City of

HAYWARD

LOCAL RESILIENCE PLAN

2021 UPDATE

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EXECUTIVE SUMMARY

The U.S. Disaster Mitigation Act of 2000 calls for localities to produce and adopt Local Hazard Mitigation Plans (LHMP) in order to receive hazard mitigation grants and fully federally funded post-disaster Public Assistance. In 2015 an interdepartmental team participated in a regional effort to update Local Hazard Mitigation Plans led by the Association of Bay Area Governments (ABAG). One result of that regional effort was the 2015 Hayward LHMP (completed in 2016). This 2021 document is the required five year update of the original Hayward LHMP and is also referred to as the Hayward Resilience Plan.

The purpose of this LHMP update, now called the City of Hayward Local Resilience Plan (LRP), is to assess hazard risk and asset vulnerability in the City of Hayward and use that information to identify strategies to reduce future losses from natural hazards. The Local Resilience Plan was renamed as part of Hayward's forward-thinking resilience planning and serves as a guiding document for that strategy and the City's hazard mitigation activities. It was developed in fulfillment of and alignment with the City Council's "Safe" priority and informed by General Plan Safety Element and Hazards Element goals.

This LRP update contains the same format and background information found in the original 2015 Hayward LHMP as much of that document remained relevant. There are; however, substantial updates to the City's proposed mitigation projects and those updates are highlighted in the pages of mitigation project tables of this 2021 Local Resilience Plan.

The appendix materials from the original Hayward LHMP remain largely intact as they tell the story of the development of this Plan. Updates are provided at the end of each appendix where relevant. Updates to facts and figures, natural disaster risk, and disaster mitigation priorities have been made throughout the document. Maps and figures have been updated and enlarged for clarity.

The 2021 Local Resilience Plan effort was led by the Hayward Fire Department. A full list of the City's update team is provided in Section 2 of this Plan.

To prepare this document, LRP update team members completed the following tasks:

- *Reviewed the previous LHMP:* team members reviewed the 2015 Hayward LHMP to report on the City's progress since 2015 on implementing the plan's mitigation strategies, and to update the plan with any new information since that previous version.

- *Engaged community members and stakeholders:* the team reached out to community members in October 2021 through a news article and social media posts asking for their participation through an updated online survey (see Appendix D). Because the disaster environment has not changed in Hayward during the 5-year period since 2016 no updated stakeholder coordination was performed. Back in 2016 representatives from the Hayward planning team attended ABAG's LHMP update workshops and worked with ABAG staff and the East Bay Corridors Initiative group.

- *Evaluated the City's risk by mapping hazard exposure and vulnerable assets:* using GIS data, the team performed updated mapping of the city's exposure to hazards and identified vulnerable asserts in the affected areas.

- *Selected and prioritized mitigation strategies:* based on the risk and vulnerability analysis and careful consideration of each strategy, the team developed a prioritized list of mitigation strategies for the City of Hayward to implement over the next 5 years.

The following sections summarize the results of the team's risk assessment and mitigation strategy prioritization efforts. For further information about the plan update process, please see Section 2 of the Local Resilience Plan.

RISK ASSESSMENT & ASSET EXPOSURE

The basis of hazard mitigation planning is reliable, relevant data about the probability and location of potential hazards in the City of Hayward. Using data from state and federal agencies provided by the ABAG, the City's LRP team updated maps of the City's exposure to earthquake, fire, landslide, flooding, tsunami, sea level rise, drought, and hazardous materials hazards. These maps and a detailed discussion of Hayward's exposure to risk and specific vulnerabilities are included in Section 5 of the Local resilience Plan. Fortunately, none of these natural disasters had significant impacts on the City since the 2015 LHMP. A brief summary of the City's exposure to each hazard is available below.

Earthquake

Hayward is exposed to ground shaking, liquefaction, surface rupture, and landslides from seismic activity along the Hayward Fault, San Andreas Fault, San Gregorio Fault, and other Bay Area faults. The hills are susceptible to earthquake-induced landslides, while the flatlands are at risk of liquefaction. Tsunami and fire following an earthquake also threaten the city. According to the University of California at Berkeley Seismology Lab the Hayward Fault has a 31.7% chance of rupturing in a 6.7 magnitude earthquake or greater in the next 26 years. A major earthquake along the Hayward Fault would be particularly catastrophic.

Fire

The Hayward Hills are at risk of wildland-urban interface fire. Dry grassland adjacent to residential properties and the seasonal Diablo winds can result in large, rapidly spreading fires that cause widespread damage to hillside properties.

Landslide

Rain-induced and earthquake-induced landslides may occur on Hayward's hillsides. Extreme wet-dry cycles expected as a result of climate change may exacerbate the risk of these landslides.

Flood, Tsunami, and Sea Level Rise

Hayward's shoreline, while protected by extensive wetlands, is at risk of inundation from tsunamis, floods, and rising sea levels. Infrastructure along the shoreline will be more frequently, and eventually permanently, inundated as the sea level rises. In especially severe

floods and at sea levels above 5 feet, residential and industrial parts of South Hayward adjacent to Don Edwards National Wildlife Preserve and Ward Creek are also at risk of flooding.

Drought

Regional and statewide droughts affect the entire city and are likely to become much more common as climate change progresses.

Hazardous Materials

Hayward is home to nearly 1000 businesses throughout the city that house various hazardous materials. Hazardous materials are not a natural hazard covered by FEMA's HMGP; however, hazardous materials have the potential to become a crucial complicating factor in emergency situations and are therefore covered in this LRP. Flooding, earthquakes, and fires can all cause or be exacerbated by hazardous materials release.

MITIGATION STRATEGIES

The ultimate goal of hazard mitigation planning is to identify and implement policies, projects, and programs that prevent or lower the risk of damage and loss of life when a disaster strikes. Using the 2015 Local Hazard Mitigation Plan, the General Plan, the Climate Adaptation Plan, and a FEMA Mitigation Strategies publication, staff compiled a list of mitigation strategies to address the City's vulnerability to various hazards.

Update team members evaluated each strategy based on feasibility, social benefits, economic benefits, environmental impacts, and community objectives. The mitigation strategies were then ranked by priority level. The results of this analysis are available in Section 6 of the Plan and summarized in Table 1 below. The City's mitigation priorities have remained the same as identified in the 2015 LHMP as conditions have remained largely the same, with no new disasters occurring and steady progress being made on most of the mitigation strategies.

Overall, the planning team prioritized organizational preparedness, which would mitigate the effects of and improve the City's preparedness and response for all of the disasters discussed in this Plan. Seismically retrofitting fragile housing, working with partner organizations to address sea level rise along the shoreline, and public programs to empower residents and community members to prepare for and respond to hazards also rated highly.

Table 1: Mitigation Strategies by Priority Level

Priority Level	Strategy Group	Strategies
Very High	Organizational Preparedness	Employee Education Emergency Management Plan Update Tabletop & Field Exercises
High	Fragile Housing Retrofits	Single-Family Home Retrofits Soft Story Retrofits
	Public Programs	Public Education Community Emergency Response Teams Defensible Space Programs
	Organizational Preparedness	Communications redundancy Diversify partnerships & MOUs Acquire Equipment Participate in the ABAG Regional Lifelines Council
	Collaboration to Mitigate Sea Level Rise	Implement Adapting to Rising Tides Multiagency Support SR-92 Study
	Planning	Recovery Plan Shoreline Realignment Plan Hayward Executive Airport Seismic Evaluation
Moderate	Hazardous Materials Programs	Hazardous Materials Response Team Hazardous Materials Fee Study
	Fragile Housing Retrofits	Mobile Home Retrofits
	Environmental Programs	Expand Hayward Area Shoreline Protection Agency (HASPA) Renewable Emergency Energy Sources Watershed Analysis Hillside Landslide Mitigation
	Organizational Preparedness	Mobile Command Center
Low	Administrative Programs	Building Occupancy Resumption Program 911 Registry Priority Inspection List

1. INTRODUCTION

1.1 BACKGROUND

In 2010, Hayward participated in the Association of Bay Area Governments' Multi-Jurisdictional Hazard Mitigation Planning effort. Since then, the City has achieved many of the goals laid out in the 2010 plan, which expired in March of 2016. In 2016, the City prepared its own, single-jurisdiction Local Hazard Mitigation Plan (LHMP), which was called the 2015 LHMP and has now been updated by this current document – the 2021 LHMP Update/Local Resilience Plan. Acknowledging the certainty of a natural hazard in our City, and in fulfillment of the City Council's formal prioritization of safety in Hayward, this plan prioritizes the hazard mitigation activities the City of Hayward plans to take over the next five years, building on the comprehensive mitigation projects identified in the 2015 LHMP.

This LHMP Update contains the same format and background information found in the original 2015 Hayward LHMP as much of that document remained relevant. There are; however, substantial updates to the City's proposed mitigation projects and those updates are highlighted in the pages of mitigation project tables that start at Section 6.3.1 of this 2021 Local Resilience Plan. Minimal new development activities have occurred in Hayward, a heavily built-out city, in the past 5 years and no new exposures to natural disasters have been identified beyond the multiple risks and exposures identified in the previous LHMP. Overall, vulnerability has decreased or remained the same due to the mitigation performed to date (e.g. seismic retrofits, wildfire defensible space projects). New developments are shown on the City Planning Department's Development dashboard website (https://maps.hayward-ca.gov/devsvcdash/). Fortunately, none of these natural disasters had significant impacts on the City since the 2015 LHMP. The focus of the past five years has been working on the many mitigation projects already identified for Hayward, with one new mitigation project identified in Section 6.2.1. The progress on all of the City's mitigation projects is shown in Section 6.3.

Hazard mitigation is sustained actions taken to reduce or eliminate long-term risk to life and property from hazards. The strategies contained in this plan build toward creating a safer, more resilient Hayward, and prevent natural hazards from doing devastating damage to our City.

1.2 DISASTER MITIGATION ACT OF 2000 & AUTHORITY

This plan has been developed in accordance with and with the authority granted by the U.S. Disaster Mitigation Act of 2000, which amended the Stafford Act to require state, local, and tribal governments to develop and submit hazard mitigation plans for approval by the Federal Emergency Management Agency (FEMA). Under the Disaster Mitigation Act, plans must describe the processes for identifying natural hazards, risks, and vulnerabilities of the jurisdiction. Localities that approve and adopt a hazard mitigation plan are eligible for FEMA mitigation grants, points toward the National Flood Insurance Program Community Rating System, and a waiver of Public Assistance matching funds requirements.

The City of Hayward has prepared this Local Resilience Plan for the incorporated City of Hayward. Though unincorporated areas of Alameda County may benefit from the Local Resilience Plan by receiving services from the Hayward Fire Department, the plan focuses on mitigation strategies that address hazards, exposure, and vulnerabilities within the city limits.

1.3 WHY WE VALUE HAZARD MITIGATION IN OUR COMMUNITY

Hayward's rolling hills and beautiful shoreline are some of its best natural features and a daily reminder of the hazards that can affect our community. City residents, business owners, community members, staff, and leaders are eminently aware of the threat that exists in our city.

The Hayward City Council specifically prioritizes making and keeping the city safe, clean, green, and thriving. Hazard mitigation is an essential part of achieving those goals – especially ensuring the City's safety, and helping the City thrive following a natural hazard. In the 2014 General Plan update, goals for the City also emerged in visioning and planning conversations with residents and community members. These goals included elements specific to hazard mitigation, summarized here:

- Hayward shall have safe and clean neighborhoods that encourage long-term residency
- Hayward shall develop and enhance its utility, communications, and technology infrastructure; and provide exceptional police, fire, and emergency services
- Hayward shall preserve, enhance, increase, and connect its baylands, hillsides, greenway trails, and regional parks to protect environmental resources, mitigate the impacts of rising sea levels, and provide opportunities to live an active outdoor lifestyle.

Taking guidance from the City Council's priorities and the General Plan, the Hazard Mitigation planning team selected the strategies laid out in this plan to preserve the lives, property, and prosperity of Hayward residents in the event of a natural hazard by lessening the impact of the hazard on buildings, City infrastructure, and people. In service of this goal, our priorities were as follows:

1. Protect the lives of members of the Hayward community.
2. Preserve and maintain functional City property and structures.
3. Maintain the consistent quality delivery of essential City services on which our residents depend.
4. Facilitate timely and holistic citywide recovery following a hazard.

1.4 SCOPE

The scope of this Local Resilience Plan addresses and lays out mitigation strategies for natural hazards that may occur in the incorporated City of Hayward and the effects of climate change on those hazards. The Local Resilience Plan also includes strategies for hazardous materials management in the context of natural disasters. The hazards included in this plan are:

- Earthquake
- Fire
- Landslide
- Flood

- Drought
- Hazardous Materials

It should be noted that this LRP update was prepared after nearly two years of the Covid-19 infectious disease pandemic. The City of Hayward Fire Department played a key role in the East Bay Region operating Covid-19 testing and vaccination centers in conjunction with local non-profit groups and medical institutions. Although some municipal governments have begun including pandemics in their LHMPs, infectious disease is not currently a hazard covered by the FEMA HMGP and is not being included in Hayward's LHMP Update. Pandemic mitigation and response may be addressed by the City in a future document.

2. PLANNING PROCESS

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Hazard Mitigation Planning entails identifying the risk of various hazards in the planning area, determining which assets are exposed to those hazards and their level of vulnerability to damage as a result of that exposure, and selecting and prioritizing strategies for mitigating and preventing that vulnerability. These strategies can be drawn from or incorporated into land use plans, building codes, and other City policies to promote their implementation.

Hazard Mitigation Planning enables the City of Hayward to fulfill its responsibility to protect the health, safety, and welfare of its residents before a disaster occurs, creating a safer, more resilient community.

2.2 PREPARING THE 2015 AND 2021 UPDATES

In 2015 the City of Hayward began the 2015 plan update in May by attending ABAG's Community Engagement for Resiliency Planners workshop. Development Services Director David Rizk facilitated a kick-off meeting among staff members who had been or whose predecessors had been involved in the 2010 Multi-Jurisdictional Hazard Mitigation Plan process. From that meeting, two staff members from the City Manager's Office were tasked with managing the project. Department heads assigned key staff members to participate in the planning process. A full roster of participating staff members is available in Appendix A.

Thereafter, staff members were assigned to specific tasks in the plan, and meetings were held with each working group to coordinate and collaborate on each task – community engagement, risk assessment, and mitigation strategies. The mitigation strategies working group was further divided into hazard-specific teams tasked with identifying, evaluating and prioritizing relevant strategies drawn from the General Plan, the previous LHMP, the Climate Action Plan, neighboring jurisdictions, and FEMA's Mitigation Ideas planning resource. A timeline of these meetings, agendas, and rosters of working group members can be found in Appendix B and Appendix C.

In addition to these working group meetings, the plan was updated through ad hoc collaboration and conversations between team members. Each department prepared an update on their mitigation activities since the previous plan update (See Appendix K), discussed potential mitigation projects not included in the previous plan, and provided input and comment on the community engagement plan and risk assessment. The 2015 LHMP was adopted by Hayward City Council on November 29, 2016.

The 2021 update effort was reduced since the 2015 update was the first City-only LHMP. A project kick-off meeting explaining the impetus and timeline driving the plan update was held in July 2021. The Fire Department took the lead in the 2021 and coordinated with other City department leads as needed to update existing conditions and hazard mitigation priorities. Shanalee Gallagher, Fire Department Grants and Budget Manager was the Local Resilience Plan Update lead. The following additional City staff actively participated in the 2021 update:

- Paul Wheeler, Emergency Services Officer;
- Don Nichelson, Hayward Fire Department Public Information Officer;
- Eric Vollmer, Deputy Fire Chief;
- Mike Hildebrand, Battalion Chief (radio expert);
- Erik Pearson, Environmental Services Manager;
- Bryan Matthews, Deputy Police Chief;
- Monica Davis, Community Services Manager;
- Jessica Lobedan, Management Analyst;
- Laurel James, Management Analyst (lead author of 2015 LHMP);
- Omar Noozad, Acting Building Official;
- Pamela Syrdlin, Airport Operations Supervisor;
- Brianne Elizarrey, City Public Information Officer;
- Miles Massone, Fire Marshal;
- Hugh Murphy, Hazardous Materials Coordinator;
- Taylor Richard, Assistant Planner; and
- Garrett Contreras, Fire Chief.

Staff will submit the 2021 local resilience plan update to city council following Cal OES and FEMA approval.

2.3 COMMUNITY ENGAGEMENT PROCESS

Throughout the development of the Local Resilience Plan, the City has worked to engage the community in the update, through the internet, social media, and via public surveys. During development of the LRP engagement activities included:

- Distributing bilingual Local Hazard Mitigation Planning flyers and initiating conversations with attendees at community events (see flyer and list of events in Appendix G and Appendix I)
- Creating a bilingual Local Hazard Mitigation Planning website explaining the update process and providing a contact form. The website was closed following completion of the 2015 update and related survey.
- Running an updated bilingual hazard mitigation priority survey (see survey questions and results in Appendix E and Appendix F)
- Engaging community leaders in conversation during community meetings throughout the planning period (see list of meetings in Appendix I)
- Conducting a social media campaign through the City of Hayward Twitter, and Facebook platforms, as well as through existing City mailing lists (see examples of social media posts in Appendix D)
- Flyers were made available at various locations in City Hall, at the Hayward Library, and in local schools

Public feedback was taken into account in determining the mitigation priorities identified in this document (see Section 6.3, Table 8). Feedback came in the form of survey results, reviewed by the Hayward Project Manager (S. Gallagher) and the City's consultant Ganey Science. These results did not differ from previous 2015 public comment and resulted in no change in priorities for Hayward mitigation projects. This was likely due in part to the period of no natural disasters in the City since the previous plan.

There are multiple potential disasters which are all of a concern to citizens; and the City has worked to address all of them in this Plan. The Hayward Fault and earthquakes were frequently cited by the public as priority concerns. Future LHMP/Resilience Plan updates will continue to include opportunities for community involvement and public input on improvements for disaster mitigation is welcome on an ongoing basis.

3. CAPABILITY ASSESSMENT

Per the General Plan and the City Council's state priority of creating a Safe Hayward, staff members throughout the City organization incorporate mitigation into their everyday activities. Mitigation is important to the Hayward community – located directly on an eponymous fault with a beautiful view of San Francisco Bay, our residents, elected officials, and City staff are all acutely aware of the need to anticipate and prepare for the effects of future disasters. In a resource constrained environment, the City leverages partnerships, uses ingenuity, pursues funding opportunities, and develops multipurpose programs to achieve its mitigation goals.

3.1 EXISTING PLANS & POLICIES

The following plans, policies, and documents related to hazard mitigation exist in the City of Hayward and were reviewed and incorporated into the plan. With the exception of the Adapting to Rising Tides study, all items on the list have been adopted and implemented.

Table 2: Existing Mitigation-Related Plans & Policies

Plan or Policy	Date	Notes
Adapting to Rising Tides Hayward Shoreline Resilience Study	2015	Analyzes the effects of sea level rise on the Hayward shoreline and makes recommendations for mitigation and adaptation.
Capital Improvements Plan	2022	Includes funding for disaster preparedness exercises and seismic retrofitting of City infrastructure.
General Plan	2014	Relevant sections: Land Use and Community Character Element Safety Element Natural Resources Element Hazards Element Public Facilities and Services Element
Building Code	2019	Current codes: 2019 California Building Code Part 1 and the two volumes of Part 2 2019 California Residential Building Code Part 2.5 2019 California Historical Building Code Part 8 2019 California Existing Building Code Part 10

		2019 California Green Building Standards Code Part 11 Used as reference: 2021 International Code for Property Maintenance based on the 2021 International Building Code and 2021 International Residential Code
Hazardous Materials Area Plan	2013	Describes the city's pre-incident planning and preparedness; clarifies the roles and responsibilities of federal, state and local agencies; and describes the City's hazardous materials program, training, communication and post-incident recovery procedures in fulfillment of state law and the Certified Unified Program Agency requirements.
Comprehensive Emergency Management Plan	2009	Describes function, structure, and procedures of the City's Emergency Operations Center and plans for continuity of services and government.
Floodplain Management Ordinance	2008	Implements the Cobey-Alquist Flood Plain Management Act and complies with the eligibility requirements of the National Flood Insurance Program.
Hayward Executive Airport Master Plan	2002	Examines airport service area, forecasts aviation demand, and plans for facilities expansions and improvements.
Hillside Design and Urban/Wildlife Interface Guidelines	1993	Requires that all hillside developments protect and preserve important environmental resources and significant natural features in the hills, and ensures that hillside developments incorporate public safety measures relating to fire defensibility and access.

3.2 DEPARTMENTAL MITIGATION ACTIVITIES

Additionally, the programs and policies listed below represent a selection of department-specific policies and programs. There are few resources to expand these activities at this time.

3.2.1 Development Services

- Waives plan check fees for Brace and Bolt-type retrofits using Plan Set A.
- Requires site-specific geological reports for development on landslide areas and along fault traces.

- Regulates construction in flood zones to comply with National Flood Insurance Program Community Rating System.
- Oversaw the retrofit or demolition of all unreinforced masonry buildings in the city.
- Requires simultaneous retrofit during reconstruction and repair following disaster.
- Provide continuing education classes on retrofitting and Plan Set A to staff.
- Ensures development near faults with a history of complex surface rupture has setback of greater than 50 feet.
- Updated the General Plan to include best practices for earthquake, landslide, and fire safety, address sea level rise and flooding, and commit to renewable energy and climate adaptation practices.

3.2.2 Fire

- Employs a full-time Emergency Management Specialist to coordinate Citywide emergency mitigation, preparedness, response, and recovery efforts
- Operates the Community Emergency Response Team (CERT) program.
- Participates in inter-jurisdictional information sharing & attendance at hazard conferences, events, and workshops.
- Requires new structures in fire-threatened communities to incorporate fire-resistant materials and design.
- Develops adequate evacuation plans for fire-threatened areas.
- Creates and identifies model properties demonstrating defensible space and structural survivability in wildland-urban interface or fire threatened communities – specifically, Fire Station 8 and the Stonebrae residential development.
- Requires all new developments that house or include hazardous materials to be graded above Flood Zone A.
- Enforces compliance with California Certified Unified Program Agency hazardous materials requirements.
- Provides information on hazardous materials disposal and drop-off locations to the public.
- Monitors weather during times of high fire risk.
- Works with major employers and hazardous materials agencies to coordinate mitigation.
- Requires either fire sprinklers or smoke detectors in all developments.
- Establishes memorandum of understanding (MOU) agreements with other local agencies to provide shelter and supplies in an emergency.
- Manages vegetation, including chipping, mechanical fuel reduction equipment, goats, selective harvesting, and controlled burning.
- Encourages private landowners to participate in building elevation programs within the floodplain.
- Applies floodplain management regulations for private developments in the floodplain/floodway.
- Establishes requirements for repair and re-occupancy of historically significant structures, including shoring and stabilization, consultation with a preservationist, and expedited permits.

3.2.3 Maintenance Services Division

- Provides information, sandbags, and plastic sheeting to residents and businesses at multiple locations in advance of a rainstorm and delivers to vulnerable populations upon request.
- Maintains stormwater infrastructure, pipelines, and waterways to minimize flooding.
- Prioritizes energy efficiency and recycling throughout city facilities.
- Retrofits and replaces vulnerable critical facilities.
- Installs and maintains emergency generators at city facilities.

3.2.4 Public Works – Engineering & Transportation

- Uses water management ordinances to control erosion and sedimentation. (Municipal Code Ch. 10, Article 8 - Grading and Clearing)
- Ensures critical intersection traffic lights function following loss of power.

3.2.5 Utilities & Environmental Services

- Replaces or retrofits structurally deficient water retention structures.
- Provides materials to the public related to coping with disrupted storm drains, sewage lines, and wastewater treatment beyond statutory requirements.
- Includes the vulnerability to ground failure in criteria used for determining a pipeline replacement schedule.
- Determines the vulnerability of wastewater treatment plants to flooding and takes mitigation measures.
- Increases the use of clean, alternative energy at the Water Pollution Control Facility through installation of solar panels and cogeneration technology.
- Installs specially-engineered pipelines in areas vulnerable to earthquakes, portable facilities to allow pipelines to bypass failure zones, and earthquake-resistant connections where pipes enter or exit bridges.

4. COMMUNITY PROFILE

4.1 AREA AT A GLANCE

Hayward is a mid-sized, culturally diverse community that is centrally located within the San Francisco Bay Area. The city is located in Alameda County, California, on the eastern shore of the San Francisco Bay, 25 miles southeast of San Francisco, 14 miles south of Oakland, 26 miles north of San Jose, and 10 miles west of the Livermore Valley. The City covers an area of approximately 63.7 square miles ranging from the shore of the Bay eastward toward the Hayward hills. The Hayward Fault traverses through the City along the base of the hillside.

Hayward continues to plan for the future, maintaining a balance between the needs of our diverse residents and a growing business community. Hayward's Growth Management Strategy, designed with input from citizens, balances the needs of the City's growing population with the preservation of open space, and the need for economic development.

4.2 DEMOGRAPHICS

Hayward has a total population of 162,954. With a median age of just 34.6 years, the City enjoys a population that is younger than the national median by 3.9 years.

By census figures, Hayward is the second most diverse city in the state of California, with large African American, Latino and Asian populations, among others. The percentage of residents who speak a primary language other than English (59.5%) is significantly higher than the state average (44.2%), and the percentage of residents with a bachelor's degree or higher (27.7%) is below the Alameda County average. Per the U.S. Census Bureau, from 2015-2019, Hayward's median household income was $86,744 and the median value of owner-occupied housing units was $581,200.

4.3 ASSETS & FACILITIES

Hayward City assets and facilities are identified in Table 3, below. Section 5 also identifies City assets that are located in the portions of the city that are especially vulnerable to wildfire and landslide hazards; that is the eastern Hayward Hills, which are more heavily vegetated (i.e., wildfire vulnerable) and steeply sloped (i.e., landslide vulnerable).

Table 3: City of Hayward Facilities List

Facility	Address	Year Built	Sq. Ft.	Retrofit ?	Function & Notes
Hayward Animal Shelter	16 Barnes Ct.	1969	75,000	N	The animal shelter structure is home to the City's animal services.
Cinema Place Garage	22631 Foothill Blvd.	2007	91,100	N	Parking structure with 244 spaces.
City Center Garage	22332 Foothill Blvd.	1983	112,500	N	Unused parking structure containing 700 spaces. Damaged in Loma Prieta earthquake.
City Hall Garage	22600 Watkins St.	1998	112,500	N	Parking structure with 481 spaces located across the street from City Hall.
City Hall	777 B St.	1997	104,100	N	Used for offices and assemblies, including City Council meetings, and built to withstand a major earthquake on the Hayward Fault
Fire Station #1	22700 Main St.	1996	14,000	N	In addition to being an operating station, Fire Station 1 houses secondary offices for the Fire Chief and Battalion Chiefs.
Fire Station #2	360 West Harder Rd.	1955	4,650	Y	Retrofitted to critical facilities standards.
Fire Station #3	31982 Medinah St.	1957	3,320	Y	Retrofitted to critical facilities standards.

Fire Station #4	27836 Loyola Ave.	1956	3,949	Y	Retrofitted to critical facilities standards.
Fire Station #5	28595 Hayward Blvd.	1976	4,300	Y	Retrofitted to critical facilities standards.
Fire Station #6 & Training Center	1401 West Winton Ave.	1975	10,525	Y	Fire Station 6 includes a Training Center used by the City of Hayward and many other fire agencies in Alameda County. Additionally, houses Emergency Medical Services (EMS) Coordinator as well as EMS supplies and EMS training. Retrofitted to critical facilities standards.
Fire Station #7	28270 Huntwood Ave.	2015	13,124	N, New	Fire Station 7 houses both a traditional fire station, and a clinic run by the Tiburcio Vasquez Health Center. Both buildings are new construction, built to modern seismic safety standards.
Fire Station Clinic	28300 Huntwood Ave.				
Fire Station #8 (Old)	24200 Fairview Ave.	1938 1975	3,500	Y	No longer an operating fire station; primarily used as storage space for documents.
Fire Station #8 (New)	25862 Five Canyons Pkway	2000	5,600	N	Built to critical facilities standards.
Fire Station #9	24912 Second St.	1998	3,000	N	Built to critical facilities standards.
Former Hayward Area Historical Society Building	22701 Main St.	1926	6,000	N	Houses items belonging to the Hayward Area Historical Society as well as a small satellite police station.
Main Library	835 C St.	1950	20,300	N	Will be demolished and was replaced by the new 21st Century Library and Heritage Plaza, completed in 2018.

21st Century Library & Heritage Plaza	Mission Blvd. at C St.	2018	58,200		Most environmentally sustainable public project ever constructed in Hayward..
Weekes Branch Library	27300 Patrick Ave.	1964	8,600	N	A branch of the Hayward library.
Police Department HQ	300 West Winton Ave.	1975	41,128	Y	Built to critical facilities standards.
Corp Yard	24505 Soto Rd.	1964	10,530 7,380	N	The corp yard is home to equipment maintenance, streets, fleet, and landscape management facilities and staff.
Water Pollution Source Control	24499 Soto Rd.	1960	14,000	N	Utilities operations and maintenance and water pollution source control staff and equipment are located in this building.
Water Pollution Control Facility	3700 Enterprise Way	1952	300 acres	Y	The WPCF is comprised of many different structures and facilities. In addition to water processing facilities, solar panels and a cogeneration operation at this location produce renewable energy to both power the plant and return to the grid.
Executive Airport	20301 Skywest Dr.	--	543 acres	N	The Hayward Executive Airport is comprised of many different structures, including hangars and an administration building, as well as two runways and a helipad.
Garin Radio Building	Garin Regional Park 1320 Garin Ave.	2007	525	N	Small portable building on concrete slab housing communications equipment in the Hayward hills.

Walpert Radio Building		1975	525	N	Small portable building on concrete slab housing communications equipment in the Hayward hills.

4.4 PAST DISASTERS

Since the adoption of the 2010 Annex and the 2015 LHMP, there has been no major hazardous event in Hayward. However, absence of a major event does not absolve the City from the threat of a natural hazard. Hayward continues to be very susceptible to several types of natural hazards, most notably earthquakes, flooding, and associated landslides.

4.4.1 EARTHQUAKE HAZARDS

The Bay Area is very well known for its exposure to earthquake hazards. Major faults intersect every Bay Area county. 97 of the 101 Bay Area Cities lie within ten miles of a major earthquake fault line[1]. For Hayward, it is the fault named for the City that threatens the way of life for our residents. The Hayward fault divides the City and is close in proximity to several major transportation and public transit infrastructure networks including Bay Area Rapid Transit, Amtrak, and the Route 238 and the Route 92 corridors.

In 1868, Hayward was the epicenter of a 6.8-7.0 magnitude earthquake which brought significant damage to Hayward, especially in the downtown district and throughout Alameda County. The 1989 Loma Prieta Earthquake also caused severe damage to the City, including jeopardizing the structural integrity of the then Hayward City Hall, known as the City Center Building today.

A repeat of the 1868 earthquake could cause economic losses (including damage to buildings and contents, business interruption, and living expenses) exceeding $120 billion, with more than 90% of both residential and commercial losses being uninsured. Also, damage to infrastructure and other long-term economic effects could substantially increase the total losses.

Disaster in Hayward's recent past has been relatively limited. Therefore, the Hayward Fire Department has not as of yet, experienced a significant incident that has impacted the city beyond normal mutual aid capabilities due to an earthquake. Hayward Fire Department responded to incidents resulting from the 1989 Loma Prieta earthquake but the City was not severely impacted. The City of Hayward did not have any reported injuries, deaths or displacements of residents or businesses. Damage sustained to homes and businesses was minor. However, Hayward City Hall sustained damage and City Hall operations were moved to temporary offices in anticipation of the completion of the current City Hall that was completed in 1998.

4.4.2 FIRE HAZARDS

The Hayward Hills is susceptible to urban wildfires. The City of Hayward has not experienced occurrences of major natural disasters over the past 10 years. However, one of the most common threats in the City of Hayward is hillside urban wildfires. On August 2, 2011, the Hayward Fire Department requested mutual aid to suppress a vegetation fire in the Hayward Hills just southeast of the Stonebrae Country Club. Two fixed winged aircraft, and two helicopters from Cal-Fire and East Bay Regional Parks Department responded via air with dozers and hand crews on the ground coming from Hollister and Santa Clara. The

[1] Bay Area Risk Landscapes, Pg 7

Alameda County Fire Department brought equipment and personnel into the Hayward Fire stations to backfill. This is the most significant incident that has occurred within the past 10 year period.

Hayward Fire Department responded to mutual aid requests to assist with the 1991 Oakland Hills fire in addition to other significant mutual aid emergencies outside the City of Hayward. Mutual aid provided by Hayward Fire Department during California wildfires alone, provided over 2,000 hours of firefighting outside of Hayward impacting local emergency callback for Hayward personnel and possible coverage for residents.

4.4.3 LANDSLIDE

The eastern section of Hayward in the hillside also has areas susceptible to landslide. The Hayward General Plan identifies slope instability areas and occasionally, following incidents of heavy rain, minor landslides will occur. Earthquakes can also trigger landslides. In addition, minor land slippage occurs under some residential structures that were constructed with engineered design features in anticipation of such events. These events do not result in Fire Department response and in very few cases were residents affected.

4.4.4 FLOODING

Hayward is susceptible to flooding. Parts of the City's western and southern land falls within a 100 year floodplain. Localized flooding effects the City during times of heavy precipitation found in events like El Nino. In years past, El Nino events with marked impact (including "Pineapple Express" weather events of 1986, and 1997) required Hayward Fire Department to respond to flooding and landslides resulting from severe weather. These events are found on related National Oceanic and Atmospheric Administration (NOAA) and FEMA websites.

Rising sea levels will impact the occurrence of flooding in the coastal neighborhoods of Hayward. As tides rise, so will the frequency and duration of flooding.

4.4.5 DROUGHT

Since drought is a regional rather than local phenomenon, the City of Hayward has not specifically experienced drought. However, Hayward is impacted by the statewide droughts that periodically occur in California including a current drought affecting the entire state, according to the National Integrated Drought Information System. See **Error! Reference source not found.** below for a chronology of memorable droughts in California, including the ongoing drought.

Table 4: Notable California Droughts

Date	Area Affected	Recurrence Interval (years)	Notes
1917 - 1921	Statewide except central Sierra Nevada and north coast.	10 to 40	Simultaneous in affected areas, 1919- 20. Most extreme in north.
1922 - 1926	Statewide except central Sierra Nevada.	20 to 40	Simultaneous in effect for entire State only during 1924, which was particularly severe.
1928 - 1937	Statewide	>100	Simultaneously in effect for entire State, 1929- 34. Longest in State's history.
1943 - 1951	Statewide	20 to 80	Simultaneously in effect for entire State, 1947- 49. Most extreme in south.
1959 - 1962	Statewide	10 to 75	Most extreme in Sierra Nevada and central coast.
1976 - 1977	Statewide, with the exception of southwestern deserts.	>100	Second-driest 2 years in State's history. Most severe in northern two-thirds of State.
1986 - 1991	Statewide	10 to 40	Moderate, continuing through 1989. Most extreme in northern Sierra Nevada.
2007 - 2009	Statewide	Not available	First drought for which statewide emergency proclamation was issued.
2011 - 2016	Statewide	Not available	Most severe drought in California history.

2020 - current	Statewide	Not available	All California counties under a state drought declaration in October 2021

4.4.6 HAZARDOUS MATERIALS RELEASE

As discussed in Section 5.1.6, Hayward's economically robust industrial sector is also a source of potential hazardous materials release. The Hayward Executive Airport, the railroad, and I-880, the only major highway connecting the East Bay with the South Bay and a major transportation corridor, are also potential sources of hazardous materials releases from airplanes, trucks, or other vehicles transporting hazardous materials.

Several major hazardous materials incidents have occurred in Hayward, in addition to the crucial day-to-day work monitoring and cleanup of smaller releases. While none of the major releases were due to of a natural hazard, similar releases have the potential to occur during future natural hazards as a result of damage to storage tanks, valves, or other containers. Previous major incidents have included:

- August 26, 2014 – Improper mixing and disposal of hazardous materials at a site in the industrial area resulted in the evacuation of surrounding businesses and a shelter in place order that affected nearby schools.
- September 18, 1993 – A dichlorosilane vapor release near the Union City border required the evacuation of 150 people in nearby areas, and resulted in one injury.
- April 9, 1980 – A train crash beneath an overpass resulted in a fire and spilled diesel fuel. Other hazardous materials were onboard the train. Approximately 10,000 gallons of diesel fuel burned in the incident.

4.5 KEY PARTNERS

In addition to services provided by the City, transportation and utilities services operated by other agencies serve the Hayward community. Rail, rapid transit, and power and gas lines run through Hayward. Additionally, the City purchases water from the San Francisco Public Utilities Commission. In the event of a hazard, these agencies' individual preparedness efforts will have an effect on Hayward.

4.5.1 Bay Area Rapid Transit

Bay Area Rapid Transit (BART) is one of the San Francisco Bay Area's most vital transportation links throughout the East Bay and between the East Bay and San Francisco, carrying an average of about 350,000 passenger trips a day prior to the 2020 Covid-19 pandemic. In 2002 BART completed a study of the earthquake vulnerability of the entire system, analyzing multiple earthquakes, predicting damage, and assessing cost-effectiveness of retrofits. This study was the most comprehensive evaluation of BART facilities since the original construction of the system. It involved one and one-half years of engineering and statistical analyses. The study also incorporated information from the 1994 Northridge, California and 1995 Kobe, Japan earthquakes.

