2025 HAZARDS AND CLIMATE RESILIENCE PLAN

CALOES/FEMA REVIEW DRAFT

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ONESF
Building Our Future

Executive Summary

SOMA Street Tree Nursery

The City and County of San Francisco's 2025 Hazards and Climate Resilience Plan (HCR) is an action plan for reducing the impacts of hazards that have long been a part of life in San Francisco, such as earthquakes, and hazards that are becoming more frequent and severe due to climate change, including flooding, drought, extreme heat, and poor air quality. The HCR is a combined hazard mitigation and climate adaptation plan and is closely aligned with the City's Safety and Resilience Element of the General Plan and the Climate Action Plan. It includes goals, objectives, and actions to increase the resilience of San Francisco's buildings, infrastructure, and communities. By making hazard information more accessible, engaging the community in plan development, and identifying priority resilience actions, the Hazards and Climate Resilience Plan (HCR) is an important tool for building a safer and more resilient future in San Francisco.

Vision and Guiding Principles

The vision of the HCR is to make San Francisco more resilient to the immediate and long-term threats of climate change and natural hazards through actions to mitigate risks, adapt built and natural assets, and build a more equitable and sustainable city. This includes ensuring systems are in place so that individuals, communities, institutions and businesses survive, adapt, and thrive no matter the kinds of chronic stresses and acute shocks they experience. The HCR also coordinates with and supports the City's Climate Action Plan, which outlines urgent strategies needed to reduce greenhouse gas emissions and minimize the severity of climate change and its associated impacts.

The following principles guided how the City developed the HCR, from scoping the assessment to evaluating strategies:

FIGURE ES-1: GUIDING PRINCIPLES

Planning Process

Chapter 02 describes the HCR planning process. The scope of the update was "right-sized" to reflect the comprehensive nature of the 2020 HCR assessment, limited changes in risk and development since 2020, and on-going community engagement on resilience plans since 2020. The goals of the planning process are as follows:

- Build greater understanding of San Francisco's hazard and climate risks among City leaders, staff, and community stakeholders.
- Learn from community members, especially in Environmental Justice Communities, about their experiences with and concerns about hazards and incorporate their priorities for resilience into the Plan update.
- Provide strategic policy guidance and direction for ongoing and future citywide multi-hazard risk reduction efforts.
- Build the capacity of City staff and partners to develop hazard and climate resilience projects and programs.

This approach included working with a multi-departmental team and departmental leadership to identify information that has changed since 2020 and new priorities. Community engagement focused on attending existing community convenings hosted by community organizations rather than creating standalone workshops. This outreach emphasized receiving feedback from Environmental Justice (EJ) Communities and community organizations that were partners on the 2020 HCR. Lastly, the Project Team leveraged other opportunities for engagement, such as meetings with organizations by request, attending the Waterfront Flood Study Public Workshops, and hosting a workshop at the San Francisco Lifelines Council.

FIGURE ES-2: COMMUNITY AND STAKEHOLDER ENGAGEMENT EVENTS

Themes from Stakeholder Engagement

The Project Team reviewed the data collected from stakeholder engagement events and found five high level themes that were most prevalent in stakeholder feedback.

Energy Resilience	• Energy access for low-income residents • Grid improvements to avoid power outages • Battery back up power and microgrids • Support with electrification
Earthquake Resilience	• Neighborhood scale planning • Unretrofitted soft story buildings (<5 units) • Fire-following earthquake and water supplies
Waterfront Resilience	• Addressing contaminated sites and sea level rise • Protecting and adapting bridges and other transportation routes • Using nature based solutions where feasible
Transportation	• Maintaining state-of-good repair of the public realm, including sidewalks and streets • Reliable transit service
Neighborhood Capacity Building	• Importance of neighorhood based organizations • Supporting the elderly • Developing community networks

Climate Change Implications for Hazards

Chapter 03 describes how changes in the global climate system influences the severity and frequency of local hazards. Climate change is happening and its effects are impacting more people every year. The 10 warmest years on record have all occurred during the last decade from 2014-2023.[1] Extreme temperatures have a cascading impact on global weather patterns. High temperatures melt polar ice caps and contribute to the thermal expansion of the oceans which cause global sea levels to rise. Warm ocean temperatures also increase evaporation, and this increased concentration of water vapor in the atmosphere changes rainfall patterns as storms and droughts both become more extreme.

