to 23 per year, an 18-day increase over the historical average. Similarly, warm nights are projected to increase from 8 per year to 35 by mid-century and 78 by late century. Warm nights are a significant health concern because the body relies on cooler overnight temperatures to recover from daytime heat. When nighttime lows remain above 65°F, the body cannot dissipate stored heat effectively, which increases physiological stress, raises the risk of heat related illness, and contributes to higher mortality during heat waves (Seltenrich, 2023a).

Table 4. Projected extreme heat days and warm nights in Mountain View (Cal-Adapt, 2022).

Time Period	Extreme Heat Days (days)	Change from Historical	Warm Nights (days)	Change from Historical
Historical (1961-1990)	5 days	--	8 days	--
2035-2064	12 days	+ 7 days (+140%)	35 days	+27 days (+ 338%)
2070-2099	23 days	+ 18 days (+360%)	78 days	+70 days (+ 875%)

Unhoused individuals, including those living in vehicles, face elevated risks from extreme heat due to prolonged exposure, lack of shade or water, and barriers to accessing cooling centers (Gabbe et al., 2023; Lin et al., 2024). The 2025 Point-in-Time Count documented 879 unhoused residents in Mountain View, a 56% increase from 562 in 2023. The sharp rise in both sheltered and unsheltered populations is likely attributed to the ongoing shortage of affordable housing and limited availability of temporary shelters and assistance programs in Santa Clara County and the greater Bay Area.

Figure 3 identifies areas of moderate to severe exposure to extreme heat, defined as days exceeding 91°F, and the projected number of such days per year. These high-exposure zones often overlap with neighborhoods that have greater concentrations of vulnerable residents, including children and older adults. Children and youth who spend time outdoors during school hours or after-school activities face heightened risks from extreme heat, especially when shade or cooling options are limited. Young people are more vulnerable to heat stress because their bodies heat up faster, they lose fluids more quickly, and they may have limited ability to recognize or communicate early signs of heat illness. Multi-day heatwaves can expose students and staff to reduced indoor air quality, disrupt learning, and force closures or early dismissals (Ackerly et al., 2018).

Schools without adequate air conditioning or ventilation are also sensitive to prolonged heat events. Many campuses fall within severe heat zones, including:

- **Public schools:** Mountain View High School, Alta Vista High School, Theuerkauf Elementary, Edith Landels Elementary, Graham Middle School, Springer Elementary, Benjamin Bubb Elementary, Mariano Castro Elementary, Crittenden Middle School, Amy Imai Elementary, Stevenson Elementary, Gabriela Mistral Elementary, and Jose Antonio Vargas Elementary.
- **Private schools:** St. Joseph Catholic School, St. Francis Catholic High School, Waldorf School of the Peninsula, Yew Chung International School, and Action Day Primary Plus.
- **Childcare centers:** Google Day Care and Tiny Einstein Child Development Center.

Neighborhoods such as South Mountain View have a higher proportion of adults aged 65 and older relative to the county average and overlap with high-to-severe heat exposure zones. Older adults are more sensitive to extreme heat due to pre-existing health conditions, medications that affect the body's ability to regulate temperature, and limited mobility or transportation options that reduce access to cooling (CDPH, 2024). Social isolation can further increase risk, as some older residents may be less likely to seek assistance or relocate to cooling centers during heat waves.

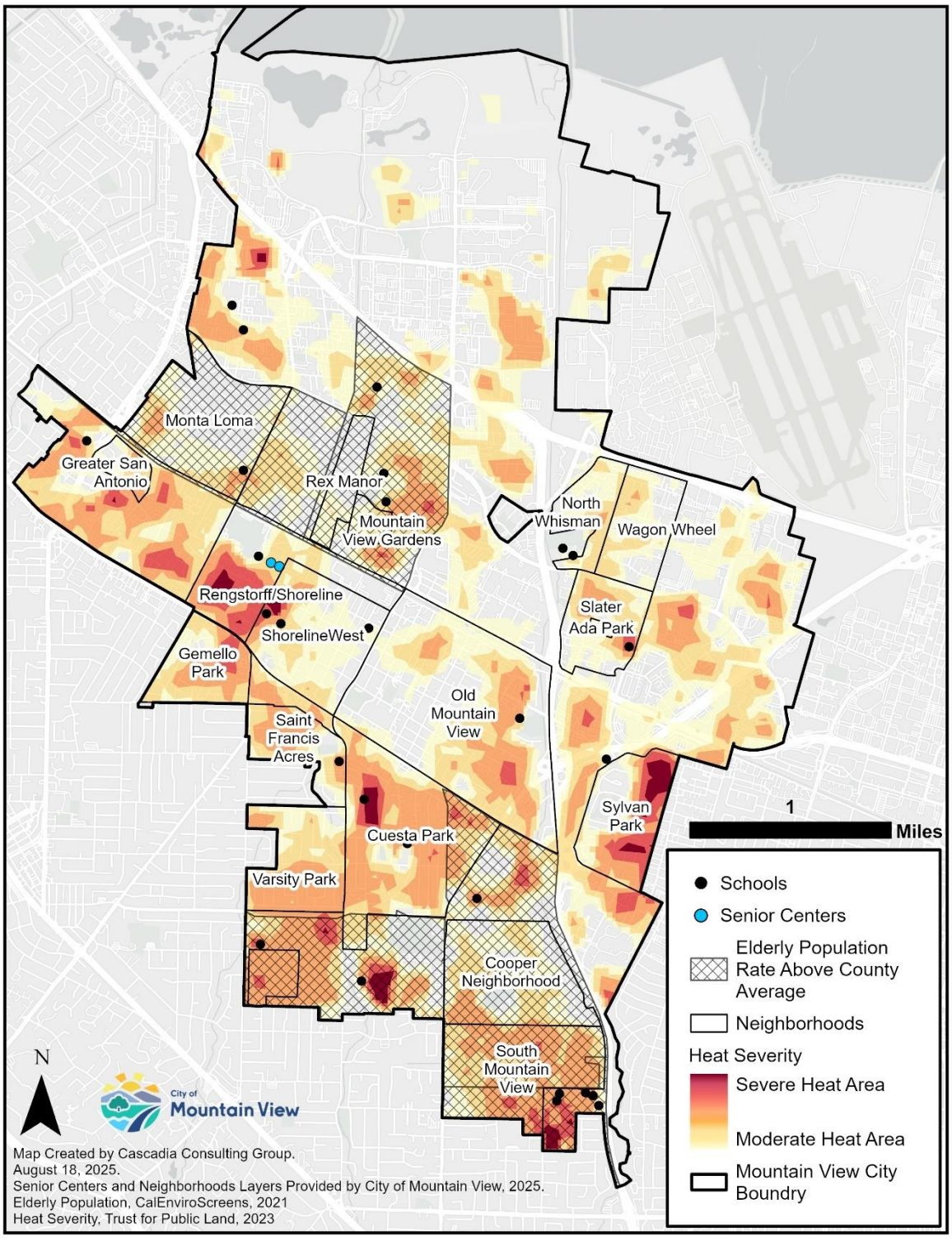


Figure 13. Areas of Mountain View where higher populations of older adults (age 65 and over) and youth overlap with moderate to severe heat conditions, including nearby schools located in higher heat zones (CalEPA, 2021; Trust for Public Land et al., 2023).

Table 4 shows the distribution of areas by heat severity score, or the number of degrees above the citywide average surface temperature. Approximately 20 percent of Mountain View experiences surface temperatures at least 1°F higher than the city average, while 18 percent of the city experiences temperatures more than 3°F above average. Smaller areas, roughly 4 percent of total land area, experience temperature differences of 8°F or more. These "hot spots" often coincide with industrial areas, large parking lots, and other highly paved zones with limited vegetation. Figure 3 above shows the distribution of heat severity in Mountain View, with the darkest red areas in the map corresponding with a heat severity score of 5.

Table 5. Distribution of heat severity across Mountain View.

Heat Severity Score	Degrees Above City Average	Area (Acres)	Percent of City
1	1+	1,572	20%
2	3+	1,430	18%
3	5+	1,220	16%
4	8+	203	3%
5	15+	49	1%

These areas of elevated surface temperature tend to align with neighborhoods identified in Figure 3 as experiencing both higher population vulnerability and limited access to tree canopy or cooling infrastructure. This overlap indicates that targeted heat mitigation strategies, such as shade expansion, cool roofing and pavements, and increased vegetation, could be beneficial in areas where heat exposure and social vulnerability are most concentrated.

Air Quality

Rising temperatures are expected to contribute to increased ozone concentrations in the Bay Area, leading to more frequent "unhealthy air quality days" (County of Santa Clara, 2015). Mountain View's current average ozone level is approximately 0.037 parts per million (ppm), which falls within a moderate range based on California Air Resources Board standards. Although this is lower than the state's upper range of 0.07 ppm, concentrations at these levels can still be unhealthy for sensitive groups and may reach harmful levels during prolonged heat events. [3] Even moderate ozone exposure can trigger respiratory irritation, reduced lung function, and aggravation of conditions such as asthma or chronic obstructive pulmonary disease (COPD)(EPA, 2025). Statewide modeling suggests that by mid-century, the number of high-ozone days in California could rise by 30–50 percent, particularly in inland and urbanized regions where heat and vehicle emissions interact (Zhu et al., 2019).

Fine particulate matter (PM2.5) levels in Mountain View currently average 8.23 µg/m³, placing the city in the low to moderate range and the 17th percentile statewide (CalEPA, 2021). While this suggests relatively good average air quality, it does not capture localized exposure patterns. For example, residents living near major roadways or industrial areas, in older buildings with poor ventilation, or without access to filtered indoor air may experience significantly higher exposure. PM2.5 is linked to

[3] The indicator is the mean of summer months (May - October) of the daily maximum 8-hour ozone concentration (ppm). This measurement is used to represent short-term ozone health impacts. The data is from 2017 to 2019. Ozone concentrations in California range between 0.03 - 0.07 ppm.

respiratory and cardiovascular illness, increased hospital visits, and premature death. From 2014 to 2019, mortality risk in California increased by 6.1 percent on extremely hot days, 5 percent on high PM2.5 days, and 21 percent when both occurred together (Figure 4) (Barone, 2022; Rahman et al., 2022). As regional temperatures rise and wildfire seasons lengthen, PM2.5 concentrations in Mountain View are expected to increase due to more frequent smoke events, higher vehicle emissions during hot weather, and stagnant air conditions that trap pollutants near the ground.

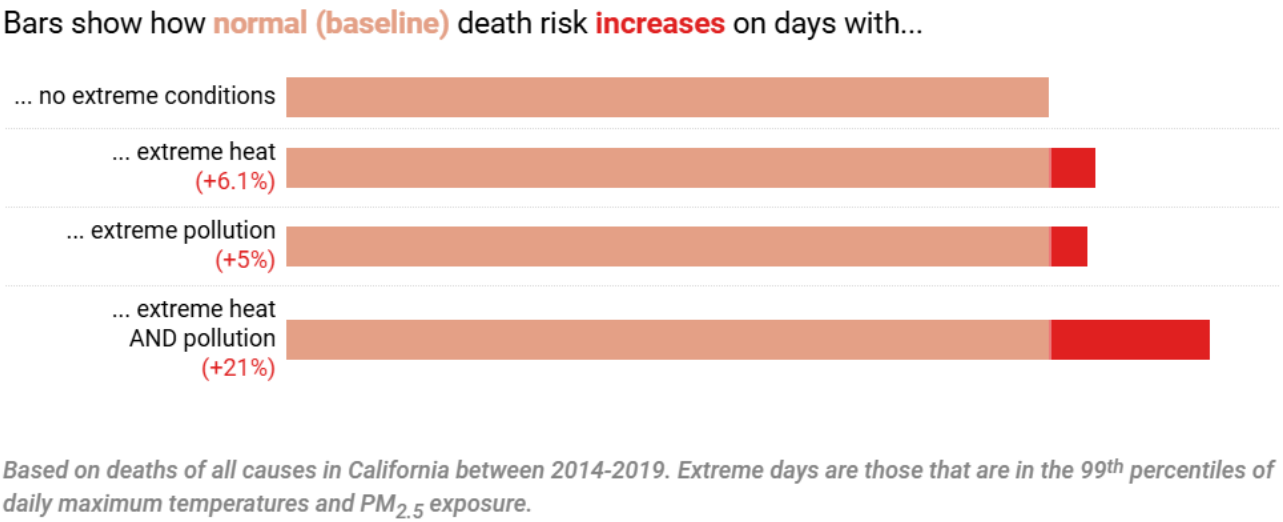


Figure 14. Extreme heat and pollution impact on mortality risk (Barone, 2022; Rahman et al., 2022).

Parts of Mountain View rank in the 85th percentile for diesel particulate matter (PM) exposure, meaning residents are exposed to higher diesel emissions than 85 percent of census tracts statewide (see yellow areas of Figure 5). Diesel exhaust is a major contributor to localized air pollution and contains carcinogenic compounds. Warmer conditions also increase diesel emissions, compounding health risks for nearby residents (Liu et al., 2023).

While children, older adults, and people with existing health conditions remain especially sensitive to poor air quality, worsening ozone and particulate matter exposure can also increase the risk of chronic respiratory and cardiovascular disease among the general population. As both heat and pollution increase, more residents, regardless of age or health status, may experience reduced lung function, respiratory irritation, and greater risk of developing long-term conditions such as asthma or heart disease (CalEPA, 2021; California Air Resources Board, n.d.).

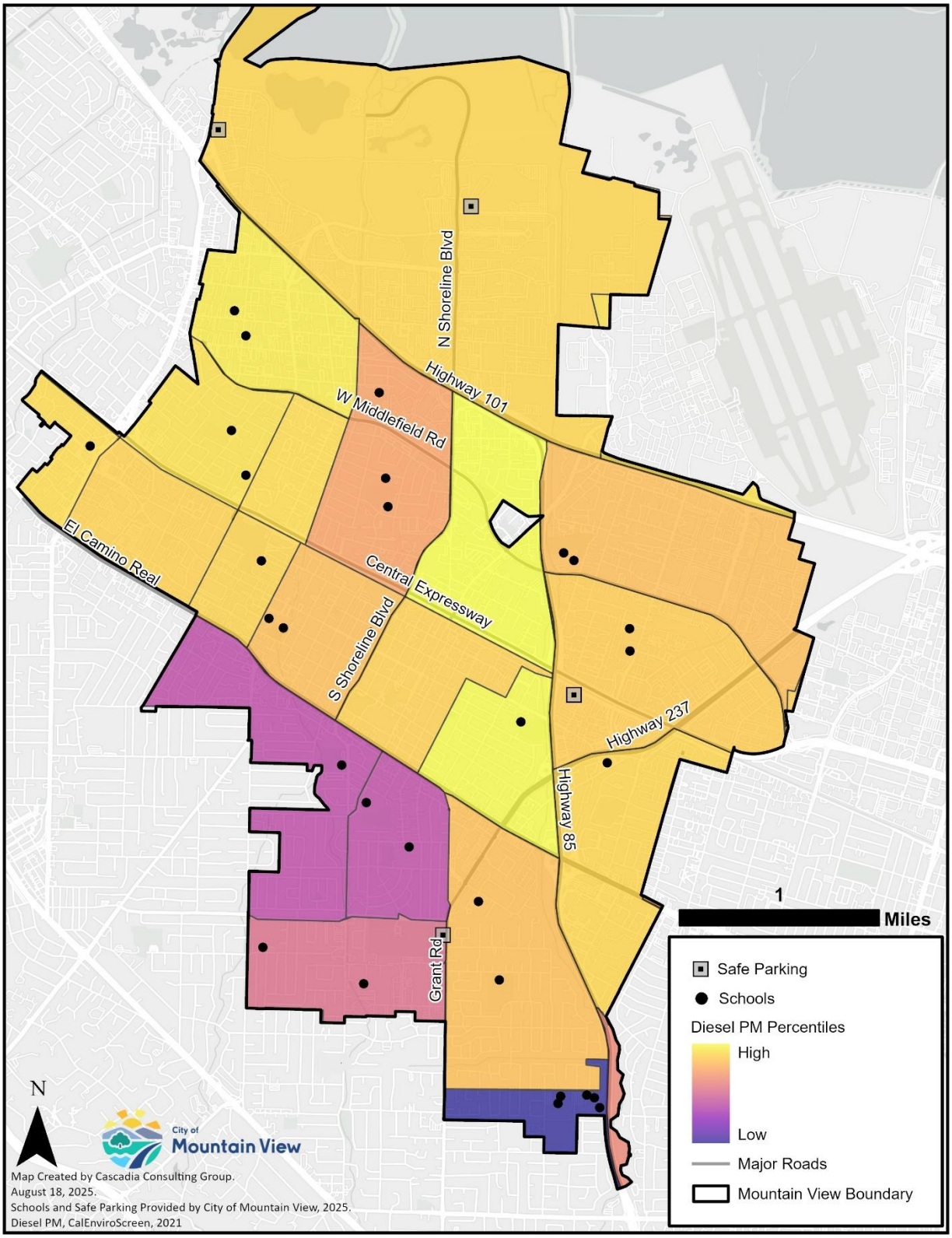


Figure 15. Diesel PM percentile showing much of Mountain View in the 85th percentile or greater (shown in yellow) (CalEPA, 2021).

Extreme Precipitation and Flooding

Flooding can disrupt access to health services, especially for residents with limited mobility or urgent medical needs (County of Santa Clara, 2015b, 2024a). Contaminated water and mold growth following flood events increase illness risk, particularly in older buildings or overcrowded housing (County of Santa Clara, 2015b). Low-lying areas such as North Bayshore face additional risks from sewage overflow, infrastructure damage, and stormwater backups that may expose residents to hazardous conditions.

These public health risks are closely tied to housing and infrastructure vulnerabilities, which are discussed in more detail in the Housing and Infrastructure and Critical Facilities and Services sections. Flooding impacts to emergency routes, residential displacement, and recovery challenges are addressed in those sectors.

Wildfire and Wildfire Smoke

Mountain View is located outside designated high fire hazard zones, and wildfire burn risk to physical infrastructure and residents is expected to remain low. Major fires in nearby upland areas like Los Altos Hills may affect local health systems by increasing demand for emergency services and hospitals (County of Santa Clara, 2015a, 2024). Exposure to smoke from regional wildfire activity, which is expected to grow in severity, can also pose public health risks to Mountain View residents. Health impacts from exposure to poor air quality can include coughing, shortness of breath, and irritation of the eyes, nose, and throat.

Mountain View has already experienced reduced air quality due to wildfire smoke (Dremann, 2025). As shown in Figure 6, air quality in the Santa Clara Valley reached unhealthy, and at times very unhealthy levels due to wildfire smoke from the North Complex Fire in Plumas County and more than 20 other active wildfires in 2020 (Bay Area Air Quality Management District, 2025; Fuller, 2020).

Figure 16. Hourly AQI for the Santa Clara Valley on September 11, 2020, August 21, 2021, and September 20, 2023 during regional wildfires.