The results of the Seismic Vulnerability Study indicated that if the BART system was not strengthened, it would take years to restore service after a major earthquake. The study found that portions of the system most susceptible to earthquake damage included the Transbay Tube, various aerial structures, stations and equipment. The study recommended that priority be given to the Transbay Tube, where soil backfill is prone to liquefaction. Though the consequences of liquefaction on the Tube are uncertain, a worst-case scenario could cause excessive movement of the seismic joints and structural stress that could result in significant damage. Work to upgrade the Transbay Tube seismic joints was completed in 2010. BART continues to secure the Transbay Tube to a higher level of strength against future large earthquakes.

Through its Earthquake Safety Program, BART is working to prepare the entire BART system to better withstand future earthquakes. Upgrades to the system are being funded by $980 million in General Obligation Bonds, authorized by voters in Alameda, Contra Costa, and San Francisco counties, supplemented with an additional $240 million from other sources. BART anticipates the completion of all earthquake upgrades by 2022.

BART's investment in earthquake retrofit is strengthened by its earthquake early warning system, which can help prevent train derailments in the system by slowing or stopping trains upon notification of an earthquake. Currently, BART has a system in place, which is activated when an earthquake larger than magnitude 4 or 5 is experienced within the BART system. BART is working with UC Berkeley and others to implement a statewide earthquake early warning system. This system would issue notification to operators such as BART upon detection of P-waves. Upon notification, BART would automatically slow or stop trains within the system. The length of advance warning depends on how far away the earthquake originates.

Since 2009, the Hayward BART station, the South Hayward BART station, the Hayward station parking structure, and all elevated structures in the City of Hayward have been seismically retrofitted.

4.5.2 Union Pacific

A railroad corridor owned by Union Pacific runs along the western edge of Alameda County through the center of Hayward. The corridor is used for both passenger travel and goods movement. Amtrak owns stations along the corridor at Berkeley, Emeryville, Oakland Jack London, Oakland Coliseum, and Hayward with multiple daily passenger trips between Sacramento and San Jose. Rail lines are vulnerable to track damage in a number of natural hazard events.

In earthquakes, liquefaction, lateral spreading, and landslides cause damage to tracks. Along the Alameda portion of the tracks there is potential for liquefaction and lateral spreading to occur at multiple locations, primarily due to the tracks' proximity to the bay shoreline. North of Alameda County the corridor passes through landslide hazard zones in Contra Costa County. Damage to the corridor at any point would interrupt service along the entire East Bay Corridor. Ground shaking does not typically cause damage to at grade

tracks; however, ground shaking can cause severe damage to rail bridges. Small bridges over streams and creeks could settle or be damaged. Additionally, the rail bridge adjacent to the Benicia-Martinez Bridge connecting Contra Costa and Solano Counties has not undergone any major seismic improvement. If the bridge was damaged rail traffic would need to be rerouted for a significant amount of time.

In large storm events the rail tracks can be flooded, halting service until inundation recedes. There is also the potential for flooding events with flows that could damage line infrastructure requiring repair before service can be restarted. There are locations in Albany, Oakland, San Leandro, and Hayward where the Union Pacific lines intersect with FEMA 1% and 0.2% annual chance flood zones.

4.5.3 PG&E

Pacific Gas and Electric (PG&E) provides electricity and natural gas to 16 million people in northern and central California. They have a staff of 23,000 and are prepared to respond to restore electrical service after disasters and storms. They also have a well-established priority system for restoring power to emergency services before other community needs. PG&E recognizes that large earthquakes may damage key facilities and that electric power might be lost for limited periods of time. The potential for a loss of power means that emergency and critical uses should have dedicated emergency power sources.

The electrical system is vulnerable to many different hazards. In storm events downed trees can damage overhead lines. In earthquakes overhead lines are not typically damaged, but electrical substations components can be destroyed by strong shaking, often requiring more extensive and time intensive repairs to return service.

Natural gas is subject to damage and disruption in areas with soil failure, for example landslide and liquefaction. Broken lines can create fires if ignited until the fuel supply is exhausted. The repair of damaged underground lines will take time. Following the Loma Prieta earthquake it took about 30 days to repair damaged lines in the San Francisco Marina.

The large scale natural gas transmission lines that service the cities along the East Bay shoreline of Alameda County are primarily located near the shore. The transmission line runs along a single corridor through Albany, Berkeley, and Emeryville before splitting into two parallel lines in Oakland that run through Oakland, San Leandro and Hayward. Across the entirety of the natural gas line between Albany and Hayward the natural gas transmission line(s) pass through medium-level susceptibility zones with some lines passing through very high liquefaction susceptibly zones in East Oakland and San Leandro. The thousands of miles of natural gas distribution lines are also at risk to damage from liquefaction. Neighborhoods that experience significant liquefaction are not likely to have gas service for a significant amount of time.

PG&E has assessed the seismic vulnerability of many elements of its system and has taken steps to improve its functionality after an earthquake, such as replacing bushings on high

voltage lines, anchoring substation equipment and replacing old gas lines with more flexible alternatives.

As a consequence of a 2010 pipeline rupture in San Bruno, the National Transportation Safety Board (NTSB) has issued a number of recommendations to State and federal administrations and institutions to improve the safety of pipeline networks as well as to upgrade the integrity management program and emergency response system.

As a result, PG&E proposed a $2.2 billion Pipeline Safety Enhancement Plan to modernize its gas transmissions operations over the next several years. As part of this plan and in direct response to the recommendations issued by the NTSB, PG&E has begun improving its network by automating shutoff valves, with automatic shutoff valves planned for East Bay Communities; updating its emergency response plan to reflect industry best practices; and implementing data management systems intended to ensure its pipeline records are traceable, verifiable and complete.

Additionally, PG&E has created a First Responders Safety website, which provides secure access to maps and information about natural gas transmission lines, natural gas storage facilities, and shut-off valves.

4.5.4 San Francisco Public Utilities Commission

The City of Hayward purchases its water from the San Francisco Public Utilities Commission (SFPUC). The water is sourced from the Tuolumne River fed by the Hetch Hetchy Valley Reservoir in the Sierra foothills. Between the mountains and the Bay Area, SFPUC's gravity-powered water system traverses three separate fault zones. The Hetch Hetchy Regional Water System has been hard hit by the most recent drought, as have other California water systems.

The SFPUC has completed a series of projects to improve water supply reliability in the event of a major earthquake. The Water System Improvement Program (WSIP) is a $4.8 billion invest in regional and local water systems through 83 individual projects located from Hetch Hetchy Valley in the Sierra foothills to San Francisco. In addition to the WSIP, the Hetchy System Improvement Program involves completing capital upgrades to water transmission and hydroelectric facilities through 40 individual projects, totaling $1 billion in upgrades. These improvements have reduced the system's vulnerability to earthquake damage, increase system redundancy to prevent outages, and protect the water supply in anticipation of future droughts.

Risk, asset, and vulnerability information about the SFPUC and the Hetch Hetchy Regional Water System is provided in the 2020 San Francisco Hazards and Climate Resilience Plan.

5.1.1 Earthquake

Earthquakes occur following sudden slip on a fault (fracture in the earth's crust), causing sudden and rapid shaking of the surrounding ground. Most earthquakes originate on fault planes below the earth's surface, and are caused by interactions between tectonic plates (large, rigid segments of Earth's crust). In California, as the North American and Pacific plates move past each other, they tend not to slide smoothly and instead become "locked," straining against each other and building up energy along the fault. Eventually, the mounting stress causes sudden movement of the tectonic plates and the stored energy is released as seismic waves, causing ground acceleration to radiate from the point of release, known as the "epicenter."

The quantified size or measurement of an earthquake is dependent on factors that include the length of the fault and the ease with which the plates slip past one another. The traditional Richter scale (abbreviated as M) is logarithmic, meaning the ground shaking caused by an earthquake increases logarithmically (10 times) with each step of magnitude.[2] The more accurate moment magnitude scale measures "moment," a physical quantity proportional to the slip on the fault multiplied by the area of the fault surface that slips; it is related to the total energy released in the earthquake. For example, a M6.0 earthquake releases 33 times more energy than a M5.0, and a M7.0 earthquake releases 1,000 times more energy than a M5.0 event.

In the Bay Area, technical specialists have observed varied fault behaviors, giving some sense of which faults may or may not produce a large, damaging earthquake. Earth scientists are most concerned about the San Andreas and Hayward faults, believed most likely to produce large, regionally damaging earthquakes. Current earthquake forecasts suggest that the Hayward Fault can trigger up to an M7.5 event. There are, however, many other Bay Area faults that can produce localized damage.

Earthquakes are often not isolated events but are likely to trigger a series of smaller aftershocks along the fault plane, which can continue for months to years after a major earthquake, producing additional damage.

Hayward is situated in the heart of earthquake country. The eponymous Hayward Fault runs directly through the city from North to South, and a multitude of smaller cracks and faults branch from the main fault line. In addition to the Hayward Fault, the City of Hayward is less than 30 miles from the San Gregorio and San Andreas faults to the west, and the Calaveras and Greenville faults to the east. Figure 1 shows the location of active faults that are mapped by the State of California under the Alquist-Priolo Act.

Of all the faults running through the Bay Area, geologists predict that the Hayward fault has the highest probability of rupture within the next 30 years. Recently, researchers at UC

[2] USGS (2014)

Berkeley have discovered that the Calaveras Fault running between Danville and Pinnacles National Park is likely an extension of the Hayward Fault, as is the Rodgers Creek Fault that runs between San Pablo Bay and Healdsburg. This discovery means that the likelihood of multiple fault rupture is increased if an earthquake is triggered on any one of the three faults.

According to the California Earthquake Authority studies of the Hayward Fault reveal that it has produced 12 large earthquakes in the past 2000 years spaced on average every 150 years, with the most recent being in 1868. Earthquake scientists estimate that there is a 72% probability of a magnitude 6.7 or greater earthquake in the Bay Area in the near future (30 years).

Estimates of the maximum magnitude of an earthquake along the Hayward Fault have previously been placed at M7.2. However, a connection between the Hayward Fault and the Rodgers Creek Fault indicates the potential for an event of higher magnitude – initial estimates raise the magnitude of a worst-case scenario event to M7.3.

Earthquakes are of particular concern in Hayward due to the high likelihood of their occurrence and the extensive development in the City. Due to its location directly beneath a highly populated urban center, the Hayward Fault is one of the most dangerous in the world. All 160,000 residents of Hayward are endangered by the Hayward Fault subsystem, and the neighboring San Andreas and San Gregorio Faults, as is the entirety of the City's housing stock, industry, and infrastructure. The most vulnerable areas of Hayward to earthquake hazards include housing and other buildings in close proximity to the Hayward Fault rupture zone.

Figure 1: Alquist-Priolo Fault Zones

Legend

City of Hayward

Association of Bay Area Governments Resilience Program Counties

Alquist Priolo Fault Zones*

1. San Andreas
2. San Gregorio
3. Maacama
4. Rodgers Creek
5. Hayward
6. Hunting Creek
7. West Napa
8. Concord/ Southern Green Valley
9. Calaveras
10. Greenville
11. Sargent

Alquist Priolo Fault Zones - Region in which a fault investigation must be conducted as a condition for a permit to construct certain buildings. The zones vary in width, but average one-quarter mile wide.

N

0 10 20
Kilometers

0 10 20
Miles

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2021)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Alquist Priolo Fault Zones

Figure 1

Ground shaking is the primary cause of earthquake damage that can damage or destroy community structures and infrastructure (e.g. power lines, freeways, airports, bridges, levees, etc.). In particular, the City's buildings are at risk – though Hayward has completed retrofitting all of the City's unreinforced masonry structures, fragile housing remains a specific concern. According to initial estimates, over 900 of Hayward's apartment buildings – comprising up to 18.6% of the city's housing units – may have had soft, weak, or open-front (SWOF) features that render the building susceptible to collapse in an earthquake. That figure has been reduced to a total of 479 properties based on mitigation efforts to date (see Section 6.3.2). Damage to buildings and infrastructure from earthquakes and the potential connected results (e.g. fires and landslides) represent the greatest impacts to human life and safety.

Additionally, an estimated 16,000 single family homes are in danger of sliding off their foundations without brace and bolt-type retrofitting, jeopardizing more than a third of Hayward's housing. Earthquake damage to fragile residential structures can also result in gas line rupture and ignition.

The energy released in earthquakes can produce five different types of hazards: fault rupture, ground shaking, liquefaction, earthquake-induced landslides, and tsunamis.

5.1.1.1 SURFACE RUPTURE

When an earthquake occurs, there is a rupture on a fault as built-up energy is suddenly released. Active faults are those that have ruptured in the past 11,000 years.[3] Often the rupture occurs deep within the earth, but it is possible for the rupture to extend to the surface and create visible above- ground displacement, called "surface rupture." The California Geological Survey (CGS) publishes maps of active Bay Area faults that could produce surface rupture, as required by the Alquist-Priolo Earthquake Fault Zoning Act (1972).[4] These maps show the most comprehensive depiction of fault traces that can rupture the surface, and the zones directly above and surrounding the fault traces. The City of Hayward requires special geologic studies within these zones to closely regulate the construction of human-occupied structures.

Surface fault rupture varies in size and can change over time. Generally, a large magnitude earthquake can generate a longer rupture and greater displacement, though the surface expression of the displacement can vary widely. The M6.0 2014 South Napa Earthquake resulted in over one foot of displacement in some locations,[5] while the M6.9 1989 Loma Prieta Earthquake had no surface fault rupture. In the 1906 Earthquake along the San Andreas Fault, surface rupture displacements were greater than 20 feet in some locations.[6] Additionally, though the majority of displacement occurs during the actual earthquake event (called "co-seismic slip"), surface displacement can occur in the days, weeks, and even

[3] Bryant, W.A., and Hart, E.W., (2007)
[4] California Public Resources Code, Division 2, Geology, Mines and Mining, Chapter 7.5, Earthquake Fault Zoning, sections 2621-2630
[5] Brocher, T.M., et al, (2015)
[6] Thatcher W., Marshall, G., Lisowski, M., (1997)

months after the event (called “post-seismic slip”). This was also observed in Napa and can cause additional damage for up to a year after an earthquake. In a large earthquake on the Hayward Fault the fault rupture displacement could reach 8 feet in some areas. Most of the displacement would occur during the shaking, and in the first day following the earthquake, but as much as 20 percent of the total afterslip could occur up to a full year after the earthquake, continuing to damage buildings and infrastructure.[7]

In addition to the surface rupture experienced in an earthquake, the Hayward Fault is one of the few faults in the world that exhibits aseismic slip. Also referred to as fault creep, aseismic slip is fault movement that occurs in the absence of an earthquake. Over time, as the two sides of the fault continue to slide against each other, buildings, roads, and other infrastructure built atop the fault are offset. This displacement can weaken or break the manmade structures along the fault, contributing to damage in an earthquake. The rate of creep deformation along the southern segment of the Hayward Fault is about 5 millimeters per year, or roughly two inches every 10 years.

5.1.1.2 GROUND SHAKING

When faults rupture, the slip generates vibrations or waves in the earth that manifest as ground shaking. Larger magnitude earthquakes generally cause a larger area of ground to shake, and to shake more intensely and for longer periods of time. As a result, one principal factor in determining anticipated levels of shaking hazard in any given location is the magnitude of expected earthquakes. The intensity of ground shaking felt in one area versus another, however, is based on the magnitude and other factors including distance to the fault, direction of rupture, and the type of geologic materials at the site. For example, softer soils tend to amplify ground shaking, while more dense materials limit ground shaking impacts at the site surface.

Ground shaking is commonly characterized using the Modified Mercalli Intensity (MMI) scale, (see) which illustrates the intensity of ground shaking at a particular location by considering the effects on people, objects, and buildings. The MMI scale describes shaking intensity on a scale of 1-12. MMI values less than 5 don’t typically cause significant damage; MMI values greater than 10 have not been recorded.

[7] Aagaard, B., Lienkaemper, J., Schwartz, D. (2012)

Table 5: Modified Mercalli Intensity (MMI) Scale

Intensity	Building Contents	Masonry Buildings	Multi-Family Wood-Frame Buildings	1&2 Story Wood-Frame Buildings
MMI 6 Strong	Some things thrown from shelves, pictures shifted, water thrown from pools	Some walls and parapets of poorly constructed buildings crack.	Some drywall cracks.	Some chimneys are damaged, some drywall cracks. Some slab foundations, patios, and garage floors slightly crack.
MMI 7 Very Strong	Many things thrown from walls and shelves. Furniture is shifted.	Poorly constructed buildings are damaged and some well-constructed buildings crack. Cornices and unbraced parapets fall.	Plaster cracks, particularly at inside corners of buildings. Some soft-story buildings strain at the first floor level. Some partitions deform.	Many chimneys are broken and some collapse, damaging roofs, interiors, and porches. Weak foundations can be damaged.
MMI 8 Severe	Nearly everything thrown down from shelves, cabinets, and walls. Furniture overturned.	Poorly constructed buildings suffer partial or full collapse. Some well-constructed buildings are damaged. Unreinforced walls fall.	Soft-story buildings are displaced out of plumb and partially collapse. Loose partition walls are damaged and may fail. Some pipes break.	Houses shift if they are not bolted to the foundation, or are displaced and partially collapse if cripple walls are not braced. Structural elements such as beams, joists, and foundations are damaged. Some pipes break.
MMI 9 Violent	Only very well anchored contents remain in place.	Poorly constructed buildings collapse. Well-constructed buildings are heavily damaged. Retrofitted buildings damaged.	Soft-story buildings partially or completely collapse. Some well-constructed buildings are damaged.	Poorly constructed buildings are heavily damaged, some partially collapse. Some well-constructed buildings are damaged.
MMI 10 Extreme	Only very well anchored contents remain in place.	Retrofitted buildings are heavily damaged, some partially collapse.	Many well-constructed buildings are damaged.	Well-constructed buildings are damaged.

As described, there are a number of different faults that contribute to the seismic hazard in the Bay Area. ABAG and the U.S. Geological Survey (USGS) worked collaboratively to characterize which fault contributes most to an area's seismic hazard. The City of Hayward is most vulnerable to ground shaking in an earthquake along the South Hayward fault, though earthquakes on neighboring faults (particularly the North Hayward Fault) still have the potential to cause serious damage. Two likely ground shaking scenarios created by USGS are outlined below.

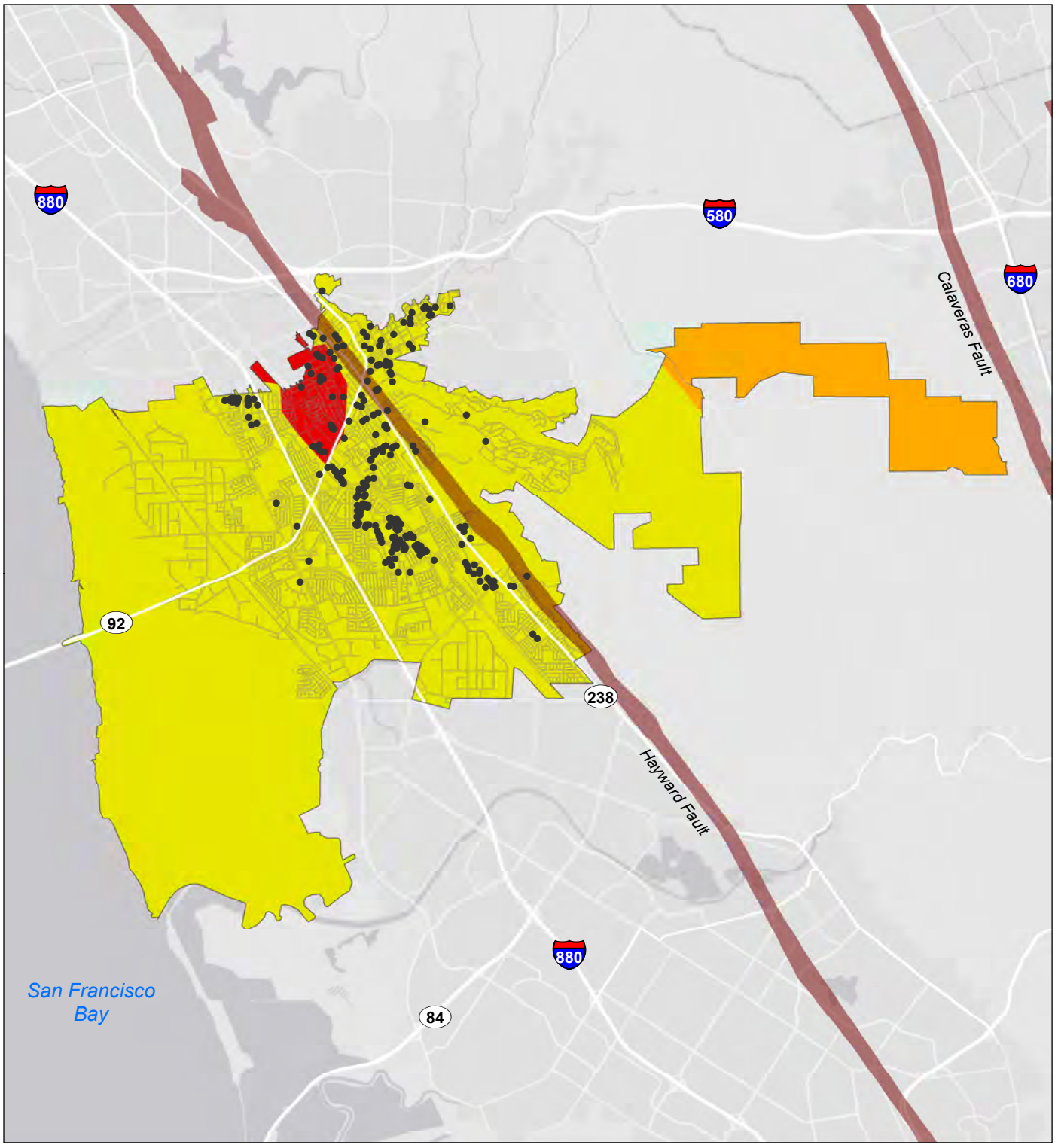
Maps shown in Figures 2 and 3 depict projected ground shaking in high-magnitude Hayward Fault earthquake scenarios. Though Hayward may experience significant and damaging ground shaking in earthquakes occurring on other faults (particularly San Andreas and San Gregorio) the City is at highest risk of an earthquake on its eponymous fault due to its high probability of rupture and proximity.

The first shaking scenario (Figure 2) projects ground shaking from an M7.0 temblor in which both the North and South segments of the Hayward Fault rupture. Potential SWOF (or soft story) buildings are represented as green dots on the map. This fragile housing type is likely to experience significant damage in the event of an earthquake.

In this scenario, the area of the city bounded by Route 238 (along Foothill Boulevard) to the East, the Amtrak route to the West, and Jackson Street to the South is predicted to experience violent shaking. This area includes or is directly adjacent to a number of community resources, including the Hayward Police Department, the Hayward Hall of Justice (a county courthouse), BART, the City of Hayward Corp Yard and Utilities Center, Hayward City Hall, the new Hayward Library and Heritage Plaza, Hayward Unified School District offices, Winton Middle School, Burbank Elementary School, and the Hayward Animal Shelter, in addition to several parks, and numerous residences, and businesses. The Tennyson-Alquire neighborhood is also predicted to experience violent ground shaking in an M7.0 earthquake scenario in the area bounded by BART tracks to the east, Tennyson Road to the north, Huntwood Avenue to the west, and Industrial Parkway West to the South. Two mobile home parks, Fire Station 7, and the South Hayward BART station are within the area. The remainder of Hayward, with the exception of the eastern hills, would experience severe ground shaking intensity.

Ground shaking projections in an M6.8 earthquake on the Hayward Fault is depicted in the second scenario map (Figure 3). Once again, the majority of the city would be exposed to severe shaking, with the exception of the eastern stretch of the Hayward Hills.

Figure 2: Hayward Fault North & South M7.0 Scenario Shakemap



Legend

- City of Hayward
- Alquist Priolo Fault Zones
- Potential Soft Story Building

Hayward Fault North and South Shaking Intensity

- Very Strong
- Severe
- Violent

N

0 2 4
Kilometers

0 1 2
Miles

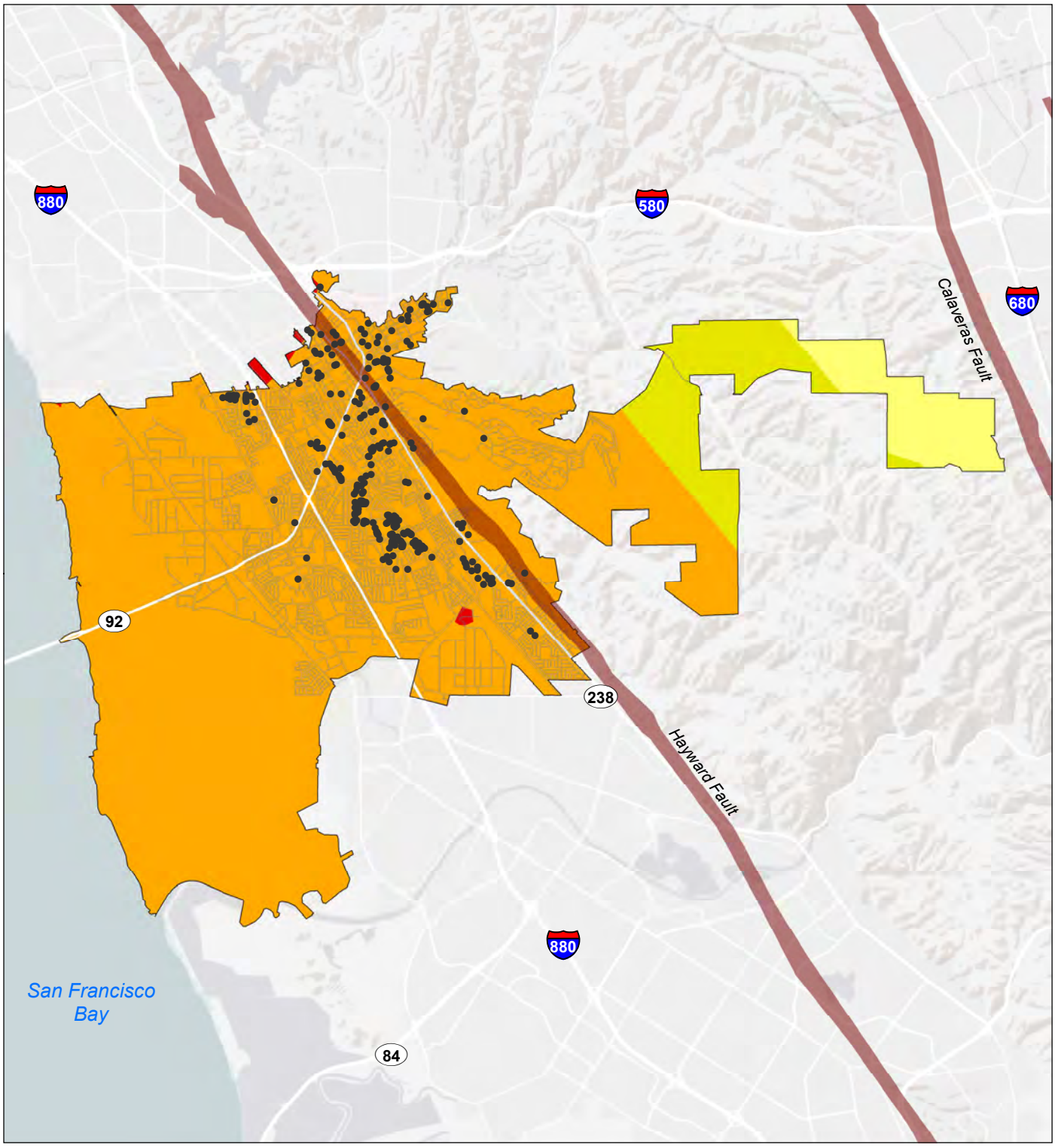
Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2015)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Hayward Fault North and South M7.0 Scenario Shakemap

Figure 2

Figure 3: Hayward Fault South M6.8 Scenario Shakemap



Legend

- City of Hayward
- Alquist Priolo Fault Zones
- Potential Soft Story Building

Hayward Fault South Shaking Intensity

- Strong
- very strong
- Severe
- Violent

N

0 2 4
Kilometers

0 1 2
Miles

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2015)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

Hayward Fault South M6.8 Scenario Shakemap

Figure 3

5.1.1.3 LIQUEFACTION

Soil that is loose, sandy, silty, or saturated with water can result in soil liquefaction if it is shaken intensely for an extended period. When ground liquefies in an earthquake, it behaves like a liquid and may sink, spread, or erupt in sand boils. This can cause pipes to break, roads and airport runways to buckle, and building foundations to be damaged. Liquefaction can only occur under certain circumstances:[8]

Loose Soils Soil must be loose – uncompacted or unconsolidated sand and silt without much clay. Such soil exists along the Bay shoreline, near creeks or other waterways, on dry creek beds, and in areas of man-made landfill.

Soggy Soils The sand and silt must be soggy and saturated with water due to a high water table.

Ground Shaking The ground must be shaken long and hard enough by the earthquake to trigger liquefaction.

Liquefaction may not necessarily occur even if all three conditions are present. Additionally, if liquefaction does occur, the ground may not move enough to have significant impact on the built environment.

As with ground shaking, several types of maps depict liquefaction potential. Liquefaction susceptibility maps show areas with soil types known to have the potential to liquefy with intense shaking. Unless areas of liquefaction susceptibility are subject to significant ground shaking, they are not likely to liquefy. Liquefaction hazard maps express where the ground is both susceptible to liquefaction, and where the ground is likely to be shaken long and intensely in an earthquake. In 2015, ABAG produced maps that combine liquefaction susceptibility with USGS-generated earthquake scenario maps to identify areas where there is a significant hazard of liquefaction. Figure 4 shows the liquefaction potential in a M7.0 Hayward Fault earthquake scenario, and Figure 5 shows the liquefaction potential during a M6.8 scenario. The map combines the liquefaction susceptibility and predicted ground shaking information into a map of scenario-based liquefaction potential.

CGS liquefaction zone maps are based on the presence of shallow historic groundwater in uncompacted sands and silts deposited during the last 15,000 years and sufficiently strong levels of earthquake shaking expected during the next 50 years.[9] Though the City of Hayward has maintained a healthy shoreline, refraining from development on landfill and wetland areas, a significant portion of the city is still at risk of liquefaction. Soil conditions between Highway 238 and the shoreline pose a risk of liquefaction in high-magnitude earthquakes, particularly along the Hayward Fault.

[8] Perkins, J.B., (2001)

[9] Department of Conservation, Seismic Hazards Zonation Program Fact Sheet, California Geological Survey

Notably, the areas in Hayward at risk of liquefaction are home to the City's industrial zones and the majority of the City's SWOF housing stock. Potential soft story building locations are indicated by green dots on Figure 4 and Figure 5.

5.1.1.4 EARTHQUAKE-INDUCED LANDSLIDES

Ground shaking can also lead to ground failure on slopes, triggering earthquake-induced landslides. Landslides tend to occur in weak soil and rock on sloping terrain. In the Loma Prieta Earthquake, earthquake-induced landslides disrupted traffic for a month along Highway 17 in the Santa Cruz Mountains.[10] In the Bay Area, the CGS has mapped areas of various risks for earthquake-induced landslide as part of its Seismic Hazards Zonation Program. For Hayward, the areas at highest risk of earthquake-induced landslide are the steep hillsides in the eastern part of the City (Figure 6), largely in areas zoned for open space or agricultural uses. While single family homes and other structures have been constructed in the hills, each development project located in areas identified as at risk of landslide must undergo geological site studies per Hayward's Hillside Design Guidelines. Landslides are discussed in greater detail in section 5.1.3.

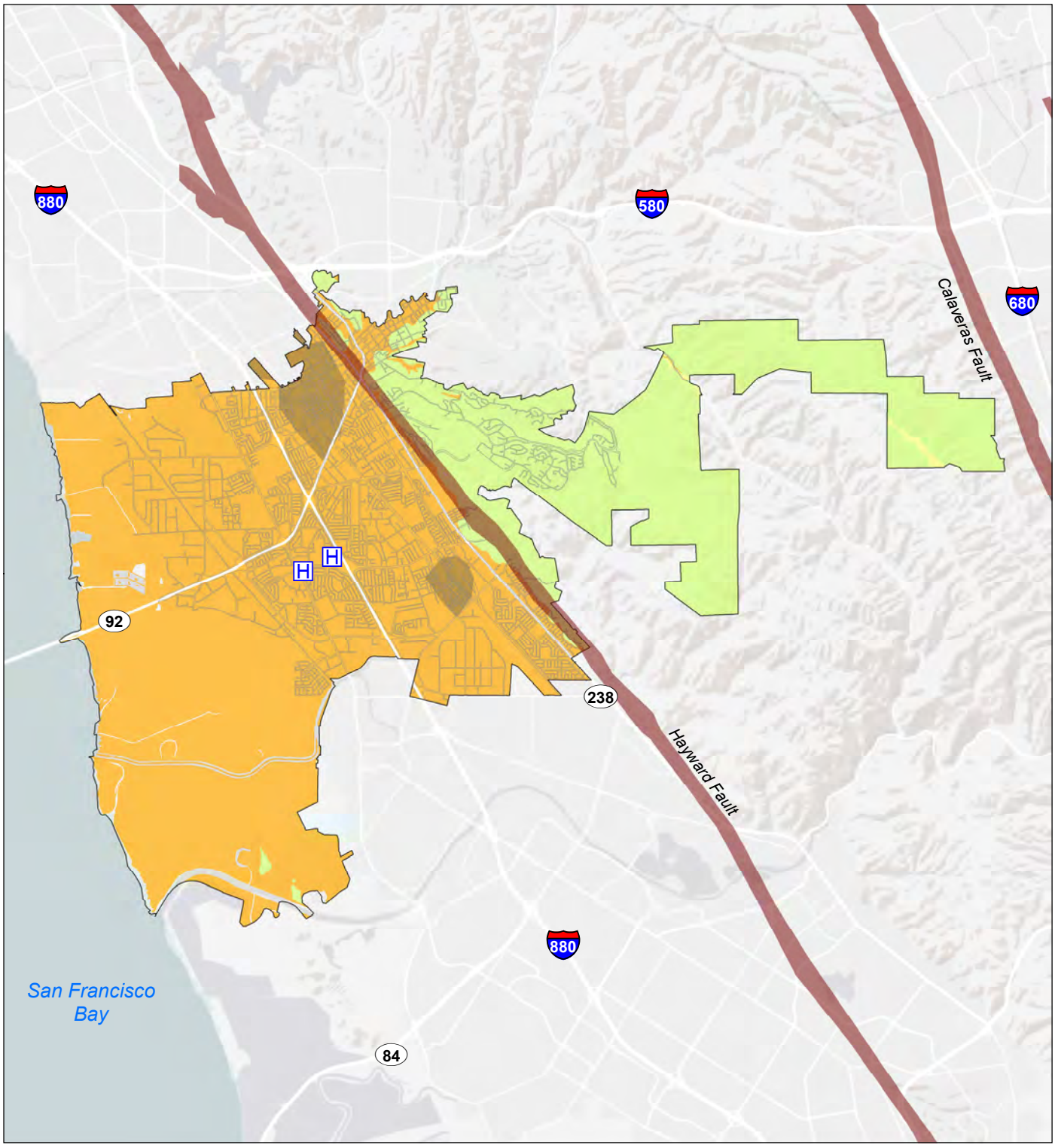
5.1.1.5 TSUNAMIS

Large underwater displacements from major underwater earthquake fault ruptures or landslides can lead to ocean waves called "tsunamis." Since tsunamis have high velocities, the damage from a particular level of inundation is far greater than in a normal flood event. Similarly, water sloshing in lakes and reservoirs during an earthquake, called "seiche," is also capable of producing damage.

Tsunamis can result from off-shore earthquakes within the Bay Area or from distant events. It is most common for tsunamis to be generated by offshore subduction faults such as those in Washington, Alaska, Japan, and South America. Tsunami waves generated at those far-off sites can travel across the ocean and can reach the California coast with several hours of warning time. Local tsunamis can also be generated from offshore strike-slip faults. Because of their close proximity, we would have little warning time. However, the Bay Area faults that pass through portions of the Pacific coastline or under portions of the Bay are not likely to produce significant tsunamis because they move side to side, rather than up and down, and do not produce the type of displacement needed to create significant tsunamis. While local faults may produce slight vertical displacements or cause small underwater landslides, overall there is a minimal risk of any significant tsunami occurring as the result of a Bay Area earthquake. The greatest risk to the Bay Area is from tsunamis generated by earthquakes elsewhere in the Pacific.