TABLE ES-1: SUMMARY OF CLIMATE CHANGE IMPLICATIONS FOR HAZARDS

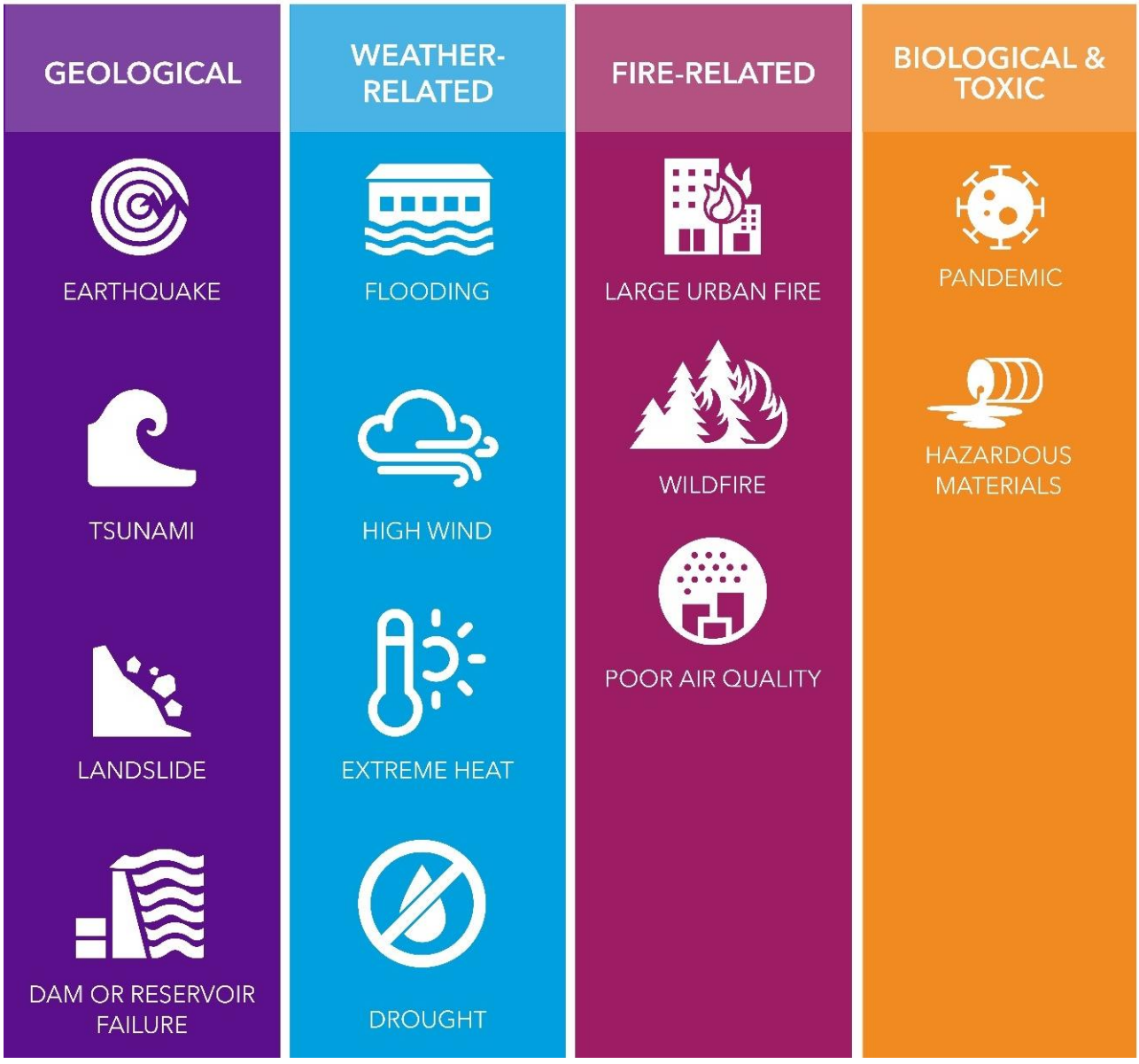
Increasing Temperatures	Rising Sea Levels	Changing Precipitation Patterns
More extreme heat days, making heatwaves more frequent and longer-lasting. **Drought and wildland-urban-interface fires** may become more frequent and severe. Wildfires create **poor air quality**.	More frequent, extensive and longer-lasting **coastal flooding**, especially during storm events. **Stormwater flooding** may increase as high bay levels can impede drainage of stormwater runoff. Higher groundwater table may **increase the susceptibility of some soils to liquefaction** during an earthquake.	More intense precipitation in discrete storm events may increase **stormwater flooding**, risk of **landslides** and **dam/reservoir** failure. **Droughts** may be more frequent and severe. Reduced snowpack in the Sierras may also exacerbate **drought**.

[1] Annual 2023 Global Climate Report (June, 2024). Retrieved from: https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202313#:~:text=The%20year%202023%20was%20the,decade%20(2014%E2%80%932023).

Hazard Profiles

The HCR profiles 13 natural hazards that impact San Francisco, as listed in Figure ES-3 below and discussed in Chapter 04. The hazards are grouped into four categories; geological, weather-related, combustion-related, and biological/toxic. The profiles describe past events, location, extent, probability of future events and potential impacts.

FIGURE ES-3: NATURAL HAZARDS PROFILED IN THE HCR



Earthquake

Damage from the 1989 Loma Prieta Eathquake

San Francisco has experienced several devastating earthquakes in its history, and there is a 72 percent chance that an earthquake of magnitude (Mw) 6.7 or greater will strike the region between now and 2043, which would result in in widespread casualties and infrastructure damage. The energy released in earthquakes can produce different types of hazards, including groundshaking, liquefaction, tsunami, landslide, fire-following-earthquake, and dam failure. All of San Francisco is susceptible to very strong to extreme ground shaking during a major earthquake. Liquefiable soils in San Francisco are generally found in water saturated sandy or silty soils or landfill along the Pacific coast and San Francisco Bay.