Regionally, wildfire-induced pollution has led to more work loss days, hospitalizations, and deaths, particularly for those with asthma or cardiovascular conditions (Carreras-Sospedra et al., 2024). These impacts have been documented during large regional fire events such as the 2020 CZU Lightning Complex Fire in San Mateo and Santa Cruz counties, the 2020 SCU Lightning Complex Fire in the East Bay and South Bay, and the 2018 Camp Fire, all of which sent heavy smoke into the Bay Area for days to weeks and contributed to measurable increases in respiratory illness, ER visits, and missed work days across the region. Figure 7 shows the thick smoke that blanketed the region during the September 2020 event.

Figure 17. Smoke covered skies in Menlo Park during the September 2020 wildfire smoke event (Dremann, 2025).

Adaptive Capacity

Mountain View has taken steps to reduce heat exposure and support residents during extreme heat events and poor air quality days. The City's Urban Forestry Division is working to help reduce heat exposure by identifying opportunities to expand shade in vulnerable areas. State building codes and design standards also promote passive cooling features, such as white roofs and window shading (City of Mountain View, 2012; Ghamari et al., 2024).

Cooling Centers

Per the City of Mountain View Policy for Heat Emergencies and Cooling Center Activation, the City opens cooling centers in the case of hot weather equal to or exceeding 91°F. The policy identifies several City facilities as cooling centers, including the Mountain View Community Center, the Mountain View Public Library, the Police Services Fire Administration Building, the Rengstorff Aquatics Center, and the Eagle Park Pool, as well as additional locations that may be utilized as needs arise (i.e., the Senior Center and the 1st floor City Hall lobby). Cooling Centers open proactively based on weather forecasts provided by the National Weather Service; or upon direction from Fire or Police Command Staff, based on emergency response activity. The City's response is in two phases, Heat Watch (activated when the National Weather Service issues a statement indicating a heat index of 80°F - 90°F) and Heat Warning (activated when the National Weather Service issues an Extreme Caution Alert (indicating a heat index of 91°F - 105°F) or a Danger (issued when the heat index goes above 105°F). Cooling Center personnel ensure facilities have necessary amenities for the situation, including staff, air conditioning, chairs, water, fans, first-aid kits, AEDs, ice packs, and entertainment materials, as appropriate.

Clean Air Centers

The Mountain View Senior Center and the Community Services Agency (CSA) act as clean air facilities during wildfire smoke events for seniors (Santa Clara County, 2018). However, access to these facilities may be limited by operational hours, temporary closures, or a lack of public awareness. For example, the Mountain View Public Library, typically used as a cooling resource, was closed during a July 2024 heat event due to heating, ventilation, and air conditioning (HVAC) failure, requiring the City to quickly adjust its response and redirect residents to alternate sites (City of Mountain View, 2024c).

Emergency Preparedness

To enhance preparedness, over the summer of 2025, the City's Sustainability and Resilience Division partnered with the Police Department Neighborhood and Event Services Unit (NES) and CSA to distribute 200 heat and air quality resilience kits that included supplies such as water misting fans, heat stress thermometers, sun hats, reusable water bottles, sunscreen, hand fans, heat illness information cards, N95 masks, electrolyte packets, instant cold compresses, and solar battery packs (Figure 8). These kits were funded through a $25,000 grant from the Santa Clara County Department of Public Health as well as general City resiliency funds and were distributed to residents living in vehicles who are at high risk for heat impacts. Heat and air quality preparedness flyers were also distributed to residents to inform them of the risks and ways to stay safe during extreme heat events.

Figure 18. Heat resilience kits distributed to Mountain View residents living in vehicles.

The City's Safe Parking Program is a free program that provides a temporary, safe location to park for individuals and families living in a vehicle, while providing access to services that will transition them into more stable housing (City of Mountain View, 2025b). However, challenges remain for this population, particularly during prolonged heat events when access to consistent cooling and shaded areas is limited. Increasing access to daytime cooling centers and enhancing outreach and public education could help strengthen Mountain View's adaptive capacity for community members living in vehicles and other vulnerable communities.

Figure 19. Safe parking lot in Mountain View (City of Mountain View, 2025b).

The City of Mountain View's Police Department operates a Neighborhood and Event Services Unit (NES) that focuses on community outreach, education, and enforcement of municipal codes that impact the quality of life in the city. NES Community Outreach Officers help connect unhoused residents with community services and non-profit organizations in the city.

MENTAL HEALTH

Climate change can impact mental and emotional wellbeing, particularly during and after extreme weather events such as heatwaves, wildfires, and flooding (Table 5). These events can lead to trauma, stress, anxiety, and depression, especially among individuals who experience displacement, service disruptions, or prolonged exposure to unsafe living conditions. National research shows that climate related stressors contribute to broader mental health and social impacts. Warmer temperatures are projected to lead to as many as 40,000 additional suicides in the United States and Mexico by 2050, and violent crime in Los Angeles increased by 5.7 percent on days hotter than 85 degrees F compared with cooler days. Climate anxiety is also widespread. A national APA survey found that 56 percent of U.S. adults consider climate change the most important issue facing the world today, and nearly half of young adults ages 18 to 34 report experiencing daily stress related to climate change (Heilmann et al., 2021; Obradovich et al., 2018). Unhoused individuals, low-income households, older adults, youth, and those with pre-existing mental health conditions may be more susceptible to these impacts. Ongoing environmental stressors such as poor air quality, economic instability, and lack of access to familiar spaces can also compound these effects over time (Cianconi et al., 2020). Social isolation and language or cultural barriers may limit access to mental health support during emergencies.

Table 6. Climate vulnerability for mental health.

Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptive Capacity	Overall Vulnerability
Extreme Heat	High	High	Low	Low	**High**
Extreme Precipitation & Flooding	Moderate	Moderate	Moderate	Low	**Moderate**
Wildfire	Low	Low	Very low	Moderate	**Low**
Wildfire Smoke	High	High	Moderate	Low	**High**

Climate Risks

Extreme Heat

Prolonged exposure to extreme heat can have significant psychological and emotional effects, especially for vulnerable groups such as older adults, youth, low-income residents, and those with pre-existing mental health conditions (Rony & Alamgir, 2023). As temperatures rise and heat events become more frequent and severe in Mountain View, residents may experience increased anxiety, irritability, and mood instability. Consecutive days or weeks of high temperatures are especially harmful because they limit the body's ability to recover overnight and result in cumulative stress. Extended heat waves lasting several days to weeks can increase irritability, anxiety, and symptoms of depression, while also heightening the risk of aggression and conflict in community settings (Figure 10).

Physiological stress responses triggered by high temperatures, including elevated cortisol and disrupted sleep, can lead to reduced coping capacity, impair concentration, and lower overall wellbeing. Mental health and substance use disorders may be exacerbated by heat exposure, especially among the unhoused population (Noor et al., 2025). Additionally, residents taking mental health medications, such as Selective Serotonin Reuptake Inhibitors (SSRIs), are more susceptible to the impacts of heat, as certain medications can disrupt the body's ability to regulate temperature (Lõhmus, 2018).

Figure 20. Impacts of extreme heat on mental health. Adapted from (UCLA Health, 2023).

Sleep disruption during heat events, particularly in households without air conditioning or ventilation, can contribute to chronic stress, fatigue, and reduced mental resilience (Rony & Alamgir, 2023). Over time, prolonged exposure to high heat can also lead to feelings of helplessness and emotional exhaustion, especially when residents lack access to safe, cool environments. For individuals already living with anxiety, depression, or other mental health conditions, heat may aggravate symptoms and make day-to-day functioning more difficult. As climate change continues to increase the frequency and duration of extreme heat days, the cumulative mental health toll is expected to grow.

Extreme Precipitation and Flooding

In Mountain View, overall flood exposure is considered moderate, with some residential areas located within the 100-year and 500-year flood hazard zones (see Housing section for residential flood map). Flooding and associated displacement can increase emotional distress, particularly for children, older adults, and immigrant households who may have limited support networks (County of Santa Clara, 2015b). For individuals in these areas, even temporary displacement or damage to housing can cause significant anxiety, trauma, and long-term stress, especially for those already experiencing economic hardship, behavioral health conditions, or social isolation (Heanoy & Brown, 2024). Shelter-in-place orders or disruptions to daily routines during storm events can further exacerbate mental health challenges, particularly for those without access to mental health care or reliable support systems.

Wildfire and Wildfire Smoke

While Mountain View does not face significant direct wildfire risk, regional fire events create substantial mental health impacts through prolonged smoke exposure and heightened anxiety. Residents may experience stress, worry, and a sense of uncertainty when smoke blankets the area, even without evacuation orders. For individuals who have experienced past trauma or displacement, wildfire smoke events can trigger re-traumatization. Prolonged exposure has been linked to increased rates of depression, suicide, and substance use disorders, while children and adolescents may experience greater emotional and behavioral challenges during periods of poor air quality (Ackerly et al., 2018; Anguiano, 2025).

In Mountain View, vulnerable populations such as older adults, people with preexisting behavioral health conditions, and unhoused individuals are particularly at risk. Smoke can intensify feelings of isolation, anxiety, or hopelessness, especially for residents with limited mobility or without access to filtered indoor air (Ackerly et al., 2018; Eisenman & Galway, 2022). For those living in older housing or vehicles, the inability to reduce indoor smoke exposure can worsen symptoms. These risks highlight how even without local wildfire burns, recurring smoke intrusions can strain mental health, particularly for communities already facing housing or economic insecurity.

Adaptive Capacity

Santa Clara County provides core services and coordinates emergency mental health response for city residents (City of Mountain View, 2012). City facilities such as the Community Center and the Senior Center have been identified for exploration as resilience hubs, or community-serving facilities that offer shelter, resources, and services during climate emergencies. While these hubs are primarily designed for physical safety and emergency response, their potential to support mental and emotional well-being has not yet been fully explored (City of Mountain View, 2024a). Strengthening this role could help address emotional distress linked to displacement, heat exposure, and poor air quality, especially for residents with existing behavioral health needs.

The City also has a TRUST (Trusted Response Urgent Support Team) Field Response Program that helps residents during urgent mental health or substance use situations. The TRUST team has knowledge and experience assisting people struggling with behavioral health challenges, and the field response team works to meet the unique needs of each person. The City's Police Department also has a Behavioral Services Unit that includes a licensed clinical worker.

3.2. Emergency Management

Emergency management in Mountain View relies on a network of critical facilities and services that provide essential functions before, during, and after climate-related disasters. As hazards such as extreme heat, flooding, and wildfire smoke intensify, emergency management facilities face risks to their operability, accessibility, and ability to deliver services. Disruptions could delay response times, reduce care capacity, or compromise safe shelter, especially during periods of community need.

CRITICAL FACILITIES AND SERVICES

Climate change poses risks to Mountain View's emergency and community-serving facilities, including police and fire stations, hospitals, community centers, schools, and the City's Emergency Operations Center (EOC), as shown in Table 6. While schools are not emergency response facilities in the traditional sense, they play an essential role by serving as trusted hubs for families during disasters.

Table 7. Climate risks to critical facilities and services.

Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptive Capacity	Overall Vulnerability
Extreme Heat	High	High	High	Moderate	**High**
Extreme Precipitation & Flooding	Moderate	High	High	Moderate	**Moderate**
Wildfire	Low	Moderate	Moderate	Moderate	**Low**
Wildfire Smoke	High	High	High	Moderate	**High**

Climate Risks

Extreme Heat

Critical facilities and services in Mountain View experience moderate to high exposure to extreme heat. While the city does not face the highest regional temperatures, the frequency and intensity of prolonged heat events are projected to increase, placing stress on facilities and emergency operations. As shown in Figure 11, critical facilities are located in both moderate and severe heat areas (Trust for Public Land et al., 2023).

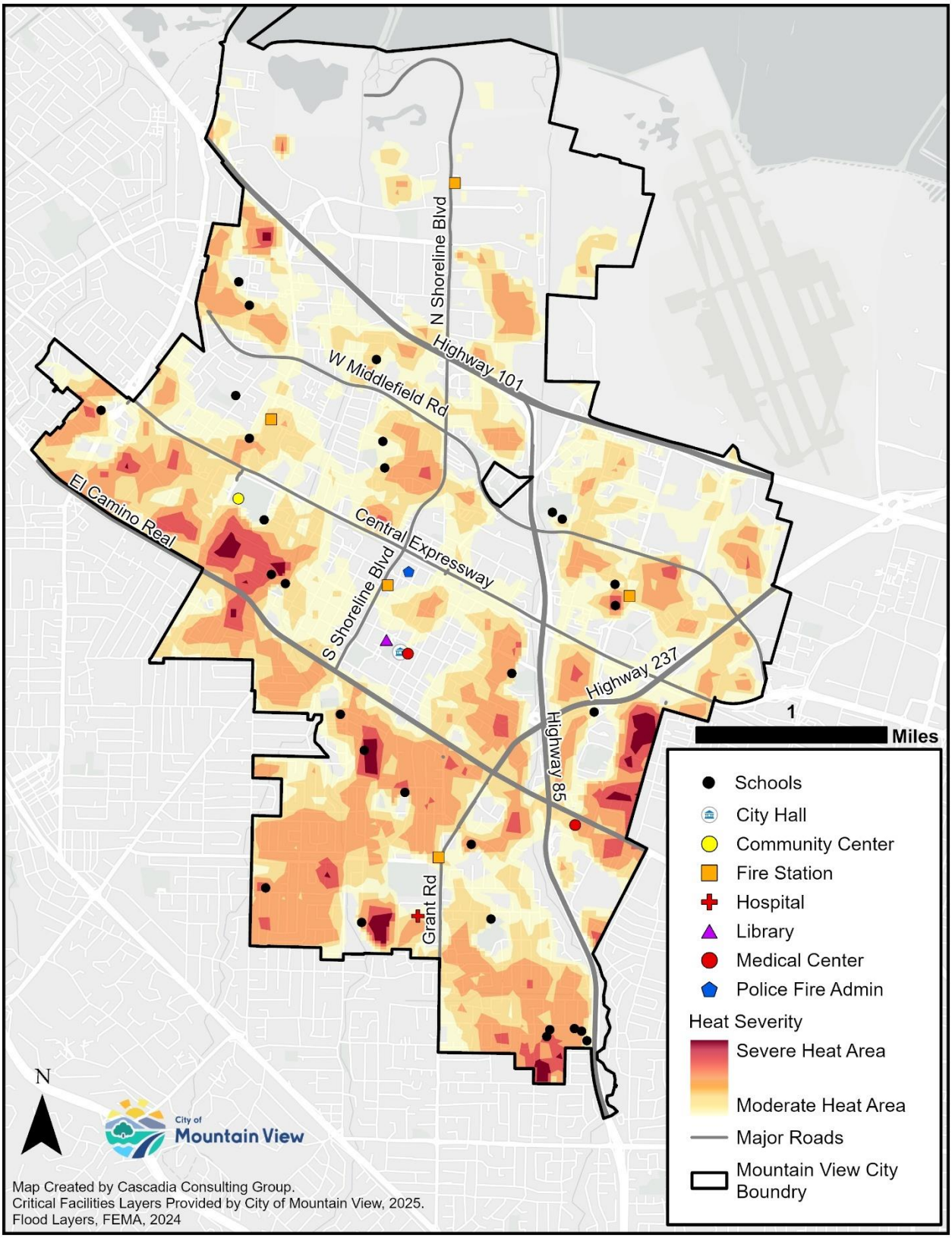


Figure 21. Critical facilities and extreme heat.

Although weather stations and forecasts report general air temperatures, the actual temperatures experienced on the ground can be much higher in urbanized areas with limited shade, tree canopy, or permeable surfaces. These "hot spots" can intensify heat exposure for residents and staff, particularly around paved areas or large buildings. See the Physical Health section for more detail on the urban heat island effect and localized temperature differences across Mountain View.

Facilities and services are highly sensitive to extreme heat events. Prolonged heat events increase hospital admissions for heat-related illnesses, straining emergency departments and can create surge conditions that impact both patient care and staff capacity. El Camino Health – Mountain View Hospital is located within a severe heat area, making both patient care and staff capacity more vulnerable during multi-day heatwaves. Power grid strain during extreme heat can also affect the operability of fire and police stations, particularly those without sufficient backup generation (Williams et al., 2020). Fire Station No. 2 and Fire Station No. 4 are located in severe heat zones.

Extreme heat also impacts emergency personnel. First responders working outdoors for extended periods face elevated risks of dehydration, heat exhaustion, and other heat-related illnesses, which can reduce workforce availability and slow emergency response times (NIHHIS, 2024).

Extreme Precipitation and Flooding

Flooding and stormwater surges can inundate key emergency response routes, delaying police, fire, and emergency medical services (EMS) access. Roads and buildings in creek-adjacent and bayfront areas, especially those lacking floodproofing or elevated infrastructure, are at risk of flooding (County of Santa Clara, 2024a).

As shown in Figure 12, several critical facilities in Mountain View, including schools, medical centers, and community-serving sites, are located within or near the 100-year and 500-year flood hazard zones. Out of the City's five fire stations, Fire Station No. 5 is the only one surrounded by the 100-year flood hazard zone, though it was constructed above the flood elevation. El Camino Health – Mountain View Hospital is also partially within the 100-year flood hazard zone. New construction within the last 20 years has ensured that critical facilities are protected from flooding, by citing outside of the flood hazard zone or constructing above flood elevation. Minor flooding within the surrounding roadways may occur during the 100-year storm.

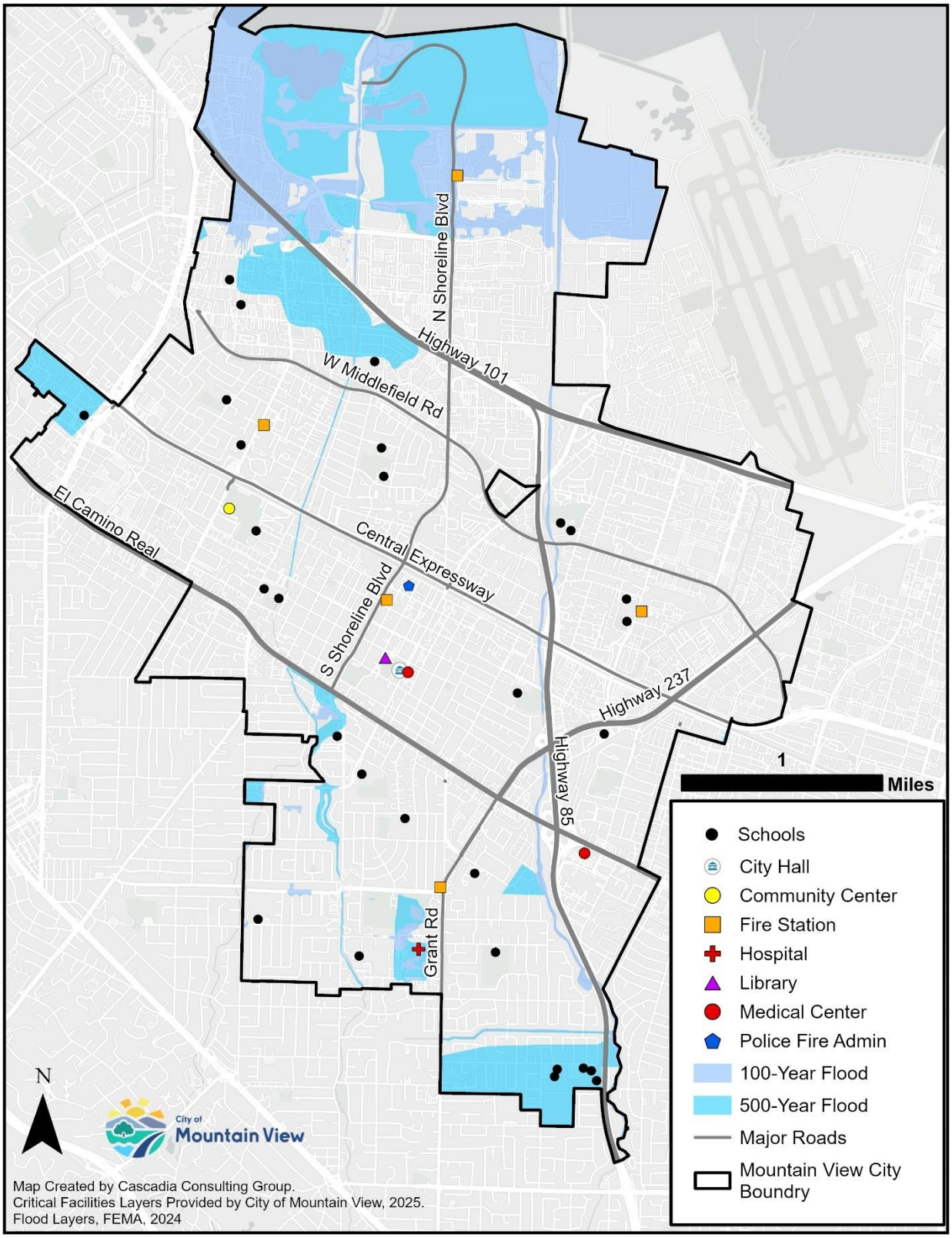


Figure 22. Critical facilities within 100-year and 500-year flood hazard zones.