[10] Schiff, A. (1990)

Figure 4:Hayward Fault North & South M7.0 Scenario Liquefaction Hazard



Legend

- City of Hayward
- Alquist Priolo Fault Zones
- Hospital
- Hayward Fault North and South Liquefaction Hazard
- High
- Moderate
- Moderately Low
- Very Low

N

0 2 4
Kilometers

0 1 2
Miles

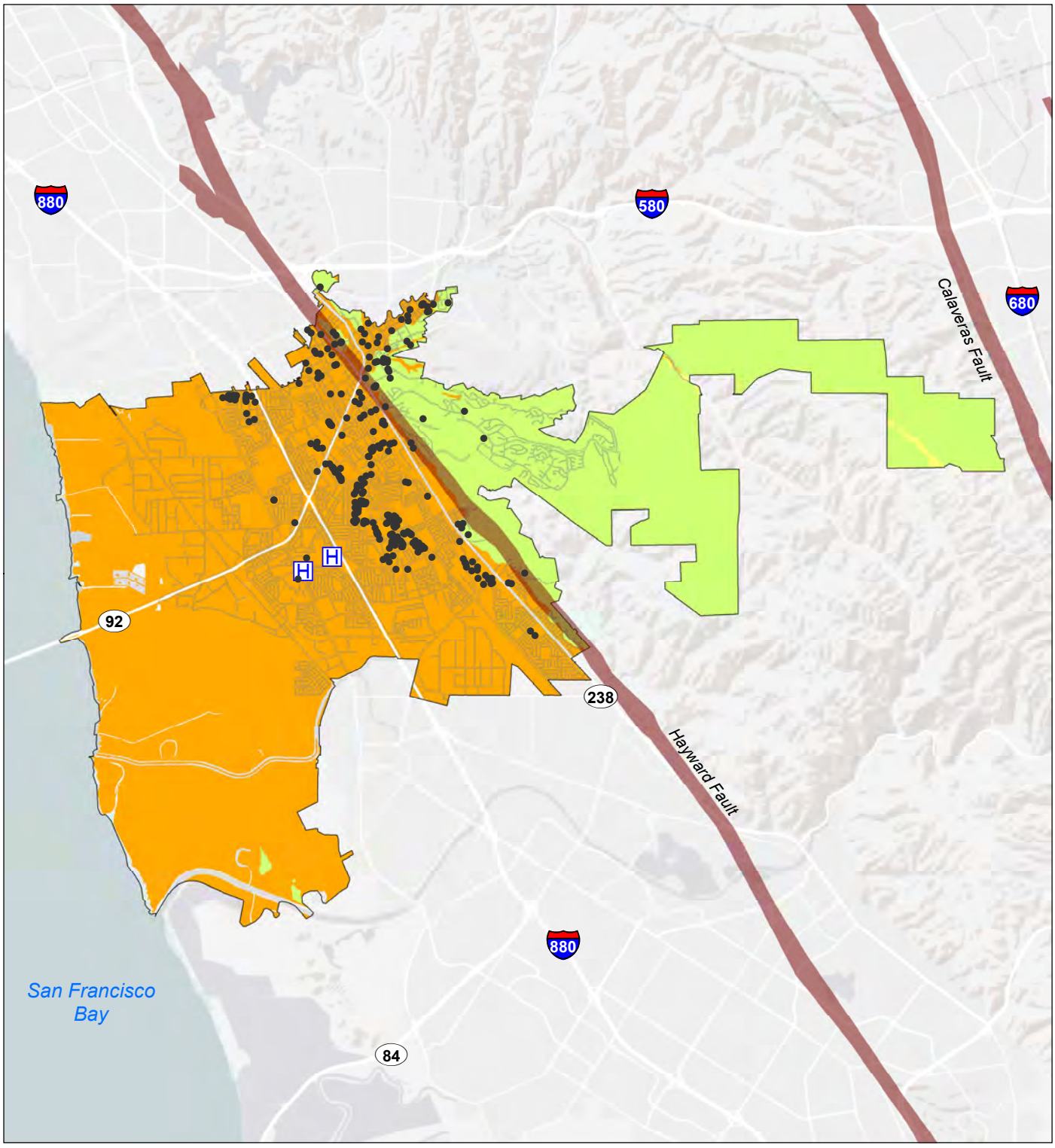
Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2021)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

Hayward Fault North and South M7.0 Scenario Liquefaction Hazard

Figure 4

Figure 5: Hayward Fault South M6.8 Scenario Liquefaction Hazard



Legend

- City of Hayward
- Alquist Priolo Fault Zones
- Hospital
- Potential Soft Story Building

Hayward Fault South Liquefaction Hazard

- Moderate
- Moderately Low
- Very Low

N

0 2 4
Kilometers

0 1 2
Miles

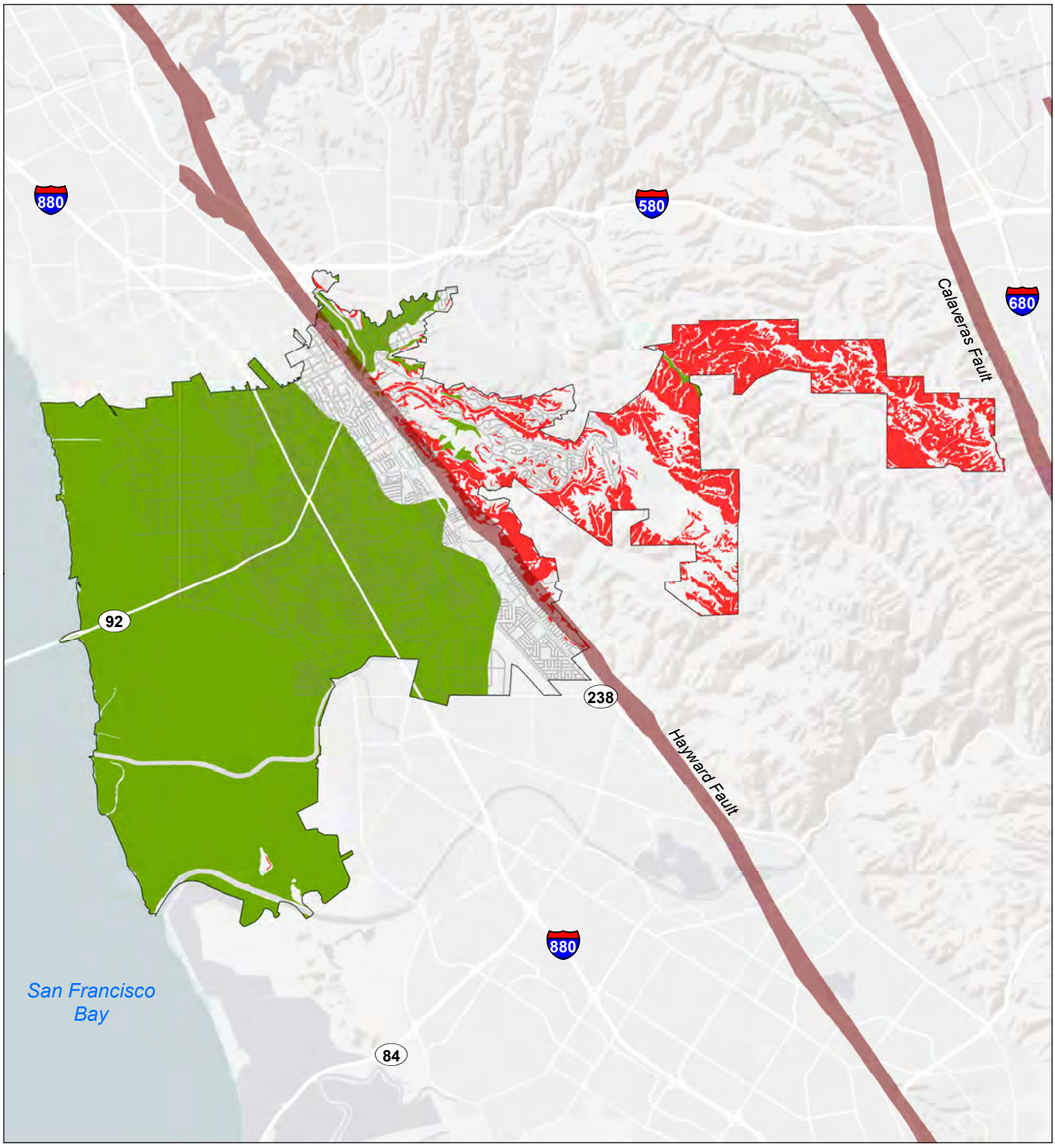
Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2021)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

Hayward Fault South M6.8 Scenario Liquefaction Hazard

Figure 5

Figure 6: Earthquake-Related Liquefaction & Landscape Hazard in Hayward



Legend

- City of Hayward
- Alquist Priolo Fault Zones
- Landslide Zone
- Liquefaction Zone

N

0 2 4
Kilometers

0 1 2
Miles

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2021)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

Earthquake-related Liquefaction and Landslide in Hayward

Figure 6

Though the Bay Area has experienced tsunamis, it has not experienced significant tsunami damage. The M6.8 1868 earthquake on the Hayward fault is reported to have created a local tsunami in the San Francisco Bay. Though other cities in the Bay Area have experienced low-level damage, Hayward has been relatively unaffected by tsunami events due to its position away from ocean currents that travel through the Golden Gate. The State of California as a whole has been fortunate in past distant-source tsunamis (1960, 1964, and 2011) that the events occurred during low tides.[11]

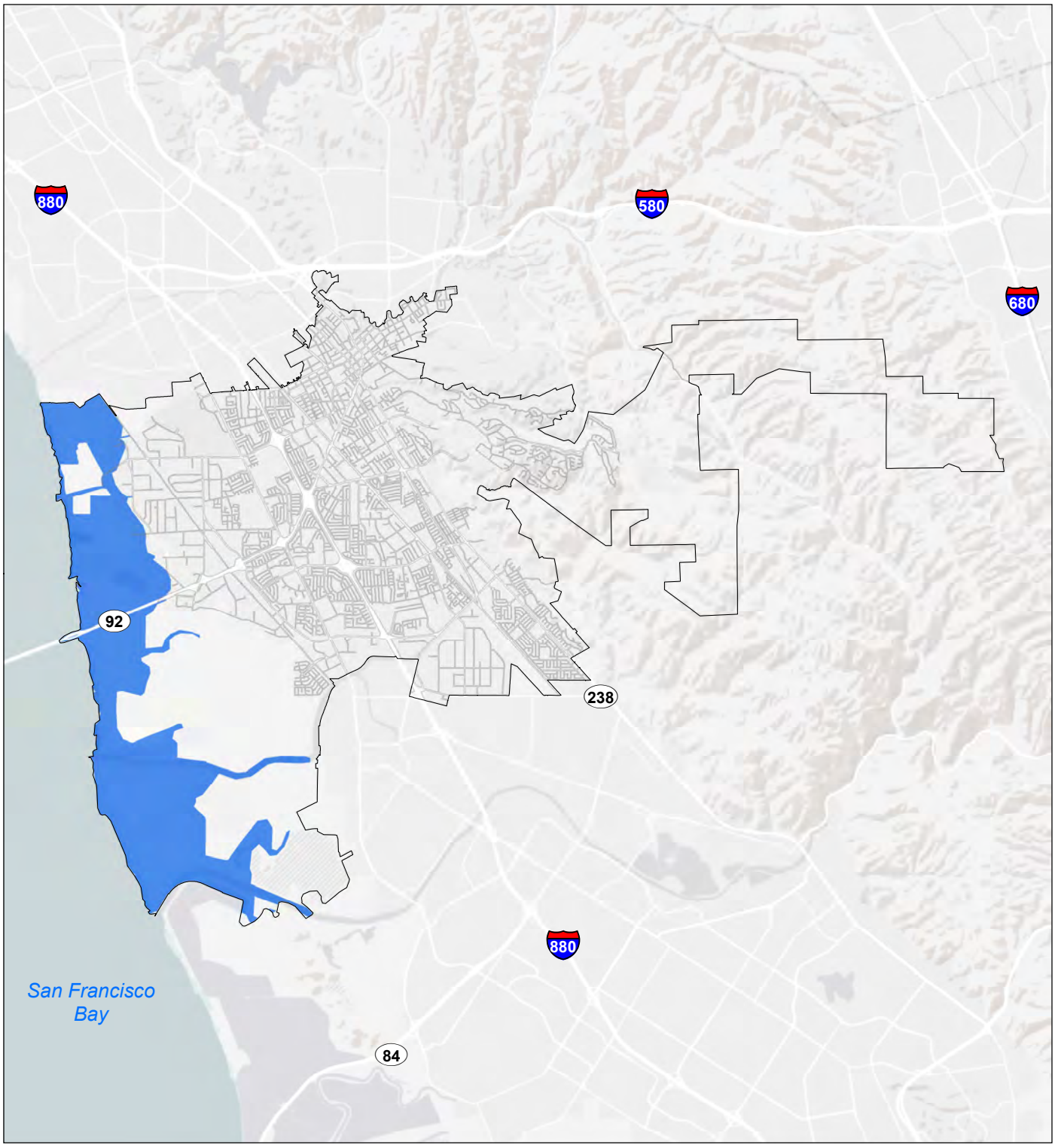
In 2013, the USGS partnered with the US Department of the Interior to publish a tsunami scenario as part of the Science Application for Risk Reduction (SAFRR) series.[12] In the scenario, the multi-disciplinary team modeled a M9.1 offshore Alaskan earthquake to study impacts to California. Assuming that the tsunami reaches the central coast at high tide, the Bay Area can expect heights ranging from two to seven meters near the shore. The study suggests that this scenario inundation is only likely to occur once in a 100 year period.

In addition to the scenario inundation maps, the California Governor's Office of Emergency Services (CalOES) developed tsunami evacuation maps indicating areas that should evacuate if a warning is given (Figure 7). The CalOES tsunami maps are not associated with a particular event but instead represent the worst-case scenario at any given location by combining a suite of extreme, but plausible, inundation scenarios. Additionally, the maps include no information about the probability of a tsunami affecting an area at any given time. Because of this, they are not intended to show locations of probable inundation but should be used for evacuation planning only. In general, the CalOES tsunami evacuation map is more conservative than the USGS SAFRR study; however, there are a few locations where the SAFRR study shows greater inundation. Hayward is not among these locations, and in fact the areas of Hayward at risk in the SAFRR scenario and those included in the CalOES evacuation maps are extremely similar.

The City of Hayward is susceptible to minimal inundation along the shoreline, primarily in the wetlands. The oxidation ponds at the City's Water Pollution Control Facility are at risk in a tsunami, as is the approach to the San Mateo Bridge (Highway 92), and many waterfront businesses along Hayward's north shoreline. To the South, tsunami inundation is largely limited to shoreline wetlands ecological and wildlife preserves. Much like flooding and sea level rise, tsunamis have the potential to damage and degrade the environment along Hayward's shoreline, detracting from the area's ecological health, recreational opportunities, aesthetic, and natural defense against flooding.

[11] Ross, S.L., and Jones, L.M, eds., (2013)
[12] Ibid

Figure 7: Tsunami Coastal Evacuation Zone



Legend

- City of Hayward
- Tsunami Evacuation Zone

N

0 2 4
Kilometers

0 1 2
Miles

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2022)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

Tsunami Coastal Evacuation Zone

Figure 7

5.1.1.6 FIRE FOLLOWING AN EARTHQUAKE

Earthquakes are often responsible for igniting fires which can contribute to a considerable share of the overall damage in a disaster. The fires can start from a variety of sources: appliances with natural gas pilot lights may tip, damaged electrical equipment may spark, and gas line connections may break. Recently in the South Napa Earthquake a number of mobile homes were destroyed and damaged when the gas connection to a home broke. In the Loma Prieta Earthquake 36 fires broke out in San Francisco alone, but luckily were contained quickly in large part due to the abnormally calm wind that evening, and the fires' proximity to the Bay which allowed a fire boat to pump water to the fires where the water lines had failed. In the 1906 earthquake over 3.5 square miles of San Francisco burned, representing 80% of San Francisco's property value at the time.

Fires following earthquake are especially difficult to control – there are often multiple ignitions at once overwhelming fire crews, typical water supply used for fighting fire may be reduced or unavailable, and maneuvering fire crews to the ignition may be hindered by streets blocked by road damage or debris. Existing fire protection systems, including sprinklers, fire doors, and fire alarms may malfunction or be incapacitated as a result of the preceding earthquake.

Fire following earthquake is an issue that could impact any part of Hayward that experiences an earthquake – both urban and rural. The problem is heightened for urban environments, where many simultaneous ignitions can lead to a firestorm, and single fires can more quickly and easily move structure to structure. USGS models of high-magnitude earthquake scenarios along the Hayward fault predict 3,000 ignitions in Alameda County alone.

Specific characteristics can make a community more vulnerable to fire following earthquake. Hayward has many buildings highly susceptible to damage or collapse in a seismic event – e.g., soft story buildings and single-family homes with pony walls and unbraced foundations, which are likely to have damaged gas or electrical lines and be the source of ignitions that then impact undamaged neighboring structures. Liquefaction zones, which include most of Hayward, are more likely to experience ground displacement during a temblor, resulting in ruptured gas and water mains that present possible ignition sites and disruption of water resources for firefighting, respectively. Areas with largely wood frame or shingle roof structures may be less prone to earthquake damage, but are at a heightened risk for the spread of fires. Much of Hayward's housing stock consists of such building types.

Areas with hazardous materials with the potential for explosion, or with the potential to produce toxic smoke are cause for concern and additional mitigation measures. Industrial facilities and labs require special attention because of the hazardous and flammable materials stored at their facilities. The City of Hayward has a number of such facilities located in the City's industrial zone, the majority of which is located in areas of possible liquefaction.

5.1.2 Fire

Fires are typically characterized into three categories: urban fires, wildland-urban interface fires, and wildland fires.

- Urban fires occur within a developed area and pose a direct risk to development.
- Wildland-urban interface (WUI) fires occur where the built environment and natural areas are intermixed (the fringe of urban areas).
- Wildland fires exist in wilderness land.

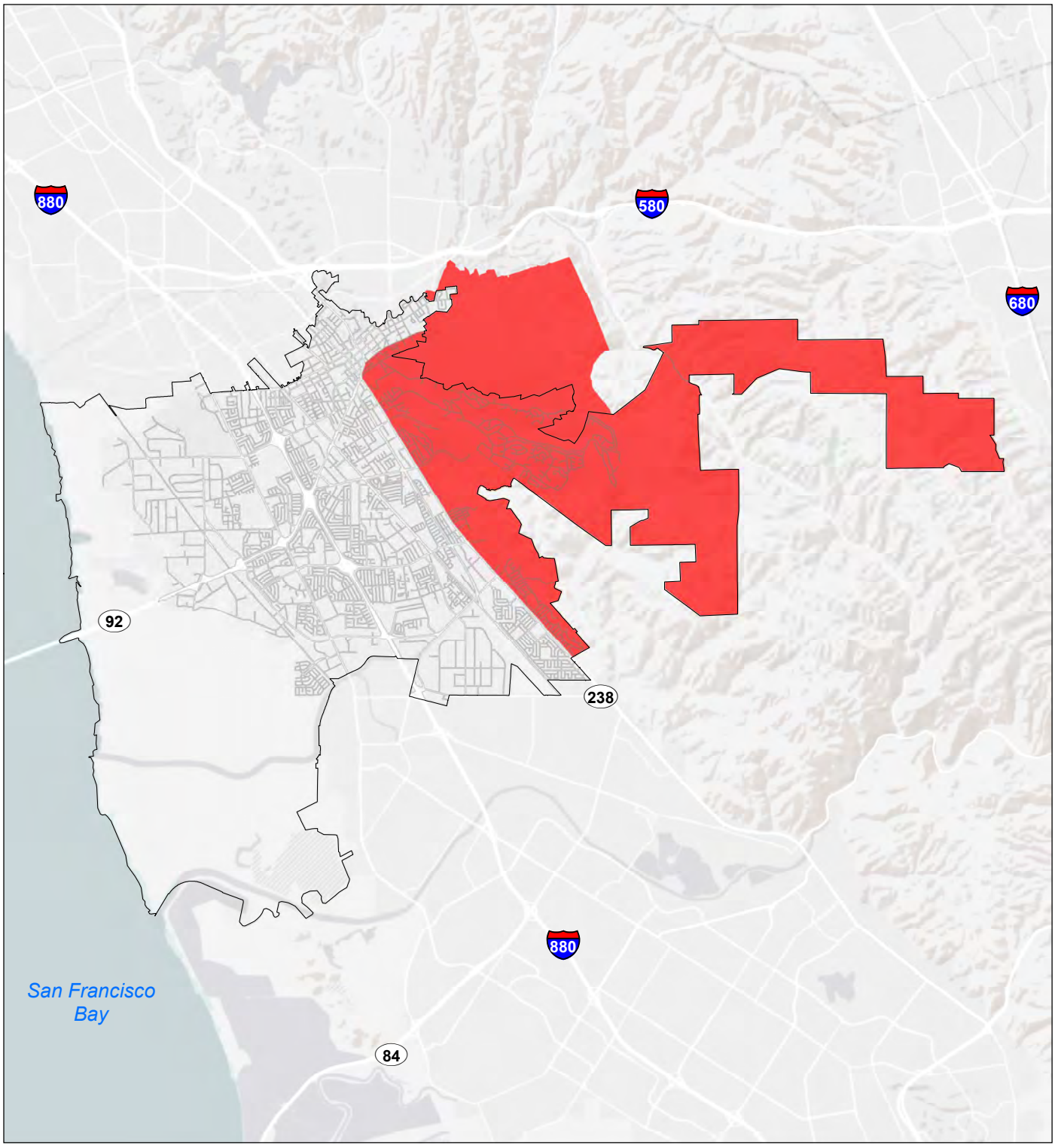
Fires in the urban environment and in the wildland-urban interface result in direct damage to the built environment and can injure or kill residents. Wildland fires can cause damage to linear infrastructure systems that serve the Bay Area, causing outages downstream of the failure; can impact the air quality in cities during the duration of the fire; and can impact water quality in watersheds impacted by a wildland fire. Wildland and wildland-urban interface fires can also damage natural environments, such as recreational areas, and can cause lasting impacts to slopes and soils.

Fire threat levels in the Hayward Hills as mapped by CAL FIRE are high to very high. Probability of wildfire occurrence in Hayward was estimated using the national Risk Index Annualized Frequency Wildfire ArcGIS tool (https://www.arcgis.com/apps/mapviewer/index.html?layers=a21028953f93448e956bc6ac93f49701). That data layer shows that the annualized frequency of a wildfire occurrence in Hayward near the Bay shore is about 0.0047, and in the Hayward Hills is about 0.0104. These values represents the modeled frequency of wildfire hazard events per year as of November 2021. Although these frequencies are low, the probability of wildfire increases in the eastern hills and is expected to increase with climate change.

The severe 1991 fires in the Oakland Hills are indicative of fire risk in the adjacent Hayward WUI. The residents of the heavily vegetated hillsides of the Hayward WUI are most vulnerable to wildfire. In the Bay Area, fire areas generally fall into two categories – State Responsibility Areas, where the California Department of Forestry and Fire Protection (CAL FIRE) is responsible for fire protection, and Local Responsibilities, where local fire departments and fire protection districts have responsibility. The City of Hayward is located entirely within a local responsibility area managed by the Hayward Fire Department.

Hayward is at particular risk of WUI fires in the Hayward Hills on the east side of the City, as depicted in Figure 8, of fire following an earthquake compounded by numerous ignitions and constrained resources, and, in the industrial areas, of fire complicated by hazardous materials. Table 6 provides a list of critical assets in the city that are located in the high wildfire vulnerability Hayward Hills area.

Figure 8: High Fire Hazard in Hayward Area



Legend

- City of Hayward
- High Fire Hazard Areas

N

0 2 4
Kilometers

0 1 2
Miles

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: City of Hayward Fire Department
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

High Fire Hazard in the Hayward Area

Figure 8

Table 6: Critical City Assets in Hayward Hills

Facility	Address	Function and Notes
D Street Reservoir	1785 D Street	Water supply reservoir; 1,000,000-gallon capacity.
High School Reservoir	1515 Rex Road	Water supply reservoir; 1,000,000-gallon capacity.
Maitland Reservoir	25561 Maitland Dr	Water supply reservoir; 1,000,000-gallon capacity.
Treeview Reservoir	31950 Veril Way	Water supply reservoir; 3,000,000-gallon capacity.
Garin Reservoir	29894 Bello View Place	Water supply reservoir; 1,250,000-gallon capacity.
North Walpert Reservoir	1241 Walpert St	Water supply reservoir; 1,500,000-gallon capacity.
South Walpert Reservoir	1241 Walpert St	Water supply reservoir; 530,000-gallon capacity.
250' Reservoir East	1122 Highland Blvd	Water supply reservoir; 500,000-gallon capacity.
250' Reservoir West	1122 Highland Blvd	Water supply reservoir; 500,000-gallon capacity.
500' Reservoir	1910 Highland Blvd	Water supply reservoir; 3,000,000-gallon capacity.
750' Reservoir	26633 Parkside Dr	Water supply reservoir; 4,400,000-gallon capacity.
1000' Reservoir	3466 La Mesa Dr	Water supply reservoir; 2,200,000-gallon capacity.
1285' Reservoir	28750 Fairview Ave	Water supply reservoir; 1,800,000-gallon capacity.
1530' Reservoir	30100 Fairview Ave	Water supply reservoir; 2,900,000-gallon capacity.
Garin P/S	935 Garin Ave	Public water supply line; 600 GPM

Stonebrae Elementary	28761 Hayward Blvd	Public school
Fairview Elementary	23515 Maud Ave	Public school
Northstar school	22502 Woodroe Ave.	Public school
Cal State University East Bay	25800 Carlos Bee Blvd	University
East Avenue Elementary	2424 East Ave	Public school
Spectrum Center School	2021 Highland Blvd	Public school
Hayward High School	1633 East Ave	Public school
Fire Station 5	28595 Hayward Blvd	Fire Station
Fire Station 8	25862 Five Canyons Parkway	Fire Station; owned by City of Hayward, located in Fairview outside city boundary
Fire Station 9	24912 Second Street	Fire Station; owned by Fairview Fire Protection District, located in Fairview outside city boundary

5.1.2.1 CLIMATE CHANGE & FIRE

Climate change increases fire risk as temperatures rise and dry periods persist over longer fire seasons. Wildfire risk will also be influenced by potential changes in vegetation as a result of changing rainfall and temperatures.[13]

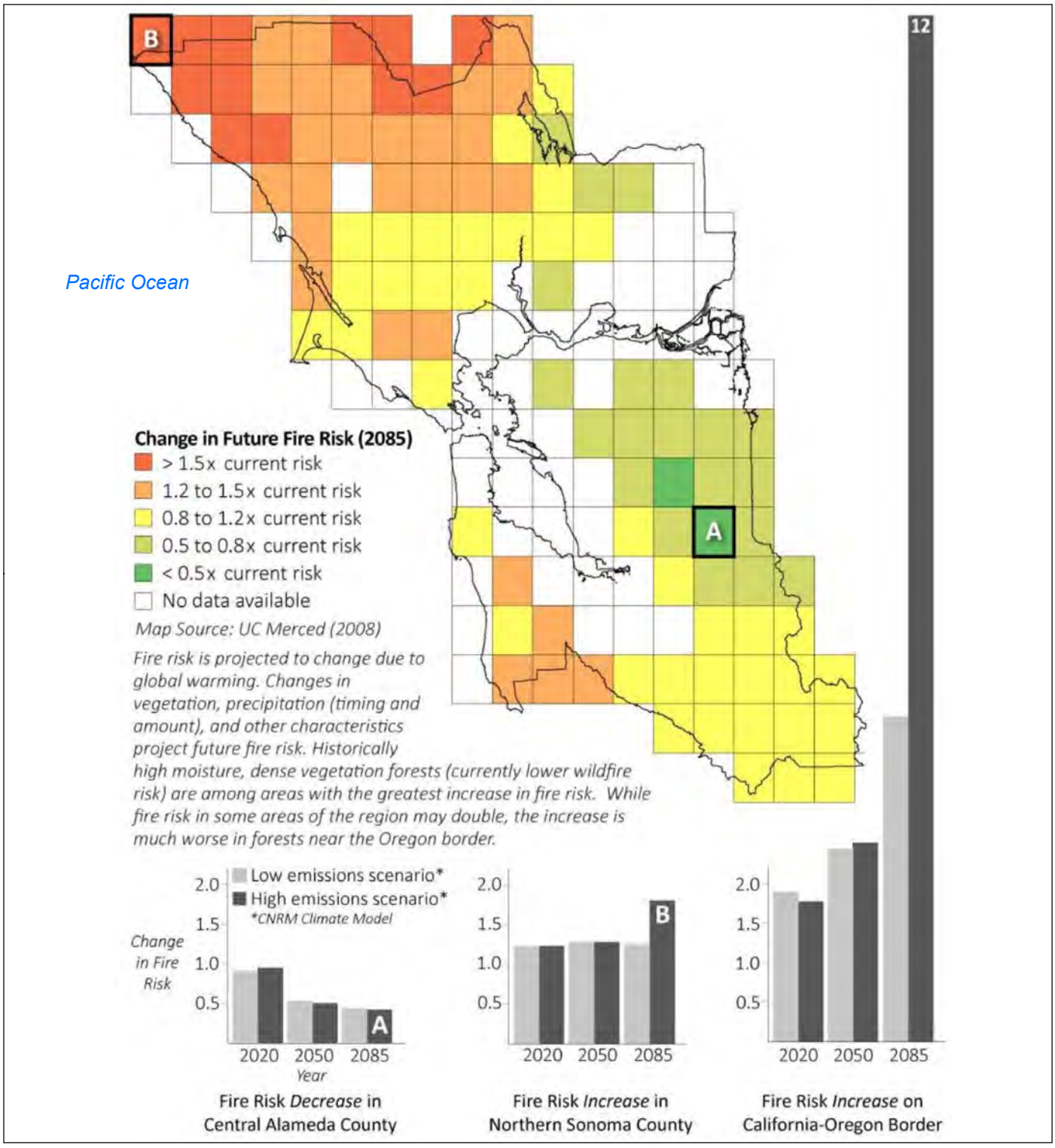
Researchers at UC Merced have projected future fire risk for the entire Bay Area by comparing existing fire risk to the predicted impacts of climate change on temperatures, seasonal precipitation, and vegetation. The research projects some locations in Central Alameda County to exhibit decreased fire risk. Generally, across the Bay Area there is fairly limited change in fire risk in the year 2050, with the greatest change in occurring between 2050 and 2085, especially in the high emission scenario. The Cal Adapt data suggests that some jurisdictions might have to adapt more aggressively compared to others. Figure 9 shows the projected fire risk increase for the Bay Area with the greatest increase and decrease areas highlighted. While there is no data available specifically for the City of Hayward, the city is located adjacent to areas of unchanged or lowered risk. However, the decreased availability of water due to frequent drought caused by climate change could impair Hayward's ability to fight fires.

The future fire risk model analyzes two primary variables: fuel availability and flammability of fuel. In California the change in fire risk is a result of either a densely forested ecosystem becoming drier, or a dry climate experiencing large vegetation growth after a year of above average precipitation. In the first scenario the suite of climate impacts (higher temperatures, less snow pack, earlier springs) result in previously wet, dense fuel ecosystems becoming dry – increasing the fire risk. In the second ecosystem, dominated by grass and low-density shrubs, the risk is often unchanged or decreased because the availability of fuel is the governing variable for fire risk, which remains unchanged or decreases as a result of projected precipitation.[14] These modeling characteristics are reflected in the future fire risk map.

Following the 2015 LHMP update and the 2013 UC Merced model, fire risk from climate change and other factors has increased. Following the 2020 devastating wildfire season in California, UC Merced assessed regional changes in forest fire area and fuel availability across the western U.S. from 1991–2020. Climate change and drought have caused increased fuel aridity and an extended fire season[15]. Wildfire fuel has also grown due to the statewide bark beetle infestation, which killed an estimated 129 million trees in California's national forests between 2010 and 2017. Proactive mitigation is required to address the excess fire fuels.

[13] California Climate Change Center, (2012)
[14] Westerling, A.L., Bryant, B.P. (2008)
[15] Abatzoglou, J.T., et al, Nature Communications Earth & Environment (2021)

Figure 9: Climate Change Influence on Fire Risk



Legend

Association of Bay Area Governments Resilience Program Counties

N

0 25 50
Kilometers

0 10 20
Miles

Notes
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CGS (2015)
3. Background:

Climate Change Influence on Future Fire Risk

Figure 9

5.1.2.2 WILDFIRE

CAL FIRE produces WUI maps that highlight areas with burnable vegetation and residential density greater than one unit per 20 acres as well as maps that identify regions of very high fire danger. These zones represent areas of potential fire and high exposure of people and property. The Hayward Fire Department has chosen to identify its own WUI and high fire danger zones based on their local knowledge of the landscape, as depicted in Figure 8.

5.1.2.3 BURN AREAS

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When all supporting vegetation is burned away, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas (see Section 5.1.3 for more information about landslides).

5.1.2.4 URBAN CONFLAGRATION

While the primary fire threat in Hayward is from wildfire, urban conflagration - a large disastrous fire in an urban area - is a major hazard that can occur as a result of wildfire, earthquake, gas leak, chemical explosion, or arson. The urban fire conflagration that followed the 1906 San Francisco Earthquake did more damage than the earthquake itself. A source of danger to cities throughout human history, urban conflagration has been reduced as a general source of risk to life and property through improvements in community design, construction materials, and fire protection systems.

Although the frequency of urban conflagration fires has been reduced, they remain a risk to human safety. One reason is the current trend toward increased urban density and infill in areas adjacent to the wildland-urban interface. In an effort to keep housing close to urban jobs, areas previously left as open space due to steep slopes and high wildland fire risk may be considered as infill areas for high-density housing. Though Hayward has no plans for high-density WUI zoning at present, portions of the Hayward Hills where residences abut wildland areas of vegetation are at particular risk of fire.

5.1.3 Landslides

The impact of a landslide can be extensive, including loss of life, destruction of buildings and other infrastructure, damage to land and loss of natural resources (e.g. forests). Landslide material can block waterways and increase the risk of floods. In the Bay Area, landslides typically occur as a result of either earthquakes (earthquake-induced landslides, addressed in section 5.1.1.4) or during heavy and sustained rainfall events. A given area can be at risk for both earthquake-induced landslides as well as landslides caused by rain-saturated soils, but the variables that contribute to each landslide risk are different. Typically, an earthquake-induced landslide occurs when seismic energy at the top of a slope gets concentrated and breaks off shallow portions of rock. In rainfall-induced landslides, the slide can begin much deeper in the slope, in very-saturated layers of soil.

A 2009 USGS paper ""Probabilistic estimation of numbers and costs of future landslides in the San Francisco Bay region" (Crovelli and Coe) determined that annual landslide probabilities in

the landslide areas shown on Figure 10 range from 1 - 9%. Steep slopes and varied types of underlying soils can influence the likelihood of landslides. Additionally, surface and subsurface drainage patterns also affect landslide hazard, and vegetation removal can increase landslide likelihood. Future landslides are most likely to occur within and around the places where they have previously occurred.[16] Although the City has not kept data on historical landslide frequency, there is evidence of numerous large landslides in the Hayward Hills. No significant landslides have occurred since the 2016 update. During the 1997-1998 winter storms caused by El Nino, Hayward's eastern hillside region was the site of moderate to abundant debris flow activity. The area along Walpert ridge, running from Hayward Memorial Park in the North to Fremont's Mission Peak in the South, was one of Alameda County's most active landslide areas during the 1997-1998 El Nino event.[17] No data on the extent of past landslides in the City is kept by the City or otherwise located. The extent of landslides is usually measured using the amount of material that is displaced (i.e., the cubic feet of earth that moved). The City will attempt to collect landslide extent data for future events and will update this LRP if data on past landslides are identified.

The possibility of strong shaking from earthquakes within the steep topography of the Hayward Hills makes those parts of the City most vulnerable to landslide threats to people and property. The USGS has identified the Hayward Hills area as a principal debris-flow source area – a site where intense rainfall is likely to trigger a fast-moving downslope mudflow. Figure 10 shows this high risk landslide area, which comprises about 1,871 acres on the east side of the City. Table 6 provides a list of critical assets in the city that are located in the high landslide vulnerability Hayward Hills area. Landslide probability in Hayward varies based on local geology and land slope. Vegetation loss caused by the ongoing drought has likely contributed to the degradation of slope stability in the Old Highlands area, increasing landslide hazard. Additionally, wet-dry cycles, such as those produced by the combination of ongoing severe drought and a period of intense rainfall (similar to wet El Nino events), can exacerbate soil creep, an early sign of landslide.

Landslides in the Hayward Hills could cause damage to structures – primarily residences – ranging from inundation with some mud and/or debris to complete destruction or relocation. Landslides may also result in the rupture of gas lines, water lines, and other utilities, and the destruction or displacement of roads, compounding the hazard and interfering with evacuation and response. However, relatively few homes are located in areas at risk of a landslide, either earthquake- or rainfall-induced.

5.1.3.1 CLIMATE CHANGE AND LANDSLIDES

Climate change is not expected to change the risk of earthquake-induced landslide, but climate change will likely change the behavior of winter storms and droughts. Regional models project fairly similar precipitation totals in the Bay Area, but the variability season to season may

[16] USGS (1999)

[17] *Source: USGS Map Showing Locations of Damaging Landslides in Alameda County, California, Resulting from 1997-98 El Nino Rainstorms, 1999.*

increase. If winters are compressed, with more rain falling in fewer months, or if individual years are more extreme the chance of rainfall-induced landslide will increase.