Landslide

Landslides are most likely to occur on steep slopes on hills and cliffs. In addition, weak saturated soils that are bordered by steep or unsupported embankments are prone to landslide. Given the dense urban nature of San Francisco, landslides can result in casualties and serious damage to homes and other infrastructure. An increase in heavy rainfall events due to climate change may also increase the risk of landslides in the future.

Tsunami

A tsunami is a series of ocean waves caused by sudden movement of the sea floor, typically as a result of major earthquakes. Tsunamis not only affect beaches open to the ocean, but also may cause damage to bays, ports, harbors, tidal flats, and coastal inlets. Areas within San Francisco susceptible to tsunami inundation include Pacific Coast areas of Lake Merced, the Sunset and Richmond Districts, Sea Cliff, and the Presidio. Areas adjacent to San Francisco Bay are also subject to tsunami inundation. Tsunamis

are infrequent, but high impact events that may result in widespread damage, injuries and deaths.

Dam or Reservoir Failure

Dam or reservoir failure may impact the Sunset, Midtown Terrace, Twin Peaks, Clarendon Heights, and University Mound areas of San Francisco, where state-regulated reservoirs are located. Factors that increase the risk of dam or reservoir failure include the age of the structures and the likelihood of an earthquake. Climate change, including changing precipitation patterns, may also increase the risk of dam or reservoir failure in and outside of the County.

Flooding

Parts of San Francisco's shoreline currently experience temporary flooding during extreme high tides and coastal storm events. As sea level rises, temporary coastal flooding will be more frequent and will flood larger areas. Areas that are particularly susceptible to increasing risk of coastal flooding include Mission Bay, Islais Creek, Hunters Point, Candlestick Point, the Financial District, the Marina District, Treasure Island, and SFO.

King Tide Flooding

Stormwater flooding occurs during storm events as runoff collects in areas that at one time were naturally formed waterways but are now managed through the City's combined sewer and stormwater collection system. The Islais Creek area (Cayuga/Alemany), South of Market, Inner Mission, and Civic/Center Western Addition include significant areas that are at risk of stormwater flooding during a 100-year storm, as well as during rainfall events that occur more frequently. As climate change causes sea level rise and precipitation events to become more intense, the frequency and extent of stormwater flooding may increase. Regardless of the source of the water, flooding poses a threat to life and public safety, can cause physical damage to buildings and infrastructure, can disrupt economic activity, and can impair public health.

Extreme Heat

Historically, San Francisco has experienced six to seven extreme heat days per year. By 2100, San Francisco could have up to 51 extreme heat days per year. The elderly, the very young, and those with chronic health problems are most at risk when extreme heat occurs. Neighborhoods with the greatest risk, based on sociodemographic characteristics, include Chinatown, SOMA, Tenderloin Center, Bayview/ Hunters Point, and the Mission District. Climate change is expected to increase the frequency and severity of extreme heat events.

Drought

California's Mediterranean climate is typified by dry summers followed by long, wet winters, thus making the state particularly susceptible to drought and flooding. The majority of San Francisco's water is brought to the city from the Hetch Hetchy watershed located in the Sierra Nevada Mountains through a complex series of reservoirs, tunnels, pipelines, and treatment systems.[2] As a result, changes in precipitation in the Sierra Nevada impacts the water supply in the Bay Area. Climate models project that a warming planet will lead to a reduced Sierra snowpack.[3]

High Wind

The most disruptive "high winds" occur either with strong storms in the winter or spring, or in late fall as part of the warm "Diablo winds". The "Diablo winds" can stoke fires in nearby counties and transport smoke to San Francisco. Storm-related wind can down trees or power lines and contribute to electrical outages.

Tree Damaged by High Winds

[2] San Francisco Public Utilities Commission, "About Us: Overview", accessed September 28, 2018, https://sfwater.org/index.aspx?page=355

[3] Reich, KD, N Berg, DB Walton, M Schwartz, F Sun, X Huang, and A Hall, 2018: "Climate Change in the Sierra Nevada: California's Water Future." UCLA Center for Climate Science.

Wildfire

Within San Francisco, a small portion of the Crocker Amazon neighborhood has been designated as a high fire hazard severity area by CAL FIRE. Moderate fire hazard severity areas in the city include wooded areas such as Mounts Sutro and Davidson, as well as Yerba Buena Island. A significant portion of the Hetch Hetchy Regional Water System in San Mateo, Santa Clara, and Tuolumne Counties is also located in state-designated very high fire hazard areas. This can impact the system through increasing sedimentation, damaging pump stations and other associated infrastructure. Global warming and lower precipitation rates due to climate change are increasing the risk of damaging fires in Northern California.