Schools and school district facilities within the flood hazard zone include:

- Monta Loma Elementary School
- Mountain View High School
- Alta Vista High School
- Mountain View–Los Altos Union High School District administrative building
- School District maintenance facility

Disruption to these facilities during severe storms could delay emergency response, reduce access to care, and compromise safe shelter, particularly in North Bayshore and southern portions of the city that are also located in the 100-year and 500-year flood hazard zones.

Wildfire and Wildfire Smoke

Critical facilities and services in Mountain View have low direct exposure to wildfire since the city is not located in high hazard zones. However, regional wildfire activity creates indirect risks, including mutual aid demands that draw fire personnel and equipment to surrounding areas (County of Santa Clara, 2024).

In addition, heavy smoke from regional fires can lead to increased 911 calls, which can overwhelm emergency dispatch and EMS systems with respiratory calls and affect outdoor emergency operations (Rice et al., 2021). Hospitals, schools, and shelters are also vulnerable to smoke infiltration; without upgraded air filtration systems, these facilities may be unable to maintain safe indoor air quality for staff, patients, students, and displaced residents (D'Evelyn et al., 2022).

Adaptive Capacity

Mountain View maintains a local Emergency Operations Center (EOC) and is developing Continuity of Operations and Disaster Recovery Plans to strengthen emergency readiness (County of Santa Clara, 2024a). The City participates in mutual aid agreements for dispatch, SWAT, and fire services, which provide backup resources when local capacity is strained. Emergency communications are supported by AlertSCC, which delivers alerts in multiple formats and languages.

Neighborhood CERT groups are also a critical part of this capacity. As shown in Figure 13, Mountain View currently has more than a dozen organized CERT neighborhoods distributed across the city. These groups provide ongoing disaster preparedness education, conduct periodic drills, and serve as a vital link between neighborhoods and the EOC when phone or 911 services are unavailable. Their presence helps ensure that preparedness and response efforts occur at the neighborhood level, allowing for faster assessments and communication of needs during major emergencies.

Figure 23. Existing neighborhood CERT groups in Mountain View.

The City has also assessed facility vulnerability to flooding and sea level rise through recent studies and integrated those findings into its Capital Improvement Program (County of Santa Clara, 2024a). Partnerships with local school districts support the joint use of school sites for community emergency needs, such as sheltering during disasters. Emergency planners use GIS mapping tools to identify and visualize climate risks to critical facilities, helping inform investment and preparedness strategies.

3.3. Economy

Mountain View's economy is shaped by a mix of global technology firms, local retail and service businesses, and a diverse workforce that supports innovation, entrepreneurship, and essential community services (City of Mountain View, 2024b). Employers such as Google, Microsoft, Intuit, and LinkedIn in the information sector account for nearly half of local jobs. Since 2010, the City has added more than 33,000 jobs in the Information and Professional and Scientific Services sectors, which now make up about two-thirds of all local employment. Small businesses in retail, hospitality, and the arts continue to play an important role in the local economy but remain smaller and slower to recover from pandemic-related job losses (City of Mountain View, 2024b). Many workers in these industries face challenges keeping up with the region's high cost of living. Climate impacts could further strain these sectors by disrupting operations and supply chains, damaging infrastructure, and reducing workforce stability, particularly among lower-wage workers who may struggle to recover from climate-related shocks.

LOCAL BUSINESSES

Extreme heat, flooding, and wildfires due to climate change will damage buildings, disrupt power, transportation, and supply chains. As a result, local businesses may face repair costs, workforce and productivity disruptions, and losses from power outages that interrupt operations (Çevik, 2024). Tech-dominated local businesses may be at risk from climate impacts near and far, as the industry, and the global economy, depend on data centers that are highly vulnerable to climate hazards (Cross Dependency Initiative, 2025). In a high emissions scenario, the average listed software and platform company may face $133 million in fixed-asset losses per year by 2035 due to climate change (World Economic Forum & Accenture, 2024). Small businesses will be especially vulnerable to climate change due to limited resources for recovery, in addition to high housing costs that may continue to push out lower-wage workers in essential sectors such as retail, food service, and education, straining the local workforce (City of Mountain View, 2024b). Table 7 below characterizes local businesses vulnerability to climate hazards.

Table 8. Climate risks to local businesses.

Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptive Capacity	Overall Vulnerability
Extreme Heat	High	Moderate	Moderate	Moderate	**Moderate**
Extreme Precipitation & Flooding	High	Moderate	Low	Moderate	**High**
Wildfire	Low	Moderate	High	Moderate	**Moderate**
Wildfire Smoke	High	Moderate	Low	Moderate	**Moderate**

Climate Risks

Extreme Heat

Extreme heat impacts Mountain View's local businesses, particularly for industries with outdoor workers, such as construction, landscaping, and maintenance. High temperatures can reduce labor productivity, increase health risks for employees, and strain public health systems during prolonged heatwaves (County of Santa Clara, 2015a). Extreme heat events and rising annual temperatures can contribute to lost wages for climate-exposed occupations, due to lost or reduced work hours during high-heat events. Table 8 shows the lost wages per worker and per year across all climate-exposed occupations in Mountain View for mid-century and late century projections under a high-emissions scenario based on the average wage for climate-exposed occupations in the San Jose-Sunnyvale-Santa Clara Metropolitan Statistical Area for the first quarter of 2025 ($33.97)(California Employment Development Department, 2025; EPA, 2021c).[4]

Table 9. Temperature impacts outdoor occupation wages for individuals and the city (Data USA, n.d.; EPA, 2021b).

Time period	Extreme Heat Days (90°F+ degree days)	Lost wages for all climate-exposed occupations per worker	Lost wages for all climate-exposed occupations per year
Mid-century (2035-2064)	12 extreme heat days, +7 days from baseline	$36	$124,092
Late century (2070-2099)	23 extreme heat days, +18 from baseline	$145	$497,280

Although direct property damage to local businesses from heat is typically limited compared to other climate hazards, prolonged extreme heat can still lead to substantial indirect losses (County of Santa Clara, 2015). These include lost sales tax revenue, decreased foot traffic, reduced output, and increased cooling costs (Çevik, 2024; Poledna et al., 2018). Currently, many local businesses in older buildings lack

[4] Estimates for the number of outdoor workers in Mountain View were calculated using data from Data USA, which compiles workforce data from the U.S. Census (Data USA, n.d.).

air conditioning systems. The cost of installation or retrofits for small businesses is burdensome, and the spaces may become unviable during extreme heat. Other potential disruptions, while currently unquantified, include transportation delays, power outages, increased water demand, and rising crime, all of which can interfere with daily operations and increase business costs (County of Santa Clara, 2015). Power outages may cause data centers to face severe shutdowns, data loss, and service interruptions (Cross Dependency Initiative, 2025). While local roads are expected to remain resilient to heat in the near term, their sensitivity may increase toward the end of the century with higher temperatures and more frequent extreme heat days, which could result in impacts to business due to transportation disruptions. The potential direct and indirect impacts to businesses due to climate hazards, including extreme heat, are summarized in Figure 14 below.

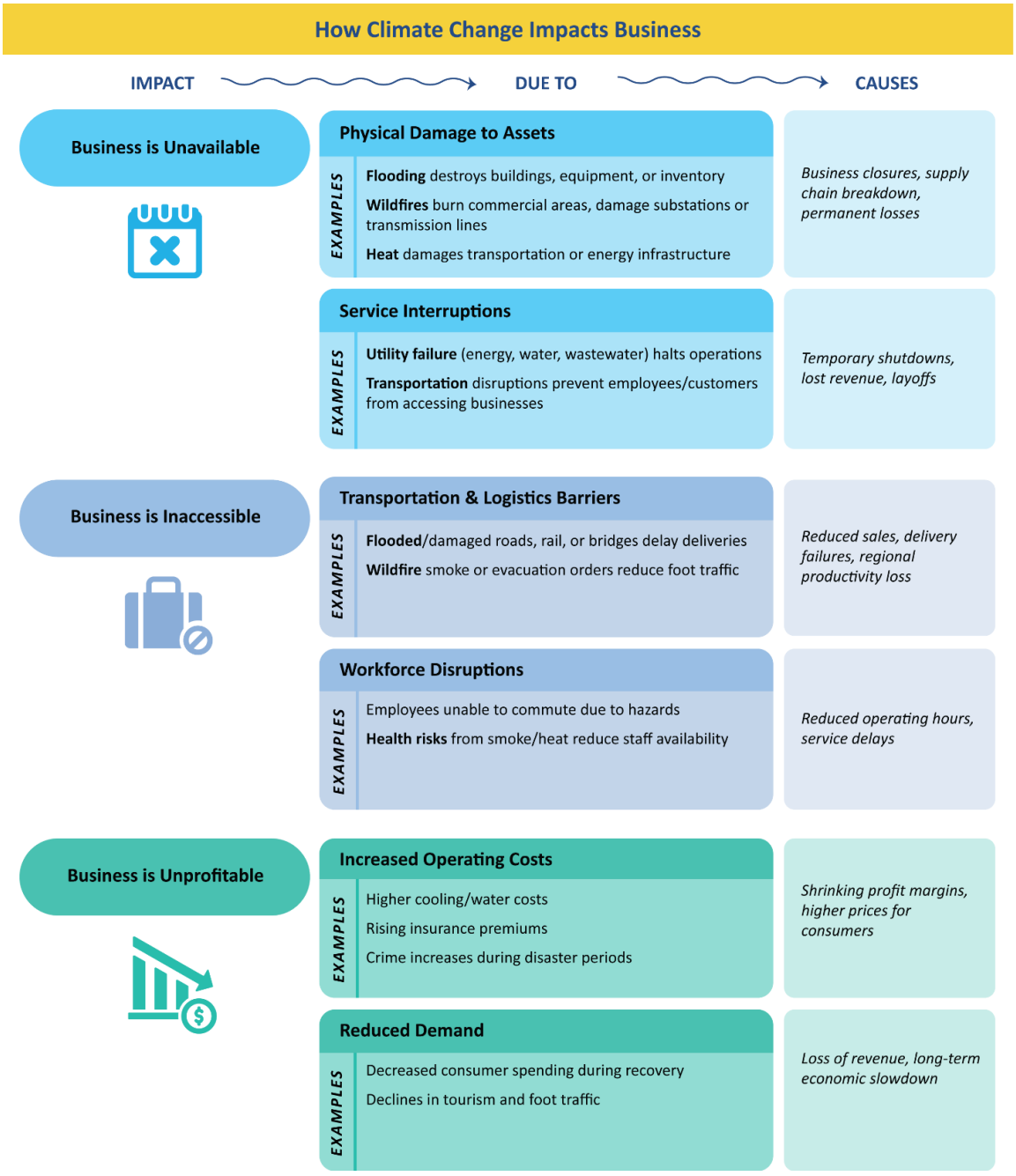


Figure 24. How climate change impacts business (Çevik, 2024; Poledna et al., 2018).

Extreme Precipitation and Flooding

Climate change is likely to cause heavier rainfall concentrated in fewer storms, increasing the chances of flash floods and stormwater system overflows in Mountain View (Ackerly et al., 2018; Bedsworth et al., 2018). Flood risk will vary depending on the condition of stormwater infrastructure, building age and condition, and impervious surface coverage. As shown in Figure 15, there are commercial, office space, and industrial zones within the 100-Year flood hazard zone, primarily north of and along Highway 101, that are particularly vulnerable to flooding. Areas in the 100-year flood hazard zone have

a 1 in 100 chance of flooding each year based on historical averages. In addition, there are commercial, mixed use, office space, and industrial zones within the 500-year flood hazard zone, which have a 1 in 500 chance of flooding each year based on historic conditions. Given that climate change is expected to cause heavier precipitation during extreme rainfall events, this flooding may become more frequent in the future. Several major office developments, including Google buildings at Charleston Road and Landings Drive, and Intuit buildings on Marine Way, are located within designated flood hazard zones (County of Santa Clara, 2024b). In addition, there are two data centers located in the 500-year flood hazard zone (County of Santa Clara, 2015c). All new developments in the flood hazard zone must be floodproofed as required by the City code. The 100-year and 500-year flood hazard zones contain structural assets valued at over $670 million, representing significant exposure for both public and private infrastructure (County of Santa Clara, 2024a).

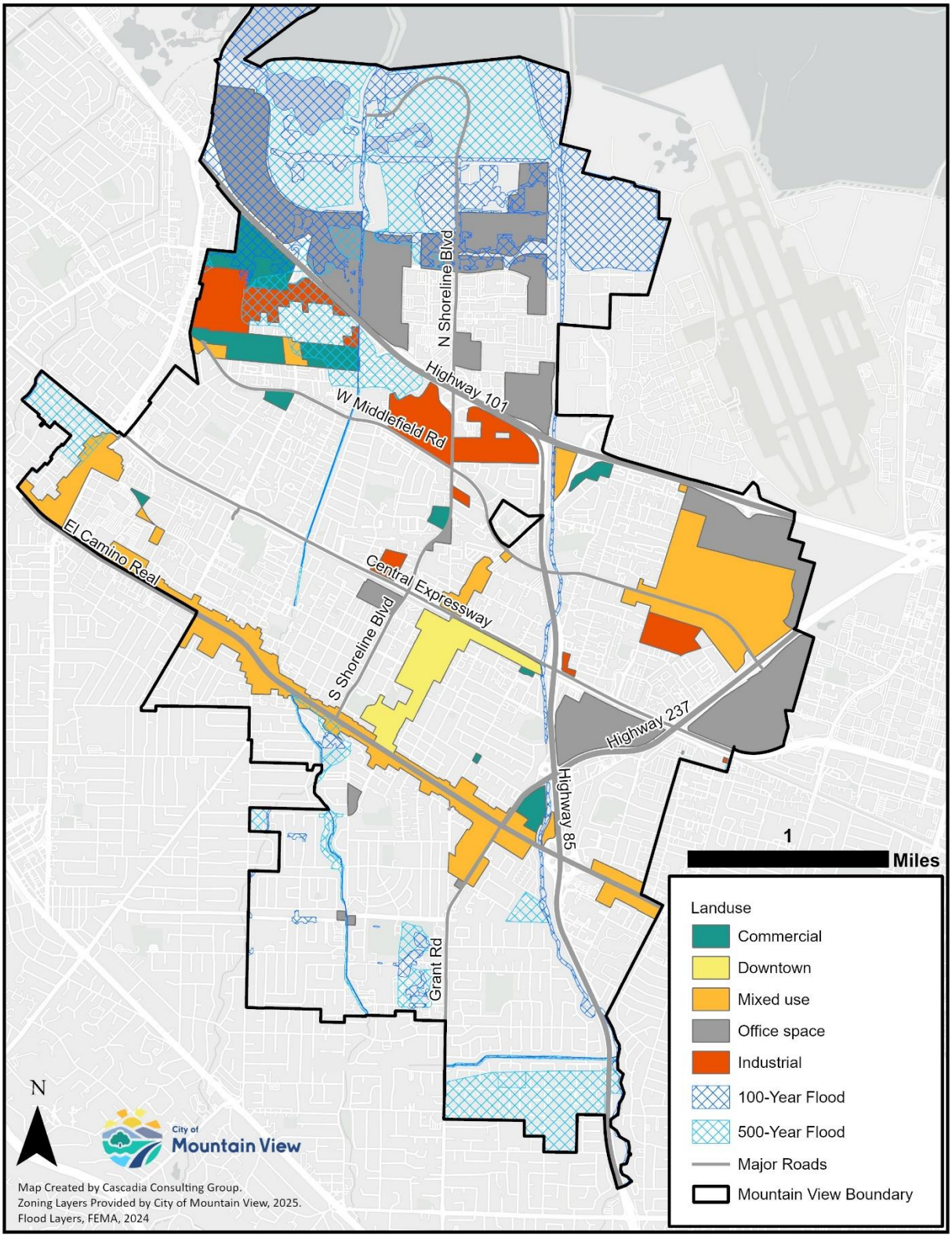


Figure 25. Non-residential zones overlayed with 100-year and 500-year flood hazard zones. There are commercial, mixed-use, office space, and industrial zones within the flood hazard zone.

Riverine flooding could severely disrupt local economic activity. Countywide, a flood event is projected to cause over $13 billion in building replacement costs alone, with additional impacts including $3-13 billion in economic activity interruption and $18-$90 million in fiscal revenue losses due to reduced assessed building values (County of Santa Clara, 2015).[5] For example, riverine flooding can cause severe damages to electronics, walls, roofs, and power systems, resulting in disabled power supply and severed fibre-optic connectivity at data centers (Cross Dependency Initiative, 2025). Past events highlight the magnitude of this risk: in 1998, flooding in Santa Clara County caused more than $20 million in damages, including localized flooding in Mountain View due to the overbanking of Hale and Permanente Creeks (County of Santa Clara, 2015).Businesses in affected areas may face impacts beyond direct damages including service interruptions, supply chain delays, and long-term closures (Çevik, 2024; Polina et al., 2018). Indirect impacts, such as road and rail shutdowns, can delay or prevent employees and customers from accessing business, decrease foot traffic and consumer spending, impede or delay goods movement, and reduce regional productivity. Additional impacts that can contribute to the economic burden of flooding include loss in tax revenue, increased insurance claims and rising insurance premiums, displacement and moving costs, and costs associated with flooding deaths.