Additionally, if fires burn greater portions of landslide- vulnerable hillsides, removing vegetation and increasing storm runoff, or droughts result in large-scale death of vegetation, the landslide probability will increase. The increase in future fire risk in Hayward is described in Section 5.1.2.1. Currently, there is not enough evidence to suggest with certainty that future landslide probabilities will increase in Hayward, though a local study that takes local conditions into account may be able to more accurately predict the possibility of landslide.

5.1.4 Floods

Flooding is a temporary condition that causes the partial or complete inundation of land that is normally dry. Flooding occurs when streams, rivers, lakes, reservoirs, or coastal water bodies are abnormally high and overflow into adjacent low-lying areas, areas at risk of recurring floods known as floodplains.

Riverine flooding, also known as overbank flooding, can occur if there is excessive rainfall especially in conjunction with high tides and strong winds. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions to wide, flat areas in plains and coastal regions. The potential for flooding of a floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. Flooding in steep, mountainous areas is usually confined, occurs with less warning time, and has a short duration. The lower portions of coastal rivers are more likely to flood during high tides with backwater conditions that lead to overbank flooding.

Localized, or nuisance, flooding can occur in areas that typically do not flood during locally heavy precipitation events, especially if ground water levels are high during extremely wet seasons or if stormwater storage or conveyance facilities are inadequate. Localized flooding tends to occur in flat, urbanized areas that are highly impermeable and can result in inundation of basements, low lying roads, and parking lots from street drainage.

The City of Hayward is susceptible to both riverine and nuisance flooding. The local watershed is comprised of numerous small creeks leading from the Hayward Hills down across the western part of the City to the San Francisco Bay. In the event of severe storm surge combined with abnormally heavy rainfall, these creeks may flood the adjacent bayside flatlands, particularly in the downstream stretches of Ward Creek in South Hayward. Though Hayward's stormwater drainage system is robust and equipped with debris screens, abnormally heavy rainfall or a buildup of debris in storm drains or other parts of the stormwater management system could cause nuisance flooding in any part of the city. Floods can result to loss or damage to community buildings, roads, and other critical infrastructure, and can result in loss of life. Coastal flooding cab also result in loss of marshes, shoreline habitat and recreational opportunities.

Although the City has not kept data on historical flood frequency, there are some available online records of historical flooding. The Hayward Historical Society describes the "Flood of 1950," when heavy rain combined with a levee failure on Alameda Creek caused extensive

flooding in South Hayward, inundating 25 square miles. No flood events have occurred since the 2016 update.

The shoreline is at highest risk of and most vulnerable to flooding. While healthy wetlands and manmade levees and berms provide some protection against storm surge and riverine flooding, these barriers still leave some shoreline habitats, recreational facilities, roads, and businesses at risk of particularly severe flooding. This exposure will only be increased by sea level rise. Important Infrastructure vulnerable to shoreline flooding and storm surge includes the Calpine Russel City Energy Center, the Oro Loma Wastewater Treatment Plant, the Hayward Water Pollution Control Facility, the City and Alameda County landfills, two solar energy fields, and the State Highway 92 bridge approach.

Figure 11 depicts the FEMA-designated flood zones in the City of Hayward, including areas with a 1% chance of flooding each year with and without wave damage, and areas at .02% chance of flooding each year. The shoreline area is most likely to flood in a given year, putting shoreline assets at risk. The central area of the city along and to the north of Ward Creek is at risk of flooding in 500-year (.02% chance) floods, as are the inland stretches of San Lorenzo Creek. Industrial, commercial, residential, and civic buildings are all located within this zone. The vulnerable population of residents in these flood zones was estimated by the City GIS Coordinator using Census tract data. For Census tracts that intersect the flood zones the 2020 Census population is 63,495. That number represents a high estimate since some of the Census tracts that intersect the flood zone include areas outside of the flood zone and that distinction in population is not available.

5.1.4.1 CLIMATE CHANGE AND FLOODING

Globally, sea levels are rising due to thermal expansion caused by the ocean warming and the melting of land-based ice such as glaciers and polar ice caps. Regionally and locally, the rate of sea level rise is affected by other processes, including changes in land elevation (subsidence or uplift), coastal erosion, wind and ocean currents, ocean temperature and salinity, atmospheric pressure, and large-scale climate regimes.[18]

The National Research Council (NRC) *Sea-Level Rise for the Coasts of California, Oregon, and Washington* study, released June 2012, provides regionally specific sea level rise projections for the Coasts of California, Oregon, and Washington. Because there is significant uncertainty in how much sea level will rise, the range in projected values increases over time. The predicted mean sea level rise and estimates based on both high sea level rise and low sea level rise scenarios along the coast of California are included in Table 7: Regional Sea Level Rise Projections Relative to Year 2000 for the California Coast South of Cape Mendocino.

In 2017, the State of California Ocean Protection Council (OPC) Science Advisory Team updated Statewide Sea-Level Rise Guidance to reflect recent advances in ice loss science and

[18] Committee on Sea Level Rise in California, Oregon, and Washington, and Board on Earth Sciences and Resources and Ocean Studies Board, Division on Earth and Life Studies, (2012)

projections of sea-level rise[19]. The predictions in the 2017 OPC for the likely sea level rise at the Golden Gate in San Francisco are similar to those from the 2012 study data. All of the predictions for sea level rise are contingent on projections of greenhouse gas scenarios, which vary based on current rate and whether emissions are reduced or left to grow unabated.

Table 7: Regional Sea Level Rise Projections Relative to Year 2000 for the California Coast South of Cape Mendocino[20]

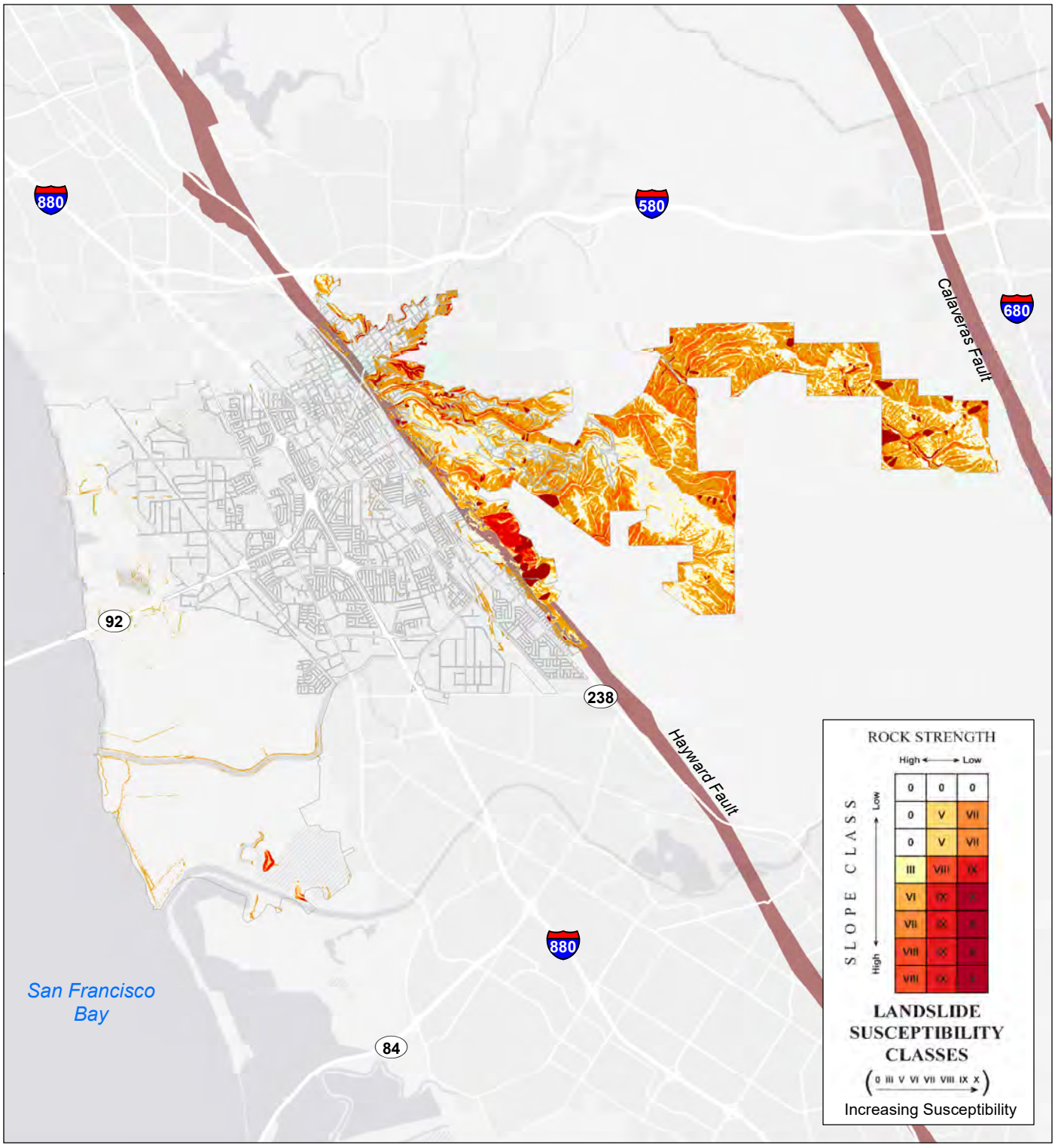
	Sea Level Rise (inches)		
Year	**NRC 2012 Projection** (mean ± the standard deviation for the A1B Scenario[21])	**Low** (mean of the B1 scenario)	**High** (mean of the A1F1 scenario)
2030	**5.6** (±1.9)	2	12
2050	**11.0** (±3.6)	5	24
2100	**36.1** (±10)	17	66

[19] OPC Science Advisory Team, and California Ocean Science Trust, Rising Seas in California, An Update on Sea Level Rise (2017)

[20] Committee on Sea Level Rise in California, Oregon, and Washington, and Board on Earth Sciences and Resources and Ocean Studies Board, Division on Earth and Life Studies, (2012).

[21] The A1 scenario family assumes high economic growth, low population growth that peaks mid-century, and the rapid introduction of more efficient technologies (A1B is balanced and A1FI is fossil fuel intensive). The B1 scenario family assumes the same low population growth as the A1 scenarios, but a shift toward a lower-emission service and information economy and cleaner technologies.

Figure 10: Rainfall-Induced Landslide Hazard in the City of Hayward



Legend

- City of Hayward
- Landslide Susceptibility Classes
  - 0
  - III
  - V
  - VI
  - VII
  - VIII
  - IX
  - X

N

0 2 4
Kilometers

0 1 2
Miles

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
2. Data Sources: CDC (2018)
3. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Rainfall-Induced Landslide Hazard in the City of Hayward

Figure 10

Sea level rise has the potential to influence the impact of coastal, riverine and localized nuisance flooding. In particular, without intervention rising sea levels may cause:

More frequent floods: Rising sea levels can lead to more frequent flooding of existing flood-prone areas, including more frequent overtopping and overbank flooding of riverine systems that already flood when rainfall coincides with high tides due to the increased backwater effect. In addition, gravity drained and pumped systems that discharge stormwater into flood control channels can have reduced performance, causing backups and flooding of streets and basements.

More extensive, longer-duration flooding: As sea levels rise there is the potential that storm events will flood larger areas for longer periods of time and that there will be new overtopping and overbank flooding of riverine systems that that do not currently cause flooding.

Shoreline erosion and overtopping: Sea level rise can cause shoreline protection, such as levees, berms and revetments, to be damaged or fail due to increased tidal and wave energy. There is also the potential that shoreline protection will be overtopped during storm events when there are extreme tide levels and wind-driven waves, flooding inland areas, including homes and community services that are currently protected.

Elevated groundwater and increased salinity intrusion: As sea levels rise, groundwater and salinity levels are also predicted to rise. This will cause damage to below grade living spaces, finished basements, and electrical/mechanical equipment that is below or at-grade. In addition, increasing groundwater levels may increase liquefaction susceptibility, and require the use of pumping of stormwater for flood management, which will increase both operations and maintenance costs.

Permanent inundation: Sea level rise can cause areas that are not currently exposed to regular high tide inundation to be flooded, resulting in the need to either protect or move people and infrastructure, and the loss of trails, beaches, vistas, and other shoreline recreation areas. In addition, increased tidal scour due to increased tidal prism in riverine systems can trigger changes in channel geometry and sediment transport processes.

5.1.4.2 CURRENT FLOODING

The magnitude of flood used as the standard for floodplain management in the United States is a flood having a probability of occurrence of one percent in any given year, also known as the 100-year flood or base flood. The most readily available source of information regarding the 100-year flood is the system of Flood Insurance Rate Maps (FIRMs) prepared by FEMA. These maps are used to support the National Flood Insurance Program (NFIP) and show 100-year floodplain boundaries for identified flood hazards. These areas are also referred to as Special Flood Hazard Areas and are the basis for flood insurance and floodplain management requirements under the NFIP. FIRMs also show floodplain boundaries for the 500-year flood, which is the flood having a 0.2 percent chance of occurrence in any given year (see Figure 11). In Hayward about 7,773 acres of near the Bay are located in a FEMA 100-year flood zone with wave hazard risk, and 1,986 acres are located in other FEMA 100-year flood zones (AE, AH, and AO zones). About 1,654 acres in a FEMA 500-year flood zone as shown on Figure 11.

The rivers and streams for which FEMA has prepared detailed engineering studies may also have designated floodways. The floodway is the channel of a watercourse and portion of the adjacent floodplain that is needed to convey the base or 100-year flood event without increasing flood levels by more than 1 foot and without significantly increasing flood velocities. The floodway must be kept free of development or other encroachments.

Existing coastal and riverine flood maps are available from the FEMA Map Service Center, and on the San Francisco Bay Conservation and Development Commission (BCDC)'s Adopting to Rising Tides web site.[22]

The following factors contribute to the frequency and severity of **coastal flooding**:

- Astronomical or "King" Tides
- Storm Surge
- Wind Waves
- El Nino Events
- Sea Level Rise

The following factors contribute to the frequency and severity of **riverine flooding**:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount, and type of vegetation, and density of development
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The existence of flood control features, such as levees and flood control channels
- Velocity of flow
- Availability of sediment for transport, and the erodibility of the bed and banks of the watercourse

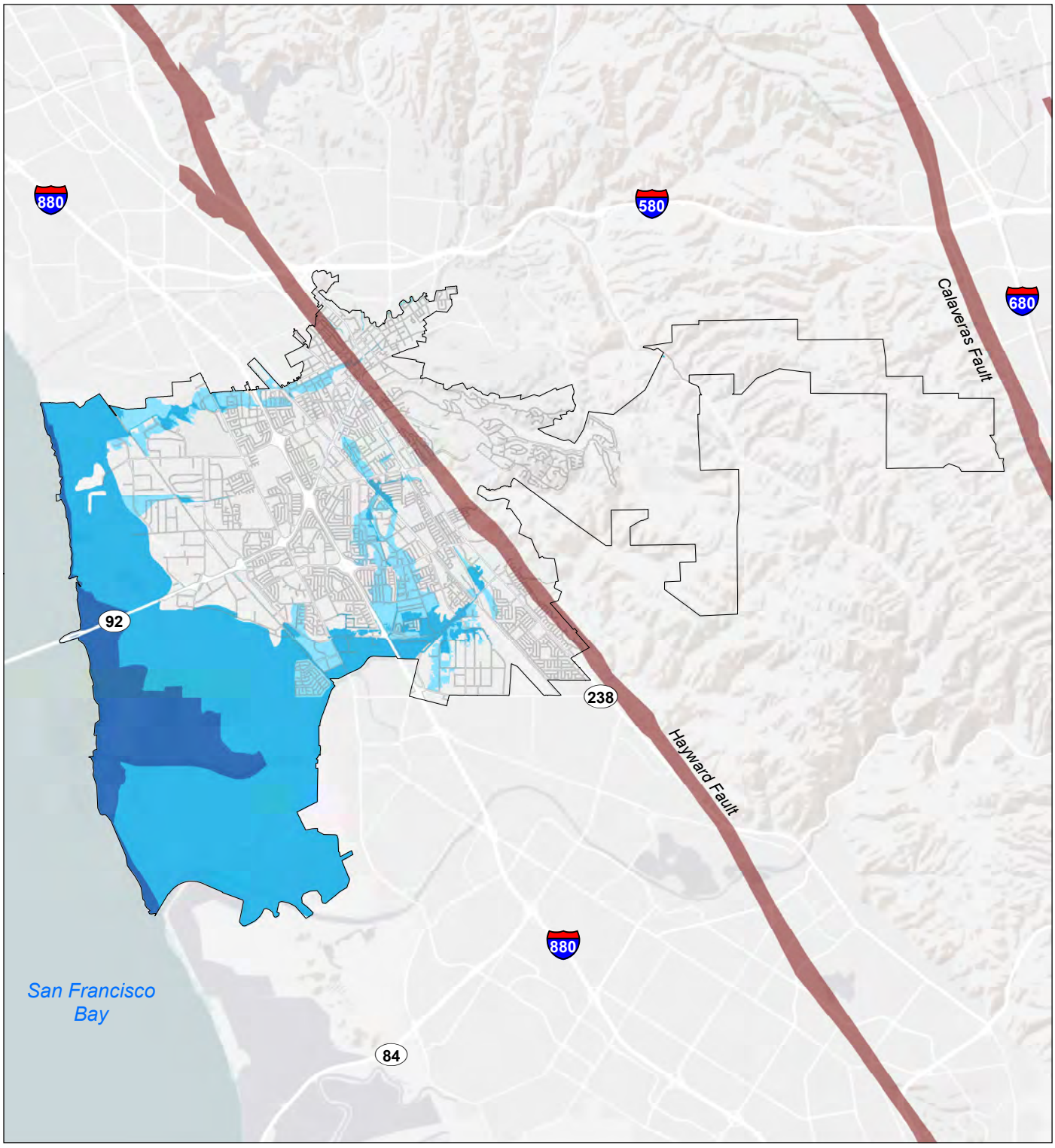
In Hayward, periods of intense rainfall and storm surges can cause nuisance and riverine flooding. The City continues to participate in the NFIP. There are no no NFIP insured properties that are classified as repetitive loss, and no current proposed revisions to flood plain mapping in Hayward. New construction in Special Flood Hazard Areas is regulated by Hayward Municipal Code Chapter 9, Article 4 - Flood Plain Management.

5.1.4.3 FUTURE FLOODING

In the Bay Area, the potential for new or prolonged flooding as sea level rises will not be confined to the shoreline. Sea level rise will increase the likelihood of major flood events around the Bay Area because higher water levels in tidal creeks and flood control channels will reduce capacity to discharge rainfall runoff. While some creeks already flood when rainstorms coincide with high tides, rising sea levels will cause flooding during smaller, more frequent rainfall events.

[22] BCDC Bay Area Sea Level Rise and Shoreline Analysis Maps
http://www.adaptingtorisingtides.org/project/regional-sea-level-rise-mapping-and-shoreline-analysis/

Figure 11: Flood Zones in the City of Hayward



Legend

- City of Hayward

FEMA Flood Risk

- 100-year Flood Zone with Wave Hazard
- 100-year Flood Zone (AE, AH, AO)
- 500-year Flood Zone (XL)

N

0 2 4
Kilometers

0 1 2
Miles

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

2. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, USGS, NOAA

Flood Zones in the City of Hayward

Figure 11

Sea level rise inundation maps (see Figure 12) help to visually assess under what conditions assets may be impacted by sea level rise and storm events and how far reaching the consequences may be if they are impacted. To understand these factors it is helpful to evaluate a range of possible future sea level rise scenarios. The "total water level" approach presented below simplifies this process and reduces the number of maps needed. In this approach each inundation map represents a number of different unique combinations of sea level rise and extreme tide (storm surge) conditions.[23]

A total water level of 36 inches above mean higher high water (MHHW)[24] can represent a new "daily" high tide with 36 inches of sea level rise. This amount of sea level rise, which is a likely projection for 2100, could result in regular, i.e. permanent, tidal inundation. This total water level can also represent today's 50-year extreme tide level, a one-year extreme tide level with 24 inches of sea level rise, or a five-year extreme tide level with 12 inches of sea level rise, which is a likely 2050 projection. Extreme tide events that are larger than daily high tide levels can result in episodic, short duration, or temporary, flooding.

The matrix of numbers presented in Table 7 can be used to understand a range of total water levels, from 0 to 95 inches above MHHW, represented both in terms of today's tides and future tides as sea level rises. Each total water level represents a combination of sea level rise (0 to 60") and tide levels (MHHW to a 100-year extreme event). As an example, the likely mid-century daily high tide is projected to be 12" above today's high tide, or 12"+MHHW. This water level is color coded in green in Table 7. This total water level is approximately the level observed during a King Tide, which is an astronomical tide that occur approximately twice per year when the Moon and the Sun simultaneously exert their gravitational influence on the Earth.

Because of the uncertainties associated with modeling and mapping sea level rise it is reasonable to allow for a +/- 3-inch range when interpreting the total waters in Table 7. As an example, the likely end-century high tide is projected to be 36 inches above today's high tide, or 36"+MHHW. Water levels ranging from 33 to 39 inches can be used to understand what other combination of tides and sea level rise that may result in the same amount of flooding or inundation as 36"+MHHW.

[23] Extreme tides are the maximum high tide level that has occurred over a specific return period (recurrence interval) that correlates to a specific occurrence probability. For example a 100-year extreme tide has a return period of 100 years, and therefore a one percent chance of occurring in any given year.
[24] Mean higher high water (MHHW) is calculated as the average of the higher of the two daily high tides over a 19-year tidal epoch.

The values presented in Table 8 are generally applicable to central San Francisco Bay[25] and are therefore appropriate for Hayward's climate adaptation planning, although it may not be as precise for some areas of the South and North Bay. In addition, because tide levels do vary around the Bay, additional information about tide levels should be used for site-scale planning. Finally, the values in Table 8 are based on an analysis that does not include the effects of local wind waves and assumes that future storms will behave like past storms.

[25] Existing condition water levels in the first row of Table 8 are based on FEMA model results for Central San Francisco Bay, http://www.r9map.org/Pages/San-Francisco-Coastal-Bay-Study.aspx, and are being used by Alameda and San Francisco Counties. Existing water level conditions for the other counties in the Bay Area will be available by the end of 2015.

Table 8: Matrix showing combinations of Sea Level Rise and Extreme Tide Level

Timeframe	Sea Level Rise	Total water level above today's daily high tide, MHHW (inches NAVD88), by tide recurrence interval							
		MHHW (≈ daily high tide)	1-yr (≈ King Tide)	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr (1% annual chance)
Today		0	12	19	23	27	32	36	41
	+6	6	18	25	29	33	38	42	47
Likely Mid-Century	+12	12	24	31	35	39	44		53
	+18	18	30	37	41	45	50	54	59
	+24	24	36	43	47	51	56	60	65
	+30	30	42	49	53	57	62	66	71
Likely End-Century	+36	36	48	55	59	63	68	72	77
	+42	42	54	61	65	69	74	78	83
	+48	48	60	67	71	75	80	84	89

Color Code	Map Scenario (inches above MHHW)
	12
	24
	36
	48

There are a number of online tools that provide regionally relevant sea level rise inundation maps. The most used is the NOAA Sea Level Rise and Coastal Flooding Impacts Viewer. This is a national tool that depicts potential impacts to marshes and human communities from a range of sea level rise projections from zero to six feet coupled with MHHW. It also illustrates changes in flood frequency and includes visual simulations of flooding at local sites.[26]

For more information on sea level rise, future flooding, and Hayward, please consult the Adapting to Rising Tides Hayward Shoreline Area Study.

5.1.5 Drought

A drought is a gradual phenomenon that occurs over several dry years, depleting reservoirs and groundwater basins without the expected annual recharge from winter precipitation. While drought does not have any primary impacts in the Bay Area, prolonged periods of drought can cause secondary impacts that can affect the region, including:

- Reduced water supply for crops and livestock feed, impacting the economy centered around the agriculture industry
- Increased wildfire hazard, including more fire starts and more prolonged conflagrations fueled by excessively dry vegetation and reduced water supply for firefighting purposes
- Subsidence due to a lowering water table
- May be correlated to high heat conditions.

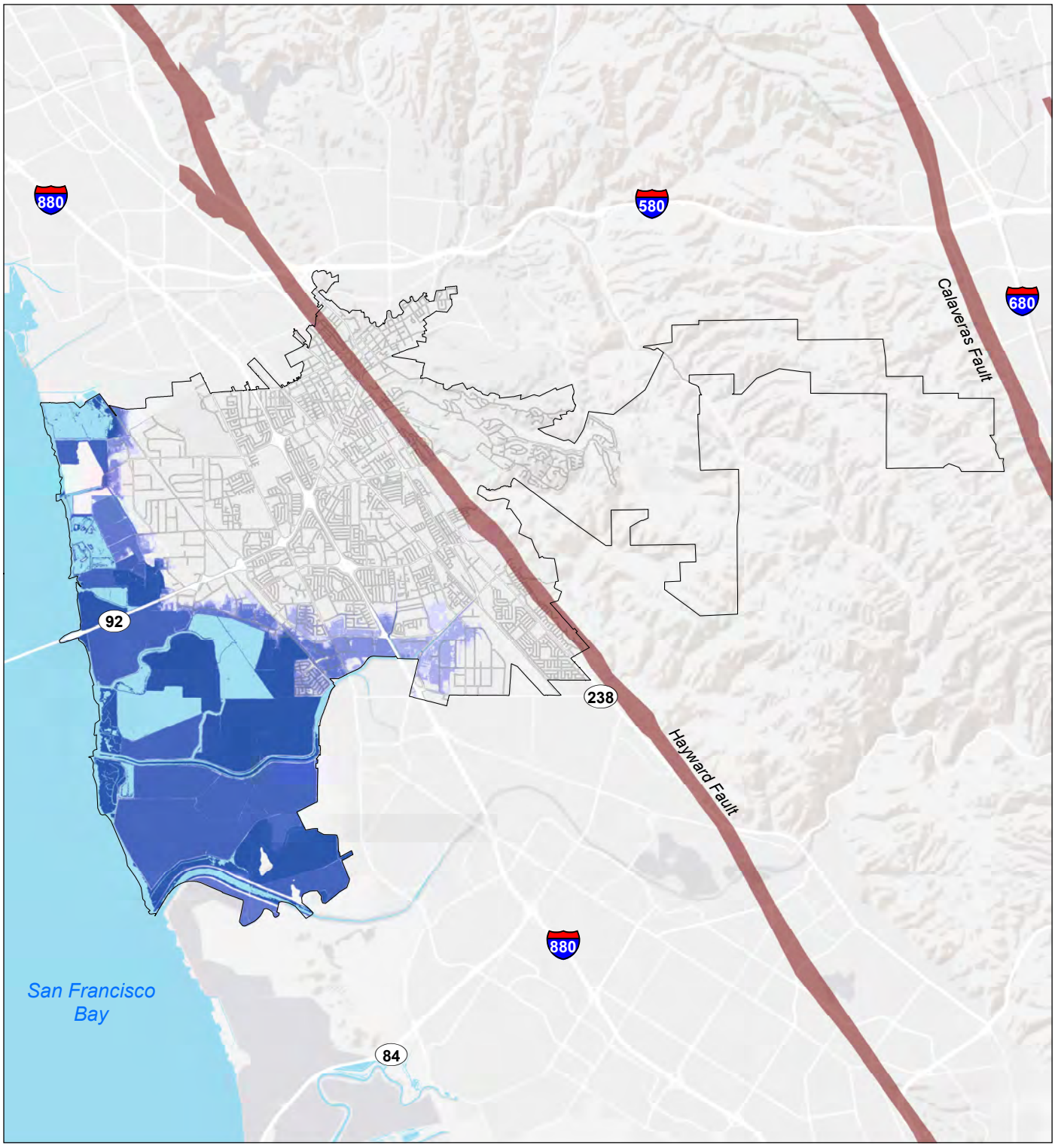
Drought is not localized, but occurs simultaneously across the region, and may extend statewide or across western states. Drought is a cyclic part of the climate of California, with an average recurrence interval of 3 to 10 years as identified in the Alameda County LHMP. California's Fourth Climate Change Assessment (https://climateassessment.ca.gov/) suggests the possibility of longer and more destructive droughts with climate change. Therefore, drought conditions are likely to occur in Hayward at least every decade.

A 5-year statewide drought existed in California at the time of the 2015 LHMP update and extended from 2012-2017. After a few wetter years, California is in another drought at the time of this 2021 Local Resilience Plan (see Figure 13). While the drought exists in every California county (per an October 2021 Governor's declaration), the impacts are locally unique, based on local water supply systems, soil conditions, the typical climate, and vegetation land covering. The entire Hayward planning area is equally at risk to drought hazard. The effects of drought are managed in the Bay Area through the import of water and the storage of water in reservoirs.

Drought vulnerability is related to three factors: exposure, sensitivity and adaptive capacity. Although drought affects 100% of the Hayward Planning Area some of its impacts are distributed unevenly. Areas especially vulnerable to drought in Hayward include the high wildfire risk areas in the WUI, where dried vegetation results in increased fire risk. Other vulnerable areas include shoreline and wetland ecosystems, which are highly sensitive to decreased rainfall and freshwater inputs, and which may have limited capacity to adapt to changes.

[26] coast.noaa.gov/slr/

Figure 12: Sea Level Rise Inundation in the City of Hayward



Legend

- City of Hayward
- Sea Level Rise Inundation
  - Current
  - 1 foot
  - 2 feet
  - 3 feet
  - 4 feet
  - 5 feet
  - 6 feet

N

0 2 4
Kilometers

0 1 2
Miles

Notes

1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

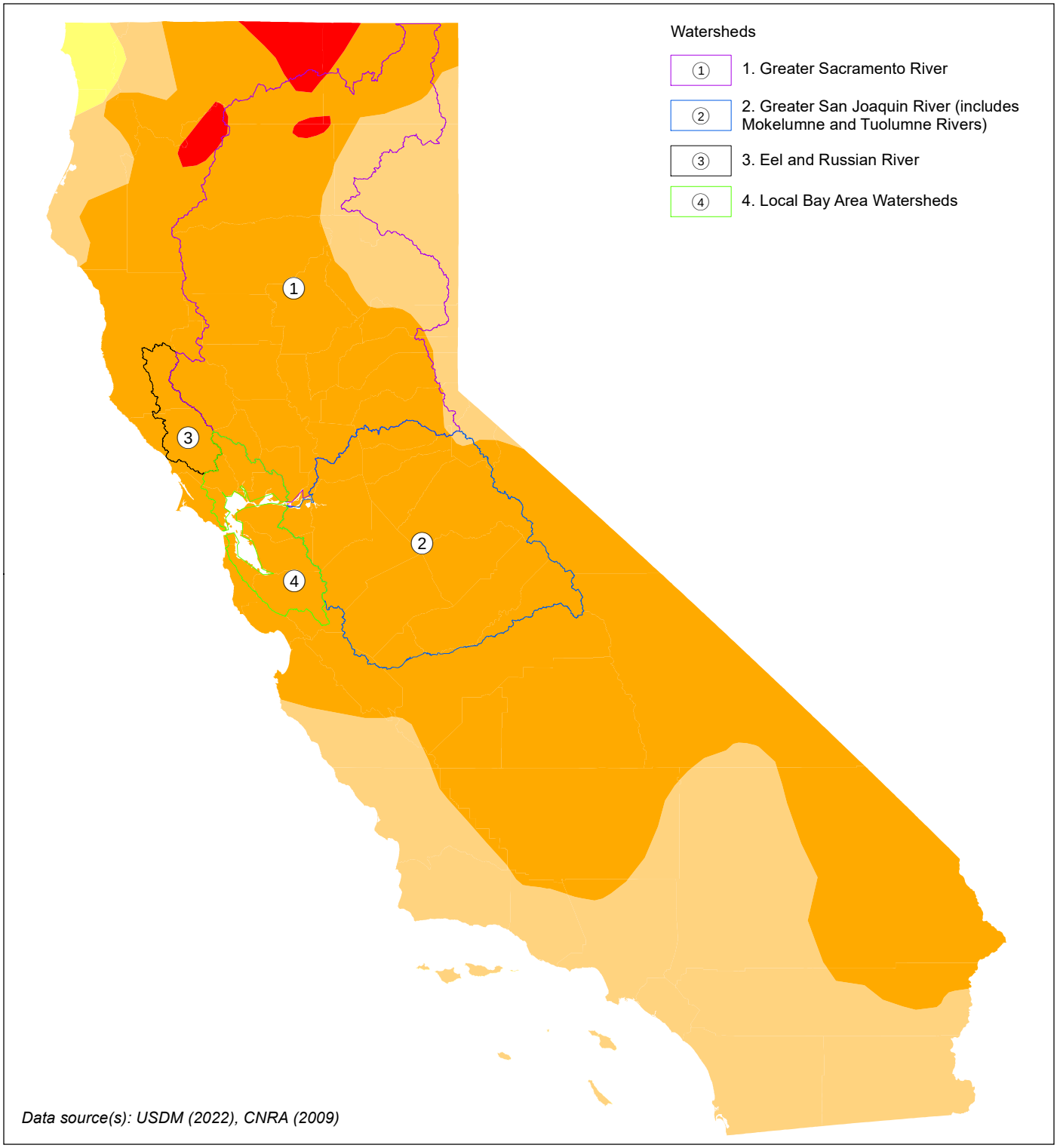
2. Background: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Sources: Esri, USGS, NOAA

Sea Level Rise Inundation at High Tide (from 0 to 6 feet)

Figure 12

Figure 13:California Drought (Dec.2021) in Watersheds the Bay Area Relies On



Legend

Drought Intensity

- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

N

0 90 180

Kilometers

0 40 80

Miles

California Drought (Jan. 2022) in Watersheds the Bay Area Relies On

Figure 13

The *United States Drought Monitor* is produced by the NOAA and the U.S. Department of Agriculture. The Monitor releases weekly maps of current drought conditions. NOAA also publishes one year outlook maps for temperature and precipitation.[27] The maps project temperature and precipitation twelve months out – describing the conditions as likely below, above, or average.

In response to the recent droughts, the City has undertaken major conservation efforts, including replacing lawns with bay-friendly landscaping, using aerators on City faucets, leaving fountains dry, pursuing recycled water for non-potable uses, and encouraging residents to do the same through a public education campaign. As a result, Hayward has been able to reduce water consumption by 26%.

5.1.6.1 CLIMATE CHANGE AND DROUGHT

Climate change is likely to increase the number and severity of future droughts. The cumulative impact of climate change impacts will result in drier conditions and will alter the timing and efficiency of the Bay Area water supply. An increase in temperature and a reduction in snowpack are the two most direct effects of climate change that will result in a drier state with fewer natural water resources than historically have been available. In Hayward, temperatures are projected to increase between 3 degrees (low emission scenario) and 6 degrees Fahrenheit (high emission scenario).[28]

The reduction in snowpack does not have direct impacts in the Bay Area as the region does not accumulate meaningful levels of snow. Hayward is adversely impacted by the severe reduction in snowpack in the Sierra Nevada mountains, the source of two-thirds of the Bay Area's water, including the water Hayward purchases from the San Francisco Public Utilities Commission. By the end of the century, the spring snowpack in the Sierras could be reduced by as much as 70 to 90 percent of the historic average.[29]

5.1.6 Hazardous Materials Release

Though hazardous materials are a man-made hazard, this plan primarily focuses on the effects of hazardous materials releases secondary to a natural hazard. Hazardous materials have the potential to become a crucial complicating factor in emergency situations. Flooding, earthquakes, and fires can all cause or be exacerbated by hazardous materials release.

The Hayward Fire Department regulates the location, handling, and storage of hazardous materials according to City, State, and Federal laws, and maintains an agreement with the Alameda County and the City of Fremont for hazardous materials response in the event of an

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[27] http://www.cpc.ncep.noaa.gov/products/predictions/multi_season/13_seasonal_outlooks/color/churchill.php

[28] Cayan, D., et al. (2009)

[29] Scripps Institute of Oceanography (2012)

incident. However, should a regional emergency require a hazardous materials response in other parts of Alameda County or in the City of Fremont, Hayward does not have its own response team to address a simultaneous incident in Hayward.

There are approximately 12,953 businesses in the City of Hayward. A little less than eight percent (8%) of these businesses, approximately 995, use, store and handle hazardous materials or generate hazardous waste in quantities that subject them to local, state or federal regulations. These are referred to as hazardous material facilities and are regulated by the Hazardous Materials Office under the local hazardous materials storage ordinance and the state's unified program for hazardous materials and hazardous waste management.

Hazardous material facilities in Hayward are diverse, not only in size but also in the nature of their activities and the quantities of hazardous materials involved in their operation. Many are automotive-related such as body shops, dealership service-centers, gasoline service stations, car washes, detail shops and general and specialty repair and maintenance garages, including those in bus, truck, car rental and taxi terminals, and corporation yards. Manufacturing companies produce buses, various specialty foods, packaging materials, medical devices, soap, detergents and other cleaning products, adhesives, sealants, paints and other chemical, pharmaceutical and cosmetic preparations, and products fabricated from wood, metal and plastic. Retailers and wholesalers include department stores, liquefied petroleum gas terminals, storage batteries, and other specialty stores. There are also service companies, government-owned or private, engaged in dry cleaning, printing, photofinishing, pest control, funeral and cremation, recycling, construction, warehousing and distribution, transportation and delivery, telecommunication, air transportation terminal, sanitation and sewage collection, water distribution, flood control, and fire, police and medical emergencies.