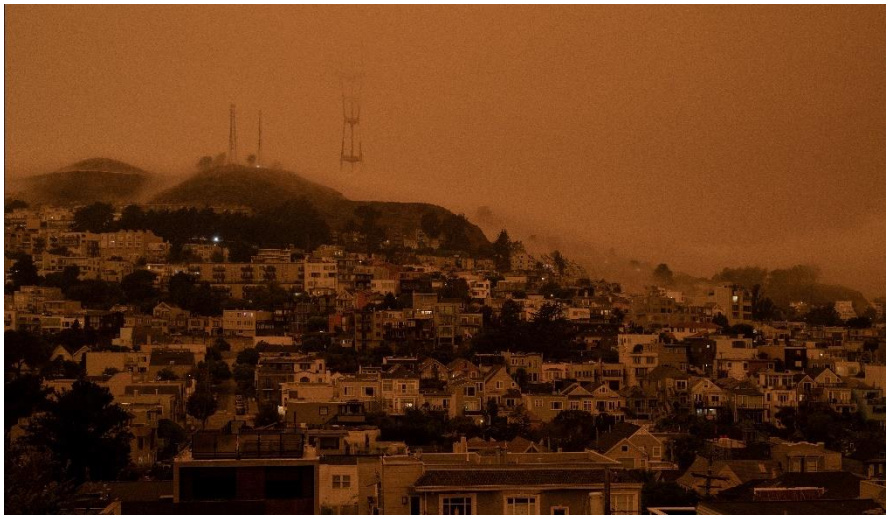
Crews clean up from the 2013 Rim Fire that threatened the Hetch Hetchy Water System

Large Urban Fire

The most likely cause of large urban fire in San Francisco is a severe earthquake (fire following earthquake). When making decisions about capital projects, maintenance, operations, and investments in the City's fire fighting systems, the San Francisco Fire Department (SFFD), San Francisco Public Utilities Commission (SFPUC), and San Francisco Public Works (SFPW) utilize a model that reflects the fires that could arise after a 7.8 earthquake on the San Andres fault. Most of San Francisco is believed to have a moderate risk of large urban fires, but areas believed to be at greatest risk include the North Waterfront, South Beach, Mission Bay, Potrero Hill, Hunters Point, Civic Center, Downtown, Tenderloin, and Hayes Valley neighborhoods.

Poor Air Quality

San Francisco is vulnerable to air quality impacts of wildfires. Wildfire smoke from may be transported into the city and significantly impact San Francisco's air quality. Air quality is closely associated with public health.



Wildfire Smoke Causing "Orange Sky Day" in 2020

Pandemic

COVID-19 had severe health, social, and economic impacts in San Francisco and throughout the world. Pandemics severely strain the healthcare system by causing prolonged patient surge. Because of their frequency, duration, and scale, pandemics are one of the greater public health threats to San Francisco; this threat has only increased with the rise in population density and international travel.

Hazardous Materials Release

According to state & local databases there are approximately 2,700 Hazardous Materials facilities throughout San Francisco[4]. Accidental hazardous materials releases can occur wherever hazardous materials are manufactured, stored, transported, or used. The majority of these facilities are located along the east/south east portion of the city; therefore, the risk is greatest in that part of the city.

[4] Josuwa Bernardo (SFDPH), *SF Hazardous Materials Sites*, 2018, Distributed by California State Water Resource Board (SWRCB). Email Correspondence regarding compiled data.

Vulnerabilities and Consequences

Chapter 05 describes Key Planning Issues that highlight significant and/or near-term vulnerabilities that require coordination between numerous asset managers, issues that may cluster in a particular geography, and vulnerabilities that require regulatory changes to solve. They are used to support the development of the objectives in Chapter 07.

Existing Buildings: San Francisco has a relatively older building stock and numerous barriers exist to improving their resilience. Many older buildings were designed before engineers understood certain types of seismic vulnerabilities and are not designed to be resilient to increasing climate hazards, such as extreme heat and flooding.

New Housing and Development: To accommodate a growing population, major development projects are planned in areas that may be exposed to hazards, including coastal flooding and liquefaction. Development agreements are an important tool for delivering resilient infrastructure and housing. Due to recent changes in state laws, there has been a recent emphasis on increasing housing development in "high opportunity" neighborhoods on the west side of the city, which also happen to be less vulnerable to some hazard events.

Communities at Increased Risk: Numerous factors contribute to communities being at increased risk including socioeconomic and demographic factors, housing quality and living conditions, community characteristics and social cohesion, and pre-existing health conditions.

Engagement and Capacity Building: San Franciscans may not have access to information about hazards and climate change impacts. They may not know how the City is working to increase resilience, and how they can participate, prepare, and benefit. Strong relationships within neighborhoods, at the block level, and even within large buildings can ensure that residents stay safe during and following a hazard event.

Business and Workforce: Many businesses don't have resources to invest in hazard mitigation and are dependent upon building owners to invest in mitigation. Many businesses, especially smaller ones, can't withstand disruption from a hazard. In addition, a missed paycheck for a lower-income worker puts severe strain on ability to pay for housing and other essential needs.

Transportation: San Franciscans depend on reliable, affordable, and accessible transportation on a daily basis. Critical transportation assets are vulnerable to current and future hazards and impairment could have citywide or regional consequences.