Wildfire and Wildfire Smoke

While there is a low exposure risk of wildfire ignition in Mountain View, a wildfire in the region would significantly impact local businesses (County of Santa Clara, 2024a). Damage to regional energy infrastructure, including substations, transmission lines, and power generation facilities, can trigger power outages, communication failures, and supply chain delays that may affect daily operations in Mountain View. Prolonged outages can disrupt manufacturing, retail, and service industries, while increased heat and smoke may limit outdoor work and decrease consumer activity (Çevik, 2024; Poledna et al., 2018). Data centers could see disruptions from cooling or power system failures, regional outages, or blocked access to infrastructure, in addition to costly equipment repairs (Cross Dependency Initiative, 2025). Even in areas not directly affected by flames, businesses may experience closures, staffing shortages, or reduced consumer activity during evacuation periods. These disruptions can compound losses across sectors, making recovery more difficult for small and large employers alike.

Mountain View is already experiencing the effects of worsening air quality from wildfire smoke, a trend expected to intensify as fires both near and far grow more frequent (County of Santa Clara, 2015a; Dremann, 2025). Wildfire smoke can disrupt the local economy by reducing earnings and employment outcomes, as individuals respond by spending more time indoors, reducing outings, or missing work (Lappe & Vargo, 2022). The Standford Institute for Economic Policy Research found that a day of smoke reduces quarterly per capita earnings by $5.20, or about 0.10 percent (Borgschulte et al., 2022). While outdoor workers make up a relatively small share of the city's workforce (7.19%), they face heightened risks in addition to those who work in poorly ventilated indoor spaces (City of Mountain View, 2024b; Data USA, n.d.). For workers already vulnerable due to health or housing challenges, adapting to wildfire smoke will be even more difficult. Over time, businesses and workers may need to shift

[5] This analysis estimates the economic consequences in order of magnitude under a mid-century climate change scenario in which no adaptive measures have been taken.

seasons, relocate, or even change industries, creating new costs for employers, employees, and consumers (Lappe & Vargo, 2022).

Adaptive Capacity

There are several existing City, regional, and private sector efforts which support Mountain View's ability to adapt to projected climate impacts. The City building code includes floodproofing and air filtration requirements that will enhance resiliency for new developments. Mountain View's Economic Vitality Strategy includes goals to support small businesses, promote entrepreneurship, and enhance business diversity. While not currently focused on climate adaptation, this framework supports local economic stability, which is foundational to resilience (City of Mountain View, 2024b). Mountain View's Sustainability Action Plan 4 and Strategic Pathways Through 2030 promote green business certification and support public-private collaboration (City of Mountain View, 2024).

Large technology employers like Google have historically focused more on sustainability and emissions reduction than on climate resilience, though some steps toward adaptation are emerging. Alphabet's 2024 CDP Climate Change Response notes resilience planning for facilities such as the Bay View campus in Mountain View, designed with flood protection and sea-level rise in mind, and efforts to improve data center efficiency under drought and heat stress (Alphabet, 2024). The Silicon Valley 2.0 Climate Adaptation Guidebook recommends broader collaboration among tech campuses to create shared adaptation strategies and avoid fragmented, site-specific responses (County of Santa Clara, 2015a). Expanding regional coordination may enhance Mountain View's ability to manage climate risks effectively.

Finally, regional studies have found that economic resilience is closely tied to financial and social resources at the local level (Ackerly et al., 2018). Community capacity to prepare for and recover from climate hazards, including floods, heatwaves, and wildfires, is shaped by existing inequalities. People already living on economic margins are particularly vulnerable to disruption, and affordable, safe housing remains a cornerstone of regional resilience (Ackerly et al., 2018). Increasing costs due to climate change, driven by property damage, rising insurance rates, and increased demand for energy, will continue to push out lower-wage workers in essential sectors such as retail, food service, and education, straining the local workforce. Furthermore, small businesses may struggle to adapt to higher repair and operating costs, in addition to reduced consumer spending.

3.4. Housing and Infrastructure

Mountain View's housing, transportation, and stormwater systems form the backbone of the city's built environment and are critical to safe and reliable living conditions, mobility, and public services. These systems are increasingly vulnerable to the impacts of climate change, which can disrupt daily life and strain essential infrastructure.

Prolonged heat can reduce habitability in older or poorly insulated homes, damage infrastructure, and strain energy and cooling systems. Heavy rainfall and rising groundwater can overwhelm drainage systems, flood homes, and disrupt transportation routes. While, wildfire smoke and air pollution can

reduce indoor air quality and make outdoor travel unsafe, affecting both residents and essential workers.

Vulnerability varies across Mountain View depending on building age, location, and access to resources. Renters, low-income households, residents of mobile home parks, and those living near major roadways or in low-lying areas are particularly at risk. Strengthening the resilience of housing, transportation, and stormwater systems will be essential to safeguard health, maintain mobility, and ensure that all residents have stable, safe, and climate-resilient places to live.

HOUSING

Housing supports the safety, stability, and well-being of Mountain View residents. More frequent extreme heat events, heavier rainfall and flooding, wildfire smoke and worsening air quality impact the city's housing stock and residents. These climate stressors can damage structures, reduce habitability, displace residents, and deepen existing housing and environmental health inequities, particularly for those with limited resources and fewer housing options.[6] Table 9 below characterizes the vulnerability of housing to climate hazards.

Table 10. Climate risks to housing.

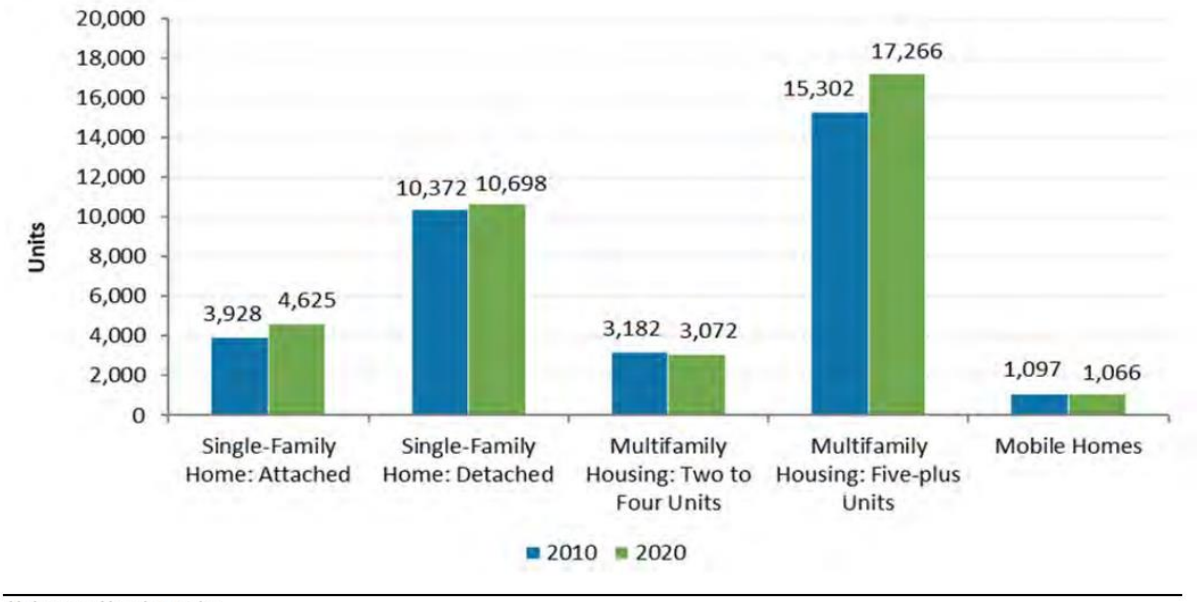
Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptive Capacity	Overall Vulnerability
Extreme Heat	High	Very High	High	High	**High**
Extreme Precipitation & Flooding	Low	Low	Very High	Moderate	**Moderate**
Wildfire	Low	Moderate	Very High	High	**Moderate**
Wildfire Smoke	Low	Very High	Low	Moderate	**Moderate**

[6] The City's 2023–2031 Housing Element highlights key challenges, including a high share of renters, the demolition of over 1,000 apartments, and disproportionate housing burdens on lower-income residents, seniors, people with disabilities, large households, and Hispanic/Latinx communities (pp. 82–83).

Who is most at risk?

- Low-income renters
- Residents of poor-quality housing
- Individuals with mental or physical health conditions
- People living with disabilities or limited mobility
- Racial ethnic groups that experience housing-related discrimination
- Cost-burdened households
- Unhoused or unstably housed individuals

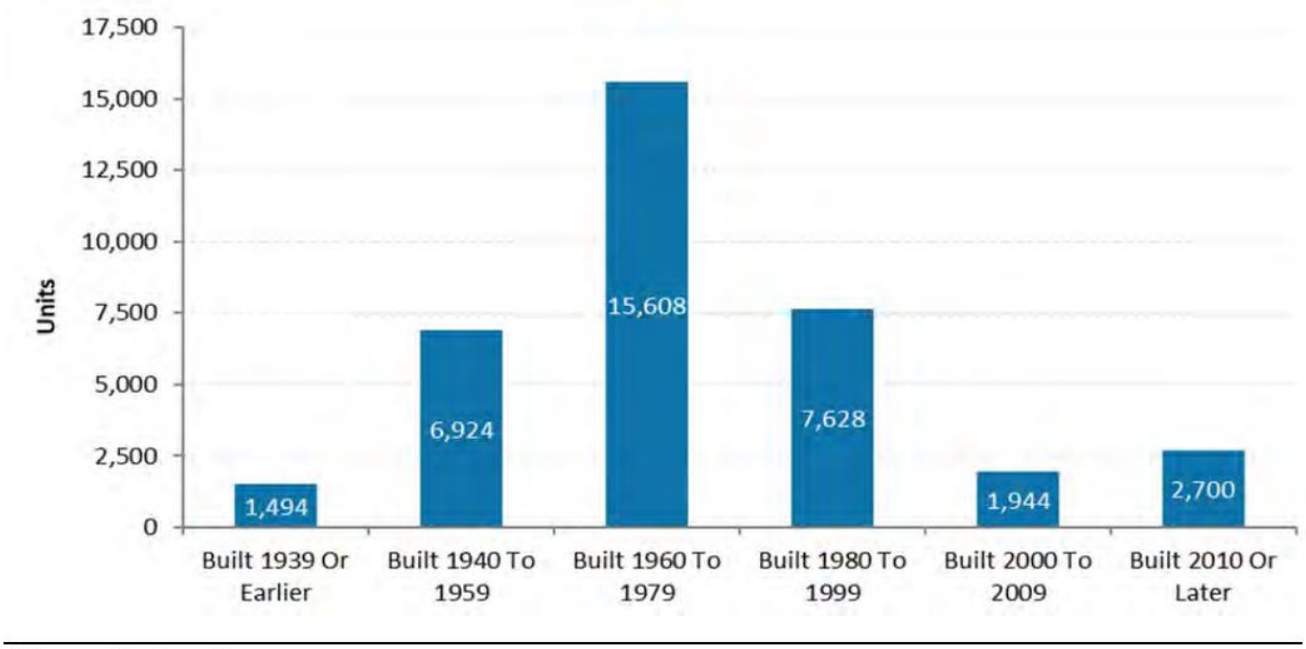
As of 2020, the housing stock in Mountain View was made up of 29.1% single-family detached homes, 12.6% single family-attached homes, 8.4% multifamily homes in structures with two to four units, 47.0% multifamily homes in structures with five or more units, and 2.9% mobile homes (Figure 16) (City of Mountain View, 2023a). More than half of Mountain View households are renters, a higher proportion than in Santa Clara County or the Bay Area overall (City of Mountain View, 2012). Many renters live in multifamily housing with five or more units, which makes up the largest share of the city's housing stock and experienced the most growth between 2010 and 2020 (City of Mountain View, 2023a).



Universe: Housing units
Sources: California Department of Finance, E-5 series; BAE, 2021.

Figure 26. Housing units by type, 2010-2020.

The largest proportion of Mountain View's housing stock was built between 1960 to 1979, with 15,608 units constructed during this period (Figure 17) (City of Mountain View, 2023a). Approximately 7.4% of the city's current housing stock has been built since 2010. The City's 2030 General Plan envisions most new housing being built densely in areas like North Bayshore, El Camino Real, and the San Antonio Change Area, locations where residents will have strong access to jobs, services, and transit. However, these areas may also face elevated exposure to climate-driven environmental hazards like flooding, extreme heat, and air quality impacts, respectively.



Universe: Housing units
Sources: U.S. Census Bureau, American Community Survey 5-Year Data (2015-2019), Table B25034; BAE, 2021.

Figure 27. Housing units by year structure built.

Climate Risks

Extreme Heat

Extreme heat poses risks for residents living in heat islands, areas that absorb and retain heat due to factors like low tree canopy coverage and high concentrations of dark, dense, surfaces (e.g., pavement or roofing materials). Residential buildings located in those areas may further trap heat depending on their design: poor insulation, old windows, limited ventilation, lack of active cooling systems, and dark-colored roofing or siding that absorbs more sunlight may expose occupants to dangerous temperatures during heat events (Gabbe et al., 2023). Older mobile homes (or "manufactured housing") tend to be energy inefficient and can be difficult to heat or cool to a stable temperature, especially those constructed before the Federal Manufactured Home Construction and Safety Standards were established in 1976 (Curran-Groome et al., 2025).

Household characteristics of occupants also affect exposure to heat at home. Low-income residents of Mountain View may struggle to balance energy cost burden (e.g., paying electricity bills for air

conditioning if available) on top of housing cost burden when faced with extreme heat events. Low-income renters often live in affordable or older housing and have limited control over building conditions. Unhoused and unstably housed people, including those living in vehicles, are also at risk from heat due to lack of access to water and air-conditioned spaces, a variety of chronic stressors, and physical and mental health conditions (Figure 18). Low-income and unhoused residents are more likely to be exposed to dangerously hot living conditions that contribute to heat-related illness or deaths (see Physical Health for more information).

The Trust for Public Land urban heat island severity map measures relative heat severity on a scale of 1 to 5, with 1 being a relatively mild heat area (slightly above the mean for the city), and 5 being a severe heat area (significantly above the mean for the city). [7] This shows where certain areas of cities are hotter than the average temperature for Mountain View as a whole. Based on this heat measure, most of Mountain View's multifamily rental buildings are in areas of above average heat, while buildings in Shoreline West, Blossom Valley, blocks south of Rengstorff Park, and blocks east of Sylvan Park are in severe heat areas (Figure 18). All six of Mountain View's mobile home parks are located in areas that are above the city's mean temperature. Sunset Estates Mobile Home Park, New Frontier Mobile Home Parks, and Sahara Mobile Village on the east side are in severe heat areas, measuring significantly above the average temperature in the city when the satellite readings were taken. Affordable housing buildings in the Castro City neighborhood are also in a hot area relative to the rest of the city.

Table 11. Housing in severe heat areas.

Housing type	**In a severe heat area** (4 or 5 Heat Severity Score)	**In an area of above average heat** (1-5 Heat Severity Score)	**Total**
Multifamily rental housing (# of buildings)	116 (16.5%)	629 (89.6%)	702
Subsidized housing (# of buildings)	3 (12%)	20 (80%)	25
Mobile home parks (# of parks)	3 (50%)	6 (100%)	6

[7] The urban heat severity map shows the relative heat severity for every pixel for every city in the United States, including Alaska, Hawai'i, and Puerto Rico. This 30-meter raster was derived from Landsat 8 imagery band 10 (surface-level thermal sensor) from the summer of 2023. The absolute heat above mean values are classified into these 5 classes using the Jenks Natural Breaks classification method, which seeks to reduce the variance within classes and maximize the variance between classes.

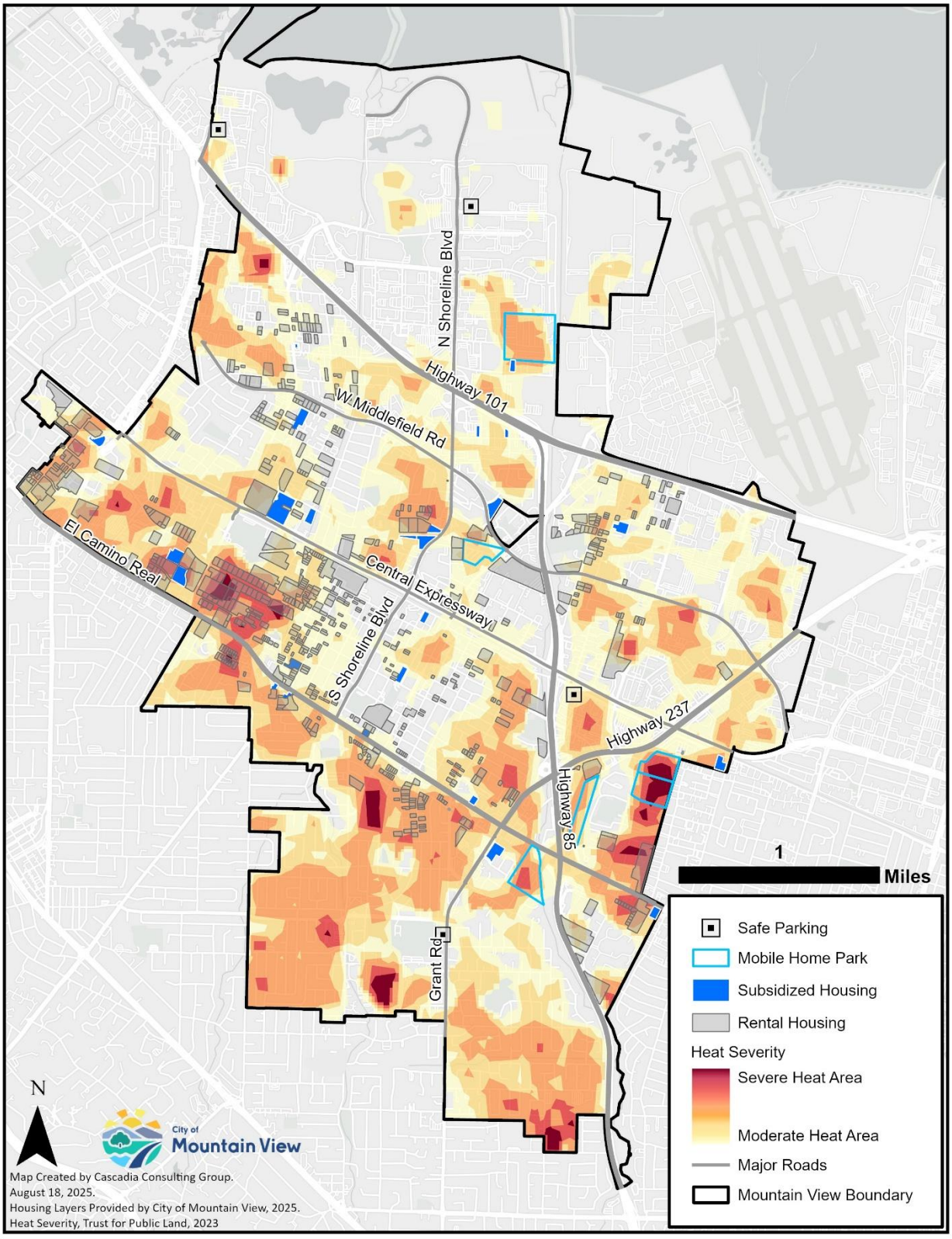


Figure 28. Types of residential areas and heat severity (Trust for Public Land, 2024).