Some 99 hazardous material facilities operate a total of 248 underground storage tanks with a combined capacity of 2,393,500 gallons, 98% of which is motor vehicle fuel like gasoline, diesel and aviation gas in retail gasoline stations, truck and bus terminals, and the airport. The remaining 2% in underground storage capacity is for used oil and solvents. The fuel, used oil and solvents in underground storage tanks are not a special concern during emergency situations because underground storage is inherently safe. Comprehensive and stringent state and local regulations for underground storage are strictly enforced by the Hayward Fire Department to prevent unwanted and accidental releases of hazardous materials into the soil and the groundwater. Air quality standards are also in place to prevent fugitive emission of vapors from underground storage systems into the atmosphere above. Hazardous materials located aboveground, inside and outside buildings or in transport, pose a more immediate danger to the population around them, the emergency response personnel and the environment than those stored underground.

The City of Hayward's industrial zones are the primary source of hazardous materials within the city. Both major industrial zones are located in areas exposed to flood; ground shaking, liquefaction, and surface rupture in an earthquake; and fire following earthquake. In the case of a flood, water may inundate hazardous materials storage and transport vessels, dispersing the substance(s) contained therein throughout the flood area. Earthquake hazards including ground

shaking, rupture, and liquefaction could damage or rupture storage and transport vessels causing a hazardous materials release locally or atmospherically. Finally, a fire following an earthquake may not only damage or rupture hazardous materials storage and transport vessels, but could cause explosions or disperse otherwise localized releases aerially.

Hayward is also exposed to hazardous materials releases in neighboring cities and the Bay, as well as spills that may occur on Highway 880 or Mission Boulevard. The location, dispersion, amount and rate of a substance spilled, and the chemical characteristics of the substance determine the effects of a hazardous materials release. Generally, releases can have public health impacts ranging from no effect or mild chemical irritation to fatality, threaten life and property generally, and can have long long-lasting negative effects on the environment.

In the City of Hayward, the Hazardous Materials Coordinator in the Fire Prevention Office oversees hazardous materials compliance and maintains information regarding the hazardous materials sites throughout the city. The Hazardous Materials Area Plan lays out strategies for preparing for and responding to hazardous materials incidents.

6. MITIGATION & ADAPTATION STRATEGY

6.1 INTRODUCTION

Identifying and selecting mitigation strategies is the final step in hazard mitigation planning. Mitigation strategies considered by the LHMP update team and included in this plan are drawn from the following sources:

- City of Hayward 2015 LHMP
- City of Hayward General Plan & Climate Adaptation Plan
- ABAG's 2010 Multi-Jurisdictional Hazard Mitigation Plan
- FEMA's Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards document
- Participants in the update process

In selecting mitigation measures, the LHMP update team considered each action's feasibility, social benefits, economic and fiscal impacts, environmental impacts, and alignment with other City plans and stated priorities.

6.2 ANALYSIS OF MITIGATION MEASURES

As part of development of the 2015 Hayward LHMP, in a series of hazard-specific meetings, City of Hayward staff members from the Development Services, Fire, Economic Development, Police, Maintenance Services, Public Works – Engineering and Transportation, Utilities and Environmental Services, and Hayward Executive Airport departments and divisions were invited to participate in analysis of the mitigation measures. Each participant was provided a form (see Appendix L) listing 23 criteria by which to score the strategies on a scale of "criteria met" to "criteria not met." Strategies were then ranked based on their total score and selected and prioritized based on an aggregation of participant rankings. While selecting and evaluating mitigation strategies, the plan update team identified natural groupings for the mitigation strategies:

ORGANIZATIONAL PREPAREDNESS: take the necessary steps to be fully trained, equipped, and protected from hazards on an organizational level to enable us to better respond to emergencies.

RETROFIT FRAGILE HOUSING: develop programs to promote and incentivize retrofits for fragile housing types to protect lives and property of Hayward residents and community members.

PUBLIC PROGRAMS: work with the public, school district, parks district and non-governmental organizations to engage the Hayward community in disaster preparedness and hazard mitigation activities to better prepare our community to experience a disaster.

COLLABORATE TO MITIGATE SEA LEVEL RISE: partner with local agencies and private business owners to develop and implement strategies for adapting to sea level rise, resulting in the protection or relocation of industrial, recreational, and cultural assets along the shoreline.

PLANNING: study and establish plans to mitigate sea level rise, address seismic hazards at the airport, and guide post-disaster recovery.

HAZARDOUS MATERIALS PROGRAMS: establish and sustainably fund hazardous materials response programs in collaboration with local businesses.

ENVIRONMENTAL PROGRAMS: leverage the relationship between environmental sustainability and hazard mitigation to reinforce the City's safe, clean, and green goals and strengthen both programs.

ADMINISTRATIVE PROGRAMS: establish and maintain administrative programs to prioritize and speed disaster response and recovery efforts.

6.2.1 New Mitigation Projects

As stated in Section 1 the focus of the past five years has been working on the comprehensive mitigation projects already identified for Hayward. The progress on all of those is shown in the tables of Section 6.3. The City has identified two new mitigation project – the recruitment and hiring of a City Resilience Officer (CRO), and drought mitigation via the City's Water Shortage Contingency Plan. Information on that new projects is as follows:

Strategy Name*	**Chief Resilience Officer:** Fund, recruit and hire a Chief Resilience Officer to implement multiple City resilience projects and documents.						
Problem Statement*	The City of Hayward is extremely short-staffed and currently has no dedicated staff to oversee all of its resilience efforts including to manage and direct all of the programs in this Local Resilience Plan. Pending funding, the City will initiate recruitment for this position. Upon hire, the CRO will oversee the projects listed under Actions/Activities below.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	**Evaluation**	**Program/ Operation**	**Policy Development**	**Coordination**	**Education/ Outreach**		
Process/ Implementation Mechanism	**Long-Range Planning**	**Land Use Planning**	**Capital Planning**	**Operations**	**Emergency & Hazards Planning**	**Project Planning & Design**	**New Initiatives**
Responsible Agency*	Fire Department						
Partners*	FEMA, Cal OES, Alameda County, Chabot, CSU, HUSD, HARD, EBRP, Coast Guard, water pollution control, flood control, Cal Fire, Cal OES, CA Firesafe Council, neighboring jurisdictions						
Priority (Evaluation Score)*	Very High						

Actions/ Activities	Oversight of the following programs: • emergency management plan update • organizational and citywide disaster recovery plan • hazardous materials fee study • local resilience plan (LRP) • continuity of operations plan (COOP) • completing the community risk assessment and standards of cover (to ensure equitable resources and effective deployment models are in place) • Assist emergency services officer with preparedness activities – • organizing and funding large-scale evacuation drills • facilitate the review and revision of internal policies related to procedures following a natural disaster • Formalize the cost recovery team • Assist with Emergency Operations Center (EOC) activities • Co-manage the strategic implementation plan for Hayward Communications Center
Staff Lead	New Chief Resilience Officer, Fire Chief
Cost Estimate*	Estimated $840,500 for 2.5-year plan
Benefits (losses avoided)*	Implementation of multiple mitigation and resilience plans and projects stalled by lack of staff to oversee them.
Potential Funding Sources*	HMGP, Cal OES PREPARECA JumpStart Program.
Timeline*	3-year term
Related Policies*	Not applicable

Strategy Name*	**Water Shortage Contingency Plan:** Prepare the City for water shortage considering ongoing and projected statewide droughts.						
Problem Statement*	The City of Hayward, like all of California, is vulnerable to the impacts of ongoing and projected statewide droughts. To mitigate the effects of water shortages, the City has developed a Water Shortage Contingency Plan.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	Future Flooding	Wildfire	Landslide	**Drought**
Strategy Type	**Evaluation**	**Program/ Operation**	**Policy Development**	**Coordination**	**Education/ Outreach**		

Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	Public Works & Utilities Department						
Partners*	Alameda County, San Francisco Public Utilities Commission						
Priority (Evaluation Score)*	High						
Actions/ Activities	The Water Shortage Contingency Plan (WSCP) is a strategic planning document designed to prepare for and respond to water shortages in compliance with CA Water Code Section 10632, requiring every urban water supplier to prepare and adopt a WSCP (every five years) as part of its Urban Water Management Plan. The WSCP is used to reduce the potential for, and impacts of catastrophic service disruptions such as drought or seismic events. https://www.hayward-ca.gov/documents/urban-water-management-plan						
Staff Lead	Cheryl Munoz, Water Resources Management						
Cost Estimate*	Estimated $840,500 for 2.5-year plan						
Benefits (losses avoided)*	Implementation of multiple mitigation and resilience plans and projects stalled by lack of staff to oversee them.						
Potential Funding Sources*	Municipal budget, ratepayers, HMGP Planning						
Timeline*	25 year planning horizon						
Related Policies*	Urban Water Management Plan						

6.3 MITIGATION STRATEGIES & IMPLEMENTATION

The following mitigation strategies and implementation plans have been developed to address the hazards and risks detailed in Section 5. Those indicated as very high priority strategies were identified as such by both City staff and residents who participated in the Local Hazard Mitigation Planning Update online poll, and the City has taken steps to begin implementation over the last five years. High priority mitigation strategies are in the planning and implementation stages.

Table 9 offers an overview of the mitigation strategies organized by priority. Mitigation strategies by hazard, including more in-depth description of each strategy and its implementation, are provided in detailed tables in Sections 6.3.1 through 6.3.6 of this plan. Each table in these sections contains a new row containing a description of updates for each mitigation project. Timeframes for projects are either specific (e.g., “2 years”) or identified as “short-term” (about 1-2 years), “medium term” (about 2-5 years), or “long term” (greater than 5 years).

The mitigation strategies outlined in this plan align with the goals and land use designations of the City of Hayward’s 2014 General Plan (currently also being updated), which also includes climate adaptation strategies. Public feedback was also taken into account in determining the mitigation priorities. There are multiple potential disasters which are all of a concern to citizens; and the City has worked to address all of them in this Plan. The Hayward Fault and earthquakes were frequently cited by the public as priority concerns. Overall preparedness and earthquake retrofits are at the top of the Table 8, reflecting public priorities. This plan will be reviewed during preparation for the Capital Improvements Plan update to determine the feasibility of implementing each mitigation strategy at the time.

Table 9: Mitigation Strategies by Priority

Priority Level	Strategy Group	Strategies
Very High	Organizational Preparedness	Employee Education Emergency Management Plan Update Tabletop & Field Exercises
High	Fragile Housing Retrofits	Single-Family Home Retrofits Soft Story Retrofits
	Public Programs	Public Education Community Emergency Response Teams Defensible Space Programs
	Organizational Preparedness	Communications redundancy Diversify partnerships & MOUs Acquire Equipment Participate in the ABAG Regional Lifelines Council
	Collaboration to Mitigate Sea Level Rise	Implement Adapting to Rising Tides Multiagency Support SR-92 Study
	Planning	Recovery Plan Shoreline Realignment Plan Hayward Executive Airport Seismic Evaluation
Moderate	Hazardous Materials Programs	Hazardous Materials Response Team Hazardous Materials Fee Study
	Fragile Housing Retrofits	Mobile Home Retrofits
	Environmental Programs	Expand Hayward Area Shoreline Protection Agency (HASPA) Renewable Emergency Energy Sources Watershed Analysis Hillside Landslide Mitigation
	Organizational Preparedness	Mobile Command Center
Low	Administrative Programs	Building Occupancy Resumption Program 911 Registry Priority Inspection List

6.3.1 Multiple Hazards

Strategy Name*	**Employee Education:** Develop and implement an employee preparedness program to increase employee knowledge and preparedness.						
Problem Statement*	Hayward's Emergency Management Plan is 12 years old, and newer employees may not have been trained or may not be prepared for a major hazard and EOC activation.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	Program/ Operation	Policy Development	Coordination	**Education/ Outreach**		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	Fire, CMO, Human Resources (HR)						
Partners*	FEMA, CalOES, Alameda County, Hayward Area Parks & Recreation District (HARD), Hayward Unified School District (HUSD), neighboring jurisdictions						
Priority (Evaluation Score)*	Very High						
Actions/ Activities	Create disaster preparedness awareness campaign and materials, schedule EOC refresher trainings, plan tabletop and field response exercises.						
Update	**The City conducted a Know Your Zone / AC Alert / Preparedness Campaign in March 2021 and currently ongoing.** **The City also implemented Veoci, a software program used for emergency operating centers that shares and exchanges data with Alameda County.**						
Staff Lead	Emergency Management Specialist, Fire Department Public Education & Information Officer, Hayward Public Information Officer (PIO)						
Cost Estimate*	To be determined on exercises $20,000 / year for Veoci.						
Benefits (losses avoided)*	Protects employees in the event of a disaster by promoting individual preparedness, increases organizational capacity to respond to a disaster and protect citizens						
Potential Funding Sources*	General Fund, HMGP, Building Resilient Infrastructure and Communities (BRIC), which replaces the former FEMA Pre-Disaster Mitigation Program.						
Timeline*	2 year launch program, and ongoing thereafter.						

Related Policies*	General Plan Goal CS-5.1 Public Education General Plan Goal CS-5.5 Emergency and Disaster Drills

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Emergency Management Plan:** Update and revise the Emergency Management Plan to reflect organizational changes and align with current emergency management best practices.						
Problem Statement*	Hayward's Emergency Management Plan is 12 years old, and newer employees may not have been trained or may not be prepared for a major hazard and EOC activation.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	Program/ Operation	**Policy Development**	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	**Emergency & Hazards Planning**	Project Planning & Design	New Initiatives
Responsible Agency*	Fire						
Partners*	CMO, Alameda County, FEMA, CalOES, neighboring jurisdictions						
Priority (Evaluation Score)*	Very High						
Actions/ Activities	To be determined.						
Update	**No updates**						
Staff Lead	Emergency Management Specialist						
Cost Estimate*	To be determined.						
Benefits (losses avoided)*	Enables efficient management of City resources during emergencies, ensures accurate accounting for City resource expenditures for post-disaster reimbursements.						
Potential Funding Sources*	Capital Improvement Program (CIP), City of Hayward.						

Timeline*	2 years
Related Policies*	General Plan Goal CS-5.6 Comprehensive Emergency Management Plan

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Exercises:** Establish regular tabletop and field exercises to improve organizational response capacity and preparedness.						
Problem Statement*	Hayward's Emergency Management Plan is 12 years old, and newer employees may not have been trained or may not be prepared for a major hazard and EOC activation.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	**Emergency & Hazards Planning**	Project Planning & Design	**New Initiatives**
Responsible Agency*	Fire						
Partners*	CMO/City Departments, HARD, HUSD, FEMA, CalOES, Alameda County						
Priority (Evaluation Score)*	Very High						
Actions/ Activities	Run tabletop and field exercises for City executives and staff both internally and in partnership with other organizations. Plan for expansion to include CERT teams, Radio Amateur Civil Emergency Services, and other members of the public.						
Update	**1. Delivered a five-day training to City staff for City EOC disaster service workers (DSW)** **2. Hosted a regional exercise on evacuation and pet care with neighboring jurisdictions** **3. Completed EOC Logistics training** **4. Developed and delivered COVID response that served as real world training: food distribution, COVID hotline, EOC activation, stood up testing site with regional partnerships, stood up 11 vaccine points of distribution throughout Alameda County, mobile testing and vaccination** **5. Stood up community points of distribution for Afghan refugees, organized donations of perishable and non-perishable items** **6. Expanded CERT program and in progress of developing a new plan to expand CERT/Neighborhood Emergency Response Team program by creating a formal DSW group that reports to EOC leadership.**						

Staff Lead	Emergency Management Specialist
Cost Estimate*	To be determined. Staff time and department budget used to date.
Benefits (losses avoided)*	Improved organizational response capacity and experience in preparation for an emergency.
Potential Funding Sources*	CIP and General Fund
Timeline*	2 year launch, and ongoing thereafter.
Related Policies*	General Plan Goal CS-5.5 Emergency and Disaster Drills

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Public Education:** Create and implement a public outreach program (like SF72 or do1thing) to help "nudge" residents into being prepared and provide information on available city resources. This would be a public education campaign, not a training class (like CERT)						
Problem Statement*	Hayward residents are exposed and vulnerable to many types of natural hazards, and may not be adequately prepared.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	Program/ Operation	Policy Development	Coordination	**Education/ Outreach**		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	CMO, Fire						
Partners*	Alameda County, CalOES, FEMA, other jurisdictions, community organizations, HUSD, HARD						
Priority (Evaluation Score)*	High						

Actions/ Activities	Design program, secure funding, implement.
Update	**In July 2021, the City launched a Know Your Zone campaign to promote evacuation awareness and preparedness.** **In March of 2021, the Department launched a campaign to promote wildfire awareness and prepare residents for upcoming demonstrations on how to create defensible space on private property. Delivered four webinars and training materials.** **Delivered 954 CERT classes.**
Staff Lead	Emergency Management Specialist, Fire Department Public Education & Information Officer, PIO
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Prevents loss of life and property in a disaster, government resources can be allocated more efficiently when residents have the necessary equipment and resources to stay safe during a disaster and survive without regular services during the following recovery phase.
Potential Funding Sources*	Urban Area Security Initiative
Timeline*	Long-term, ongoing.
Related Policies*	General Plan Goal CS-5.1 Public Education General Plan Goal CS-5.3 Emergency Preparedness Kits

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**CERT Teams:** Expand the Community Emergency Response Team multi-hazard training program to establish and maintain CERT teams.						
Problem Statement*	Hayward residents are exposed and vulnerable to many types of natural hazards, and may not be adequately prepared.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	**Education/ Outreach**		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	**Emergency & Hazards Planning**	Project Planning & Design	**New Initiatives**

Responsible Agency*	Fire
Partners*	CMO, FEMA, CalOES, HARD, HUSD
Priority (Evaluation Score)*	High
Actions/ Activities	Create CERT team participation agreement, recruit members and provide training
Update	None
Staff Lead	Fire Department Public Education/Information Officer
Cost Estimate*	To be determined by participation.
Benefits (losses avoided)*	Prevents loss of life and property in a disaster, government resources can be allocated more efficiently when residents have the necessary equipment and resources to stay safe during a disaster and survive without regular services during the following recovery phase, more human capital to respond to emergency.
Potential Funding Sources*	Classes held September 1, 2019 – May 31, 2022 were funded by the Homeland Security Grant #2019-0035; Cal OES ID# 001-00000
Timeline*	2 year launch, then ongoing.
Related Policies*	General Plan Goal CS-5.1 Public Education General Plan Goal CS-5.2 Neighborhood Preparedness Tools and Resources General Plan Goal CS-5.4 Community Emergency Response Training

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Communications Redundancy:** Develop hardened/redundant technology and communications systems to ensure ability to communicate internally, with the public, and with other jurisdictions in an emergency, including installing GPS units on traffic signals for traffic preemption in an emergency.						
Problem Statement*	In an emergency, communications networks may be damaged and become unusable. Hayward does not have a functioning redundant communications system.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**

Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	**Capital Planning**	**Operations**	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	Information Technology (IT)/Fire						
Partners*	East Bay Regional Communications System Authority, City General Plan						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify, repair, purchase, or install communications redundancies in City of Hayward facilities						
Update	**1. Purchased two plum cases and approved to purchase two more in FY23. Council approved CIP budget to purchase satellite phones for City leadership in FY22** **2. Upgraded radios to 800 MHz and kept old VHF (very high frequency) radios for redundancy – older version of BK radios that are compatible with any jurisdiction that has BK radios**						
Staff Lead	Emergency Management Specialist						
Cost Estimate*	Plum Cases $58,000						
Benefits (losses avoided)*	Prevents breakdown of communications systems in an emergency, improving ability to assess damage, prioritize, and deploy resources effectively.						
Potential Funding Sources*	City General Fund						
Timeline*	Long-term.						
Related Policies*	General Plan Goal CS-5.11 Mass Communications Device						

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Diversify Partnerships & MOUs:** Develop partnerships with suppliers and other jurisdictions for supplies and mutual aid following a region-wide disaster

Problem Statement*	In the event of a disaster impacting the entire region (likely an earthquake), partners may not have the capacity to fulfill pre-arranged contracts and mutual aid agreements.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	Program/ Operation	Policy Development	**Coordination**	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	**Emergency & Hazards Planning**	Project Planning & Design	New Initiatives
Responsible Agency*	Fire						
Partners*	FEMA, CalOES, jurisdictions/agencies/companies outside the Bay Area						
Priority (Evaluation Score)*	High						
Actions/ Activities	Develop relationships with appropriate partners, write and approve MOUs.						
Update	**Strengthened partnerships with local red cross, HARD, HUSD, California State University, East Bay, and Chabot College to provide shelters for residents during large-scale disasters. Finalizing schedule and training for shelter DSWs.**						
Staff Lead	Emergency Management Specialist						
Cost Estimate*	No additional funding required.						
Benefits (losses avoided)*	Ensures ability to receive mutual aid in the event of an emergency, including fuel and supplies.						
Potential Funding Sources*	No additional funding required.						
Timeline*	1 year, ongoing.						
Related Policies*	General Plan Goal CS-5.10 Mutual Aid Agreements						

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Recovery Plan:** Create an organizational and citywide disaster recovery plan.
Problem Statement*	The City of Hayward currently does not have a comprehensive disaster recovery plan.
Hazard(s) Addressed	**Earthquake Ground Shaking** | **Earthquake Liquefaction** | **Current Flooding** | **Future Flooding** | **Wildfire** | **Landslide** | **Other Hazards**
Strategy Type	Evaluation | Program/ Operation | **Policy Development** | Coordination | Education/ Outreach
Process/ Implementation Mechanism	Long-Range Planning | Land Use Planning | Capital Planning | Operations | **Emergency & Hazards Planning** | Project Planning & Design | New Initiatives
Responsible Agency*	Fire
Partners*	CMO, City Departments, ABAG, Alameda County, FEMA, CalOES, community organizations, businesses, HARD, HUSD
Priority (Evaluation Score)*	High
Actions/ Activities	Develop and adopt a citywide emergency recovery plan.
Update	None
Staff Lead	Emergency Management Specialist
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Help guide the City through the difficult and attenuated recovery process following a disaster, and can foster accelerated economic, infrastructure, and resident recovery.
Potential Funding Sources*	HMGP, BRIC, General Fund
Timeline*	Medium-term.
Related Policies*	City Council “Safe” and “Thriving” priorities

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Renewable Emergency Energy Sources:** Install microgrid technology or emergency generators that run on renewable energy at all appropriate City facilities.
Problem Statement*	City facilities are equipped with backup generators that may run out of fuel in the event of a long-term or regional emergency in which fuel delivery may be impossible or unreliable, and the generators do not comport with the City's commitment to renewable energy.
Hazard(s) Addressed	**Earthquake Ground Shaking** | **Earthquake Liquefaction** | **Current Flooding** | **Future Flooding** | **Wildfire** | **Landslide** | **Other Hazards**
Strategy Type	Evaluation | **Program/ Operation** | Policy Development | Coordination | Education/ Outreach
Process/ Implementation Mechanism	Long-Range Planning | Land Use Planning | **Capital Planning** | Operations | Emergency & Hazards Planning | Project Planning & Design | New Initiatives
Responsible Agency*	City of Hayward Department of Public Works &Utilities
Partners*	FEMA, Alameda County, California Energy Commission (CEC) East Bay Community Energy (EBCE), Pacific Gas & Electric (PG&E)
Priority (Evaluation Score)*	Moderate
Actions/ Activities	Design, purchase, install, and maintain microgrid infrastructure or portable solar generators at City facilities
Update	**In 2021, City Council approved budget for purchase of solar-powered generators that can be loaned to community/other departments.** **EBCE has completed an assessment of City facilities to determine feasibility of installing solar and battery back-up systems. Report from EBCE is expected by February 2022. For more detail, see this Council report from June 15, 2021: https://hayward.legistar.com/LegislationDetail.aspx?ID=4983875&GUID=B7E2C26B-6C63-45A4-BA3D-A0C5C1DFCA43&Options=&Search=**
Staff Lead	Emergency Management Specialist, Environmental Services Manager
Cost Estimate*	To be determined
Benefits (losses avoided)*	Will ensure timely and less costly delivery of essential services in a disaster while preventing further harm to the environment.

Potential Funding Sources*	Capital Improvement Fund, HMGP, CEC grants
Timeline*	Short-term
Related Policies*	General Plan Goal PFS-4.8 Seismic Safety General Plan Goal PFS-4.12 Renewable Energy

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Mobile Command Center:** Install microgrid technology or emergency generators that run on renewable energy at all appropriate City facilities.						
Problem Statement*	The City of Hayward is expected to experience a major earthquake in the next 30 years. Though constructed to critical facilities standards, City Hall sits on the fault and is the only identified EOC location.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	**Capital Planning**	Operations	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	Fire Department						
Partners*	FEMA, Alameda County, Police Department						
Priority (Evaluation Score)*	Moderate						
Actions/ Activities	Select, purchase, and outfit a mobile command center.						
Update	**Hayward Police Department purchased a mobile command center and will serve as a temporary EOC location in the event of a large scale disaster and City Hall is not functional.**						
Staff Lead	Fire Chief						

Cost Estimate*	To be determined.
Benefits (losses avoided)*	Will ensure responsiveness and proximity to a disaster, can provide mutual aid during major regional emergencies, strengthens communications redundancy.
Potential Funding Sources*	Capital Improvement Fund, HMGP
Timeline*	Medium-term.
Related Policies*	General Plan Goal CS-5.8 Emergency Operations Center General Plan Goal CS-5.9 New Emergency Operations Center General Plan Goal CS-5.10 Mutual Aid Agreements General Plan Goal CS-5.11 Mass Communications Device

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Participate in the ABAG Regional Lifelines Council**						
Problem Statement*	The City of Hayward and surrounding community are served by transportation and utilities agencies over which they have little, if any, jurisdiction and to which they have little connection, affecting holistic emergency management, climate adaptation, and resilience planning.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	Fire Department						
Partners*	ABAG, PG&E, Department of Homeland Security (DHS)						
Priority (Evaluation Score)*	High						
Actions/ Activities	Participate in Regional Lifelines Council.						

Update	**Participated from 2016-2020 until COVID-19 shutdown in 2020.**
Staff Lead	Emergency Management Specialist
Cost Estimate*	No additional cost.
Benefits (losses avoided)*	Assists the City in preparing for any hazard or other emergency by obtaining information about regional lifeline utilities and their anticipated performance and actions in a disaster.
Potential Funding Sources*	No additional cost.
Timeline*	Ongoing
Related Policies*	General Plan Hazard Element Goal 1 Regional Coordination General Plan Goal CS-5.7 Energy Assurance Plan

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

6.3.2 Earthquakes

Strategy Name*	**Single-Family Home Retrofits:** Develop and launch a voluntary single-family home "Brace and Bolt" retrofit program that educates and provides incentives for homeowners to retrofit. Secure funding for low-income homeowners to retrofit.						
Problem Statement*	The housing stock in the City of Hayward includes a large amount of fragile housing types (i.e., pony/cripple wall and soft story) in earthquake hazard zones, putting residents' homes and lives at risk.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	Current Flooding	Future Flooding	Wildfire	Landslide	Other Hazards
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	**Education/ Outreach**		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	Development Services Department, Library and Community Services						
Partners*	U.S. Department of Housing and Urban Development (HUD), California Earthquake Authority (CEA)						

Priority (Evaluation Score)*	High
Actions/ Activities	Identify affected homes, offer plan check and permit fee waivers, apply for funding, recruit residents to the program, screen and train contractors, retrofit homes.
Update	**The City of Hayward piloted the "Brace & Bolt" seismic retrofit program in 2016. From 2016 – 2018, the program provided seismic retrofit services for 19 low/moderate income housing units.** **All retrofit work is done in the crawl space and around the perimeter of the foundation. The approved retrofit is for bolting and bracing--anchor bolts or foundation plates and plywood or OSB sheathing on the perimeter cripple walls.**
Staff Lead	Deputy Director of Development Services Department, Senior Property Rehabilitation Specialist
Cost Estimate*	$34,606.95. in Federal Community Development Block Grant funds were allocated to the Brace & Bolt program.
Benefits (losses avoided)*	Prevents loss of life and property in an earthquake, and can protect against long-term housing and economic losses due to uninhabitable or abandoned properties. Allows more residents to shelter in place. Reduces number of ignition sources for fire following earthquake. An estimated 16,000 homes in Hayward could be affected.
Potential Funding Sources*	CDBG grants, CEA Earthquake Brace & Bolt (EBB) Program, HMGP, BRIC
Timeline*	1 year for funded program, ongoing thereafter.
Related Policies*	General Plan Goal HAZ-2.9 Seismic Retrofits

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Soft Story Retrofits:** Develop and launch a mandatory soft, weak, and open-front (SWOF) building retrofit program that offers incentives for property owners to retrofit. (Approximately 900 potential SWOF buildings in Hayward)						
Problem Statement*	The housing stock in the City of Hayward includes a large amount of fragile housing types (i.e., pony/cripple wall and soft story) in earthquake hazard zones, putting residents' homes and lives at risk.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	Current Flooding	Future Flooding	Wildfire	Landslide	Other Hazards
Strategy Type	Evaluation	Program/ Operation	**Policy Development**	Coordination	Education/ Outreach		

Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	Development Services Department						
Partners*	ABAG, FEMA, neighboring jurisdictions						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify affected buildings, develop standards, pass resolution, survey buildings, require engineering reports, enforce.						
Update	**The City of Hayward Mandatory Soft Story Screening Program has been implemented. To date there is a total of 479 properties that were targeted in the soft story ordinance. There are 58 properties that were deemed exempt from the soft story ordinance. There are 53 properties that are not exempt. There are 2 properties that are exempt/nonexempt, some buildings onsite that have been retrofitted and some that have not. There are 366 properties that are still pending and/or have not responded to the soft story ordinance survey.**						
Staff Lead	Deputy Director of Development Services, Building Official						
Cost Estimate*	To be determined.						
Benefits (losses avoided)*	Prevents loss of life and property in an earthquake, and can protect against long-term housing and economic losses due to uninhabitable or abandoned properties. Allows more residents to shelter in place. Reduces number of ignition sources for fire following earthquake. An estimated 900 properties in Hayward could be affected.						
Potential Funding Sources*	CDBG, HMGP, BRIC						
Timeline*	5 years						
Related Policies*	General Plan Goal HAZ-2.9 Seismic Retrofits						

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Building Occupancy Resumption Program:** A Building Occupancy Resumption Program (BORP) authorizes building owners to contract with licensed inspectors who become deputized by the City in the event of an emergency to inspect buildings.

Problem Statement*	In an emergency, City of Hayward Code Enforcement and Building staff will be overwhelmed by the volume of inspections necessary to determine building safety.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	Current Flooding	Future Flooding	Wildfire	Landslide	Other Hazards
Strategy Type	Evaluation	Program/ Operation	**Policy Development**	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	Development Services Department						
Partners*	Earthquake Engineering Research Institute (EERI)						
Priority (Evaluation Score)*	Low						
Actions/ Activities	To be determined.						
Update	**The City is currently has licensed engineers and architects on staff and is contracted with third party inspection agency agencies that should be contracted during emergencies ("Approved Special Inspection Agency" list).**						
Staff Lead	Building Official, Planning Department						
Cost Estimate*	To be determined.						
Benefits (losses avoided)*	Assists with economic recovery and prevents loss of life.						
Potential Funding Sources*	No additional funding necessary.						
Timeline*	ongoing.						
Related Policies*	City Council "Safe" and "Thriving" priorities						

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Mobile Home Retrofits:** Develop a retrofit program to assist mobile homeowners with purchase or installation of Earthquake Resistant Bracing Systems, Engineered Tie-Down Systems or reinforce foundations. Could include water heater bracing and flexible gas connections to reduce fire.
Problem Statement*	Many of Hayward's older residents live in mobile homes, which can collapse in an earthquake. Most of Hayward's mobile home parks are located in the liquefaction zone.
Hazard(s) Addressed	**Earthquake Ground Shaking** | **Earthquake Liquefaction** | Current Flooding | Future Flooding | Wildfire | Landslide | Other Hazards
Strategy Type	Evaluation | **Program/ Operation** | **Policy Development** | Coordination | Education/ Outreach
Process/ Implementation Mechanism	Long-Range Planning | Land Use Planning | Capital Planning | Operations | Emergency & Hazards Planning | Project Planning & Design | **New Initiatives**
Responsible Agency*	Development Services
Partners*	ABAG
Priority (Evaluation Score)*	Moderate
Actions/ Activities	To be determined.
Update	**The City discussed installing a seismic gas shutoff valve to be installed for low income/mobile homeowners as a potential for gas leak mitigation process in conjunction with strapping of water heaters.**
Staff Lead	Building Official
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Prevents loss of life and property, prevents fire after earthquake by protecting gas connections on mobile homes. Allows more residents to shelter in place.
Potential Funding Sources*	HMGP, BRIC
Timeline*	Medium-term.
Related Policies*	General Plan Goal HAZ-2.9 Seismic Retrofits

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Hayward Executive Airport Seismic Evaluation:** Complete an evaluation of airport buildings and facilities to determine their anticipated performance in a seismic event.
Problem Statement*	Though Hayward is located on a fault and the airport in a liquefaction zone, there has been no evaluation of the seismic safety of airport facilities, which are crucial to both emergency response and economic recovery in the event of a disaster.
Hazard(s) Addressed	**Earthquake Ground Shaking** | **Earthquake Liquefaction** | Current Flooding | Future Flooding | Wildfire | Landslide | Other Hazards
Strategy Type	**Evaluation** | Program/ Operation | Policy Development | Coordination | Education/ Outreach
Process/ Implementation Mechanism	Long-Range Planning | Land Use Planning | **Capital Planning** | Operations | Emergency & Hazards Planning | Project Planning & Design | New Initiatives
Responsible Agency*	Maintenance Services Department - Hayward Executive Airport
Partners*	Economic Development, Development Special District, ABAG, CalOES, EERI, Federal Aviation Administration (FAA)
Priority (Evaluation Score)*	High
Actions/ Activities	Identify funding.
Update	**Airport is conducting a study in 2022 to determine load capacity of runways and taxiways based on current FAA regulation and guidance.**
Staff Lead	Airport Manager
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Provides crucial information about the seismic safety of airport infrastructure so the City can identify and implement mitigation measures to protect city property and preserve the operational benefit of the airport in an emergency, as well as its economic benefit to Hayward.
Potential Funding Sources*	Capital Improvements Plan (CIP), HMGP
Timeline*	Short-term.

Related Policies*	General Plan Goal HAZ-2.10 City Facilities

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

6.3.3 Fire

Strategy Name*	**Acquire Equipment:** Ensure emergency personnel have adequate equipment (radios, breathing apparatuses, protective gear, etc.) for disaster response.						
Problem Statement*	The City of Hayward lacks sufficient equipment for the Fire Department to respond to a citywide disaster.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	**Earthquake Liquefaction**	**Current Flooding**	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	**Emergency & Hazards Planning**	Project Planning & Design	New Initiatives
Responsible Agency*	City of Hayward Fire Department						
Partners*	CalOES						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify funding to purchase new necessary equipment, purchase and distribute equipment throughout the Hayward Fire Department						
Update	**The Fire Department purchased new radios, new self-contained breathing apparatuses, and is currently ordering turnout replacements**						
Staff Lead	Fire Chief						
Cost Estimate*	To be Determined.						
Benefits (losses avoided)*	Emergency Personnel will have the equipment necessary to provide adequate support to the community before, during and after a hazardous event.						
Potential Funding Sources*	HMGP, Federal Assistance to Firefighters Grants, Other Fire equipment-related federal and state grants						

Timeline*	Completed
Related Policies*	General Plan Policy: CS 4.10 Investment in Technology General Plan Policy: CS 5.11 Mass Communications Devices

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Defensible Space Programs:** Continue to expand and support vegetation management and defensible space programs in the Hayward hills.						
Problem Statement*	The Hayward Hills is an area of wildland-urban interface susceptible to wildfire endangering hillside homes.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	Future Flooding	**Wildfire**	Landslide	Other Hazards
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	City of Hayward Fire Department						
Partners*	CalOES, East Bay Regional Parks District (EBRPD), HARD						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify funding, purchase necessary equipment and expand programs.						
Update	**In 2021, the Hayward Fire Department was approved for HMGP funding to expand defensible space program. The Department launched an education campaign and will be demonstrating vegetation management activities in June 2022.**						
Staff Lead	Fire Chief						
Cost Estimate*	To be Determined.						
Benefits (losses avoided)*	Lives, homes, and recreational resources in the Hayward Hills will be protected from wildfire.						