Water and Wastewater: Water and wastewater utilities are critical for the daily needs of households and businesses and protecting water quality. Disruption can have significant consequences for public health, ecosystem health, and the economy. The SFPUC has made significant improvements, and more are planned/underway through Sewer System Improvement Program (SSIP), Water System Improvement Program (WSIP), and the Emergency Firefighting Water System (EFWS).

Open Space and Biodiversity: 95% of San Francisco's land area has been developed and its remaining natural heritage is in a precarious state due to the ongoing challenges of invasive species, urban growth, pollutants, and the effects of climate change. Nature-based solutions weave natural features and processes into a community's landscape through planning, design, and engineering practices.5

Communications and Power: Functioning power and communications systems are critical for response and recovery following a disaster. Additionally, many other systems are dependent upon power and communications. Hardening these systems is not only essential to reducing potential disruptions, but it can also be life or death for residents that rely on power for medical devices.

Waterfront: San Francisco's waterfront communities may be exposed to multiple hazards, including increasing flood risks due to sea level rise, liquefaction, and tsunami. The waterfront includes a mix of densely populated neighborhoods (existing and planned), vulnerable populations, and critical infrastructure, including transit, shoreline protection, and stormwater/wastewater.

[5] FEMA, 2021. "Building Community Resilience with Nature Based Solutions: A Guide for Local Communities." https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf

Capabilities

Chapter 06 describes the roles that the City and County of San Francisco plays with respect to how it develops and implements measures to increase resilience to hazards. These roles are organized into five categories listed below with examples of such capabilities.

Funding and Finance

San Francisco is one of the most expensive places in the world to live and build so the ability to have strong funding and financial mechanisms is critical to San Francisco's mitigation efforts. The **City's 10-Year Capital Plan** and its **5-Year Financial Plan** lay the foundation for hazard mitigation and climate adaptation funding. Federal sources such as FEMA grant programs are also essential.

Public Asset Owner

As an owner and builder of buildings and infrastructure, San Francisco has strong programs, mechanisms, and staff expertise to design, develop, construct, and maintain its assets. An example includes the **Earthquake Safety and Emergency Response General Obligation Bond Program** that funds critical seismic improvements to fire stations and other emergency response infrastructure.

Community Services Delivery

The City and County of San Francisco offers many services that assist vulnerable populations, helping them access services that reduce their vulnerability before and after a natural disaster. An Example is the **Extreme Weather Resilience Program** that DEM launched in 2023. This program establishes a network of community-based organizations and equips them to maintain services during extreme weather event.

Research, Planning, and Guidance

The City invests in innovative hazards and climate change research that directly inform policies, programs, and services. An example includes the **Guidance for Incorporating Sea Level Rise into Capital Planning,** which provides direction to departments on how to incorporate sea level rise into new construction, capital improvement, and maintenance projects.

Adopts & Enforces Regulations

San Francisco adopts regulations that govern the construction of buildings, the form of urban development, and natural resource protection, among others. For example, San Francisco passed a **Soft Story Retrofit Ordinance** in 2013 which mandated the retrofit of wood-frame buildings of two or more stories with five or more residential dwelling units built before 1978 that are vulnerable to potential collapse in an earthquake. This program was completed in 2021 and improved the safety of nearly 5,000 buildings and more than 111,000 residents.

Resilience Strategy

Chapter 7 details the resilience strategy, which consists of 3 pillars (buildings, communities, infrastructure), 17 objectives, and 74 actions that update the 2020 HCR based on an evaluation of progress made and new priorities. The strategy balances being comprehensive of the range of hazards, risks, and priorities within the San Francisco community with a pragmatic lens of what will be feasible to make progress on by 2030 and will provide significant benefit, especially for those who are most likely to be adversely impacted by hazards. The 2025 goals build upon related citywide planning documents and remain unchanged from the 2020 Hazards and Climate Resilience Plan.