Mountain View's population swells during the day from an estimated 88,760 people to 124,641 as workers commute into the city. While daytime populations[8] are exposed to the hottest parts of the day, with an estimated 6,738 people living or working in areas scoring either 4 or 5 in heat severity, even more people (approximately 7,136 or 8% of the population) are living in homes in these areas and may face high overnight temperatures (Table 11). Hot nights also cause stress on the body and are associated with higher rates of mortality during heat waves (Seltenrich, 2023).

Table 12. Populations in severe heat areas.

Heat Severity Score	2025 Residential Population	2025 Daytime Population	2025 Daytime Population: *Residential*	2025 Daytime Population: *Worker*
1	19,955	18,598	7,696	10,902
2	21,048	18,870	8,802	10,068
3	18,155	29,057	8,151	20,906
4	4,908	4,551	1,993	2,558
5	2,228	2,187	1,053	1,134

Air Quality

Housing near highways and major roads faces additional exposure to ozone and traffic-related pollution, which will be intensified by higher temperatures and stagnant air caused by climate change (Horton et al., 2012). Mountain View's northern neighborhoods, such as Monta Loma, North Whisman, and Shoreline West, are currently most impacted by traffic and diesel particulate matter emissions from trucks, buses, trains, and other equipment. This is likely due to the area's proximity to Highway 101.

Some of Mountain View's market-rate affordable housing and planned affordable housing projects are located in these northern neighborhoods. Census tracts in north Mountain View with higher pollution includes North Bayshore and other neighborhoods adjacent to Highway 101, which are slated to accommodate the largest share of new affordable housing units during the Housing Element planning period (2023–2031), based on findings from the City's Rapid Housing Needs Assessment (RHNA).[9] The

[8] Daytime population represents the number of people present in an area during typical working hours, including those who commute in for work. This differs from the resident population, which reflects those who are in the area during evening and nighttime hours.

[9] CalEnviroScreen, a product of California's Office of Environmental Health Hazard Assessment, provides a methodology to assist in identifying whether a local community is disproportionately burdened by pollution. For every Census Tract in the state, CalEnviroScreen produces a score using environmental, health, and socioeconomic information derived from government sources, with higher scores associated with a higher pollution burden. A higher score indicates worse environmental conditions.

RHNA notes that, among approved projects, pending projects, and available sites combined, units in these census tracts account for 25% of lower income units, 11% of moderate-income units, and 42% of above moderate-income units. Some of the sites for these units are located close to the freeway (City of Mountain View, 2012). There could be health impacts on residents who move into these units, and especially lower income residents who may lack access to health care to treat chronic respiratory and cardiovascular conditions, which can be caused or worsened by poor air quality conditions.

Extreme Precipitation and Flooding

Areas in Mountain View where housing is at risk of flooding due to proximity to creeks and being within the flood hazard zones include neighborhoods near Permanente Creek, Stevens Creek, and the Bay (Table 12). Increased instances of flash flooding and stormwater overflow due to climate change could impact basements, ground-floor units, older units not built to current building and floodplain management codes, and mobile home parks in low-lying and creek-adjacent residential areas (e.g., those along Stevens Creek) (Figure 19) (County of Santa Clara, 2024a).

Table 13. Housing in flood hazard zones.

Housing type	500-Year Flood hazard zone	100-Year Flood hazard zone	Total
Multifamily rental housing (# of buildings)	61 (8.7%)	56 (8%)	702
Subsidized housing (# of buildings)	6 (24%)	0 (0%)	25
Mobile home parks	3 (50%)	1 (16.7%)	6

Figure 29. People cycling at Shoreline Park.

Twelve percent of the city is located within special flood hazard areas, [10] according to the Federal Emergency Management Agency (FEMA) maps of Mountain View's flood hazard zones. Homes in these areas may be at risk of flooding. Sea level rise may lead to rising groundwater tables. That combined with projections of heavier precipitation during storms may overtax stormwater infrastructure and lead to basement seepage or flooding, even in areas outside of the flood hazard zones (Befus et al., 2020; Bosserelle et al., 2022). Floodwater can damage building foundations, basements, electrical systems, and landscaping, especially in older buildings that are not built to modern standards. Currently, the city participates in the National Flood Insurance Program Community Rating System, which gives a 10 percent discount on insurance rates for the community by exceeding minimum standards for flood risk reduction. However, homeowners could face challenges related to increasing flood insurance premiums, costs associated with retrofitting or repairing their units, damaged possessions, temporary or permanent displacement, and flood-related injuries. Homes that experience repeated flooding or are in flood-prone areas may become difficult to insure or sell, reducing property values and increasing financial vulnerability over time.

[10] *100-year flood area (also called the 1% annual chance flood hazard zone):* This area has a 1% chance of flooding in any given year. It does not mean flooding happens only once every 100 years, but rather that, in any given year, there's a 1 in 100 chance of a flood of that magnitude or greater occurring. Over a 30-year mortgage, that translates to about a 26% chance of experiencing such a flood. These areas are often labeled as "Special Flood Hazard Areas (SFHAs)", and properties within them typically require flood insurance if they have federally backed mortgages.
500-year flood area (also called the 0.2% annual chance flood hazard zone): This area has a 0.2% chance of flooding in any given year, or a 1 in 500 chance annually. These areas are considered lower risk than the 100-year flood hazard zone, but they can still flood, especially as climate change increases the frequency and intensity of extreme storms.

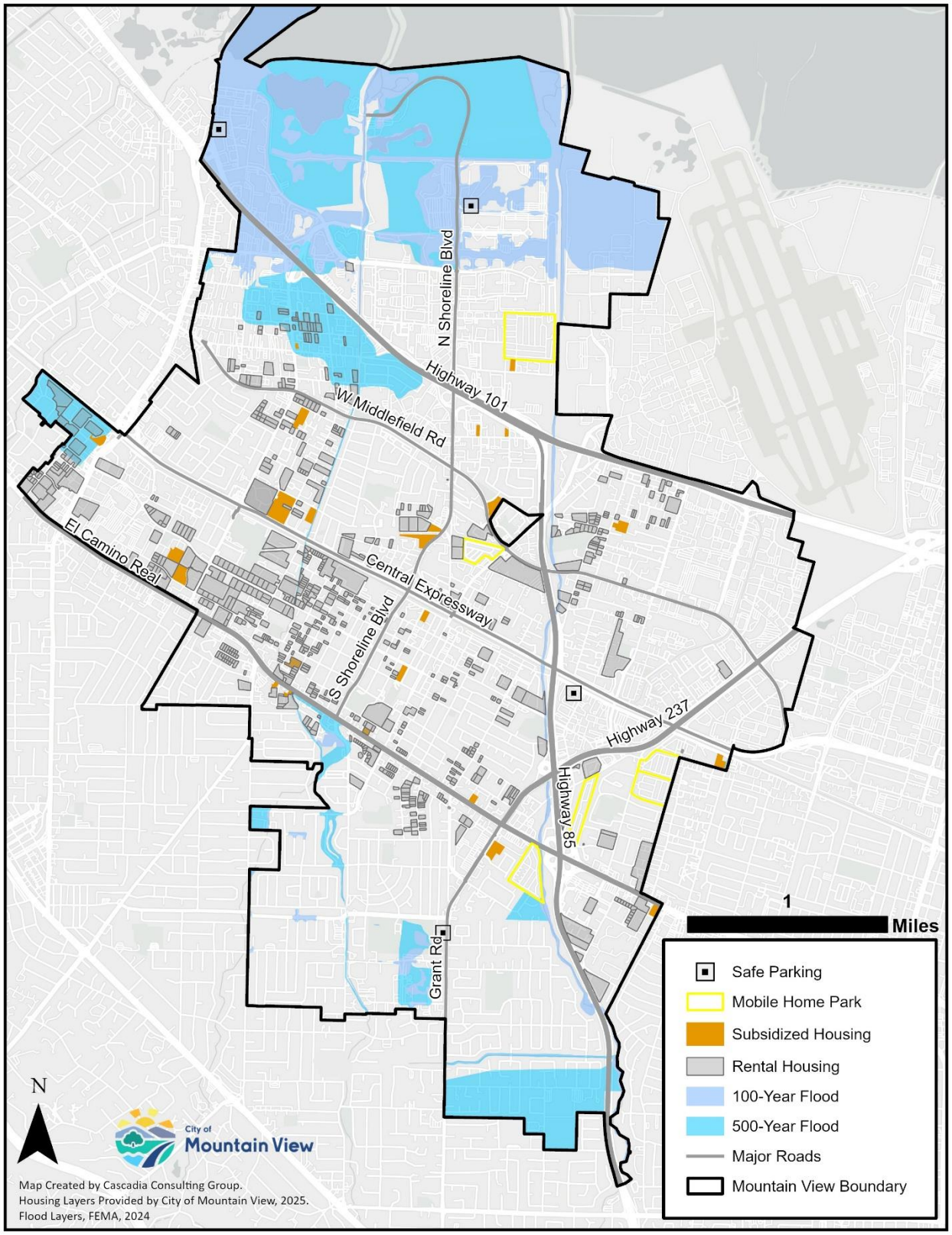


Figure 30. Types of residential areas and flood risk.

Flooding can create financial burdens for renters (e.g., finding temporary housing or replacing lost items) and can lead to displacement (Headwaters Economics, 2023). Although only a small portion of Mountain View's multifamily and subsidized affordable rental housing is located in the FEMA flood hazard zones (see Table 12 and Figure 20), renters tend to have fewer financial and legal resources, making them more susceptible to displacement and long-term hardship following a disaster (City of Mountain View, 2012). This is particularly true for low-income tenants of both naturally affordable housing as well as subsidized affordable housing units, which are only available to very low and extremely low-income households. Furthermore, renters often have limited control over whether a unit is weatherized properly, or remediation and repair is conducted to a particular standard or in a timely manner after a flood.

Half of Mountain View's mobile home parks sit in the regulated flood hazard zones and may face increased flood risk due to climate-exacerbated rainstorms. After a flood, mobile home residents are disproportionately likely to face barriers in accessing public assistance, more likely to experience long-term recovery problems, and more likely to be permanently displaced (Rumbach et al., 2020; Wilson et al., 2021). These disparities make mobile home park residents a population to prioritize for flood mitigation and recovery efforts.

Sea Level Rise and Coastal Flooding

The City's Shoreline Sea Level Rise Study Update identifies that the Bay could rise between 23 and 42 inches by 2070, which has the potential to flood a large portion of northern Mountain View (City of Mountain View, 2021). The North Bayshore was selected for extensive housing development in the 2030 General Plan and is situated in Mountain View's coastal zone, making coastal flooding, sea level rise, and stormwater a primary concern there. Sea level rise may impair stormwater drainage and result in backflow (Doan et al., 2024). The City is undertaking several capital projects to mitigate flooding in these areas, as outlined in the Sea Level Rise Capital Improvement Plan. Private developments in the area within FEMA 100-year special flood hazard areas are subject to special construction and insurance requirements (City of Mountain View, 2021).

Figure 31. Planned housing development area per North Bayshore Master Plan (City of Mountain View, 2020).

Wildfire and Wildfire Smoke

Mountain View is not located within a designated high Fire Hazard Severity Zone (CAL FIRE) and is therefore not expected to experience major wildfire events like those that have damaged and destroyed residential neighborhoods in other California cities (First Street, 2025).

Wildfire activity in the Bay Area is projected, which could lead to displacement of residents in various Bay Area cities. This could indirectly impact Mountain View by contributing to increased housing demand and costs. Furthermore, insurance premiums across California continue to rise due to increased wildfire risk statewide and increased losses for insurers (Kaenel, 2025). These premiums create cost burdens for homeowners as well as additional barriers to pursuing home ownership in Mountain View. Insurers may choose to limit coverage in the future or not renew existing policies due to increasing fire risk.

Additionally, smoke exposure from regional fires could contribute to poor indoor air quality within Mountain View housing (Westerling, 2018). As smoke events become more frequent and prolonged, with rising levels of fine particulate matter (PM2.5) contributing to more poor air quality days, many homes, particularly older units, are vulnerable to smoke infiltration due to poor sealing, lack of filtration systems, and outdated ventilation.

Adaptive Capacity

Enhancing the adaptive capacity of Mountain View's housing is essential to protecting residents from the growing risks of extreme heat, wildfire smoke, flooding, and poor air quality. A range of strategies spanning building design, public infrastructure, neighborhood planning, community engagement, and emergency preparedness can help improve resilience, particularly for vulnerable populations in older or

affordable housing. For example, urban greening strategies, including tree planting, green infrastructure, and reflective roofing, can mitigate urban heat island effects, while building-specific data on cooling access, air filtration, and tenant vulnerability can inform targeted investments.

Mountain View has taken steps to support adaptive capacity through existing housing and economic development efforts. To prevent displacement and increase housing affordability, the City has adopted policies such as high-density zoning, rent-stabilization and just cause evictions, rental unit replacement requirements, and tenant relocation assistance (County of Santa Clara, 2024). These policies aim to reduce housing instability, particularly for lower-wage workers in essential sectors. The City also partners with public and private entities to improve disaster preparedness and mitigation, including participation in countywide hazard planning and coordination with emergency service providers.

In December 2017, the City Council adopted the updated North Bayshore Precise Plan to help the city adapt to climate change by prioritizing development away from the Bay, which is vulnerable to sea level rise, and by enhancing ecosystems and habitats (City of Mountain View, 2020). By ensuring that future development follows the Plan's guidelines, the City seeks to reduce the impacts of sea level rise, the urban heat island effect, and other climate change impacts in the North Bayshore. The Precise Plan identifies infrastructure and capital improvements that are necessary to mitigate these risks (City of Mountain View, 2014).

Expanding building retrofit programs to address heat, flooding, smoke, and other air quality risks in affordable housing and older rental properties can reduce climate-related health and displacement risks. The Bay Area Air District's 2017 Clean Air Plan includes strategies to address air quality, such as promoting smoke readiness and improving filtration in public and private buildings (BAAD, 2017). Programs offered by BayREN, Silicon Valley Clean Energy (SVCE), and the Bay Area Air District (BAAD) provide technical support and funding for retrofitting and electrifying single family homes and multifamily apartment buildings, as well as improving indoor air quality (BayREN, 2021, 2025; Silicon Valley Clean Energy, 2025).

TRANSPORTATION

Transportation systems in Mountain View are critical for mobility, emergency response, and the local economy. Climate change poses growing risks to the reliability, safety, and equity of these systems. (MTC & ABAG, 2021).

Mountain View's transportation network includes major regional corridors like U.S. Highway 101, State Routes 85 and 237, and El Camino Real, local, and regional rail service via Caltrain, light rail and bus routes via Valley Transportation Authority (VTA), the Mountain View Community Shuttle, and a network of bicycle and pedestrian infrastructure (VTA, 2025). Parts of the network are vulnerable to climate-related disruptions such as mudslides, flooding, downed trees from storms, and extreme heat causing rail tracks to expand, buckle, and kink (County of Santa Clara, 2015, 2023; Simon, 2024). Road closures can also cut off access to essential services or delay emergency responses.

Transit-dependent populations, cyclists, and pedestrians face higher risks during climate events (MTC & ABAG, 2021). Poor air quality, extreme heat, or service interruptions can disproportionately affect those without access to private vehicles. VTA notes that riders with limited mobility or "access and functional needs" (AFN) who depend on VTA ACCESS paratransit services may be especially impacted by climate

hazards. Affordable, climate-resilient mobility options will play a key role in reducing these disparities and maintaining access for vulnerable residents.

Table 14. Climate risks to transportation.

Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptive Capacity	Overall Vulnerability
Extreme Heat	Moderate	High	High	Moderate	Moderate
Extreme Precipitation & Flooding	Moderate	Moderate	Very High	High	Moderate
Wildfire	Low	Moderate	Low	Moderate	Low
Wildfire Smoke	Low	High	Very Low	Moderate	Low

Climate Risks

Extreme Heat

Prolonged and more frequent heatwaves impact Mountain View's transportation infrastructure (Figure 22). Extreme heat can accelerate pavement degradation and may affect traffic signal systems and other heat-sensitive components, potentially reducing the reliability and safety of the transportation network (Caltrans, 2018). Extreme heat can also overheat light rail breaks, cause power outages, and increase the risk of steel rails buckling and warping, impacting Caltrain and VTA lines. Caltrain has speed restrictions in place based on heat thresholds: once the ambient temperature reaches 95°F, track inspections are required, and freight and light rail trains must reduce speed. These speed restrictions can cause service delays. VTA has identified extreme heat to be a growing problem across their service region unless adaptation measures are adopted, having already proven to slow light rail service speeds and cause maintenance delays (Santa Clara Valley Transportation Authority, 2024). Light rail, buses, and paratransit services are highly reliant on external electricity sources for charging the electric fleet and for traffic signals, so any power outages during flooding, wildfire, or extreme heat events will have significant impacts on service and have already proven to impact service in the past.

Extreme heat can also impact transit ridership, transit service, and the comfort, health, and safety of riders and workers. Riders may avoid using public transit during hot weather if stops and vehicles lack adequate shade or cooling. VTA notes cooling systems in buses can be difficult to maintain during extreme heat events. These disruptions can disproportionately affect transit-dependent populations and low-income residents who lack access to private vehicles, as highlighted in the Bay Area Heat Vulnerability Index (UCLA, 2021).