Potential Funding Sources*	HMGP, Federal Assistance to Firefighters Grants, Other Fire equipment-related federal and state grants
Timeline*	1-5 Years
Related Policies*	General Plan Policy: CS-3.1 Fire Prevention Education General Plan Policy: CS-3.7 Removal of Fire Hazards

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**911 Registry:** Create a 911 Registry program for people with disabilities, elderly people, and people with serious illnesses to voluntarily register to a confidential list so first responders know to look for them and respond accordingly in an emergency.						
Problem Statement*	Hayward is home to residents who may be especially vulnerable in an emergency, including disabled and elderly people. The City does not know exactly where all of these residents are located.						
Hazard(s) Addressed	**Earthquake Ground Shaking**	Earthquake Liquefaction	Current Flooding	**Future Flooding**	**Wildfire**	**Landslide**	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	City of Hayward Fire Department						
Partners*	Alameda County, neighboring jurisdictions						
Priority (Evaluation Score)*	Low						
Actions/ Activities	Leverage community partnerships through a comprehensive community outreach effort to raise awareness of the registry, maintain records and distribute to relevant staff for use in a future hazardous event.						
Update	**This project remains in discussion**						
Staff Lead	To be determined						
Cost Estimate*	To be determined.						

Benefits (losses avoided)*	Emergency workers will have a roster that identifies particularly vulnerable residents, allowing them to prioritize of assistance in the wake of a hazardous event.
Potential Funding Sources*	General Fund
Timeline*	Long-term.
Related Policies*	General Plan Policy: CS 1.1 Community Partnerships General Plan Policy: CS 1.16 Immigrant Outreach Programs General Plan Policy: CS 5.1 Public Education

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Priority Inspection List:** Create a list of high-occupancy, high fire risk buildings for expedited inspection.						
Problem Statement*	Some of Hayward's buildings may be especially vulnerable to fire. In the case of high-occupancy buildings, the problem is compounded by the number of residents.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	Future Flooding	**Wildfire**	Landslide	Other Hazards
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	**Emergency & Hazards Planning**	Project Planning & Design	New Initiatives
Responsible Agency*	City of Hayward Fire Department						
Partners*	City of Hayward Development Services Department						
Priority (Evaluation Score)*	Low						
Actions/ Activities	Compile list of potential problem properties, engage Code Enforcement Officers to remedy any violations.						
Update	**A list of high occupancy structures, i.e., high density housing, and high fire risk buildings have been complied so they can be quickly inspected after an earthquake.**						

Staff Lead	Fire Marshal
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Proactively prioritizes problem properties, mitigating the number of potential fire related disasters that may occur as a result of fire vulnerable buildings. Reduces the potential for loss of life, injury, and economic damage to Hayward residents and businesses from wildfires.
Potential Funding Sources*	City General Fund, existing personnel.
Timeline*	Short-term.
Related Policies*	General Plan Policy: CS 3.2 Fire and Building Codes General Plan Policy: CS 3.6 Fire Safety Inspections General Plan Policy: CS 3.7 Removal of Fire Hazards

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

6.3.4 Landslide

Strategy Name*	**Hillside Landslide Mitigation:** Mitigate landslide risk in the Hayward Hills by improving drainage, reconstructing retaining walls, and installing netting and drought-resistant vegetation.						
Problem Statement*	The Hayward Hills are susceptible to both rainfall- and earthquake-induced landslides, which may be exacerbated by climate change, putting homes, roads, and recreational areas at risk.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	Future Flooding	Wildfire	**Landslide**	Other Hazards
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	**Capital Planning**	**Operations**	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	Public Works – Engineering & Transportation						
Partners*	EBRPD, HARD						

Priority (Evaluation Score)*	Moderate
Actions/ Activities	Compile list of potential problem streets and hillsides, prioritize locations, identify funding, select most appropriate mitigation measures for site, complete construction.
Update	**Project has not yet started.**
Staff Lead	Director of Public Works – Engineering & Transportation
Cost Estimate*	To be determined; varies by location.
Benefits (losses avoided)*	Prevents the potential loss of life and homes in the hills, City infrastructure, and recreational areas as a result of landslide.
Potential Funding Sources*	HMGP, CIP, Measure C funds
Timeline*	Long-term.
Related Policies*	City Council “Safe” and “Thriving” priorities

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

6.3.5 Flooding, Tsunami, & Sea Level Rise

Strategy Name*	**Implement Adapting to Rising Tides:** Implement recommendations and take mitigation measures from the Adapting to Rising Tides report.						
Problem Statement*	The Water Pollution Control Facility (WPCF) is at risk of sea level rise and flooding.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	**Future Flooding**	Wildfire	Landslide	Other Hazards
Strategy Type	Evaluation	Program/ Operation	**Policy Development**	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	**Capital Planning**	**Operations**	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	City of Hayward Department of Public Works & Utilities						

Partners*	City of Hayward Development Services Department, ABAG, BCDC, Hayward Area Shoreline Planning Agency (HASPA), East Bay Dischargers Authority (EBDA), adjacent businesses
Priority (Evaluation Score)*	High
Actions/ Activities	Monitor and participate in regional and State-level research on projected sea-level rise in Hayward and the region, develop guidelines, regulations, and development review procedures to protect this vital municipal asset from floods due to anticipated sea-level rise.
Update	**In February 2021, the City, in partnership with the Hayward Area Shoreline Planning Agency, completed the Hayward Regional Shoreline Adaptation Master Plan. More information at https://www.hayward-ca.gov/shoreline-master-plan**
Staff Lead	Water Pollution Control Facility Manager
Cost Estimate*	Projects identified in the Master Plan that will protect the WPCF include: • Salt Marsh Harvest Mouse Preserve Interim Levee – est cost = up to $20M • Cogswell Marsh Adaptive Management – est cost = $5m • Hayward LOP (Line of Protection) – PHASE 1 – est cost = more than $20M
Benefits (losses avoided)*	Increase the disaster resilience of the WPCF allowing it to remain operational in the wake of a hazardous event.
Potential Funding Sources*	HMGP, BRIC, Capital Improvement Program, Facilities Capital Fund
Timeline*	Medium-term.
Related Policies*	General Plan Policies HAZ 4.1-4.5 Rising Sea Levels Climate Action Plan- Strategy 8- Climate Change Adaptation

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Shoreline Realignment Plan:** Create and implement recommendations from a mile-by-mile plan to protect public and private assets from and mitigate the impacts of sea level rise on the Hayward shoreline, particularly the WPCF.						
Problem Statement*	Sea level rise and fluctuation between extreme wet and dry seasons that is expected as a result of climate change could overwhelm creek watersheds in Hayward.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	**Future Flooding**	Wildfire	Landslide	Other Hazards
Strategy Type	**Evaluation**	Program/ Operation	**Policy Development**	Coordination	Education/ Outreach		

Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	**Capital Planning**	Operations	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	City of Hayward Development Services Department						
Partners*	Department of Public Works &Utilities, Alameda County Flood Control & Water Conservation District (ACFC), EBRPD, HARD, HASPA, BCDC, ABAG, private property owners						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify funding, create plan, and implement mitigation measures in partnership with EBRPD and HARD.						
Update	In February 2021, the City, in partnership with the Hayward Area Shoreline Planning Agency, completed the Hayward Regional Shoreline Adaptation Master Plan. More information at https://www.hayward-ca.gov/shoreline-master-plan						
Staff Lead	Environmental Services Manager, Assistant Planner						
Cost Estimate*	To be determined.						
Benefits (losses avoided)*	Allows Hayward to identify specific strategies to and take action to protect shoreline assets from sea level rise and historic floods, particularly the WPCF.						
Potential Funding Sources*	Capital Improvement Fund, HMGP, BRIC, Wastewater Capital Improvements Plan (WWCIP)						
Timeline*	3 years, tentatively.						
Related Policies*	General Plan Policy HAZ-4.3 Shore Realignment Master Plan General Plan Goal PFS-6.1 Interagency Levee Management						

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Multiagency Support:** Coordinate with and support other agencies and organizations (ACFC, CA Dept of Fish & Wildlife, EBRPD and East Bay Dischargers Authority) to reinforce waterfront infrastructure and plan for sea level rise.						
Problem Statement*	As sea level rise progresses, the marshes along Hayward's shoreline will become inundated and existing berms will provide insufficient protection against flooding.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	**Future Flooding**	Wildfire	Landslide	Other Hazards

Strategy Type	Evaluation	Program/ Operation	Policy Development	**Coordination**	Education/ Outreach

Process/ Implementation Mechanism	Long-Range Planning	**Land Use Planning**	**Capital Planning**	**Operations**	Emergency & Hazards Planning	Project Planning & Design	New Initiatives

Responsible Agency*	City of Hayward Department of Development Services
Partners*	City of Hayward Department of Public Works & Utilities, HASPA, ACFC, CA Dept of Fish & Wildlife, EBRPD, BCDC and East Bay Dischargers Authority
Priority (Evaluation Score)*	High
Actions/ Activities	Monitor and participate in regional and State-level policy and programmatic development on waterfront protection and rehabilitation in Hayward and the region.
Update	HASPA is currently in the process of adding more partner agencies to join the Joint Powers Authority (JPA). Expect to have new expanded membership and new JPA by end of 2022.
Staff Lead	Planning Manager
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Foster collaborative relationships to proactively address sea level rise in Hayward and the surrounding region.
Potential Funding Sources*	Climate change-related grant programs
Timeline*	Long-term.
Related Policies*	General Plan Policy HAZ-3.3 Flood Plain Management Ordinance General Plan Policy HAZ-4.3 Shore Realignment Master Plan General Plan Goal PFS-6.1 Interagency Levee Management

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**SR-92 Study:** Work with CalTrans, ACFC, regional parks, and CA Dept of Fish & Wildlife to determine functional capacity as sea level rises.

Problem Statement*	The San Mateo Bridge approach and toll plaza are vulnerable to flooding and sea level rise inundation.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	**Future Flooding**	Wildfire	Landslide	Other Hazards
Strategy Type	**Evaluation**	Program/ Operation	Policy Development	**Coordination**	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	City of Hayward Department of Public Works & Utilities, Department of Development Services						
Partners*	ACFC, EBRPD, HARD, CA Dept of Fish & Wildlife, CalTrans						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify resources, engage and collaborate with local and regional partners to conduct study determining SR-92 functional capacity as sea level rises.						
Update	As part of the development of the Hayward Regional Shoreline Adaptation Master Plan, HASPA staff discussed with Caltrans the possibility of building a causeway for the bridge approach. Caltrans will need to complete additional study.						
Staff Lead	Environmental Services Manager						
Cost Estimate*	To be determined.						
Benefits (losses avoided)*	Production of knowledge to drive future capital infrastructure mitigation activities.						
Potential Funding Sources*	No additional funding required.						
Timeline*	Long-term.						
Related Policies*	General Plan Policy: HAZ 4.1 Monitor Rising Sea Levels General Plan Policy: HAZ 4.2 Adapting to Rising Ties Climate Action Plan- Strategy 8- Climate Change Adaptation						

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Expand Hayward Area Shoreline Protection Agency (HASPA):** Expand HASPA to include more shoreline property owners and support with more staff and funding to create a space for sea level rise mitigation planning and action.						
Problem Statement*	Temporary flooding and permanent inundation will affect Hayward's shoreline and flood-vulnerable areas.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	**Future Flooding**	Wildfire	Landslide	Other Hazards
Strategy Type	Evaluation	Program/ Operation	Policy Development	**Coordination**	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	Emergency & Hazards Planning	Project Planning & Design	New Initiatives
Responsible Agency*	City of Hayward Department of Development Services						
Partners*	HARD, EBRPD, private landowners, other shoreline agencies						
Priority (Evaluation Score)*	Low						
Actions/ Activities	Solicit and engage new partners to annex into the HASPA, charge HASPA with facilitating the implementation of LHMP strategies regarding sea level rise mitigation.						
Update	**HASPA is currently in the process of adding more partner agencies to join the Joint Powers Authority. Expect to have new expanded membership and new JPA by end of CY 2022.**						
Staff Lead	Environmental Services Manager						
Cost Estimate*	To be determined.						
Benefits (losses avoided)*	Additional human capital resources to research, identify, and implement shoreline protection policies and programs.						
Potential Funding Sources*	General Fund, Additional Partner Agency Funding						

Timeline*	Long-term.
Related Policies*	General Plan Policy: HAZ 4.2 Adapting to Rising Tides General Plan Policy: HAZ 4.3 Shore Realignment Master Plan General Plan Policy: NR 1.4 Shoreline Protection and Enhancement Climate Action Plan- Strategy 8 Climate Change Adaptation

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Watershed Analysis:** Conduct a watershed analysis to determine areas of insufficient capacity in storm drain and natural creek systems and predict impacts of abnormally high rainfall and sea level rise.						
Problem Statement*	Sea level rise and fluctuation between extreme wet and dry seasons that is expected as a result of climate change could overwhelm creek watersheds in Hayward.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	**Future Flooding**	Wildfire	Landslide	Other Hazards
Strategy Type	**Evaluation**	Program/ Operation	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	Operations	**Emergency & Hazards Planning**	Project Planning & Design	New Initiatives
Responsible Agency*	City of Hayward Department of Public Works: Utilities and Environmental Services						
Partners*	ACFC, EBRPD, HARD						
Priority (Evaluation Score)*	Moderate						
Actions/ Activities	Complete the hydraulic analysis of watersheds in the city to identify and predict areas of insufficient capacity, identify funding streams to make necessary improvements to increase capacity, safety, and overall health of the watershed.						
Update	**No update**						
Staff Lead	Department of Public Works: Utilities and Environmental Services Department of Public Works: Engineering and Transportation						
Cost Estimate*	Medium-term.						

Benefits (losses avoided)*	Production of knowledge to drive future capital infrastructure investment, which as a result will increase capacity to handle a future flooding event and mitigate any potential damage to the City.
Potential Funding Sources*	Capital Improvement Fund, Stormwater-Flooding Management Projects Grants (Prop 1E), HMGP
Timeline*	To be determined.
Related Policies*	General Plan Policy: NR 6.6 Stormwater Management

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

6.3.6 Hazardous Materials

Strategy Name*	**Hazardous Materials Response Team:** Plan for, establish, train, and equip a hazardous materials response team.						
Problem Statement*	The City of Hayward has hazardous materials in businesses throughout most of the City. However, we do not have a hazardous materials response plan or dedicated response team.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	Future Flooding	Wildfire	Landslide	**Other Hazards**
Strategy Type	Evaluation	**Program/ Operation**	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	Emergency & Hazards Planning	Project Planning & Design	**New Initiatives**
Responsible Agency*	Fire						
Partners*	Alameda County, CalOES, FEMA, private businesses						
Priority (Evaluation Score)*	Moderate						
Actions/ Activities	Identify funding, purchase equipment, created a training plan, put together a team, execute training plan and ongoing refresher training.						
Update	**Annual refresher training completed 2015-2021 and on-going. Training includes classroom and drills. The Department could not identify funding but submitted new budget requests to stand up hazmat response team for FY23 and 24.**						
Staff Lead	Operations						

Cost Estimate*	$1.2 million.
Benefits (losses avoided)*	Allows Hayward to respond to hazardous materials release more quickly and effectively, and allows the City to prioritize hazardous materials release in Hayward in the event of an emergency rendering mutual aid unavailable, such as a regional disaster. Prevents greater damage from occurring.
Potential Funding Sources*	CIP, Hazardous Materials Impact Fee
Timeline*	Short-term.
Related Policies*	Hazardous Materials Area Plan

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

Strategy Name*	**Hazardous Materials Fee Study:** Conduct an evaluation of the estimated costs of hazmat team operations and explore potential funding sources, including an impact fee.						
Problem Statement*	The City of Hayward has hazardous materials in businesses throughout most of the City. However, we do not have a hazardous materials response plan or dedicated response team and currently have no means by which to fund an ongoing hazmat program.						
Hazard(s) Addressed	Earthquake Ground Shaking	Earthquake Liquefaction	Current Flooding	Future Flooding	Wildfire	Landslide	**Other Hazards**
Strategy Type	**Evaluation**	Program/ Operation	Policy Development	Coordination	Education/ Outreach		
Process/ Implementation Mechanism	Long-Range Planning	Land Use Planning	Capital Planning	**Operations**	**Emergency & Hazards Planning**	Project Planning & Design	**New Initiatives**
Responsible Agency*	Fire						
Partners*	Economic Development, CMO, CalOES, FEMA, consultants						
Priority (Evaluation Score)*	Moderate						
Actions/ Activities	Identify funding and hire consultant to conduct study and make recommendations for impact fee.						

Update	**The City could not identify funding for a consultant. The Department collaborated with Calpine (energy plant) leadership to conduct annual drills and training following a turbine explosion at that facility in May 2021.**
Staff Lead	Fire Operations
Cost Estimate*	To be determined.
Benefits (losses avoided)*	Provides the City with an ongoing funding stream to maintain a hazardous materials response team and robust hazardous materials program.
Potential Funding Sources*	HMGP, HMEP, Hazardous Materials Impact Fee
Timeline*	Short-term.
Related Policies*	City Council “Safe” and “Thriving” priorities

* Indicates overlap with FEMA Worksheet 6.1, Mitigation Action Evaluation Worksheet

7. PLAN MAINTENANCE PROCEDURES

This section details the procedures for implementing, monitoring, and updating the plan over the next five years.

7.1 IMPLEMENTATION AND UPDATES

The LHMP/Resilience Plan includes and is built upon principles and policies drawn from existing City plans and priorities. Many of the mitigation strategies listed above align with the General Plan, and City Council's stated priority to create a safe, clean, green, and thriving Hayward.

7.1.1 Implementation

Implementation is being led by the City departments identified as responsible for each mitigation strategy, with the support and encouragement of the City Manager's Office and the Emergency Management Specialist. Once the proposed new CRO is hired implementation of many of the projects will be overseen by that position. In the interim Hayward Fire Department Analyst/Project Manager Shanalee Gallagher is leading the implementation. Budget cycles include the allocation of funds for hazard mitigation programs, and the inclusion of necessary hazard-related infrastructure improvements in the Capital Improvements Plan and budget. However, implementation of most of the mitigation measure in this plan will require securing funding from outside sources.

The status of implementation of the City's mitigation strategies/projects is provided in the tables of Sections 6.3.1 through 6.3.6 under Actions/Activities. The primary barriers or obstacles to successful implementation or completion of the mitigation actions are staff availability and funding. The City works to find new funding sources on a ongoing basis and the proposed hire of a CRO would help substantially with the staffing issue.

7.1.2 Next Update

In 2025, Hayward will begin the next plan update in per federal regulations. The update process will begin 18 months in advance of the current plan's expiration. The update will address all sections of the plan, following a similar course to the current update:

- The Fire Chief will convene an interdepartmental update team. If a Chief Resilience Officer is active at the time of the next update, that position will take the lead in convening the update team.

- Staff will consult with other hazard experts and the new analysis will take into account new research and discoveries since the previous plan, as well as new information about climate change and sea level rise.

- Using the information from the Monitoring section (see Section 7.2) and staff's individual knowledge of City programs, City staff will report on implementation progress since the Plan's approval.

- Staff will select mitigation strategies based on any changes in hazard and risk, as well as the mitigation measures completed since the prior plan update. Mitigation measures that have been attempted and lapsed or have not been attempted will be removed, retained, or rewritten. New mitigation measures will be selected as appropriate.

- Community partners and individual members of the public will be consulted for their input in the plan, which will be incorporated into the mitigation strategy selection and prioritization process.

City staff may consider partnering with the Hayward Area Recreation and Parks District and the Hayward Unified School District to create a multi-jurisdictional plan in the future.

7.2 MONITORING/EVALUATION

Currently the Emergency Management Officer (EMO), monitors and encourages progress toward implementing and completing the mitigation strategies in the plan and note the status of each strategy and emergence of additional strategies annually. The proposed new approach is for this role to be taken on by the City Fire Chief, who will designate the EMO or new CRO's responsibilities for documenting annual plan reviews and committee involvement.

The Fire Chief or his designee will monitor the LRP yearly, with an annual evaluation meeting in between 5-year plan updates. Progress and deadline on the Plan will be tracked using a spreadsheet. The Chief/designee will update the LRP for relevant changes in the Hayward built environment, as well as for substantial socioeconomic or demographic changes. The update evaluation will also include a discussion of how changing conditions could impact community resilience in the long term. The Chief/designee will focus on specific education and communication activities related to the Emergency Operations Center. City staff will also provide updates on implementation progress to the City Council upon request.

7.3 CONTINUED PUBLIC INVOLVEMENT

Public outreach and education regarding hazards, risk, mitigation, and preparedness is one of the high priority mitigation measures identified in this plan. Through expanding the City of Hayward's CERT programs, establishing a permanent CERT team, and conducting a public education and preparedness campaign as well as undertaking many highly visible mitigation efforts (including residential retrofits) the City hopes to create a framework and community for discussion of hazard mitigation among residents, business owners, and other members of our community. Together, we can achieve our mitigation goals and make Hayward a safer, more resilient place.

GLOSSARY

ABAG	Association of Bay Area Governments
ACFC	Alameda County Flood Control & Water Conservation District
BART	Bay Area Rapid Transit
BCDC	Bay Conservation and Development Corporation
BORP	Building Occupancy Resumption Program
BRIC	Building Resilient Infrastructure and Communities
Cal-Adapt	An electronic clearinghouse for climate change data and scenarios run by the California Energy Commission.
CalOES	California Governor's Office of Emergency Services
CalTrans	California Department of Transportation
CEA	California Earthquake Authority
CEC	California Energy Commission
CERT	Community Emergency Response Teams
CGS	California Geological Survey
CIP	Capital Improvements Plan
CMO	City Manager's Office
CRO	Chief Resilience Officer
DHS	Department of Homeland Security
EBB	Earthquake Brace & Bolt
EBRPD	East Bay Regional Parks District
EERI	Earthquake Engineering Research Institute
El Nino	A recurring warming climate pattern across the Pacific Ocean that disrupts global weather patterns and is associated with wetter than normal conditions in the Southwestern United States.
EMS	Emergency Medical Services
FAA	Federal Aviation Administration

FEMA	Federal Emergency Management Administration
GIS	Geographical Information Systems
HARD	Hayward Area Parks & Recreation District
HASPA	Hayward Area Shoreline Planning Agency
HEA	Hayward Executive Airport
HMGP	Hazard Mitigation Grant Program
HUD	Housing & Urban Development
HUSD	Hayward Unified School District
LHMP	Local Hazard Mitigation Plan
MHHW	Mean Higher High Water
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
Plan Set A	A plan set based on a prescriptive standard for strengthening single family homes to better withstand earthquake shaking.
SR-92	A state highway running eat-west from downtown Hayward to Half Moon Bay traversing the San Mateo Bridge.
UCERF3	Unified California Earthquake Rupture Forecast 3
USGS	United States Geological Survey
WPCF	Water pollution control facility
WUI	Wildland-Urban Interface
WWCIP	Wastewater Capital Improvements Plan

APPENDICES

APPENDIX A: PARTICIPATING STAFF

2015 LHMP
Fran David, City Manager
Kelly McAdoo, Assistant City Manager
David Rizk, Director of Development Services
Garrett Contreras, Fire Chief
Diane Urban, Chief of Police
Alex Ameri, Director of Utilities and Environmental Services
Morad Fakhrai, Director of Public Works
Todd Rullman, Director of Maintenance Services
Miriam Lens, City Clerk

Frank Holland, Community and Media Relations Officer
David Korth, Assistant to the City Manager
Micah Hinkle, Economic Development Manager
John Stefanski, Management Analyst
Laurel James, Management Fellow

Stacey Bristow, Deputy Director of Development Services
Sara Buizer, Planning Manager
Fred Cullum, Interim Building Official
Gary Nordahl, Building Inspector
Arlynne Camire, Associate Planner

Eric Vollmer, Deputy Fire Chief
Vince Hobbs, Emergency Management Specialist
Don Nichelson, Public Information Officer/Public Education Officer

Mark Koller, Captain, Hayward Police Department

Ray Busch, Water Pollution Control Facility Manager
Erik Pearson, Environmental Services Manager
Mary Thomas, Management Analyst

Yaw Owusu, Assistant City Engineer
Fred Kelley, Transportation Manager
Douglas McNeeley, Airport Manager

Allen Koscinski, Facilities Manager
Liz Sanchez, Management Analyst

Avinta Madhukansh, Management Analyst

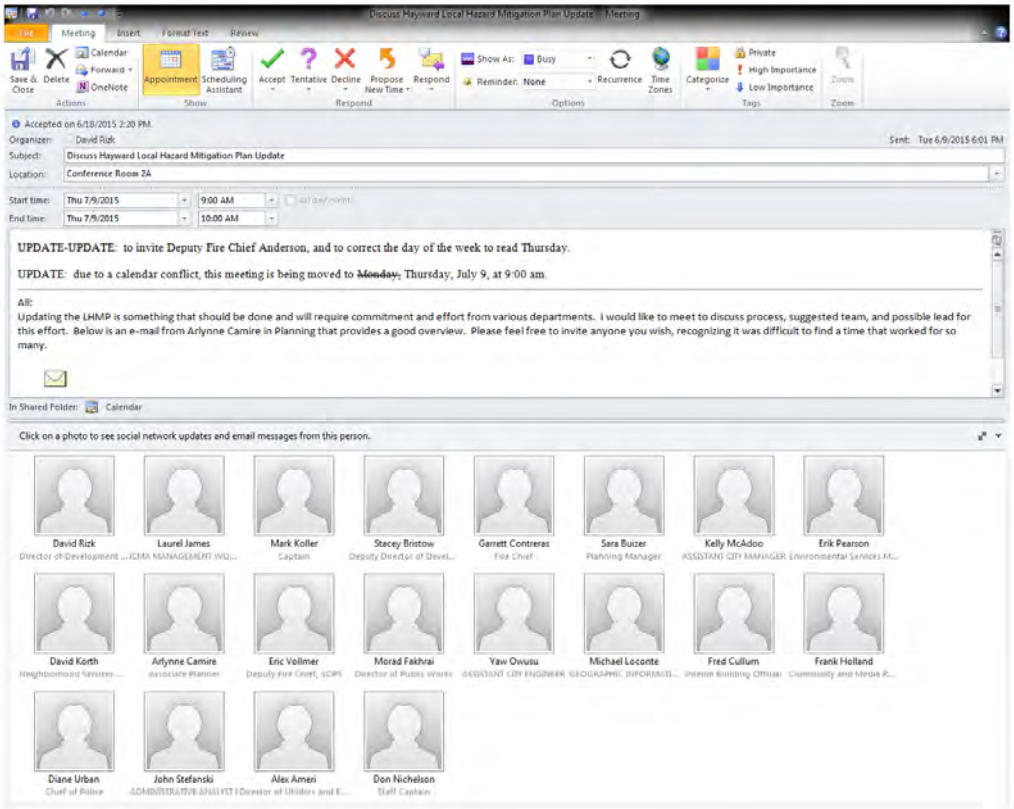
Michael Loconte, GIS Specialist

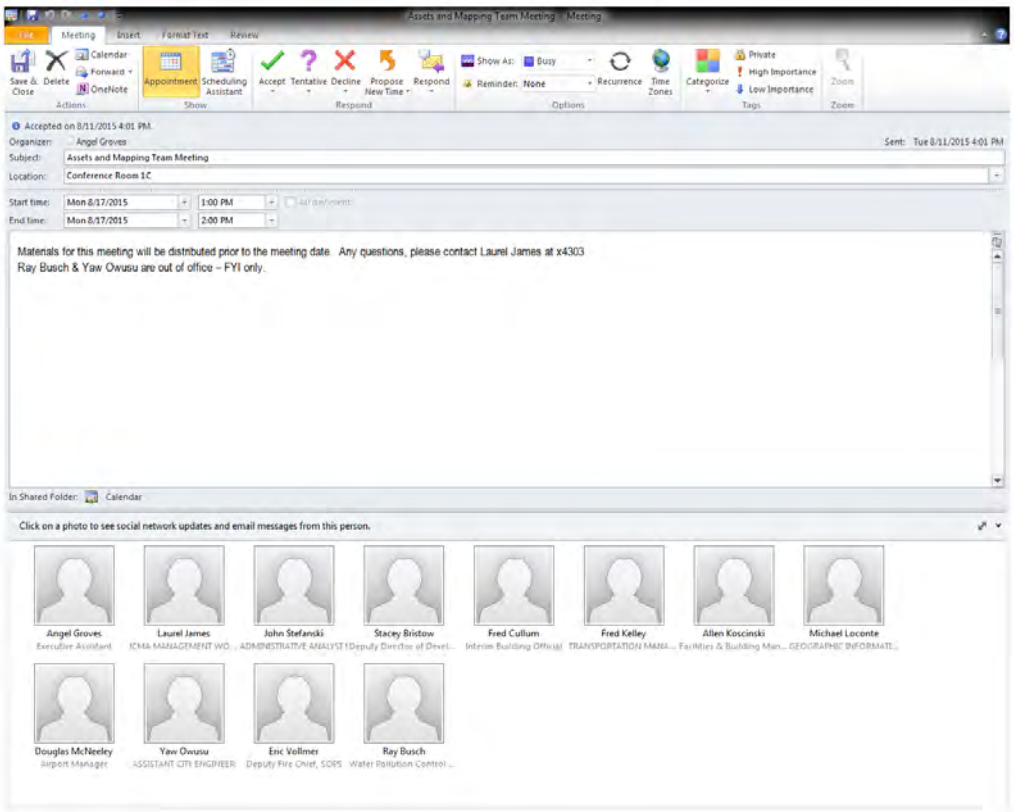
2021 Update

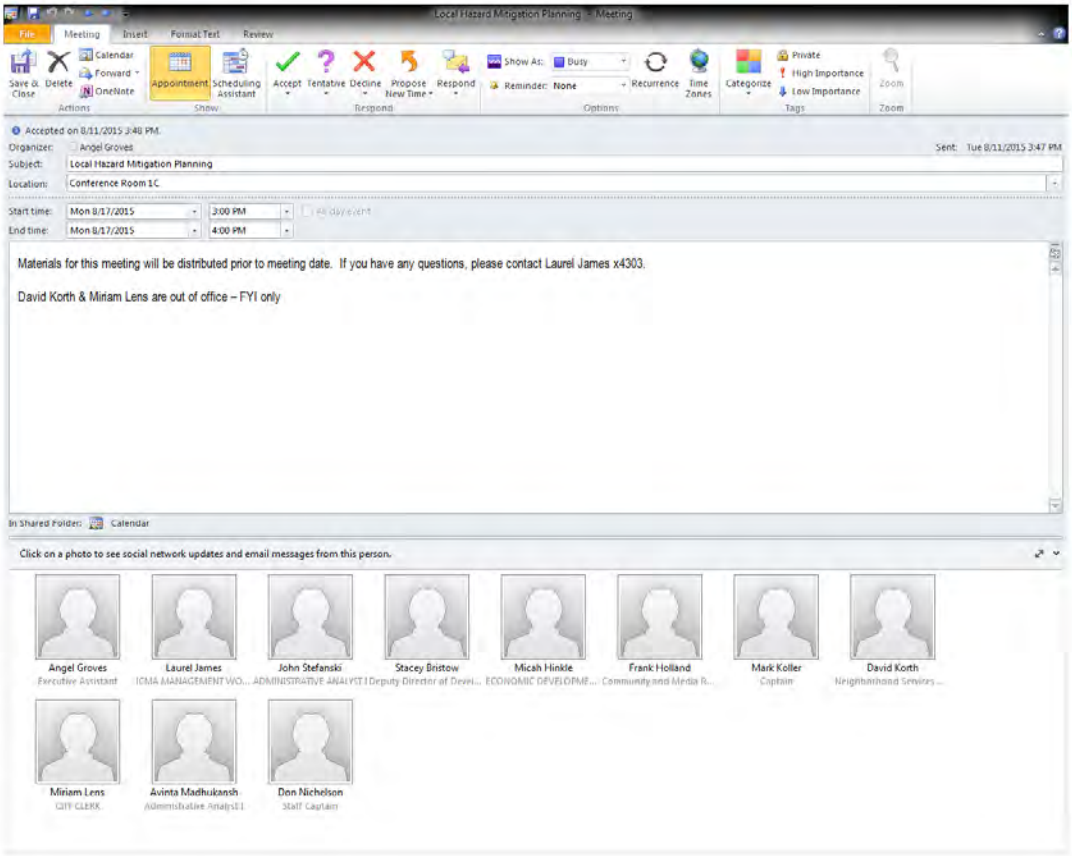
Paul Wheeler, Emergency Services Officer;
Don Nichelson, Hayward Fire Department Public Information Officer;
Eric Vollmer, Deputy Fire Chief;
Mike Hildebrand, Battalion Chief (radio expert);
Erik Pearson, Environmental Services Manager;
Bryan Matthews, Deputy Police Chief;
Monica Davis, Community Services Manager;
Jessica Lobedan, Management Analyst;
Laurel James, Management Analyst;
Omar Noozad, Acting Building Official;
Pamela Syrdlin, Airport Operations Supervisor;
Brianne Elizarrey, City Public Information Officer;
Miles Massone, Fire Marshal;
Hugh Murphy, Hazardous Materials Coordinator;
Taylor Richard, Assistant Planner;
Garrett Contreras, Fire Chief; and
Shanalee Gallagher, Fire Department Project Manager

APPENDIX B: MEETING ROSTERS & TIMELINE

2015 LHMP PLANNING PROCESS



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Reminder: None
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Low Importance
Tags
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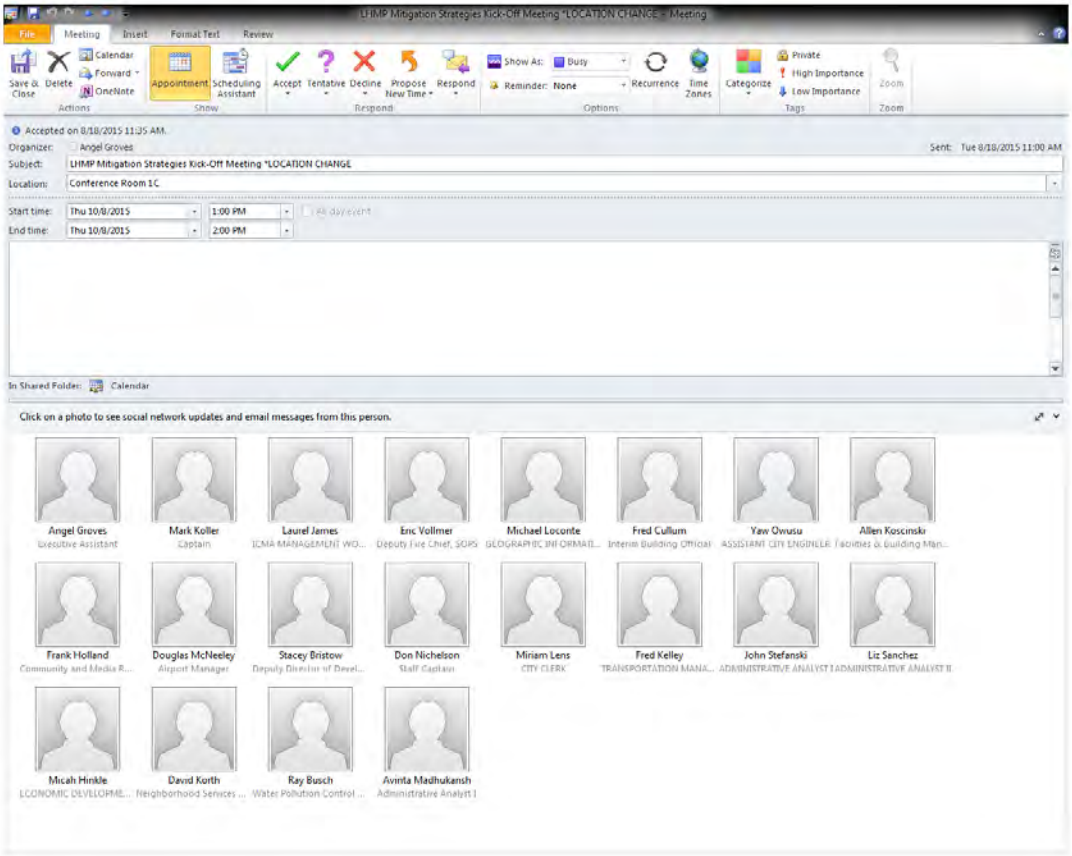
Accepted on 8/11/2015 3:48 PM.
Organizer: Angel Groves
Sent: Tue 8/11/2015 3:47 PM
Subject: Local Hazard Mitigation Planning
Location: Conference Room 1C
Start time: Mon 8/17/2015 3:00 PM
End time: Mon 8/17/2015 4:00 PM
All day event
Materials for this meeting will be distributed prior to meeting date. If you have any questions, please contact Laurel James x4303.
David Korth & Miriam Lens are out of office – FYI only
In Shared Folder: Calendar
Click on a photo to see social network updates and email messages from this person.
Angel Groves
Executive Assistant
Laurel James
ICMA MANAGEMENT VO...
John Stefanski
ADMINISTRATIVE ANALYST I
Stacey Bristow
Deputy Director of Devel...
Micah Hinkle
ECONOMIC DEVELOPME...
Frank Holland
Community and Media R...
Mark Koller
Captain
David Korth
Neighborhood Services ...
Miriam Lens
CITY CLERK
Avinta Madhukansh
Administrative Analyst I
Don Nicholson
Staff Captain