FIGURE ES-4: 2025 HCR GOALS

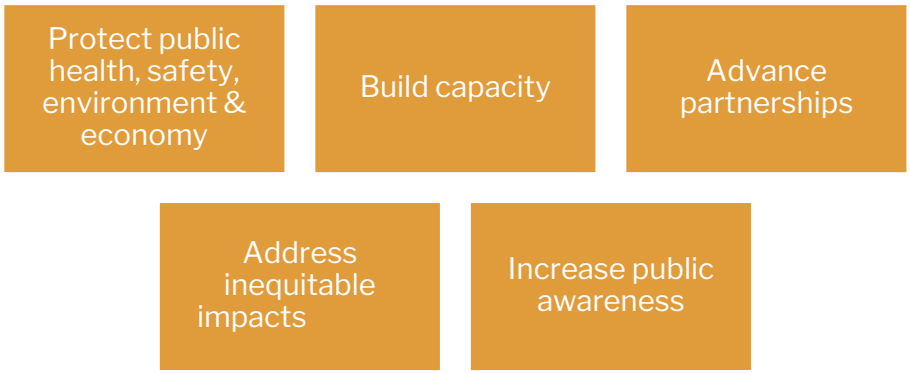


TABLE 7-3: BUILDINGS-RELATED OBJECTIVES AND ACTIONS

CODE	OBJECTIVE/ACTION TITLE	LEAD
B-1	**Increase the resilience of existing seismically vulnerable buildings.**	
B-1.1	Assess and seismically retrofit municipal buildings or secure new resilient facilities as needed.	ORCP
B-1.2	Implement priority tasks of the Earthquake Safety Implementation Program, such as addressing vulnerable concrete, steel, and soft-story buildings.	ORCP, DBI
B-1.3	Implement the recommendations of the Tall Building Safety Strategy.	ORCP, DBI
B-1.4	Address mandatory seismic retrofit needs within San Francisco's affordable housing stock.	MOHCD
B-2	**Increase climate and multi-hazard resilience of existing buildings.**	
B-2.1	Increase resilience and operation efficiency of municipal maintenance yards.	DPW
B-2.2	Determine the City and community facilities that will comprise a network of respite locations open to the public for a range of emergencies and the services, roles, and responsibilities necessary to facilitate their use.	DEM
B-2.3	Seek to add resilience scope to affordable housing rehabilitation funding opportunities with support from state/federal funds.	MOHCD
B-2.4	Continue to implement Floodwater Management Grant Program to assist residents with floodproofing.	SFPUC
B-2.5	Support increased building electrification (fuel switching), mechanical upgrade, and weatherization.	SFE, SFPUC
B-3	**Design and construct new buildings for high resilience performance for current and future hazards.**	
B-3.1	Continue to implement the Sea Level Rise Capital Planning Guidance and update as new science is available.	ORCP
B-3.2	Develop multi-hazard resilience design guidelines for capital planning.	ORCP
B-3.3	Incorporate flood resilience into the San Francisco Building Code.	SFPUC

TABLE 7-4: COMMUNITIES-RELATED OBJECTIVES AND ACTIONS

COMMUNITIES		LEAD
C-1	**Limit exposure and protect public health against hazards related to environmental health.**	
C-1.1	Develop projects in green infrastructure priority zones.	ORCP
C-1.2	Develop public education initiatives to connect benefits of green infrastructure to public health.	DPW
C-1.3	Investigate and pilot strategies to cool impervious surfaces.	SFO, DPW
C-1.4	Enhance monitoring, measurement, and improvement of indoor air quality and temperatures.	SFO, DPH
C-1.5	Conduct studies to better understand how sea level rise may interact with contaminated lands and potential health risks.	DPH
C-1.6	Protect human health and the environment through close involvement in the framework of property controls and mitigations at the Hunters Point Shipyard	OCII
C-1.7	Expand household hazardous waste collection efforts.	SFE
C-2	**Support the growth of community resilience networks to empower all people.**	
C-2.1	Continue to support neighborhood level capacity building.	DEM, DPH, ORCP
C-2.2	Support volunteer emergency preparedness, response, and recovery programs including the Neighborhood Emergency Response Team (NERT).	SFFD
C-3	**Increase the City's capacity to improve resilience through collaboration among peer agencies, the private sector, and community-based organizations.**	
C-3.1	Coordinate resilience engagement across departments and projects through ClimateSF	ORCP
C-3.2	Track progress and update the Lifelines Restoration Performance Project recommendations	ORCP
C-3.3	Develop and improve systems for hazard and climate resilience data.	ORCP
C-3.4	Improve San Francisco's climate health research capacity.	DPH
C-3.5	Develop citywide policy and proposed governance structure for flood resilience.	SFPUC

C-4	**Support robust emergency response planning in partnership with communities most adversely impacted by hazards.**	
C-4.1	Establish an evacuation strategy for people with Access and Functional Needs, including vertical evacuation and large-building refuges.	DEM
C-4.2	Pilot a wellness check program for vulnerable populations including homebound seniors, and people with access and functional needs.	HSA
C-4.3	Develop a Homelessness Disaster Response Plan	HSH
C-4.4	Develop a public outreach campaign and wayfinding plan for tsunami awareness and evacuation procedures	DEM
C-4.5	Improve citywide resilience to pandemics and infectious diseases.	DPH
C-5	**Prepare small businesses and workers to bounce back faster after a hazard.**	
C-5.1	Establish disaster relief funding and small business resilience fund.	OEWD
C-5.2	Continue to scale and mobilize layoff outplacement services for post-disaster economic impacts.	OEWD
C-6	**Make housing more affordable to increase community adaptive capacity.**	
C-6.1	Continue to meet housing production goals.	MOHCD, OCII, TIDA