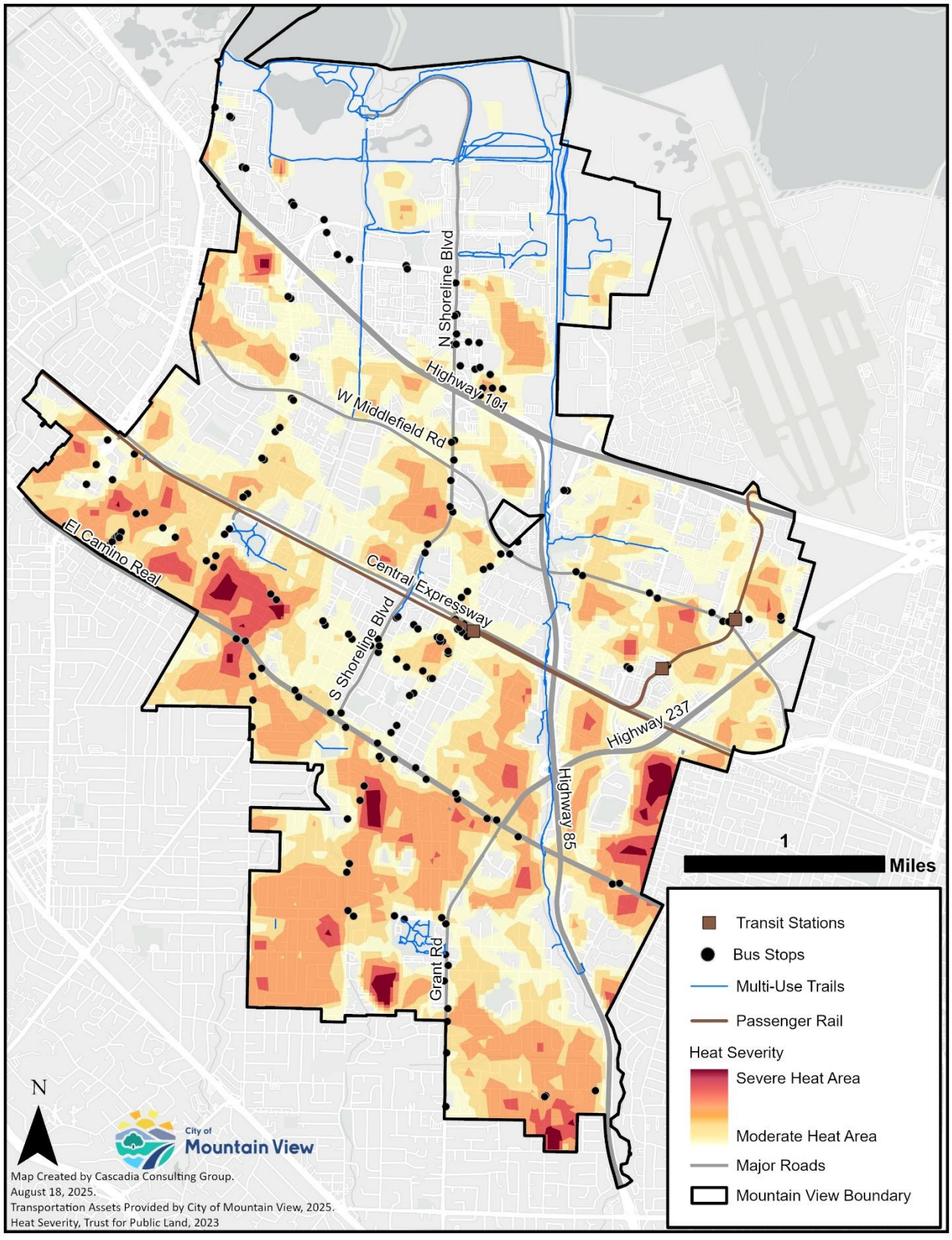


Figure 32. Transportation assets and extreme heat (Trust for Public Land et al., 2023).

Extreme Precipitation and Flooding

Localized flooding is a risk to Mountain View's transportation network, particularly along key arterials and underpasses such as Shoreline Boulevard, Charleston Road, and Central Expressway (County of Santa Clara, 2024). High-intensity storms can exceed the capacity of the city's stormwater infrastructure, leading to temporary road closures, traffic delays, and disruptions to emergency response routes. Flooding in these areas may significantly limit east-west connectivity, especially in neighborhoods with few alternative routes (Morgan, 2023). Mapping indicates that bus stops along MVgo's Route D in northwest Mountain View could be impacted by 100-year flood events, limiting access to the free shuttle that services those areas (Figure 23). In addition to those bus stops, 15.5 miles of roadway and 7.6 miles of multi-use trail are in the 100-year flood hazard zone (Table 14).

Table 15. Transportation assets in flood hazard zones.

Asset (Unit)	500-Year Flood	100-Year Flood
Bus Stops (#)	7	10
Multi-Use Trails (Miles)	6.7	7.6
Roadway (Miles)	16.9	15.5
Passenger Rail (Miles)	0.45	0

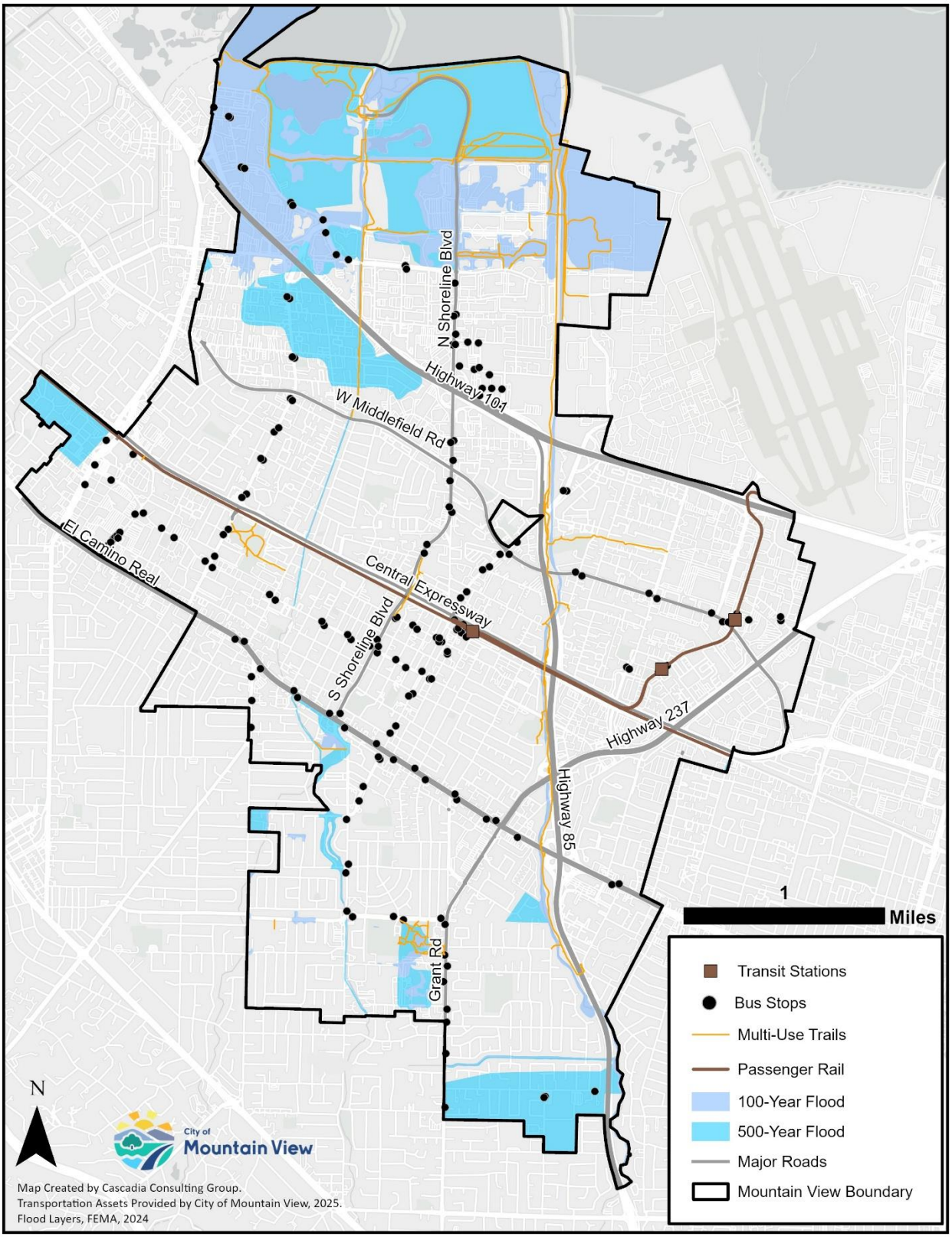


Figure 33. Transportation assets within the 100-year and 500-year flood hazard zones.

Regional transit infrastructure also faces risk. Sections of the Caltrain and VTA light rail systems run at-grade through flood-prone zones, making them susceptible to water-related service interruptions. In areas near the Bay, sea level rise and rising groundwater may compromise roadbeds and transit foundations through backflow or soil saturation (County of San Mateo, 2018; SFEI, 2019).

Wildfire

Mountain View is not located in a high fire hazard severity zone, and Caltrain and VTA light rail are sited outside of areas of high wildfire threat. However, regional wildfires can still disrupt transportation systems that support evacuation, mutual aid, and emergency response (CAL FIRE, 2024). Major roadways and rail lines that connect Mountain View to neighboring communities may face fire-related closures or detours, limiting regional mobility during critical events. The Santa Clara County Community Wildfire Protection Plan identifies the importance of maintaining access to evacuation corridors and ensuring redundancy in the broader transportation network to respond to increasing wildfire threats (Santa Clara County FireSafe Council et al., 2023).

Wildfire Smoke and Air Quality

Poor air quality from wildfire smoke events can reduce transit ridership, impact the health of transportation workers such as VTA and Caltrain operators, and discourage biking and walking while increasing health risks for residents that rely on active transportation and public transit to access jobs, schools, or services. (BAAD, 2017). These disruptions have disproportionate effects on residents without access to private vehicles, as well as those working outdoors or as transit workers.

Adaptive Capacity

While the City of Mountain View manages local roadways, active transportation infrastructure, and a community shuttle, most major transit services, including Caltrain, VTA light rail and bus, are operated and maintained by county and regional agencies. As such, Mountain View's adaptive capacity in the transportation sector relies heavily on coordination with Santa Clara County, the Valley Transportation Authority (VTA), and other regional partners (VTA, 2024).

Santa Clara County Valley Transportation Authority has outlined a commitment to integrating equity into emergency management through the C-MIST framework, which focuses on Communication, Maintaining Health, Independence, Safety, Support Services, Self-Determination, and Transportation, as a way to reduce disaster risk across the whole community (County of Santa Clara, 2024a; VTA, 2024). The County is also working to build and sustain partnerships with populations that experience transportation and service barriers during emergencies, such as people with disabilities, older adults, and transit-dependent residents (VTA, 2024). Mountain View's continued engagement in these regional efforts will be critical to ensure that emergency response and mobility services remain accessible and resilient in the face of climate change.

Mountain View's Active Transportation Plan (ATP) and Vision Zero Policy are also critical tools for building climate resilience. By expanding bike, pedestrians, and transit infrastructure, the City reduces dependence on cars, cutting emissions that drive climate change and contribute to air pollution. The ATP incorporates green treatments wherever possible: designing streets with shade trees, permeable pavements, and green stormwater features can help reduce urban heat, manage heavy rainfall, and

prevent localized flooding. Vision Zero's focus on equity and protecting vulnerable road users also increases adaptive capacity: safer, shaded, and accessible routes make it easier for all residents, including older adults, low-income households, and people living with disabilities or limited mobility, to reach cooling centers and other essential services during climate emergencies.

STORMWATER SYSTEMS

Mountain View's stormwater network includes pipes, culverts, pump stations, and green infrastructure that convey and treat runoff before it enters local creeks and the San Francisco Bay (SCVWD, 2019). These systems help safeguard neighborhoods, protect public health, and reduce pollution carried by stormwater.

As climate change increases the frequency and intensity of heavy rainfall and atmospheric river events, the city's drainage infrastructure will face greater pressure, as shown in Table 15. Intense storms can exceed system capacity, cause backups, and increase flood risk in low-lying and densely developed areas. Rising groundwater and sea levels further amplify these challenges by reducing drainage efficiency and accelerating shoreline erosion.

Table 16. Climate vulnerability to stormwater systems.

Climate Hazard	Exposure	Human Sensitivity	System Sensitivity	Adaptive Capacity	Overall Vulnerability
Extreme Precipitation & Flooding	High	Low	High	Moderate	High

Climate Risks

Extreme Precipitation and Flooding

Climate change is expected to increase the frequency and intensity of storms in Mountain View, leading to larger and more variable volumes of stormwater runoff. Heavier rainfall events, occurring over shorter periods, can overwhelm stormwater systems, resulting in localized flooding, property damage, and water quality impacts in creeks and the San Francisco Bay (Ackerly et al., 2018). These risks may be heightened in areas where stormwater infrastructure is undersized, aging, or already prone to overflow during seasonal storms.

The City's Public Works Department has emphasized the importance of understanding how future extreme precipitation events may impact critical stormwater infrastructure (City of Mountain View, 2025a). Potential vulnerabilities include:

- **Undersized or aging pipes** are overwhelmed during projected peak flows, including 10- and 100- year storms, increasing the risk of backups and localized street flooding.
- **Pump stations** can be disrupted if not equipped with backup power, reducing their ability to manage runoff during storm events.
- **Areas with recurring nuisance flooding** worsen under heavier rainfall, reflecting existing system constraints.

- **Maintenance and operational challenges** arise during back-to-back storm events, straining staff capacity and delaying repairs.

According to the City of Mountain View's 2019 Storm Drain Master Plan (SDMP), the city's storm drain system includes approximately 540,000 linear feet of storm drainpipe that primarily collects runoff through street inlets before discharging to nearby creeks and the Bay. While the system generally performs well under 10-year storm conditions, hydraulic modeling identified localized flooding during 25- and 100-year storm events, particularly in the North Whisman and Shoreline areas, where flat topography and undersized pipes limit drainage capacity. There are also specific locations where undersized pipes cannot accommodate runoff even during 10-year storms, such as south of Highway 101 near Charleston Road, along Fairchild Drive and North Whisman Road, and north of Cuesta Drive near Hale Creek (City of Mountain View, 2019). Additionally, storms during winter 2022 and 2023 required erosion repair for flood protections on Stevens and Permanente Creeks (Margaretten, 2023).

The SDMP found that approximately 12 percent of Mountain View lies within FEMA-designated flood hazard zones, with repeated nuisance flooding reported near the Shoreline Golf Course, Santiago Villa Mobile Home Park, and intersections along Plymouth Street, Higdon Avenue, and Cuesta Drive. These areas are expected to remain vulnerable during future high-intensity storms (10- and 100-year) unless drainage capacity is expanded or additional storage is created. Figure 24 (from SDMP Table 4-2) highlights these observed flooding locations across the city.

Observed Flooding Locations	Model Flood Prediction	
	10-Year	100-Year
Shoreline Golf Course	No	No
Santiago Villa Mobile Home Park	Yes	Yes
Plymouth St at Permanente Creek	No	No
Higdon Ave at Permanente Creek	Yes	Yes
Storm Drain Outfalls South of El Camino	Yes	Yes
Monsalto Dr at Hans Ave	Yes	Yes
Alta Creek at Cuesta Dr	Yes	Yes

Figure 34. Comparison between observed flooding locations and 10-year and 100-year flood predictions.

Hydraulic modeling results were used to evaluate the performance of Mountain View's five major pump stations, Amphitheatre Parkway, Coast Casey, Charleston Pond, Crittenden, and High-Level Ditch, which together manage a large portion of the city's stormwater runoff. Several facilities are over 30 years old and rely on aging electrical or mechanical systems that limit performance during concurrent high tide and rainfall events. While all of the pump stations are past their recommended replacement date, Amphitheatre and Charleston's recommended replacement years were 2012 and 2013 (City of Mountain View, 2019).

To supplement the findings from the SDMP, this analysis includes a GIS map overlaying Mountain View's stormwater pump station locations with FEMA's 100-year and 500-year flood hazard zones (Figure 25). The SDMP evaluated system performance primarily for 10-, 25-, and 100-year storm events but did not assess exposure under the 500-year flood scenario. Including the 500-year flood hazard zone provides additional context for identifying pump stations and surrounding areas that may face elevated flood risk during more extreme storm events.

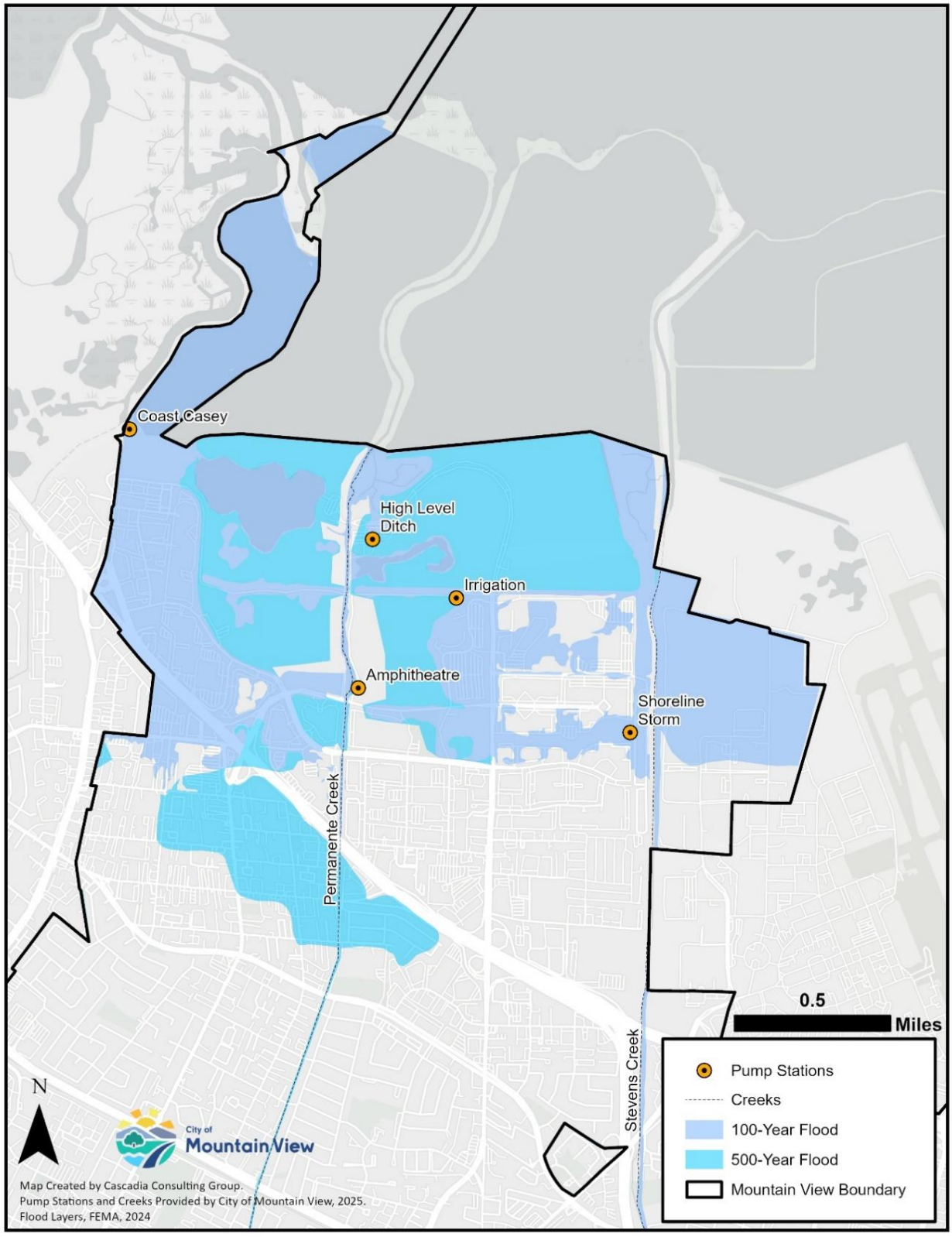


Figure 35. Locations of Mountain View's stormwater pump stations in relation to the 100-year and 500-year flood hazard zoness.

Adaptive Capacity

Mountain View's adaptive capacity for stormwater management is centered on its ability to reduce flood risk, maintain drainage performance during high-intensity storms, and ensure critical systems remain functional during power or pump failures. The city's Public Works Department maintains and operates storm drainpipes, culverts, and pump stations that collectively manage runoff from local neighborhoods to larger receiving waters, including Permanente Creek, Stevens Creek, and the San Francisco Bay.