LHMP Mitigation Strategies Kick-Off Meeting *LOCATION CHANGE - Meeting
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Organizer: Angel Groves
Sent: Tue 8/18/2015 11:00 AM
Subject: LHMP Mitigation Strategies Kick-Off Meeting *LOCATION CHANGE
Location: Conference Room 1C
Start time: Thu 10/8/2015 1:00 PM
End time: Thu 10/8/2015 2:00 PM
All day event
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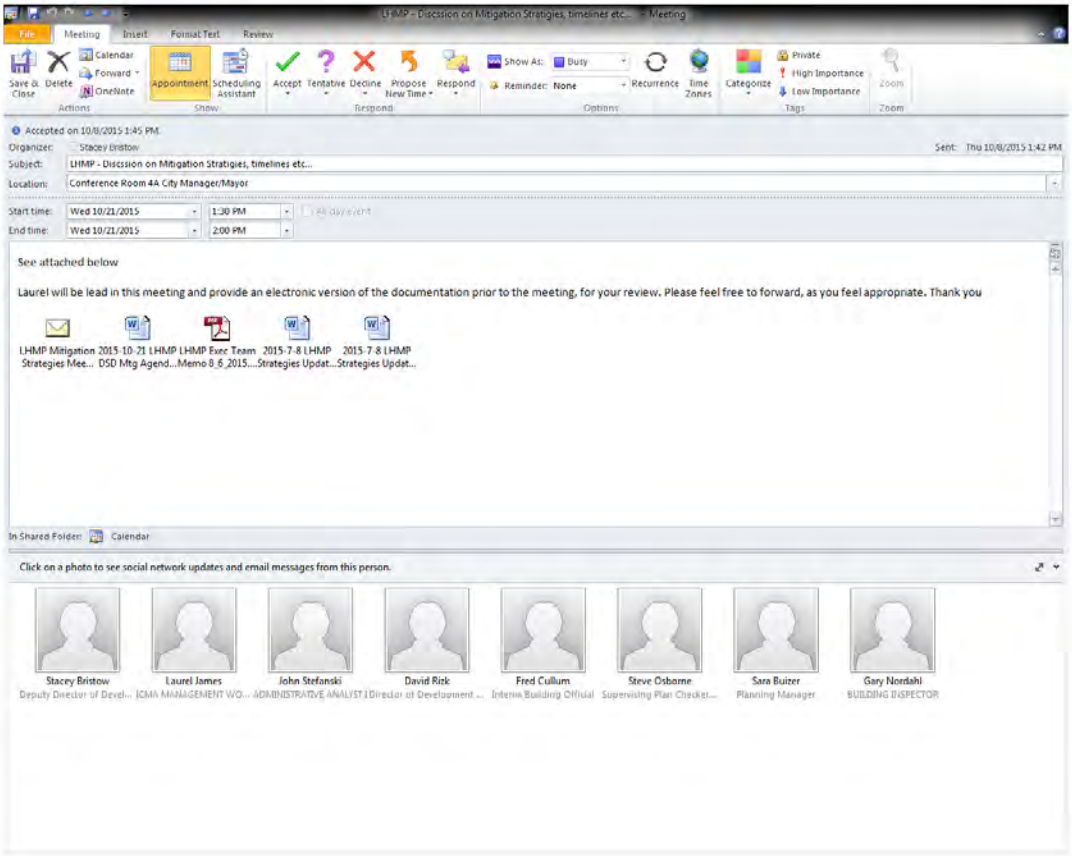
Click on a photo to see social network updates and email messages from this person.
Angel Groves
Executive Assistant
Mark Koller
Captain
Laurel James
ICMA MANAGEMENT WO...
Eric Vollmer
Deputy Fire Chief, SOPS
Michael Loconte
GEOGRAPHIC INFORMATI...
Fred Cullum
Interim Building Official
Yaw Owusu
ASSISTANT CITY ENGINEER
Allen Koscinski
Facilities & Building Man...
Frank Holland
Community and Media R...
Douglas McNeeley
Airport Manager
Stacey Bristow
Deputy Director of Devel...
Don Nicholson
Staff Captain
Miriam Lens
CITY CLERK
Fred Kelley
TRANSPORTATION MANA...
John Stefanski
ADMINISTRATIVE ANALYST I
ADMINISTRATIVE ANALYST II
Micah Hinkle
ECONOMIC DEVELOPME...
David Korth
Neighborhood Services ...
Ray Busch
Water Pollution Control ...
Avinta Madhukansh
Administrative Analyst I


LHMP - Discussion on Mitigation Strategies, timelines etc... - Meeting
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Organizer: Stacey Bristow
Sent: Thu 10/8/2015 1:42 PM
Subject: LHMP - Discussion on Mitigation Strategies, timelines etc...
Location: Conference Room 4A City Manager/Mayor
Start time: Wed 10/21/2015 1:30 PM
End time: Wed 10/21/2015 2:00 PM
All day event
See attached below
Laurel will be lead in this meeting and provide an electronic version of the documentation prior to the meeting, for your review. Please feel free to forward, as you feel appropriate. Thank you
LHMP Mitigation Strategies Mee...
2015-10-21 LHMP DSD Mtg Agend...
LHMP Exec Team Memo 8_6_2015...
2015-7-8 LHMP Strategies Updat...
2015-7-8 LHMP Strategies Updat...
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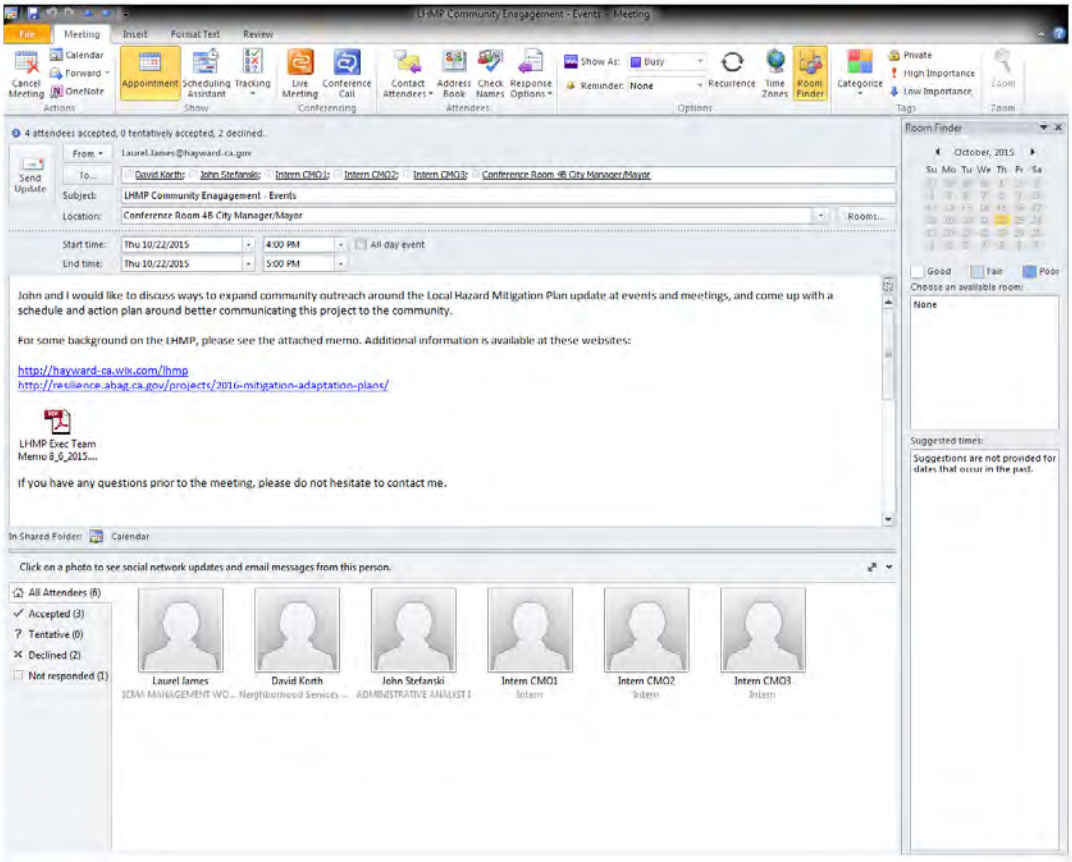
Click on a photo to see social network updates and email messages from this person.
Stacey Bristow
Deputy Director of Devel...
Laurel James
ICMA MANAGEMENT WO...
John Stefanski
ADMINISTRATIVE ANALYST I
David Rizk
Director of Development ...
Fred Cullum
Interim Building Official
Steve Osborne
Supervising Plan Checker...
Sara Buizer
Planning Manager
Gary Nordahl
BUILDING INSPECTOR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Tracking
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Check Names
Response Options
Attendees
Show As: Busy
Reminder: None
Recurrence
Time Zones
Room Finder
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Private
High Importance
Low Importance
Tags
Zoom
4 attendees accepted, 0 tentatively accepted, 2 declined.
Send Update
From
Laurel.James@hayward-ca.gov
To...
David Korth; John Stefanski; Intern CMO1; Intern CMO2; Intern CMO3; Conference Room 4B City Manager/Mayor
Subject:
LHMP Community Engagement - Events
Location:
Conference Room 4B City Manager/Mayor
Rooms...
Start time:
Thu 10/22/2015
4:00 PM
All day event
End time:
Thu 10/22/2015
5:00 PM
John and I would like to discuss ways to expand community outreach around the Local Hazard Mitigation Plan update at events and meetings, and come up with a schedule and action plan around better communicating this project to the community.
For some background on the LHMP, please see the attached memo. Additional information is available at these websites:
http://hayward-ca.wix.com/lhmp
http://resilience.abag.ca.gov/projects/2016-mitigation-adaptation-plans/
LHMP Exec Team Memo 8_6_2015....
If you have any questions prior to the meeting, please do not hesitate to contact me.
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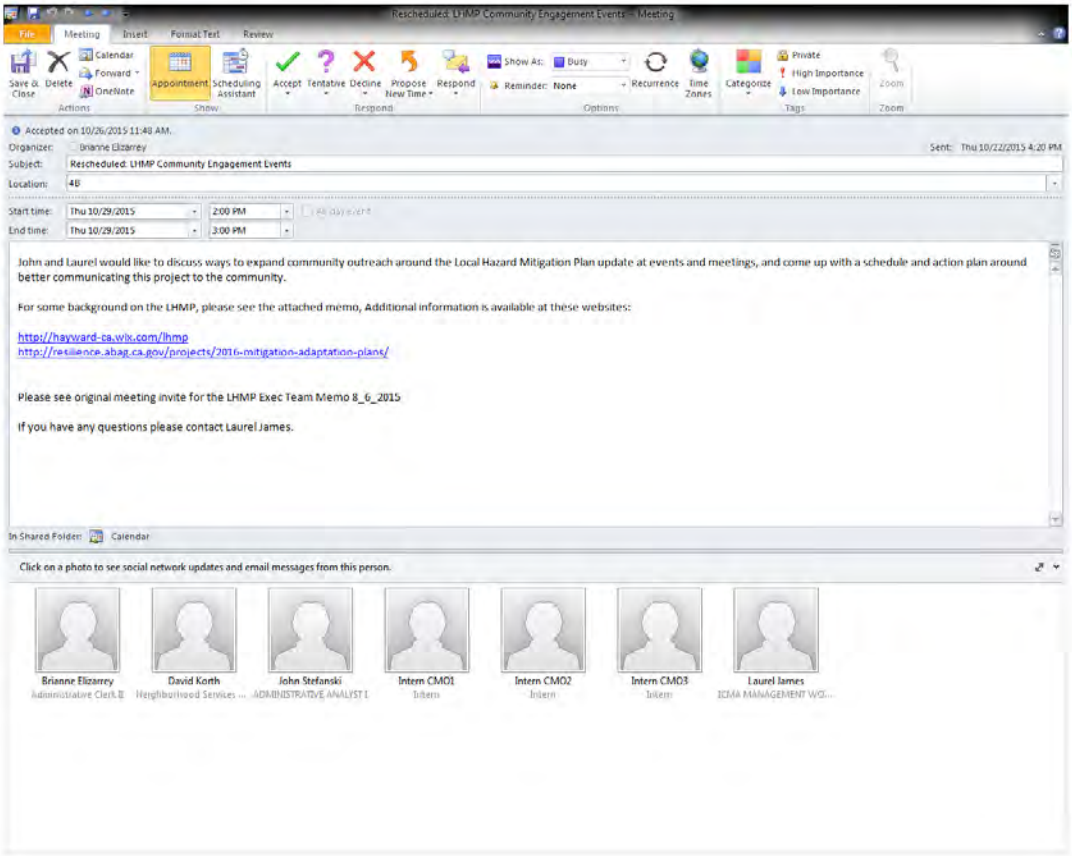
Click on a photo to see social network updates and email messages from this person.
All Attendees (6)
Accepted (3)
Tentative (0)
Declined (2)
Not responded (1)
Laurel James
David Korth
John Stefanski
Intern CMO1
Intern CMO2
Intern CMO3
Room Finder
October, 2015
Su Mo Tu We Th Fr Sa
Good
Fair
Poor
Choose an available room:
None
Suggested times:
Suggestions are not provided for dates that occur in the past.


Rescheduled: LHMP Community Engagement Events - Meeting
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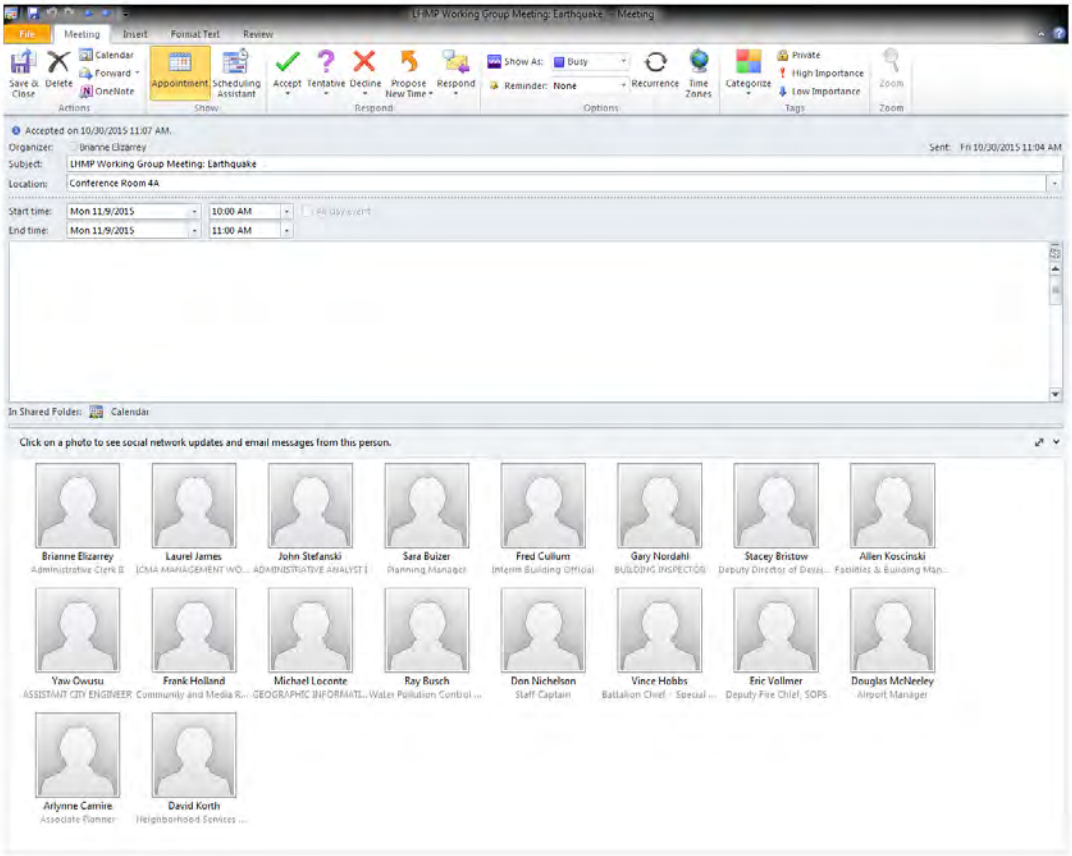
Accepted on 10/26/2015 11:48 AM.
Organizer: Brianne Elizarrey
Sent: Thu 10/22/2015 4:20 PM
Subject: Rescheduled: LHMP Community Engagement Events
Location: 4B
Start time: Thu 10/29/2015 2:00 PM
End time: Thu 10/29/2015 3:00 PM
John and Laurel would like to discuss ways to expand community outreach around the Local Hazard Mitigation Plan update at events and meetings, and come up with a schedule and action plan around better communicating this project to the community.
For some background on the LHMP, please see the attached memo, Additional information is available at these websites:
http://hayward-ca.wix.com/lhmp
http://resilience.abag.ca.gov/projects/2016-mitigation-adaptation-plans/
Please see original meeting invite for the LHMP Exec Team Memo 8_6_2015
If you have any questions please contact Laurel James.
In Shared Folder: Calendar
Click on a photo to see social network updates and email messages from this person.
Brianne Elizarrey
Administrative Clerk II
David Korth
Neighborhood Services ...
John Stefanski
ADMINISTRATIVE ANALYST I
Intern CMO1
Intern
Intern CMO2
Intern
Intern CMO3
Intern
Laurel James
ICMA MANAGEMENT WO...


LHMP Working Group Meeting: Earthquake - Meeting
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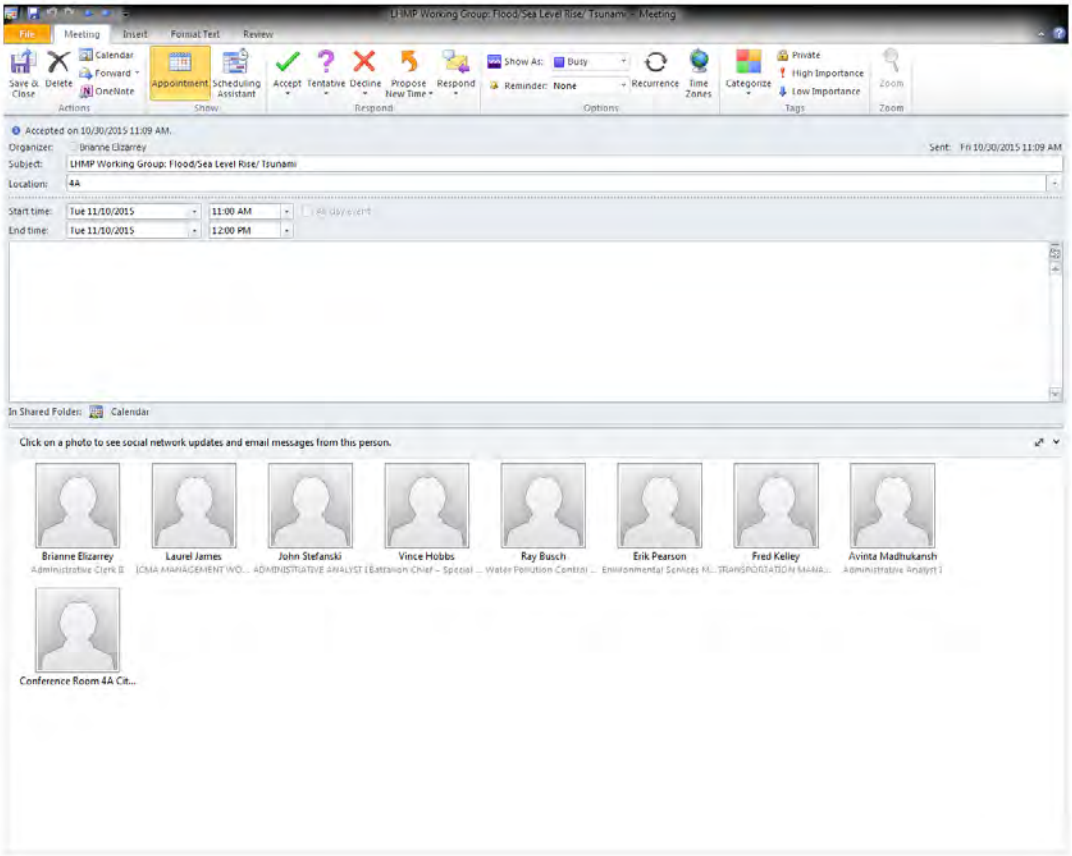
Accepted on 10/30/2015 11:07 AM.
Organizer: Brianne Elizarrey
Sent: Fri 10/30/2015 11:04 AM
Subject: LHMP Working Group Meeting: Earthquake
Location: Conference Room 4A
Start time: Mon 11/9/2015 10:00 AM
End time: Mon 11/9/2015 11:00 AM
All day event
In Shared Folder: Calendar
Click on a photo to see social network updates and email messages from this person.
Brianne Elizarrey
Administrative Clerk II
Laurel James
Sara Buizer
Planning Manager
Fred Cullum
Gary Nordahl
Stacey Bristow
Allen Koscinski
Yaw Owusu
ASSISTANT CITY ENGINEER
Frank Holland
Michael Loconte
Ray Busch
Don Nicholson
Staff Captain
Vince Hobbs
Eric Vollmer
Deputy Fire Chief, SOPS
Douglas McNeeley
Airport Manager
Arlynne Camire
Associate Planner
David Korth


LHMP Working Group: Flood/Sea Level Rise/ Tsunami - Meeting
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Organizer: Brianne Elizarrey
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Subject: LHMP Working Group: Flood/Sea Level Rise/ Tsunami
Location: 4A
Start time: Tue 11/10/2015 11:00 AM
End time: Tue 11/10/2015 12:00 PM
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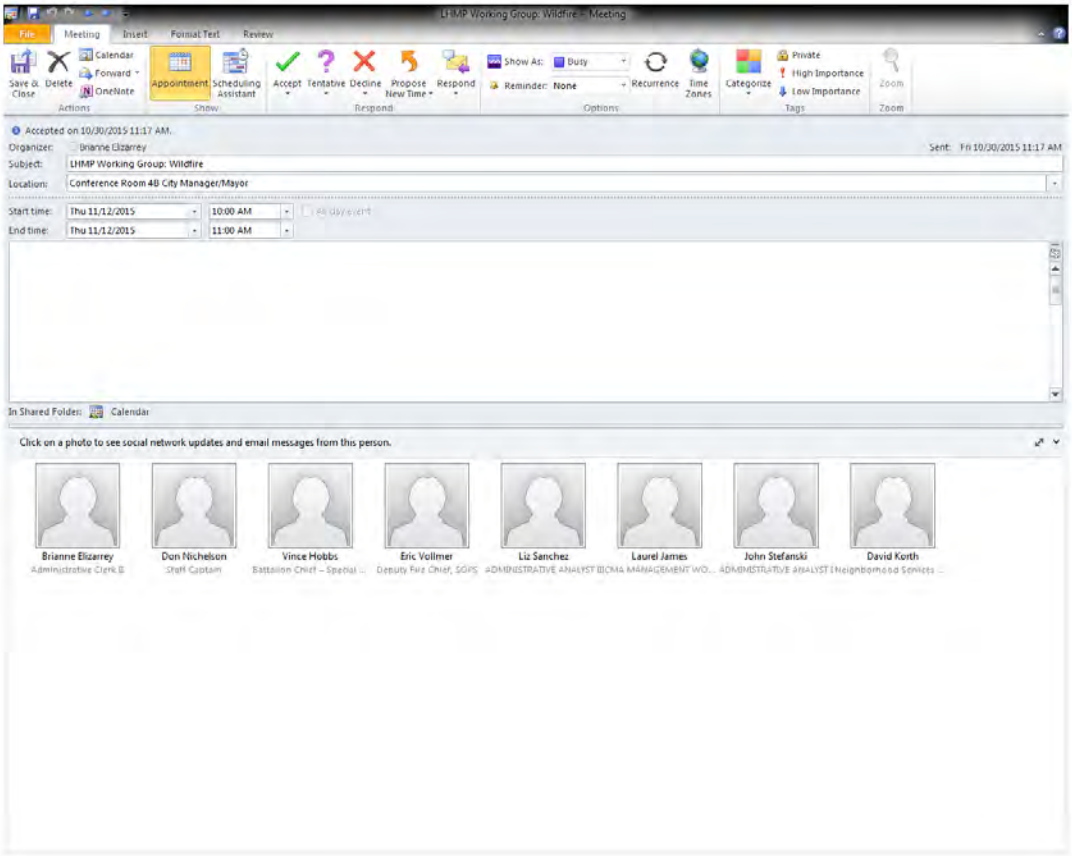
Click on a photo to see social network updates and email messages from this person.
Brianne Elizarrey
Administrative Clerk II
Laurel James
ICMA MANAGEMENT WO...
John Stefanski
ADMINISTRATIVE ANALYST I (Extension Chief – Special ...
Vince Hobbs
Water Pollution Control ...
Ray Busch
Erik Pearson
Environmental Services M...
Fred Kelley
TRANSPORTATION MANA...
Avinta Madhukansh
Administrative Analyst I
Conference Room 4A Cit...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Accepted on 10/30/2015 11:17 AM.
Organizer:
Brianne Elizarrey
Sent: Fri 10/30/2015 11:17 AM
Subject:
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Location:
Conference Room 4B City Manager/Mayor
Start time:
Thu 11/12/2015
10:00 AM
End time:
Thu 11/12/2015
11:00 AM
In Shared Folder:
Calendar
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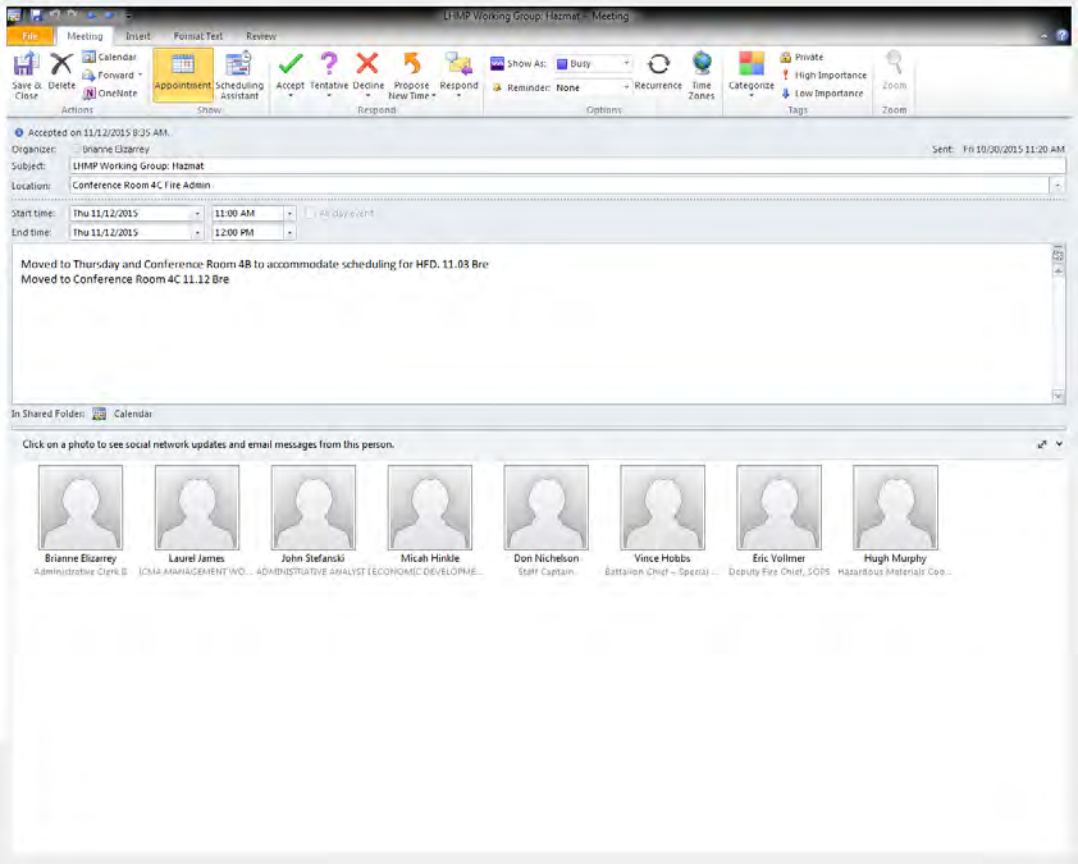
Brianne Elizarrey
Administrative Clerk II
Don Nicholson
Staff Captain
Vince Hobbs
Battalion Chief – Special ...
Eric Vollmer
Deputy Fire Chief, SOFS
Liz Sanchez
ADMINISTRATIVE ANALYST II
Laurel James
ICMA MANAGEMENT WO...
John Stefanski
ADMINISTRATIVE ANALYST I
David Korth
Neighborhood Services ...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Organizer: Brianne Elizarrey
Sent: Fri 10/30/2015 11:20 AM
Subject: LHMP Working Group: Hazmat
Location: Conference Room 4C Fire Admin
Start time: Thu 11/12/2015 11:00 AM
End time: Thu 11/12/2015 12:00 PM
All day event
Moved to Thursday and Conference Room 4B to accommodate scheduling for HFD. 11.03 Bre
Moved to Conference Room 4C 11.12 Bre
In Shared Folder: Calendar
Click on a photo to see social network updates and email messages from this person.
Brianne Elizarrey
Administrative Clerk II
Laurel James
ICMA MANAGEMENT WO...
John Stefanski
ADMINISTRATIVE ANALYST (ECONOMIC DEVELOPME...
Micah Hinkle
Don Nicholson
Staff Captain
Vince Hobbs
Battalion Chief – Special ...
Eric Vollmer
Deputy Fire Chief, SOPS
Hugh Murphy
Hazardous Materials Coo...

LOCAL HAZARD MITIGATION PLANNING

2015 LHMP UPDATE PROCESS
COMMUNITY ENGAGEMENT MEETING 1

8/17/2015 Meeting – 3:00 PM, Conference Room 1C

Objectives

- Understand why we are creating a local hazard mitigation plan and how it is created
- Understand statutory requirements for community engagement, and how community engagement fits into the overall planning process
- Outline a community engagement plan, lay out a timeline and assign tasks
- Get feedback on survey and website

Agenda

1. Why are we creating a hazard mitigation plan?

   Handout: 2015 Local Hazard Mitigation Plan Update Memo

2. What does the process entail?

3. How does community engagement factor in?

4. What needs to be done, and who will do it?

   Handout: LHMP Community Priorities Survey Draft

5. Website Preview

6. Questions

LOCAL HAZARD MITIGATION PLANNING

ASSETS, MAPPING, AND RISK ASSESSMENT MEETING 1

8/17/2015 Meeting – 1:00 PM, Conference Room 1C

Objectives

- Understand why we are creating a local hazard mitigation plan and how it is created
- Understand statutory requirements for community engagement, and how assets, mapping, and risk assessment fit into the overall planning process
- Discuss assets and data sources
- Assign data gathering tasks

Agenda

1. Why are we creating a hazard mitigation plan?

   Handout: 2015 Local Hazard Mitigation Plan Update Memo

2. What does the process entail?

3. How do assets, mapping, and risk assessment factor in?

4. What needs to be done, and who will do it?

   Handout: LHMP Maps & Data List

5. Questions

LOCAL HAZARD MITIGATION PLANNING

MITIGATION STRATEGIES MEETING

10/7/2015 Meeting – 1:00 PM, Conference Room 1C

Objectives

- Understand next steps for LHMP: mitigation strategy identification, selection, and prioritization.
- Decide how to best collaborate on identifying, selecting, and prioritizing mitigation strategies moving forward
- Distribute mitigation strategies materials & answer questions

Agenda

1. What are mitigation strategies, and what do they have to do with the LHMP?
2. What is the process for identifying, selecting and prioritizing mitigation strategies?
3. What is our role in this step of the project?
4. Discussion: What is the best way to collaborate moving forward?
5. Questions & Wrap-up

Handouts

- LHMP Handout
- Mitigation Strategies Update Form*
- Strategy Idea Sources
- Strategy Development and Implementation Worksheet
- Example Strategies
- Strategy Evaluation Worksheet

Action Items

- □ Complete Mitigation Strategies Update Form (paper or electronic) by Wednesday, 10/21
- □ Review & comment on Risk Assessment (will be distributed before Monday, 10/19)
- □ Share ideas for mitigation strategies with Laurel (Laurel.James@ or x4303) or John (John.Stefanski@ or x3904)
- □ Participate in selection and prioritization of mitigation strategies moving forward

LOCAL HAZARD MITIGATION PLANNING

MITIGATION STRATEGIES MEETING
EARTHQUAKE WORKING GROUP

11/9/2015 – 10:00 AM, Conference Room 4A

Objectives

- Review mitigation strategies for earthquakes and related hazards.
- Complete mitigation strategy evaluation worksheets.
- Discuss evaluation results.

Agenda

1. A brief review of the LHMP
2. Mitigation Strategies Development
3. Mitigation Strategies Evaluation
4. Discussion
5. Questions & Wrap-up

Handouts

- Strategy Development Worksheet
- Mitigation Strategies Evaluation Worksheet

Action Items

- □ Complete Mitigation Strategies Update Form (for those who have not)
- □ Review & comment on Risk Assessment (forthcoming)
- □ Participate in selection and prioritization of mitigation strategies moving forward
- □ Review final mitigation strategies selection (forthcoming)

LOCAL HAZARD MITIGATION PLANNING

MITIGATION STRATEGIES MEETING

SEA LEVEL RISE/FLOOD/TSUNAMI WORKING GROUP

11/10/2015 – 11:00 AM, Conference Room 4A

Objectives

- Review mitigation strategies for sea level rise, flood, tsunami and related hazards.
- Complete mitigation strategy evaluation worksheets.
- Discuss evaluation results.

Agenda

1. A brief review of the LHMP
2. Mitigation Strategies Development
3. Mitigation Strategies Evaluation
4. Discussion
5. Questions & Wrap-up

Handouts

- Strategy Development Worksheet
- Mitigation Strategies Evaluation Worksheet

Action Items

- □ Complete Mitigation Strategies Update Form (for those who have not)
- □ Review & comment on Risk Assessment (forthcoming)
- □ Participate in selection and prioritization of mitigation strategies moving forward
- □ Review final mitigation strategies selection (forthcoming)

LOCAL HAZARD MITIGATION PLANNING

MITIGATION STRATEGIES MEETING

WILDLAND-URBAN INTERFACE FIRE WORKING GROUP

11/12/2015 – 10:00 AM, Conference Room 4b

Objectives

- Review mitigation strategies for fire and related hazards.
- Complete mitigation strategy evaluation worksheets.
- Discuss evaluation results.

Agenda

1. A brief review of the LHMP
2. Mitigation Strategies Development
3. Mitigation Strategies Evaluation
4. Discussion
5. Questions & Wrap-up

Handouts

- Strategy Development Worksheet
- Mitigation Strategies Evaluation Worksheet

Action Items

- □ Complete Mitigation Strategies Update Form (for those who have not)
- □ Review & comment on Risk Assessment (forthcoming)
- □ Participate in selection and prioritization of mitigation strategies moving forward
- □ Review final mitigation strategies selection (forthcoming)

LOCAL HAZARD MITIGATION PLANNING

MITIGATION STRATEGIES MEETING

HAZARDOUS MATERIALS WORKING GROUP

11/12/2015 – 11:00 AM, Conference Room 4C

Objectives

- Review mitigation strategies for hazardous materials.
- Complete mitigation strategy evaluation worksheets.
- Discuss evaluation results.