TABLE 7-5: INFRASTRUCTURE RELATED ACTIONS

INFRASTRUCTURE		LEAD
IN-1	**Increase the resilience of electric power systems and increase access to resilient backup power.**	
IN-1.1	Enhance energy resilience at Critical Community Institutions	SFPUC, DPW
IN-1.2	Improve and expand power distribution infrastructure and advanced energy systems to support new development and increase resiliency.	SFPUC
IN-1.3	Complete the Electrical Capacity Upgrade Project to ensure redundant electrical power capacity and distribution across SFO	SFO
IN-1.4	Develop a roadmap for disaster resilient fleets and EV charging infrastructure	Fleet, ORCP
IN-2	**Increase the resilience and redundancy of critical communications systems**	
IN-2.1	Increase the Resilience of the Municipal Fiber Optic Network	DT
IN-2.2	Increase the Resilience of the 911 Radio System	DT
IN-3	**Support sustainable and resilient multi-modal mobility**	
IN-3.1	Incorporate opportunities for hazard mitigation into the planning and design of all SFMTA facility improvements and property re-development.	SFMTA
IN-3.2	Study, plan, design, and implement improvements to the multimodal transportation system that are vulnerable to coastal flooding.	SFMTA
IN-3.3	Improve the public right-of-way state-of-good-repair, including retrofitting bridges and other key structures.	ORCP, DPW
IN-3.4	Decrease the geographic vulnerability inherent to the island communities on Treasure Island and Yerba Buena Islands by increasing low-emission, connectivity to San Francisco.	TIMMA
IN-3.5	Implement the SFO Infrastructure Resilience Framework to improve resilience of critical facilities, assets, operations, and lifeline utility systems.	SFO
IN-4	**Promote, design, and use nature-based solutions to mitigate current and future hazards.**	
IN-4.1	Continue to improve wildfire prevention through vegetation management in Recreation Areas.	RPD
IN-4.2	Maximize drought tolerant, native species in plantings for parks and landscaping whenever feasible.	RPD, DPW
IN-4.3	Strengthen citywide efforts to conserve, restore, and steward biodiversity.	SFE
IN-4.4	Develop public private partnerships to conserve and steward biodiversity and habitat on Treasure Island and Yerba Buena Islands.	TIDA

IN-4.5	Adapt the shoreline to sea level rise and salt-water intrusion using nature-based solutions and maximizing native plan diversity, where feasible.	RPD, Port
IN-5	**Protect waterfront assets and communities from near-term flooding and seismic hazards.**	
IN-5.1	Implement Embarcadero Early Projects to address areas of highest earthquake and flood risk along the Embarcadero waterfront.	Port
IN-5.2	Make under deck pier structure utilities more resilient to flooding and seismic hazards.	Port
IN-5.3	Develop projects and seek funding to implement the Islais Creek Southeast Mobility Adaptation Strategy (ICSMAS).	Port, DPW, SFMTA
IN-5.4	Implement the Marina Improvement and Remediation Project	RPD
IN-5.5	Implement the Ocean Beach Climate Adaptation Project, which represent 2 of 6 "Key Moves" of the Ocean Beach Master Plan.	SFPUC
IN-5.6	Implement the San Francisco Airport Shoreline Protection Program.	SFO
IN-6	**Adapt the City's bay and ocean shorelines to current and future climate flood hazards.**	
IN-6.1	Develop subregional shoreline resiliency plan by 2034 per SB 272	Planning, ORCP
IN-6.2	Advance the Waterfront Resilience Program and San Francisco Waterfront Coastal Flood Study to reduce flooding and seismic risk along the 7.5 miles of Port jurisdiction.	Port
IN-6.3	Develop the Yosemite Slough Neighborhood Adaptation Plan	Planning
IN-6.4	Advance plans and projects for Ocean Beach and Great Highway North of Sloat Blvd.	RPD, GGNRA
IN-6.5	Advance the Adaptive Management Strategy from the Treasure Island Infrastructure Plan to ensure continual protection to changing conditions.	TIDA
IN-6.6	Develop and support major development projects and public/private partnerships that deliver resilient waterfront infrastructure.	Port, TIDA, OCII
IN-6.7	Develop comprehensive assessments of combined flood risks in each watershed.	SFPUC

IN-7	**Increase the resilience of local water and wastewater systems to natural hazards and climate change.**	
IN-7.1	Implement the Pipe Replacement Prioritization Program	SFPUC
IN-7.2	Support the completion and handover of new power, water, wastewater distribution infrastructure at Treasure Island and discontinue the use of the legacy navy systems.	TIDA, SFPUC
IN-7.3	Complete construction of the Treasure Island Water Resource Recovery Facility to improve water treatment, increase water security, and to connect recycled water to San Francisco's first neighborhood with a complete green infrastructure system.	SFPUC
IN-7.4	Complete studies and capital projects to improve and expand the Emergency Firefighting Water System (EFWS).	SFPUC
IN-7.5	Improve the capacity of the Portable Water Supply System to fight fires following earthquakes and other large urban fires.	SFFD
IN-7.6	Pursue data-driven implementation of Green (GI) Infrastructure projects to be able to manage 1 billion gallons of stormwater per year using GI by 2050.	SFPUC
IN-7.7	Complete construction of the Recycled Water Treatment Plant to ensure redundancy of water supply on SFO campus.	SFO
IN-8	**Increase resilience of the regional water system to natural hazards and climate change.**	
IN-8.1	Improve Resilience and Sustainability for regional dams and ancillary facilities from flood and earthquake events	SFPUC
IN-8.2	Mitigate wildfire hazards in SFPUC owned-watersheds to protect source water quality and minimize risk to SFPUC water and power infrastructure.	SFPUC
IN-8.3	Diversify water supply options year-round by improving the use of new water sources and drought management	SFPUC
IN-8.4	Continue climate adaptation planning for the Hetch Hetchy Regional Water System	SFPUC

Action Snapshots

The HCR actions were developed in partnership with numerous departments, organizations that serve vulnerable communities, and other stakeholders. The actions are organized into three pillars that support a more resilient city: buildings, communities, and infrastructure. A sample action for each of these areas is listed below. Detailed tables of all the actions are available in Chapter 07.