The SDMP identifies over $47 million in priority drainage improvement projects, including storm drain replacements, new parallel pipes designed to improve conveyance under future 25- and 100-year rainfall events, and improvements to the City's pump stations. Planned upgrades include replacing undersized pipes, expanding detention basins, and upgrading pump stations to handle projected peak flows during 25- and 100-year storm events. In particular, improvements at the Amphitheatre Parkway, Coast Casey, Charleston Pond, Crittenden and High Level Ditch pump stations will help prevent flooding in North Bayshore and adjacent low-lying neighborhoods (Figure).

Pumps Station	Originally Constructed	Last Upgraded	25-Year Scheduled Upgrade	50-Year Scheduled Upgrade	Receiving Waterbody	Design Capacity
Amphitheater	1987	1994	2012	2037	Permanente Creek	74,000 gpm
Coast Casey	1980	1995	2018	2043	Palo Alto Baylands Slough	66,000 gpm
Charleston Pond	1980	1992	2013	2038	Stevens Creek	38,300 gpm
Crittenden	1999	n/a	2024	2049	Stevens Creek	71,800 gpm
High Level Ditch	1972	1994	2019	2044	Permanente Creek	4,200 gpm

Figure 36. Mountain View storm water pump station summary ***(City of Mountain View, 2019)****.*

Additionally, Mountain View is supported by a regulatory framework that requires development projects meeting certain criteria to comply with the Municipal Regional Stormwater NPDES Permit C.3 (California Water Boards, 2022). These requirements, along with regional programs such as the Santa Clara Valley Urban Runoff Pollution Prevention Program, the Santa Clara Basin Stormwater Resource Plan (2019), and the C.3 Stormwater Handbook (2016), promote best practices in stormwater design and reduce pollutant loading into the Bay through infiltration and other management practices.

4. Best Practices for Building Resilience

The CVA provides a foundation for understanding how climate change may affect Mountain View's people, infrastructure, and services. While this assessment does not prescribe actions or establish a resilience plan, the guidance shared in this section can inform future discussions about how the City and community partners might strengthen local resilience to climate impacts.

The following examples highlight best practices that could be explored to address key climate risks identified through this assessment. These ideas reflect approaches taken by other jurisdictions or recommended by state and federal agencies and would require further evaluation and community input before implementation.

Example Best Practices for Future Exploration:

- **Extreme Heat and Air Quality:** Expand tree canopy, shade, and cooling infrastructure; strengthen public health and emergency communication partnerships; explore opportunities for clean air and cooling spaces in high-exposure areas.
- **Flooding and Extreme Precipitation:** Continue to coordinate with regional partners on stormwater and green infrastructure improvements; promote neighborhood-scale stormwater capture and flood preparedness education.
- **Wildfire and Wildfire Smoke:** Coordinate with regional agencies on wildfire risk reduction and smoke response; identify clean air spaces and explore HVAC and filtration upgrades in key community facilities.
- **Community Health and Well-Being:** Partner with health and social service organizations to integrate climate considerations into existing public health and emergency preparedness programs.
- **Critical Facilities and Services:** Evaluate ways to strengthen redundancy, backup power, and facility resilience through existing capital planning processes.
- **Housing and Infrastructure:** Encourage climate-responsive design through ongoing code updates, affordable housing programs, and public infrastructure investments.

These examples illustrate potential directions the City may consider if it pursues a resilience planning process in the future. Additional analysis, funding, and engagement are needed to determine priorities and implementation pathways.

5. Appendix A: Methodology

This section describes how this CVA was developed, including the sources used to identify climate-related risks, their specific impact on Mountain View, and existing plans and policies that prepare the city for climate impacts.

5.1. Summary of Data Sources

A range of established and peer-reviewed resources specific to Mountain View was utilized to identify the observed and projected climate trends affecting the city. In cases where city-scale data was unavailable, the analysis used climate impact data at the Santa Clara County level, as referenced throughout the report. The CVA began with a climate impacts assessment to identify both current and projected climate impacts. The findings from this assessment highlight considerations for future hazard risks associated with climate change (See Appendix B: Climate Impacts Summary). The following data sources were reviewed and informed of the CVA.

City of Mountain View Data Sources and Documents

Source or Document	How It Informed the CVA
The Shoreline Regional Park Community Sea Level Rise Capital Improvement Program Update (2022)	Documented sea level rise projections and identified vulnerable assets within the Shoreline area. Informed the flooding and extreme precipitation analyses and helped align adaptation opportunities with existing capital projects.
Biodiversity and Urban Forest Plan (Draft)	Provided current goals and strategies for tree canopy enhancement, habitat connectivity, and ecosystem resilience. Informed the Health and Wellbeing sector by identifying biodiversity co-benefits of climate actions.
Mountain View's 2024–2025 Capital Improvement Plan (CIP)	Identified planned infrastructure investments and facility upgrades relevant to flood management, stormwater systems, and public facility resilience. Used to assess adaptive capacity and integration opportunities across sectors.
Economic Vitality Strategy	Informed the analysis of climate-related business impacts and resilience opportunities for the local economy, including implications for workforce, small business support, and economic continuity planning.
North Bayshore Precise Plan	Provided land use and development guidance for one of the city's most climate-exposed areas, informing the flooding, extreme heat, and housing vulnerability assessments.
City of Mountain View Mapping and GIS Data Portal	Supplied spatial data on city boundaries, zoning, land use, critical facilities, and infrastructure. Formed the basis for spatial exposure analyses and map development.

Regional Data Sources and Documents

Source or Document	How It Informed the CVA
California's Fourth Climate Change Assessment – San Francisco Bay Area Region Report	Provided downscaled climate projections, regional temperature and precipitation trends, and climate hazard context for Mountain View within the Bay Area region.
San Francisco Estuary Institute (SFEI) Flood Maps	Informed sea level rise, tidal flooding, and creek-based flood exposure analyses by identifying low-lying areas and future inundation extents.
Santa Clara County Public Health Department Open Data	Provided public health indicators, hospitalization data, and vulnerability metrics used to evaluate population sensitivity to extreme heat and poor air quality.
Santa Clara County Multijurisdictional Hazard Mitigation Plan 2023 Update – City of Mountain View Annex	Provided baseline hazard exposure data, critical facility information, and local mitigation priorities that informed the CVA's risk and adaptive capacity assessments.
Silicon Valley 2.0 Climate Adaptation Guidebook	Provided a regional framework and methodology for climate vulnerability and adaptation planning. Informed structure and scoring consistency across hazard types.
Silicon Valley 2.0 Climate Change Preparedness Tool	Supported quantitative assessment of exposure and adaptive capacity through regionally consistent data and indicators.

State and Federal Data Sources and Documents

Source or Document	How It Informed the CVA
Cal-Adapt	Provided localized climate projections for temperature, precipitation, and extreme heat events under multiple emissions scenarios. Core data source for exposure analyses and tables.
CalEnviroScreen 4.0	Identified environmental health disparities and pollution burden to assess social vulnerability and adaptive capacity.
CalFire Fire Hazard Severity Zone Viewer	Mapped wildfire hazard zones and wildland-urban interface (WUI) boundaries to evaluate direct and indirect fire exposure.
California's Fourth Climate Change Assessment	Offered state-level projections and policy context for integrating science-based climate data into local planning.
Trust for Public Land – Heat Severity Data	Provided high-resolution urban heat island and tree canopy data for assessing neighborhood-level heat exposure.
U.S. Census Bureau American Community Survey (ACS)	Supplied demographic and socioeconomic data for evaluating population sensitivity and adaptive capacity across census tracts.

6. Appendix B: Climate Impacts Summary

WARMING TEMPERATURES

The City of Mountain View is experiencing a warming trend, with hotter days becoming more common and extreme heat events occurring more frequently. These shifts reflect broader regional changes driven by climate change and are expected to accelerate in the coming decades. While the Bay Area has historically benefited from a moderate climate, projections show that rising temperatures will increasingly affect public health, energy systems, and infrastructure, particularly during prolonged heat events (Ackerly et al., 2018).

Historical Trends and Projections

Projections for Mountain View indicate a significant rise in annual average maximum temperatures over the course of the 21st century. As shown in Table 16, the historical average maximum temperature between 1961 and 1990 was 69.1°F. Mid-century projections (2035–2064) estimate an increase to 72.8°F, representing a 3.7°F rise. By late century (2070–2099), the average maximum temperature is projected to reach 75.9°F, an overall increase of 6.8°F from the historical baseline. These warming trends reflect broader regional climate shifts and may intensify heat-related impacts on public health, infrastructure, and the economy within Mountain View.

Table 17. Projected annual average maximum temperature.

Time Period	Annual Average Maximum Temperature	Change from Historical
Historical (1961-1990)	69.1 °F	
2035-2064	72.8 °F	+ 3.7°F
2070-2099	75.9 °F	+ 6.8°F

The number of extreme heat days in Mountain View is projected to rise sharply over the coming decades. As shown in Table 17, the city historically experienced an average of 5 extreme heat days per year (1961–1990). [11] By mid-century (2035–2064), this number is expected to increase to 12 days annually, which is a 7-day rise. By late century (2070–2099), projections show an average of 23 extreme heat days each year, an 18-day increase from historical conditions. Extreme heat increases the risk of heat-related illness, strains the body's ability to recover, and disproportionately impacts vulnerable groups such as older adults, children, and outdoor workers (Ebi et al., 2021).

[11] An "extreme heat day" is defined as a day when the maximum temperature exceeds 91°F, which represents the 98th percentile of historical daily maximum temperatures in Mountain View (Cal-Adapt, 2022).

Table 18. Projected extreme heat days.

Time Period	Extreme Heat Days (days)	Change from Historical
Historical (1961-1990)	5 days	
2035-2064	12 days	+ 7 days
2070-2099	23 days	+ 18 days

Warm nights are expected to become far more common in Mountain View as the climate warms. [12]

As shown in Table 18, the city historically experienced about 8 warm nights per year (1961–1990). By mid-century (2035–2064), this number is projected to increase to 35 nights annually, a 27-night rise. By late century (2070–2099), Mountain View could see up to 78 warm nights each year, which is 70 more than the historical average. More frequent warm nights can reduce overnight cooling, worsen heat stress, and pose heightened health risks, particularly for residents without access to air conditioning or adequate nighttime ventilation (SCAG, 2020).

Table 19. Projected warm nights.

Time Period	Warm Nights	Change from Historical
Historical (1961-1990)	8 nights	
2035-2064	35 nights	+ 27 nights
2070-2099	78 nights	+ 70 nights

During these events, humidity and limited nighttime cooling can cause “feels like” temperatures to remain well above actual air temperatures, extending discomfort and health risk into overnight hours.

Temperatures also vary across Mountain View due to the urban heat island effect, where areas with dense development, limited vegetation, and extensive paved surfaces retain more heat than greener or coastal areas. Neighborhoods with less tree cover and fewer cooling resources can experience nighttime temperatures several degrees higher than other parts of the city, compounding exposure for residents and increasing the need for localized cooling strategies and urban greening efforts.

EXTREME PRECIPITATION & INLAND FLOODING

Mountain View, like much of the Bay Area, has historically experienced wide variation in rainfall from year to year, with intense storms often driven by atmospheric rivers (Martin, 2023; NASA Earth Observatory, 2022). For example, during the winter of 2023, a series of strong atmospheric river storms brought record rainfall and widespread flooding across California, including parts of the South Bay, where storm drains and creeks exceeded capacity and caused localized street flooding and infrastructure damage . While the region's total annual precipitation is not expected to shift dramatically, climate change is projected to bring more rain in fewer, more intense events, heightening the risk of flash flooding and stormwater overflow (Ackerly et al., 2018; Bedsworth et al., 2018). Urbanized areas, where impervious surfaces limit water absorption, are especially vulnerable to these inland flood risks. Additionally, when extreme rainfall events coincide with elevated groundwater or

[12] Number of days in a year when daily minimum temperature is above a threshold temperature of 91.5 °F

rising bay waters, the likelihood of compound flooding increases, particularly in low-lying neighborhoods (Han & Tahvildari, 2024).

Historical Trends and Projections

As shown in Table 19, projections for Mountain View indicate relatively stable annual precipitation totals over time. The historical average (1961–1990) was 17.6 inches per year. This is expected to increase only slightly to 17.7 inches by mid-century (2035–2064) and to 18.4 inches by late century (2070–2099), an overall change of less than one inch. However, even with modest changes in total rainfall, the seasonality and intensity of storms are expected to shift significantly, increasing the risk of infrastructure stress and localized flooding.

Table 20. Projected annual average precipitation.

Time Period	Annual Average Precipitation	Change from Historical
Historical (1961-1990)	17.6 inch	
2035-2064	17.7 inch	+0.1 inches
2070-2099	18.4 inch	+ 0.8 inches

SEA LEVEL

Sea level in the San Francisco Bay has risen approximately 0.7 feet over the past century, with recent tide gauge records at Fort Point and Redwood City showing accelerating rates in the past two decades due to warming temperatures, ice melt, and ocean expansion (Ackerly et al., 2018). Localized factors such as land subsidence, sediment compaction, and groundwater fluctuations have further complicated shoreline conditions in South Bay communities, including Mountain View.

Historical Trends and Projections

As shown in Table 20, sea level rise is projected to reach 1.1 feet by mid-century and 3.4 feet by late century. Locally, the City of Mountain View has adopted a “high sea level rise” planning scenario of 3.5 feet by 2070 to align with state guidance and regional efforts, including the Salt Pond Restoration and South San Francisco Bay Shoreline Projects (City of Mountain View, 2021). Much of North Bayshore, located north of U.S. 101, is low-lying and already subject to flooding from Permanente and Stevens Creeks, as well as tidal influence from the Bay. Mountain View, along with neighboring cities like Palo Alto and Sunnyvale, is identified as an area with high exposure to combining sea level rise and storm surge impacts, especially in scenarios involving critical infrastructure and shoreline development (City of Mountain View, 2021). The City is currently updating its sea level rise plan to align with the Regional Shoreline Adaptation Plan, which will update these projections and guide future capital and land use planning to address evolving coastal flood risks.

Table 21. Projected sea level rise in San Francisco Bay (Mountain View area).

Time Period	Sea Level Rise (feet)	Change from Historical
Historical (1961-1990)	0.67 ft	
2035-2064	0.8 ft	+ 0.17 ft
2070-2099	3.1 ft	+ 2.47 ft

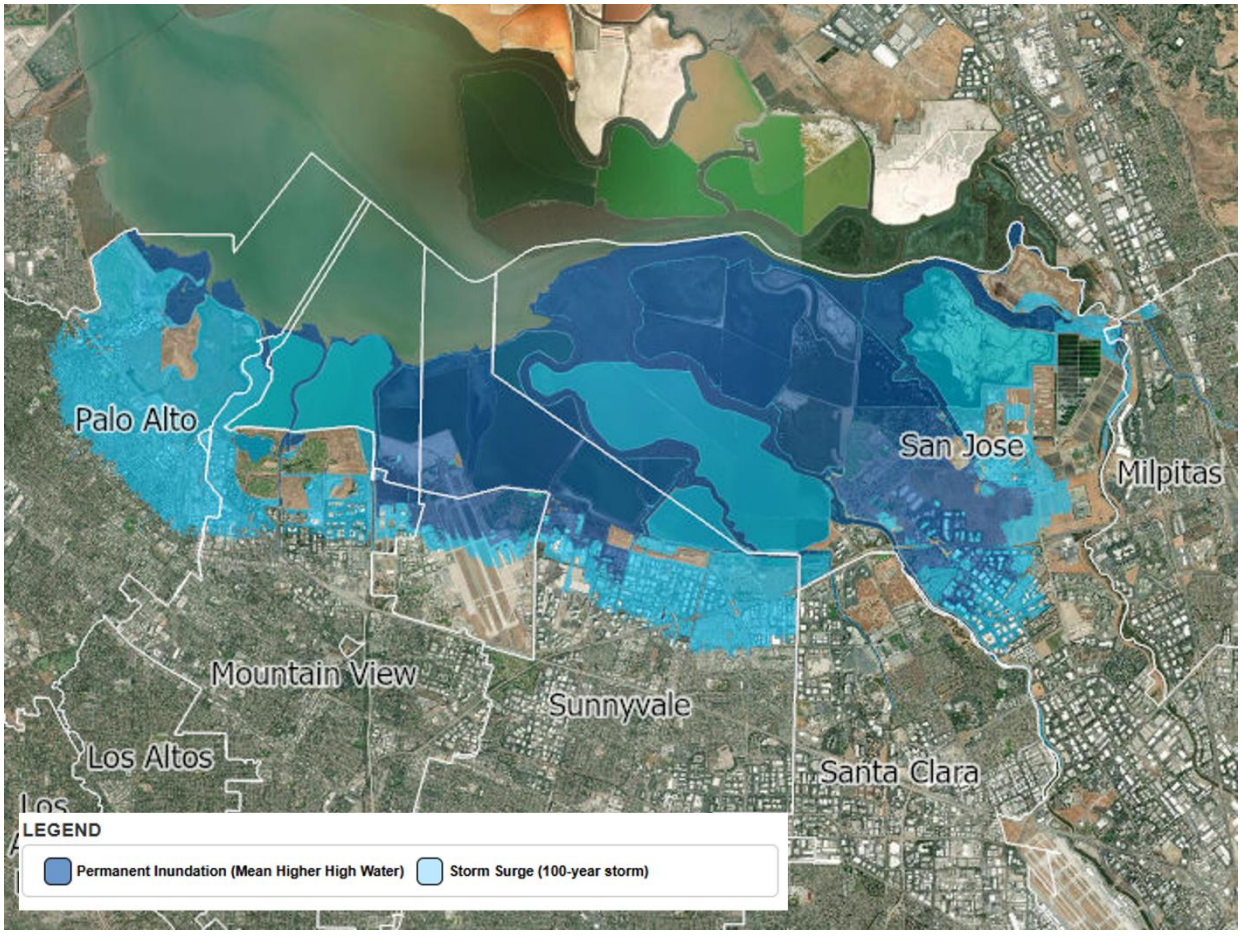


Figure 37. Projected permanent inundation and storm surge after 2 feet of sea level rise (BCDC, 2017). [13]

WILDFIRE & SMOKE

Mountain View is not located within a designated high Fire Hazard Severity Zone (CAL FIRE), but the city remains vulnerable to wildfire-related impacts, including smoke exposure from fires in nearby upland and wildland-urban interface (WUI) areas, such as the dry hills east of Santa Clara County (Figure 26)(Westerling, 2018). Wildfire activity in the Bay Area is projected to increase due to a warming climate and continued WUI development, with future fires expected to be larger, more frequent, and more intense (Ackerly et al., 2018). Even without local ignition, regional wildfires, like the 2017 North Bay fires, can result in hazardous air quality in Mountain View, with wildfire smoke posing elevated health risks for children, older adults, outdoor workers, and individuals with respiratory or cardiovascular conditions (Alameda County, 2023; D'Evelyn et al., 2022).

[13] "Permanent inundation" typically refers to areas expected to be submerged daily due to rising mean higher high water (MHHW) levels associated with sea level rise. In this context, areas shown as permanently inundated represent land that would be regularly underwater with 2 feet of sea level rise under average tidal conditions, not accounting for temporary storm events.