Sample Buildings Strategy

B-1.2	Implement priority tasks of the Earthquake Safety Implementation Program, such as addressing vulnerable concrete, steel, and soft-story buildings.	
KEY PLANNING ISSUES: Existing Buildings	VULNERABILITY ADDRESSED: Some older, un-retrofitted buildings are vulnerable to damage in an earthquake.	
LEAD: ORCP, DBI PARTNERS: DPW, MOHCD, OEWD, DEM	ACTION SUMMARY: The Earthquake Safety Implementation Program is a 30-year set of tasks for improving the seismic safety of privately-owned buildings. Upcoming priority tasks include addressing vulnerable concrete buildings, tilt-up buildings, pre-Northridge steel-moment frame buildings, and soft-story buildings with fewer than 5 units. Other tasks include developing post-earthquake repair and retrofit guidance for steel and concrete buildings, developing performance standards for building uses important to post-disaster recovery, and reducing the risk of fire-following earthquake.	
COST: Medium to develop program, High to implement	SF GOVERNMENT ACTIVITY: Adopt & Enforce Regulations	STATUS: Sustaining
POTENTIAL FUNDING SOURCES: Special Funds, Privately Funded, Grants	PRIORITY LEVEL: High	TIMELINE: Concrete screening by 2028 Steel inventory by 2027

Maxine Hall Health Center, a concrete building that was seismically retrofitted in 2022

Sample Communities Strategy

C-1.2	Develop public education initiatives to connect benefits of green infrastructure to public health	
KEY PLANNING ISSUES: Communities at Increased Risk Engagement and Capacity Building	VULNERABILITY ADDRESSED: Historic disinvestment has led to communities of color having less access to green space and tree canopy coverage, which contributes to disproportionate climate and health impacts.	
LEAD: DPW PARTNERS: DPH, ORCP	ACTION SUMMARY: This action involves developing and carrying out a public awareness campaign to educate residents on the numerous benefits of green infrastructure to encourage increased stewardship and buy-in for tree plantings initiatives. Green infrastructure provides significant benefits to San Francisco's residents, including health benefits from mitigating climate hazards in addition to the mental benefits of interacting with green spaces. This supports the City's goals on adaptation and specifically supports environmental justice and resilience to heat and poor air quality.	
COST: Low	SF GOVERNMENT ACTIVITY: Community Services Delivery	STATUS: New
POTENTIAL FUNDING SOURCES: General Funds, Grants	PRIORITY LEVEL: Medium	TIMELINE: 2030

Arbor Day 2024

Sample Infrastructure Strategy

IN-6.5	Advance the Adaptive Management Strategy from the Treasure Island Infrastructure Plan to ensure continual protection to changing conditions.	
KEY PLANNING ISSUES: Waterfront New Housing and Development	VULNERABILITY ADDRESSED: Given the low-lying geography and artificial construction, the Treasure Island Infrastructure Plan address vulnerabilities related to earthquake, tsunami, flooding, drought, and hazardous materials.	
LEAD: TIDA PARTNERS: Planning, SFPUC, SFMTA	ACTION SUMMARY: As Treasure Island continues to develop over the coming decade, resilience measures in the Treasure Island Infrastructure Plan and related development agreements will be critical to implement and require partnerships with private developers, public infrastructure owners, non-profits. Adaptive management strategies for SLR include elevating grades to 3 feet above the current 100-year flood elevation with the first floor of buildings 42 inches above that level; building shoreline protection and development setbacks that can accommodate future SLR adaptation; maximizing the use of green infrastructure, and resorting of 300 acres of open spaces with native species.	
COST: High	SF GOVERNMENT ACTIVITY: Public Assets Owner	STATUS: Sustaining
POTENTIAL FUNDING SOURCES: CFD, Grants	PRIORITY LEVEL: High	TIMELINE: 2040 and beyond

Treasure Island as seen from Yerba Buena Island

Plan Maintenance

The Office of Resilience and Capital Planning (ORCP) will continue to convene the Planning Team once per year as a primary method of monitoring, evaluating, and updating the HCR. This convening will include soliciting information on new hazard information, capabilities, new risk assessments, and significant changes to assets. These meetings will also identify any emerging issues.

In addition to the annual Planning Team meeting, ORCP will produce a mid-cycle progress report in 2027. The progress/status of the mitigation actions (Chapter 7) will be gathered through staff-level interviews with each department. Evaluation of Plan effectiveness will also occur through the progress report by collecting information through the interviews above on how the HCR Goals (Chapter 7) have been advanced.

The 2025 HCR will be integrated into the following plans as they are updated:

- 10-Year Capital Plan
- Climate Action Plan
- Safety and Resilience Element
- Subregional Shoreline Resiliency Plan (SB 272)
- Emergency response plans and exercises, including earthquake, firefighting, and mutual aid.