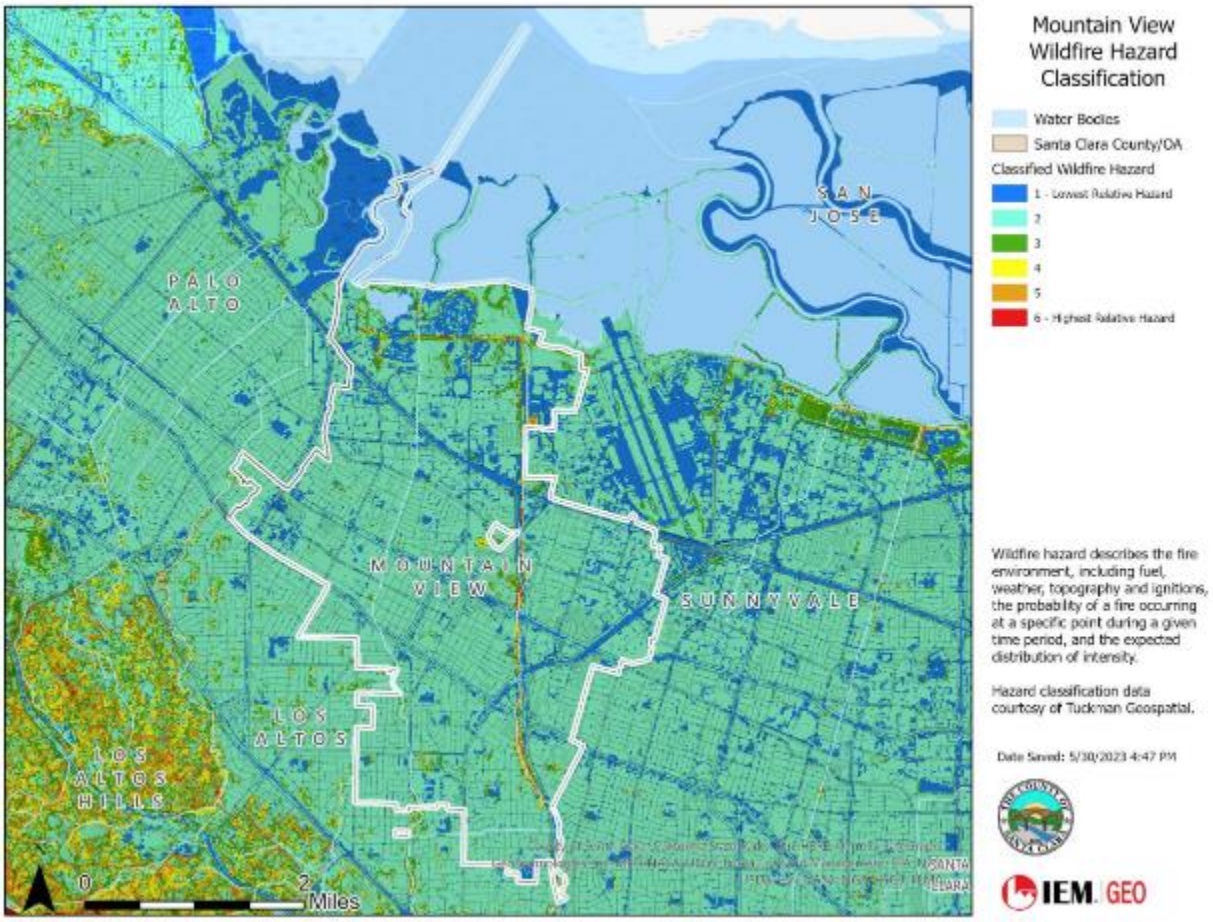


Figure 38. Wildfire hazard in Mountain View by late century (2100) (CAL FIRE, 2025).

Historical Trends and Projections

As shown in Table 21, annual average area burned in Mountain View is projected to decline from 111.6 acres historically to 77.8 acres by 2070–2099 under a high emissions scenario (RCP8.5),but this does not reflect reduced exposure to wildfire impacts, as regional smoke and air quality risks are expected to intensify (Thomas et al., 2018). The number of high fire danger days and smoke-impacted days is also expected to rise, especially as conditions like Diablo winds facilitate long-distance smoke transport across county lines. As large-scale wildfires become more common around the region and state, the City of Mountain View will likely face more frequent air quality alerts and health advisories, despite its distance from ignition zones.

Table 22. Projected annual average area burned.

Time Period	Annual Average Area Burned (acres)	Change from Historical
Historical (1961-1990)	111.6 acres	
2035-2064	100.2 acres	-11.4 acres
2070-2099	77.8 acres	-87.8 acres

DATA SOURCES USED

Category	Tool/Resource	Link or Notes
General Climate Projections	Cal-Adapt	https://cal-adapt.org/
	Cal-Adapt Analytics Portal Silicon Valley 2.0 Climate Change Preparedness Tool	https://analytics.cal-adapt.org/data/access/ https://siliconvalleytwopointzero.org/climateprojections
Extreme Heat	Cal-Heat Tool	https://www.cal-heat.org/
	Healthy Places Index – Extreme Heat Edition	https://www.healthyplacesindex.org/extreme-heat-edition-hpi
Sea Level Rise and Flooding	SFEI – Adapting to Rising Tides (ART)	https://www.sfei.org/projects/adapting-rising-tides-bay-shoreline-flood-explorer
	COSMOS (USGS)	https://www.usgs.gov/data/hydrodynamic-model-san-francisco-bay-and-delta-california
	HERA Flood Tool (USGS)	https://www.usgs.gov/apps/hera/floodTool.php
	Groundwater Impact Mapping City of Mountain View FEMA Flood Maps	Available through COSMOS/HERA tools
Wildfire and Smoke	CAL FIRE Fire Hazard Severity Zone Viewer	https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones
Social and Economic Vulnerability	Fourth California Climate Assessment	Use as a foundational reference to explain the importance of equity and frontline community focus
	CalEnviroScreen, Healthy Places Index, CDC SVI	Used in social vulnerability analysis

7. Appendix C. Vulnerability Scoring Matrix

Exposure Scoring

Definition: Degree to which an asset or population is exposed to climate-related hazards.

Score	Level of Exposure	Extreme Heat	Inland Flooding	Wildfire (Burn Zone)	Wildfire Smoke (Air Quality)
1	Very Low	**Historical:** 5 or fewer extreme heat days/year and <10 warm nights; projected increases are negligible; area has cooling factors (e.g., tree cover, AC access)	**Historical & Projected:** Outside 500-year and 100-year flood hazard zones; no local drainage or groundwater issues	**Historical & Projected:** Not within WUI; no fire history; impervious urban area with low vegetation	**Historical & Projected:** <1 day/year with PM2.5 >35 µg/m³; no expected future increase
2	Low	**Historical:** 5 days/year above 90°F; **Mid-century:** <10 extreme heat days/year; 10–30 warm nights/year	**Historical:** Outside 500-year flood hazard zone; may experience minor pooling or localized runoff	**Projected:** >1 mile from WUI; unlikely to ignite; no recent burn history	**Historical:** 1–2 smoke days/year >35 µg/m³; **Mid-century:** slightly increasing but still intermittent
3	Moderate	**Historical:** 5–12 extreme heat days/year; **Mid-century:** 12 days; **Late-century:** 23 days; 30–50 warm nights/year	**Mid-century:** Within 500-year flood hazard zone or moderate-risk drainage areas; compound flood risk possible	**Historical & Projected:** <1 mile from WUI or near open space with moderate fuel load	**Mid-century:** 2–5 smoke days/year >35 µg/m³; possible increase from nearby regional fires
4	High	**Mid-century:** 15–30 days/year above 90°F; 50+ warm nights/year;	**Projected:** Within 100-year flood hazard zone; flooding likely in 1–2 year storm events; rising Bay and	**Projected:** Within or adjacent to WUI; past local fire activity;	**Late-century:** 5–10 smoke days/year >35 µg/m³; consistent

Score	Level of Exposure	Extreme Heat	Inland Flooding	Wildfire (Burn Zone)	Wildfire Smoke (Air Quality)
		Late-century: 23+ heat days	groundwater interactions likely	fuels and wind exposure present	seasonal exposure likely
5	Very High	**Late-century:** ≥30 days/year above 90°F; >70 warm nights/year; risk of extreme heatwaves and compounding heat stress	**Projected:** In 100-year flood hazard zone and low-lying area subject to repeat flooding and tidal backup; at risk for compound events	**Projected:** High fuel load, WUI exposure, past fire loss or evacuation nearby	**Late-century:** ≥10 smoke days/year >55 µg/m³; regular and prolonged exposure expected during fire season

Notes:

- **Extreme Heat** thresholds use the city's projected increase to **23 days/year** by late century and **78 warm nights** (vs. 8 historically).
- **Inland Flooding** accounts for increasing **intensity of storm events**, compound flooding risk with sea level rise, and low-lying neighborhood exposure.
- **Wildfire Burn Zone** exposure remains **indirect** but may increase due to **WUI encroachment and fuel conditions**.
- **Wildfire Smoke** is the **primary local wildfire risk**, with PM2.5 projections aligning with **air quality alert trends**.

Sensitivity Scoring

Definition: Degree to which an asset or population experiences negative impacts when exposed to climate hazards, including both human safety and environmental impacts.

Score	Qualitative Ranking	Health & Human Safety Impact	Physical Systems & Infrastructure Function Impact
1	Very Low	Hazard has **little to no impact** on health or wellbeing for this population group. Adequate access to infrastructure, services, and care greatly reduces sensitivity.	Hazard has **negligible or no observable effect** on environmental health or ecosystems. Strong resilience or limited exposure (e.g., hardened landscapes, isolated weather events with no ecosystem intersection).

Score	Qualitative Ranking	Health & Human Safety Impact	Physical Systems & Infrastructure Function Impact
2	Low	Hazard is likely to cause **minimal health impacts** or discomfort (e.g., short-term poor air quality, brief transit or cooling center disruptions), with **access to support or alternatives** readily available.	Hazard causes **minor, localized impacts** to environmental systems, with quick or natural recovery. For example, small-scale flooding in landscaped areas, short-term AQ decline with limited ecological stress.
3	Moderate	Hazard may cause **noticeable health impacts** such as stress, discomfort, minor illness (e.g., smoke irritation or indoor heat exposure). Populations have **some adaptive capacity**, but are still moderately vulnerable.	Hazard causes **temporary but noticeable impairment** of ecosystem function (e.g., reduced water quality from runoff, short-term smoke exposure stressing urban vegetation, heat-related stress to creek-adjacent vegetation). Recovery is likely but requires time or intervention.
4	High	Climate hazard is likely to cause **significant disruption** to health or wellbeing, such as severe discomfort, increased illness, or temporary evacuation. Population may have **limited coping resources or support systems**, increasing the severity of the impact.	Hazard causes **substantial degradation** to ecosystems, including **longer-term recovery needs**. Examples include canopy die-off from heat/drought, sedimentation impacts to creek systems, or sustained smoke-related air quality deterioration.
5	Severe	Climate hazard is highly likely to cause **serious or compounding health impacts** for the population, such as heat-related illness or hospitalization, smoke-triggered asthma attacks, or displacement from flooding. Population may face **barriers to care, shelter, or recovery**, with **little to no adaptive options**.	Hazard causes **widespread, long-term, or irreversible damage** to natural systems or environmental health. Loss of habitat, biodiversity, or essential ecosystem functions (e.g., riparian zone collapse from repeated flooding, major wildfire degrading green infrastructure or urban forest canopy).

Notes:

- Use this scoring to systematically assess sensitivity for each asset or population.
- Consider both human and environmental impacts; select the higher score if there's variation between columns.
    - In some cases, an asset or population may have **low sensitivity in terms of health and human safety**, but **high sensitivity with respect to environmental health or ecosystem**

function (or vice versa). For example, a population group may experience limited direct health impacts from a flood but could face high sensitivity if the event disrupts critical services such as power, transportation, or healthcare access. When this occurs, the two dimensions of sensitivity should be **scored separately** and discussed in the narrative to reflect the **multi-dimensional nature of vulnerability**.

- Maintain consistency in assessing sensitivity across all sectors and climate hazards.

Adaptive Capacity Scoring

Definition: Ability of an asset or population to anticipate, respond to, recover from, and adapt to climate impacts.

MATRIX 1: ADAPTIVE CAPACITY – SOCIOECONOMIC EQUITY

This matrix reflects the level of environmental health disparities and socioeconomic vulnerability, often based on tools like CalEnviroScreen or the Healthy Places Index (HPI).

Score	Environmental Health Disparities Percentile Rank	Description
1	>90-100	Very high social and environmental vulnerability; low capacity to respond or adapt.
2	>80-90	High disparities; limited resources and support systems.
3	>60-80	Moderate disparities; some adaptive capacity in place.
4	>40-60	Low disparities; generally good access to adaptive resources.
5	0-40 (Low Disparity)	Very low disparity; strong socioeconomic conditions and institutional support.

MATRIX 2: ADAPTIVE CAPACITY – FUNCTION

This matrix evaluates how asset function is affected by climate hazards and how easily the system or asset can recover.

Score	Functional Impact	Description	Criteria / Justification Examples
1	Permanent elimination of asset or network segment	Asset cannot be repaired or rebuilt in place; long-term service loss or displacement	• Roadway or transit corridor repeatedly damaged by flooding or wildfire and permanently removed from service • Housing unit or complex permanently uninhabitable due to repeated wildfire smoke exposure or heat-related infrastructure failure (e.g., buyout or condemnation) • Stormwater infrastructure destroyed by extreme flood events and not feasible to reconstruct
2	Permanent loss of function	Major asset remains but cannot serve its original purpose	• Road or bridge structurally intact but permanently closed due to recurring wildfire risk or flood exposure • Multifamily housing decommissioned due to chronic heat stress or air quality concerns- Stormwater outlet fails due to scouring or blockage, cannot serve system function
3	Extended or seasonal disruption	Function disrupted for weeks or months; recovery is possible but costly or complex	• Roads closed for wildfire cleanup or prolonged flood damage repairs- Seasonal flooding or smoke exposure causes repeated temporary relocation of housing residents • Stormwater system failure results in repeated seasonal street or neighborhood flooding
4	Temporary disruption	Function interrupted for several days; recoverable with limited intervention	• Local road segment closed due to heat-related pavement damage or smoke visibility issues • Temporary evacuation or relocation due to poor air quality or indoor heat levels • Storm drains back up from isolated rainfall events, but function is quickly restored

Score	Functional Impact	Description	Criteria / Justification Examples
5	Minimal or no disruption	Resilient design or redundancies prevent meaningful service loss	• Roads remain passable due to fire-resistant materials or flood-proof design • Housing remains habitable during heatwaves due to cooling systems, tree canopy, or ventilation • Stormwater infrastructure effectively handles increased runoff from heavy precipitation events

Notes:

- If you're evaluating **networks** (e.g., transportation), consider **whether there are alternative routes** or connections to assess redundancy.
- For **stormwater**, you might ask: *Does this failure lead to localized nuisance flooding or community-wide system failure?*
- For **housing**, distinguish between **short-term displacement** (e.g., 2–3 days) vs. **permanent uninhabitability**.

Vulnerability Scoring Ranges

Score Range	Vulnerability Level	Description	Suggested Action
≤ 2.0	Low	Limited risk. Impacts minimal or recoverable.	Track and re-evaluate periodically
> 2.0 – 4.0	Moderate	Noticeable risk. Impacts require targeted measures.	Develop targeted adaptation measures
> 4.0 – 6.0	High	Significant risk. Impacts expected to strain health, systems, or services.	Prioritize for adaptation planning and resources
> 6.0	Very High	Severe risk. Widespread or compounding impacts; urgent action required.	Immediate and comprehensive adaptation action required

Example Calculation

= (Exposure + MAX (Sensitivity Human, Sensitivity Function)) - AVERAGE (AC Human, AC Function)

Where:

- **Exposure** = Degree of contact with the hazard (1–5)

- **Sensitivity Human** = Sensitivity of people (1–5)
- **Sensitivity Function** = Sensitivity of systems or services (1–5)
- **AC Human** = Adaptive capacity related to people or equity factors (1–5)
- **AC Function** = Adaptive capacity related to systems or infrastructure (1–5)

EXAMPLE: EXTREME HEAT – HEALTH & WELLBEING SECTOR

Component	Score	Notes
Exposure	4	High exposure due to increasing number of extreme heat days
Sensitivity (Human)	5	Severe sensitivity for older adults and people with chronic health conditions
Sensitivity (Function)	3	Moderate system sensitivity due to strain on healthcare facilities
Adaptive Capacity (Human)	2	Low adaptive capacity due to inequitable access to cooling and healthcare
Adaptive Capacity (Function)	3	Moderate adaptive capacity due to existing emergency plans

Step-by-Step Calculation

1. **Identify the higher sensitivity value:**
   MAX (5, 3) = **5**
2. **Find the average adaptive capacity:**
   AVERAGE (2, 3) = **2.5**
3. **Apply the formula:**
   (Exposure + MAX(Sensitivity)) - AVERAGE(AC)
   = (4 + 5) - 2.5
   = **6.5**

RESULT

Vulnerability Score = 6.5 (Very High)

This score indicates that while the city's infrastructure can partially mitigate heat impacts, the high exposure and severe human sensitivity, combined with low adaptive capacity, create an overall **very high vulnerability** to extreme heat within this sector.

8. Appendix D: Climate-Sensitive Populations

Population Estimates	Climate Risk
Low-income 5.5% of residents live below the poverty line	Less able to afford energy-efficient housing, cooling, or air filtration; at greater risk of displacement and utility shut-offs during heat or flood emergencies.
Households Below 80% Area Median Income (AMI) 32% of households earn below 80% of the Santa Clara County AMI (City of Mountain View, 2024)	Greater financial vulnerability to rising utility costs, home repair expenses, and insurance premiums related to climate hazards; may face barriers to accessing resilience upgrades and emergency recovery assistance.
Older Adults 11.7% of residents are 65 and over	Higher risk of heat-related illness, power-dependent medical needs, and social isolation during emergencies.
Children and Youth 20.3% under age 18; 6.0% under age 5	More vulnerable to heat and air quality impacts; sensitive to trauma from disaster displacement or school disruptions.
Linguistically isolated households 9% of the population	Adults with limited English proficiency may not get important information and access to resources in climate events when information is not provided in a language they speak.
Outdoor and Seasonal Workers Approximately 10% of residents	Increased exposure to extreme heat, wildfire smoke, and poor air quality during outdoor labor; risk of dehydration, heat exhaustion, and reduced productivity during prolonged heat or smoke events.
People of Color 53.3% of the population	May experience disproportionate burdens from environmental pollution and climate-related health impacts due to higher exposure to air pollution, limited access to healthcare or cooling, residence in high-risk areas, and historical inequities in infrastructure investment.
People with Health Conditions and Medical Device Dependencies Not directly quantified; inferred from sensitivity indicators	Increased sensitivity to wildfire smoke, extreme heat, and flooding; at risk during outages or emergency evacuations that disrupt power supply or medical care.

People Living with Disabilities (ambulatory, cognitive, or mental health) 4.0% under age 65 with a disability	May require evacuation assistance or specialized support during emergencies; limited mobility can restrict access to cooling centers or shelters.
Unhoused or Unstably Housed 2025 Point-in-Time (PIT) count: 879 residents	Greater direct exposure to heat, rain, and smoke; limited access to emergency shelter, filtered air, or cooling.

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