Agenda

1. A brief review of the LHMP
2. Mitigation Strategies Development
3. Mitigation Strategies Evaluation
4. Discussion
5. Questions & Wrap-up

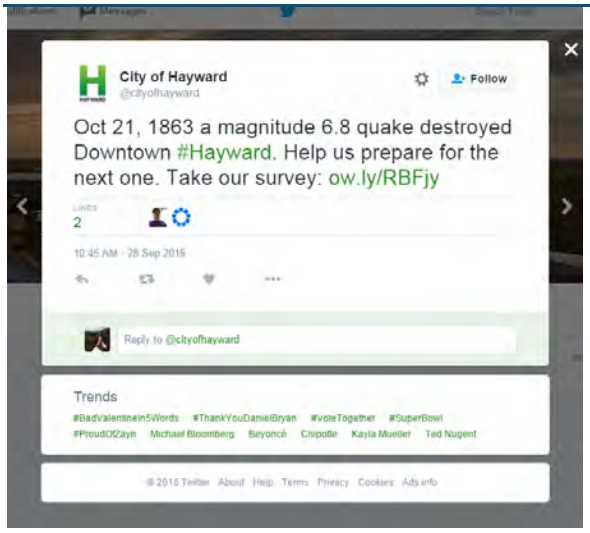
Handouts

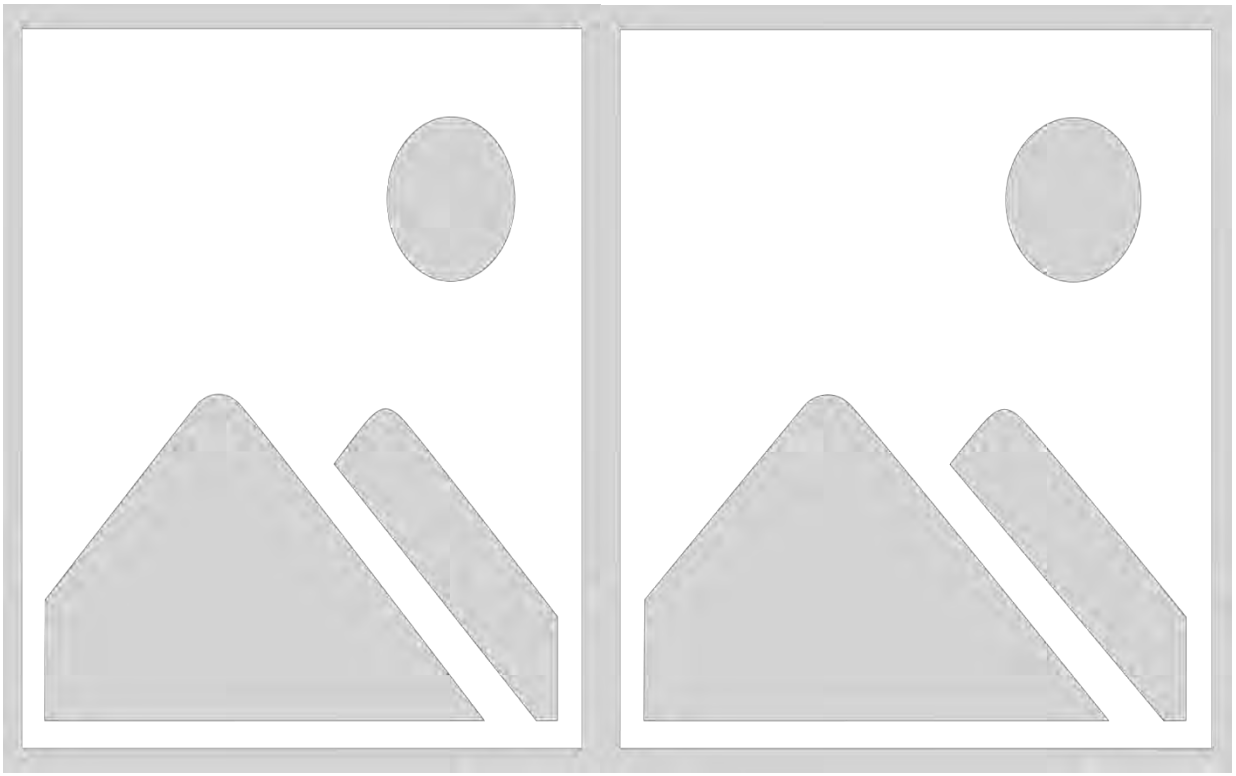
- Strategy Development Worksheet
- Mitigation Strategies Evaluation Worksheet

Action Items

- □ Complete Mitigation Strategies Update Form (for those who have not)
- □ Review & comment on Risk Assessment (forthcoming)
- □ Participate in selection and prioritization of mitigation strategies moving forward
- □ Review final mitigation strategies selection (forthcoming)

APPENDIX D: SOCIAL MEDIA POSTS & EMAIL REPORT





Hayward, CA - Bulletin Detail Report

govDELIVERY

Subject:	Is Hayward Prepared For The Next Natural Disaster?
Sent:	09/30/2015 11:15 AM PDT
Sent By:	Brianne.Elizarrey@hayward-ca.gov
Sent To:	26 Topics

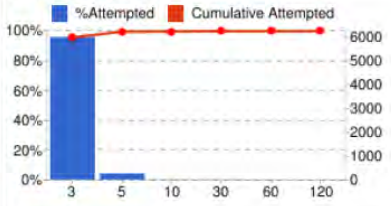
6,259 Recipients

✓ Email
✗ SMS
✗ Facebook
✗ Twitter
✓ RSS

99% Delivered

0% Pending
1% Bounced
25% Open Rate
5% Click Rate

Email Delivery Stats



Minutes	Cumulative Attempted
3	95%
5	99%
10	99%
30	100%
60	100%
120	100%

Delivery Metrics - Details

6,259	Total Sent
6,170 (99%)	Delivered
0 (0%)	Pending
89 (1%)	Bounced
3 (0%)	Unsubscribed

Bulletin Analytics

2,604	Total Opens
1536 (25%)	Unique Opens
334	Total Clicks
290 (5%)	Unique Clicks
10	# of Links

Participate in the City of Hayward's Hazard Mitigation Survey!

Administrative Clerk Brianne Elizarrey from City of Hayward

Rolling Hills? Check. Gorgeous Coastline? Check. The Constant Threat of a Catastrophic Earthquake? Yep, we have got that too.

#Hayward is an amazing, unique place to live but we are vulnerable to earthquakes, floods, sea level rise, and wildfires.

We know that the big one's coming. When it does we want to be ready and we need your help!

Take our Local Hazard Mitigation Plan Survey and tell us what matters most to you so we can be prepared to protect it! http://hayward-ca.wix.com/lhmp

Shared with City of Hayward in General

Nuestra meta: evaluar el peligro de desastres naturales y crear una politica para reducirlo. Diganos lo que es mas importante para usted: 9 Oct

Administrative Clerk Brianne Elizarrey from City of Hayward

COLINAS SUAVES. COSTA HERMOSA. ESPACIOS ABIERTOS.
LA AMENAZA CONSTANTE DE UN TERREMOTO CATASTRÓFICO.
¿ESTAMOS PREPARADOS?
La ciudad de Hayward se preocupa profundamente por la seguridad de nuestros residentes y sus familias. Es por eso que creamos una plan de mitigación de los riesgos locales.
Queremos su opinión sobre cómo prepararnos en caso de un desastre natural.
Tomé nuestra encuesta y diganos como podamos proteger lo que es más importante para usted.

PARA TOMAR LA ENCUESTA: SURVEYMONKEY.COM/r/desastres
MÁS INFORMACION: HAYWARD-CA.WIX.COM/LHMP

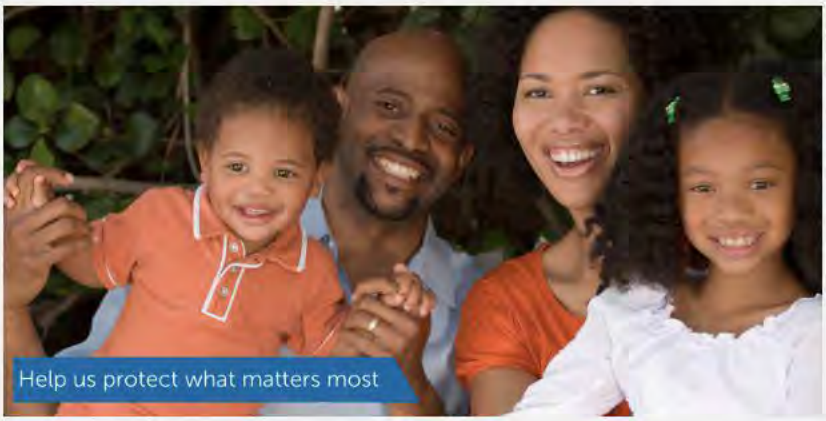
Shared with City of Hayward in General

REPLY | 28

FIRE DEPARTMENT, PUBLIC SAFETY

TAKE THE SURVEY TO HELP REDUCE HAYWARD'S EXPOSURE TO NATURAL DISASTERS

October 4, 2021



The Hayward Fire Department is requesting the help of Hayward residents as it develops and refines strategies for reducing community risk of loss of life and property damage due to natural disasters.

The information gathered will contribute to an update of the City of Hayward's Local Hazard Mitigation Plan, which received its last revision in 2016. Residents can help by completing the planning survey, which is available in both English and Spanish.

The federal Disaster Mitigation Act of 2000 calls for localities to produce and adopt Local Hazard Mitigation Plans (LHMPs) to be eligible to receive planning and preparation grants and fully funded federal assistance following a natural disaster.

The purpose of the plans is to guide hazard mitigation activities. This year, as part of the update, the City of Hayward is renaming the document the Hayward Resiliency as its scope is broadened to take into account planning and activities that go beyond preparing for natural disasters.

A copy of the 2016 Local Hazard Mitigation Plan is available here on the Hayward Fire Department website.


4:29
HELP US PROTECT WHAT MATTERS MOST
Take the survey to help reduce Hayward's exposure to natural disasters
City of Hayward - Government
Take the survey to help reduce Hayward's exposure to natural disasters
@haywardfirenews is requesting the help of Hayward residents as it develops and refines strategies for reducing community risk of loss of life and property damage due to natural disasters.
The information gathered will contribute to an update of the City of Hayward's Local Hazard Mitigation Plan, which received its last revision in 2016. Residents can help by completing the planning survey, which is available in both English and Spanish here:https://www.surveymonkey.com/r/Resiliency-Plan-2021
Timeline photos · Oct 7, 2021
facebook.com


4:33
Instagram
Log in
Open app
HELP US PROTECT WHAT MATTERS MOST
Take the survey to help reduce Hayward's exposure to natural disasters
2 likes
cityofhayward Take the survey to help reduce Hayward's exposure to natural disasters
@haywardfiredept is requesting the help of Hayward residents as it develops and refines strategies for reducing community risk of loss of life and property damage due to natural disasters.
The information gathered will contribute to an update of the City of Hayward's Local Hazard Mitigation Plan, which received its last revision in 2016. Residents can help by completing the planning survey, which is available in both English and Spanish through the link in our bio.
There's more to see from cityofhayward
Open app
AA
instagram.com


4:31
Safari
Tweet
City of Hayward
@cityofhayward
@HaywardFireNews is requesting the help of Hayward residents as it develops and refines strategies for reducing community risk of loss of life and property damage due to natural disasters.
Residents can complete the planning survey in English or Spanish: surveymonkey.com/r/Resiliency-P...
HELP US PROTECT WHAT MATTERS MOST
ALT
8:08 AM · 10/7/21
Tweet your reply

Outreach Stats for 20201 Update

Campaign		Date Sent	Link	Recipients	Open Rate	Clicks (for survey story only)
Email:	The Stack | October 2021	10/12/2021	https://mailchi.mp/hayward-ca.gov/the-stack-october2021	65,591	16.70%	105

	Posts	Impressions	Engagement Rate	Engagements
Total Across All Accounts:	71	15,875	1%	146

City of Hayward Accounts

Date	Network	Profile	Link	Impressions	Engagement	Engagements
10/7/2021 8:08	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1446130230737862660	40	0%	0
10/7/2021 8:18	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1446132717322596370	28	3.57%	1
10/7/2021 10:15	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165572468540463/?type=3	193	0.52%	1
10/7/2021 10:25	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165572494545463/?type=3	174	0%	0
10/8/2021 7:57	Instagram	cityofhayward	https://www.instagram.com/p/CUxZR8Dt4oK/	332	1.20%	4
10/8/2021 8:07	Instagram	cityofhayward	https://www.instagram.com/p/CUxabUaszVC/	310	1.61%	5
10/9/2021 16:36	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1446982817519386631	59	0%	0
10/9/2021 16:46	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1446985334743576577	76	1.32%	1
10/12/2021 12:54	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165586640330463/?type=3	184	1.63%	3
10/12/2021 13:04	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165586673285463/?type=3	262	0.38%	1
10/12/2021 16:47	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1448072752573857794	46	0%	0
10/12/2021 16:57	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1448075266656546819	34	0%	0
10/15/2021 7:57	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1449026536582025219	35	2.86%	1
10/15/2021 8:07	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1449029055374925830	54	3.70%	2
10/16/2021 0:06	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165595626415463/?type=3	412	0.97%	4
10/16/2021 11:14	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1449438500781166603	65	0%	0

10/16/2021	11:24	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1449441017091043339	58	0%	0
10/16/2021	11:56	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165596888450463/?type=3	317	3.15%	10
10/18/2021	17:01	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1450250605172232195	56	0%	0
10/18/2021	17:10	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1450252867315642369	64	1.56%	1
10/21/2021	8:09	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1451203889118814213	41	9.76%	4
10/21/2021	8:19	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1451206401452355585	32	0%	0
10/21/2021	15:39	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165610851820463/?type=3	274	1.09%	3
10/21/2021	15:49	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165610875740463/?type=3	237	3.38%	8
10/23/2021	17:04	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1452063292994818052	46	2.17%	1
10/23/2021	17:14	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1452065811552669698	50	0%	0
10/24/2021	9:05	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1452305143836315658	58	0%	0
10/24/2021	9:15	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1452307662880837634	56	1.79%	1
10/26/2021	17:01	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1453149703470727171	49	0%	0
10/26/2021	17:11	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1453152222066397185	61	0%	0
10/27/2021	9:19	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1453395824826896387	40	2.50%	1
10/27/2021	9:29	Twitter	@cityofhayward	https://twitter.com/cityofhayward/status/1453398342071984137	36	0%	0
10/27/2021	11:00	Instagram	cityofhayward	https://www.instagram.com/p/CVipZfyMSxp/	355	1.97%	7
10/27/2021	11:10	Instagram	cityofhayward	https://www.instagram.com/p/CViqfGUF-uV/	340	2.06%	7
10/27/2021	11:32	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165630661675463/?type=3	197	1.52%	3
10/27/2021	11:42	Facebook	City of Hayward - Government	https://www.facebook.com/cityofhayward/photos/a.10150168152755463/10165630701865463/?type=3	313	1.92%	6
10/6/2021	0:00	Nextdoor	City of Hayward - Government		4329	1.91%	2

			City Total	9313	1%	77

HFD Accounts

Date	Network	Profile	Link	Impressions	Engagement	Engagements
10/7/2021 7:44	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1446124177790959627	224	2.68%	6
10/7/2021 7:54	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1446126693291200513	188	0%	0
10/7/2021 7:59	Instagram	haywardfiredept	https://www.instagram.com/p/CUu0t04syt7/	152	3.95%	6
10/7/2021 8:09	Instagram	haywardfiredept	https://www.instagram.com/p/CUu13HztyYn/	147	2.72%	4
10/7/2021 10:58	Facebook	Hayward Fire News	https://www.facebook.com/haywardfirenews/photos/a.771045849602930/6352599868114139/?type=3	109	0%	0
10/7/2021 11:08	Facebook	Hayward Fire News	https://www.facebook.com/haywardfirenews/photos/a.771045849602930/6352640034776789/?type=3	119	0.84%	1
10/8/2021 16:47	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1446623202868924422	182	0%	0
10/8/2021 16:57	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1446625714086760451	267	4.12%	11
10/10/2021 8:35	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1447224158664990724	265	1.13%	3
10/10/2021 8:45	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1447226680041410567	215	1.40%	3
10/13/2021 11:25	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1448354110114258950	208	0.96%	2
10/13/2021 11:35	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1448356632853876740	185	0%	0
10/13/2021 12:26	Facebook	Hayward Fire News	https://www.facebook.com/haywardfirenews/photos/a.771045849602930/6386019731438819/?type=3	158	0.63%	1
10/13/2021 12:36	Facebook	Hayward Fire News	https://www.facebook.com/haywardfirenews/photos/a.771045849602930/6386057554768370/?type=3	531	0.94%	5
10/15/2021 17:15	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1449166969429708805	211	0.47%	1
10/15/2021 17:25	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1449169476600143873	279	1.43%	4
10/18/2021 9:46	Facebook	Hayward Fire News	https://www.facebook.com/haywardfirenews/photos/a.771045849602930/6412051502168975/?type=3	80	0%	0
10/18/2021 9:56	Facebook	Hayward Fire News	https://www.facebook.com/haywardfirenews/photos/a.771045849602930/6412090962165029/?type=3	126	0%	0
10/19/2021 7:42	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1450472311719698438	188	0.53%	1

10/19/2021	7:52	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1450474830264942599	151	0%	0
10/22/2021	17:13	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1451703177288503297	243	0%	0
10/22/2021	17:23	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1451705687600414721	346	1.45%	5
10/23/2021	11:15	Facebook	Hayward Fire News	https://www.facebook.com/686939608013555/photos/a.771045849602930/6438836476157144/?type=3	122	0%	0
10/23/2021	11:25	Facebook	Hayward Fire News	https://www.facebook.com/686939608013555/photos/a.771045849602930/6438871326153659/?type=3	87	0%	0
10/24/2021	9:05	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1452305144826191872	287	0.70%	2
10/24/2021	9:15	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1452307661781929985	243	0%	0
10/26/2021	16:50	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1453146941433552902	188	0.53%	1
10/26/2021	17:00	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1453149480870633472	213	1.41%	3
10/27/2021	10:57	Instagram	haywardfiredept	https://www.instagram.com/p/CVio_JZMHsy/	130	3.85%	5
10/27/2021	11:08	Instagram	haywardfiredept	https://www.instagram.com/p/CViqPtSMZk1/	104	1.92%	2
10/27/2021	11:25	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1453427539360296960	226	0.88%	2
10/27/2021	11:35	Twitter	@HaywardFireNews	https://twitter.com/HaywardFireNews/status/1453430057104547844	205	0%	0
10/27/2021	12:07	Facebook	Hayward Fire News	https://www.facebook.com/686939608013555/photos/a.771045849602930/6460226417351483/?type=3	108	0%	0
10/27/2021	12:17	Facebook	Hayward Fire News	https://www.facebook.com/686939608013555/photos/a.771045849602930/6460267207347404/?type=3	75	1.33%	1
				Fire Total	Total:	6562	1.00%

APPENDIX E: SURVEY

2015 SURVEY

Page 1 - Disaster Preparedness

1. How concerned are you by the possibility of your neighborhood being impacted by a natural disaster? (Likert scale; not at all concerned to very concerned)

2. Have you taken any action to prepare your home, your family, or yourself for the effects of a natural disaster? (For example: retrofitting your home, assembling an emergency kit, or taking a CPR class) (Y/N)

3. What have you and your family done to prepare for a natural disaster? (check boxes w/option)

    - Created an emergency plan
    - Practiced duck, cover, and hold
    - Stored 72 hours' worth of water
    - Have emergency food supply to last 72 hours
    - Picked an out-of-state emergency contact
    - Made copies of important documents
    - Purchased a First Aid kit
    - Secured household hazards (strapped water heater, bolted bookshelves, affixed objects and picture frames with Museum Wax)
    - Joined a Community Emergency Response Team (CERT)
    - Other:

4. How prepared do you feel for a natural disaster? (Likert scale w/ comment; not at all prepared to very prepared)

5. Where do you get information about how to protect your family, your home, and yourself from natural disasters? (Check boxes, option to select multiple)

    - News media
    - Government agency
    - Insurance agent or company
    - Utility company
    - University or research institution
    - American Red Cross
    - Church/religious organization
    - Other non-profits,
    - Other:

Disaster Preparedness Priorities

6. Please rank the list of hazards below in order of highest concern to you. For example, put “earthquake” at #1 if you are most concerned about an earthquake happening in Hayward. (Ranked list)

    - Earthquake
    - Flood
    - Landslide
    - Wildfire
    - Drought
    - Severe Weather/Winter Storms
    - Hazardous Materials Release
    - Tsunami
    - Other:

7. There are a number of strategies our community can use to decrease the damage caused by natural disasters. Most of these strategies fit in to the categories described below. Please rank them in order of your preference, where #1 is the one you prefer the most, and #6 is the one you prefer the least. (Ranked list)

    - **Prevention:** regulate what kinds of buildings are built and where to limit the damage caused by a natural disaster. Example: requiring new buildings along the fault to have earthquake safe construction.

    - **Property Protection:** modify existing buildings to protect them from a disaster or remove them from a hazard area. Example: earthquake retrofits.

    - **Natural Resource Protection:** lower the risk of a natural disaster by protecting open space and natural habitats. Example: planting along the hillside to prevent landslide.

    - **Structural Projects:** lessen the impact of the disaster by interrupting the natural progression of the disaster. Example: building retaining walls to prevent landslide.

    - **Emergency Services:** protect people and property immediately after a disaster happens. Example: training city employees and residents to respond to emergencies.

- **Public Education & Awareness:** inform residents and community members about disasters and what they can do to protect their families, their homes, and themselves. Example: providing preparedness training for residents and businesses.

8. The City of Hayward is limited in the number and size of natural disaster prevention projects we can complete in the next five years. Please rank the types of projects below, with what you think is most important at #1, and what you think is least important at #3. (Ranked list)

    - Projects that impact the largest number of people, even if they only reduce their disaster risk by a little bit
    - Projects that impact the people most likely to experience the effects of a disaster
    - Projects that impact the people most likely to have difficulty recovering from a disaster
    - Other:

9. Is there anything else you think the City of Hayward should consider when deciding how to prepare for natural disasters? (Comment field)

Page 2 - Soft Story Buildings

Soft story buildings contain apartments built over large, open areas like parking garages or retail space. In the event of an earthquake, these buildings are expected to cause the largest loss of life. Rough estimates place the number of soft story buildings in Hayward at approximately 900. Retrofitting these buildings will help reduce the number of deaths caused by an earthquake.

10. Based on the description above, do you think you may live or work in a soft story building? (Y/N/IDK)

11. Oakland, San Francisco, Berkeley, and Alameda have all required owners of confirmed soft story structures to reinforce their buildings. Do you think the City of Hayward should consider a similar requirement? (Y/N)

Page 3 - Floods

12. Is your home on a FEMA-designated floodplain? (Y/N/IDK)

13. Do you have flood insurance? (Y/N/IDK)

14. If you do not have flood insurance, why not? (Radio buttons)

    - I am not located in floodplain
    - I am located in a floodplain but insurance is not required

- It's not necessary, it never floods
- It's not necessary, my home is elevated
- I have other protection
- It's too expensive
- Other

Page 4 - About You

15. Have you or someone in your household directly experienced a natural disaster (such as earthquake, wildfire, flood, etc.) in Hayward in the past five years? (Y/N)

16. If yes, what kind? (Text field)

17. What is your relationship to Hayward? (Check boxes)

- I work in Hayward
- I go to school in Hayward
- I live in Hayward
- I own property or a business in Hayward
- None of these

18. Where do you live in Hayward? (Check boxes)

- I do not live in Hayward
- West of I-880
- East of I-880
- North of Jackson
- South of Jackson

19. What kind of home do you live in? (Radio buttons)

- Apartment
- Condo
- House
- Duplex
- Mobile home
- Group home (including retirement home, nursing facility, etc.)
- Other:

20. How old are you? (Radio buttons)

- Under 18

- 19-24
- 25-34
- 35-49
- 50-64
- 65-79
- Over 80

21. What ethnic group do you consider yourself a part of or feel closest to? (Radio buttons)

- African-American/Black
- American-Indian/Alaskan Native
- Asian-American
- Caucasian/White
- Latin@/Hispanic
- Native Hawaiian/Pacific Islander
- Two or more races
- Other

22. What is the last grade level you completed in school? (Radio buttons)

- Elementary school
- Middle school
- Some high school
- High school graduate or equivalent
- Some college
- Technical/Vocational school or Associate's degree
- Bachelor's Degree
- Graduate or professional degree (including DDS, JD, LLM, MA/MA, MBA, MD, PhD)

2021 SURVEY

The same survey questions were utilized in the 2021 update survey and sent to the same City mailing list to determine how answers and community priorities changed over time.

2021 SURVEY RESULTS

The same 2015 survey questions were utilized in the 2021. From October 7 to October 27, 2021, the survey was posted a total of 71 times across City of Hayward and Hayward Fire Department social media accounts (Twitter, Instagram, and Facebook) and received approximately 15,800 impressions.

There were 681 responses to the English language survey and 19 responses to the Spanish language surveys. These well exceeded the 2015 responses, which totaled 279. Response data combined from both Spanish and English surveys is provided in the tables below.

Table D-1. 2021 Public Survey Results Question 1

How concerned are you by the possibility of your neighborhood being impacted by a natural disaster?			
Response 1	Response 2	Response 3	Response 4
Not at all concerned	**Moderately concerned**	**Very concerned**	**Other/No answer**
11	229	157	304
Percentage of Replies			
2%	33%	22%	43%
Approximate Change from 2015			
+2%	-4%	-28%	+23%

Table D-1. 2021 Public Survey Results Question 2

Have you taken any action to prepare your home, your family, or yourself for the effects of a natural disaster? (For example: retrofitting your home, assembling an emergency kit, or taking a CPR class)		
Response 1	Response 2	Response 3
Yes	**No**	**Other/No answer**
369	151	181
Percentage of Replies		
53%	22%	26%
Approximate Change from 2015		
-17%	-8%	Not available

Table D-1. 2021 Public Survey Results Question 3 part 1

What have you and your family done to prepare for a natural disaster?					
Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
Created an emergency plan	**Practiced duck, cover, and hold**	**Stored 72 hours' worth of water**	**Have an emergency food supply to last 72 hours**	**Picked an out-of-state emergency contact**	**Made copies of important documents**
257	158	391	444	196	199
Percentage of Replies					
37%	23%	56%	63%	28%	28%
Approximate Change from 2015					
-4%	-9%	-6%	+2%	-8%	+1%

Table D-1. 2021 Public Survey Results Question 3 part 2

What have you and your family done to prepare for a natural disaster?			
Response 7	Response 8	Response 9	Response 10
Purchased a First Aid kit	**Secured household hazards (bolted bookshelves, strapped water heater)**	**Joined a Community Emergency Response Team (CERT)**	**Other (please specify)**
433	325	43	Earthquake retrofits, go bags, taken CPR course, stored medication and pet food, filled vehicle gas tanks, emergency kit preparation, creation of defensible space around home, fire extinguisher installation, gas main earthquake shutoffs, neighborhood disaster planning, generator backup power, home hardening against wildfire
Percentage of Replies			
62%	46%	6%	Not applicable
Approximate Change from 2015			
+6%	-4%	-5%	Not applicable

Table D-1. 2021 Public Survey Results Question 5

How prepared do you feel for a natural disaster?		
Response 1	Response 2	Response 3
- Not at all prepared	**- Moderately prepared**	**Very prepared**
119	349	29
Percentage of Replies		
17%	50%	4%
Approximate Change from 2015		
-3%	+8%	+3%

Table D-1. 2021 Public Survey Results Question 6

Where do you get information about how to protect your family, your home, and yourself from natural disasters?					
Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
News media	**Government agency**	**Insurance company or agent**	**Utility company**	**University or research institution**	**American Red Cross**
476	319	123	261	50	123
Percentage of Replies					
68%	46%	18%	37%	7%	18%
Approximate Change from 2015					
-9%	-6%	+2%	+2%	-2%	-11%

Table D-1. 2021 Public Survey Results Question 3 part 2

Where do you get information about how to protect your family, your home, and yourself from natural disasters?			
Response 7	Response 8	Response 9	Response 10
Church/religious organizations	**Other non-profits**	**Other (please specify)**	**Other (please specify)**
48	54	68	Personal research, common sense, internet, employer programs, mail, environmental organizations, friends, Library
Percentage of Replies			
7%	8%	10%	Not applicable
Approximate Change from 2015			

-1%	-2%	- -	Not applicable

Table D-1. 2021 Public Survey Results Question 7

Please rank the list of hazards below in order of highest concern to you. For example: put "earthquake" at #1 if you are most concerned about an earthquake happening in Hayward?	
Earthquake	Ranked #1 concern by 73% of respondents
Flood	Ranked #1 by 1% of respondents. Most (20%) respondents ranked flood #7 concern
Landslide	Ranked #1 by 1% of respondents. Most (17%) respondents ranked landslide #7 concern
Wildfire	Ranked #1 by 14% of respondents. Most (27%) respondents ranked wildfire #2 concern
Drought	Ranked #1 by 7% of respondents. Most (27%) respondents ranked drought #3 concern
Severe Weather/Winter Storms	Ranked #1 by 0.1% of respondents. Most (20%) respondents ranked severe weather/winter storms #4 concern
Hazardous Materials Releases	Ranked #1 by 0.1% of respondents. Most (20%) respondents ranked hazardous materials releases #7 concern
Tsunami	Ranked #1 by 0.5% of respondents. Most (48%) respondents ranked tsunami #8 concern

Table D-1. 2021 Public Survey Results Question 8

There are a number of strategies our community can use to decrease the damage caused by natural disasters. Most of these strategies fit into the categories described below. Please rank them in order of your preference, where #1 is the one you prefer the most, and #6 is the one you prefer the least.	
Prevention: regulate what kinds of buildings are built and where	Ranked #1 concern by 17% of respondents. Most (18%) respondents ranked prevention #2 strategy
Property Protection: modify existing buildings	Ranked #1 by 17% of respondents. Most (18%) respondents ranked property protection #3 strategy
Natural Resource Protection: protecting open space and natural habitats	Ranked #1 by 12% of respondents. Most (19%) respondents ranked natural resource protection #6 strategy
Structural Projects: lessen the impact of	Ranked #1 by 6% of respondents. Most (24%) respondents ranked wildfire #6 strategy

the disaster by interrupting the natural progression	
Emergency Services: protect people and property immediately after a disaster happens.	Most (23%) respondents ranked emergency services #1 strategy
Public Education & Awareness	Most (20%) respondents ranked public education #1 strategy

Table D-1. 2021 Public Survey Results Question 9

The City of Hayward is limited in the number and size of natural disaster prevention projects we can complete in the next five years. Please rank the types of projects below, with what you think is most important at #1, and what you think is least important at #3	
Projects that impact the largest number of people, even if they only reduce their disaster risk by a little bit	Ranked #1 disaster prevention project by 19% of respondents. Most (51%) respondents ranked projects that impact the largest number of people #3 project type
Projects that impact the people most likely to experience the effects of a disaster	Ranked #1 disaster prevention project by 51% of respondents.
Projects that impact the people most likely to have difficulty recovering from a disaster	Ranked #1 by 25% of respondents. Most (40%) respondents ranked projects that impact the people most likely to have difficulty recovering from a disaster #2 project type

Table D-1. 2021 Public Survey Results Question 10

Is there anything else you think the City of Hayward should consider when deciding how to prepare for natural disasters?	
Open ended question, received the following representative responses:	• Establish official gathering locations and support stations for after disasters • Increased Community and Fire Department involvement in CERT training • Donated earthquake preparation services for the elderly • Proactive projects and education to protect communities that would have the hardest time recovering

	• Increased communication with non-English and non-Spanish speakers • Emphasize personal responsibility for disaster preparation through public service announcements • Improving evacuation routes • Development of tips for disaster preparedness specific to people living in small spaces (e.g. how/where to store sufficient water) • Stop building near the Hayward Fault and in Hayward Hills • Spread awareness of the emergency alert system • Train all teachers and school staff in CPR • Financial assistance for earthquake retrofitting • Reduced carbon emissions as disaster prevention • Plan for looting prevention following a disaster • Plan for homeless persons support following disasters • Earthquake alerts through televisions • Disaster preparation curriculum for schools • Reducing building density • Have disaster drills for City staff, residents, businesses, schools • Reducing the crime rate to allow police to focus on natural disaster response • Backup City power and water supply • Increased education via flyers at city buildings, mailed newsletters, Hayward “Stack,” dedicated website, and at City Council meetings • Prepare plan for management of disaster debris • Incentivize disaster preparation via means such as tax credits • Provide emergency kits for low income families • Utilize drones for faster information and alerts during disasters • Use wetlands as a flood buffer • Relax parking restrictions on RV's & campers. They will be invaluable in an emergency • Provide mental health support

Table D-1. 2021 Public Survey Results Question 11

Based on the description above, do you think you may live or work in a soft story building?		
Response 1	Response 2	Response 3
Yes	**No**	**I Don't Know**
61	556	56
Percentage of Replies		
9%	79%	8%
Approximate Change from 2015		
-3%	0%	+1%

Table D-1. 2021 Public Survey Results Question 12

Oakland, San Francisco, Berkeley, and Alameda have all required owners of confirmed soft story structures to reinforce their buildings so that they are safer in an earthquake. Do you think the city of Hayward should consider a similar requirement?	
Response 1	Response 2
Yes	**No**
605	60
Percentage of Replies	
86%	9%
Approximate Change from 2015	
-4%	+1%

Table D-1. 2021 Public Survey Results Question 13

Is your home on a FEMA-designated floodplain?		
Response 1	Response 2	Response 3
Yes	**No**	**I Don't Know**
29	356	270
Percentage of Replies		
4%	51%	39%
Approximate Change from 2015		
0%	-3%	-1%

Table D-1. 2021 Public Survey Results Question 14

Do you have flood insurance?		
Response 1	Response 2	Response 3
Yes	**No**	**I Don't Know**
45	506	101
Percentage of Replies		
6%	72%	14%
Approximate Change from 2015		
-2%	-8%	+4%

Table D-1. 2021 Public Survey Results Question 15

If you do not have flood insurance, why not?					
Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
I am not located in a floodplain	**I am located in a floodplain, but insurance is not required**	**It's not necessary; it never floods**	**It's not necessary; my home is elevated**	**I have other protection**	**It's too expensive**
313	14	61	59	8	69
Percentage of Replies					
45%	2%	9%	8%	1%	10%
Approximate Change from 2015					
-14%	+1%	-1%	-5%	-1%	-3%

Table D-1. 2021 Public Survey Results Question 16

Have you or someone in your household directly experienced a natural disaster (such as an earthquake, wildfire, flood, etc.) in Hayward in the past five years?	
Response 1	Response 2
Yes	**No**
110	536
Percentage of Replies	
16%	77%
Approximate Change from 2015	
-8%	+2%
Disasters reported in last 5 years were primarily small earthquakes, wildfire (including regional smoke impacts), and flooding	

Table D-1. 2021 Public Survey Results Question 17

If you do not have flood insurance, why not?				
Response 1	Response 2	Response 3	Response 4	Response 5
I work in Hayward	**I go to school in Hayward**	**I live in Hayward**	**I own property in Hayward**	**None of these**
139	32	586	386	19
Percentage of Replies				
20%	5%	84%	55%	3%
Approximate Change from 2015				
-9%	-3%	-2%	-1%	+2%

Table D-1. 2021 Public Survey Results Question 18

Where do you live in Hayward?				
Response 1	Response 2	Response 3	Response 4	Response 5
I do not live in Hayward	**West of I-880**	**East of I-880**	**North of Jackson**	**South of Jackson**
34	129	399	155	218
Percentage of Replies				
5%	18%	57%	22%	31%
Approximate Change from 2015				
-3%	+6%	-11%	-5%	-8%

Table D-1. 2021 Public Survey Results Question 19

What kind of home do you live in?					
Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
Apartment	**Condo**	**House**	**Duplex**	**Mobile Home**	**Group home (including retirement home, nursing facility, etc.)**
44	66	476	19	22	3
Percentage of Replies					
6%	9%	68%	3%	3%	0.4%
Approximate Change from 2015					
-1%	-1%	-8%	+1%	-1%	0%

Table D-1. 2021 Public Survey Results Question 20

How old are you?					
Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
0-24	**25-34**	**35-49**	**50-64**	**65-79**	**Over 80**
12	53	156	204	195	23
Percentage of Replies					
2%	8%	22%	29%	28%	3%
Approximate Change from 2015					
+1%	-4%	0%	-8%	+5%	0%

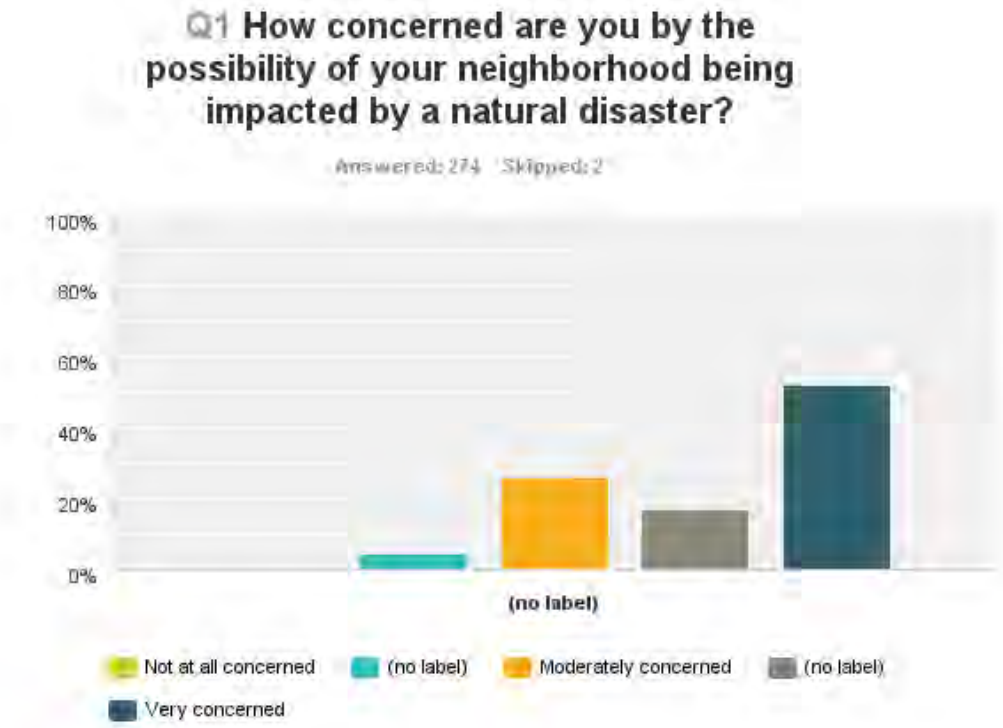
Table D-1. 2021 Public Survey Results Question 21

What ethnic group do you consider yourself to be a part of or feel closest to?						
Response 1	Response 2	Response 3	Response 4	Response 5	Response 6	Response 7
African-American/ Black	**American Indian/Alaskan Native**	**Asian-American**	**Caucasian /White**	**Latino(a)/ Hispanic**	**Native Hawaiian/Pacific Islander**	**Two or more races**
46	5	113	291	99	5	55
Percentage of Replies						
7%	0.1%	16%	42%	14%	0.1%	8%
Approximate Change from 2015						
0%	-1%	+8%	-19%	+3%	-2%	-2%

Table D-1. 2021 Public Survey Results Question 22

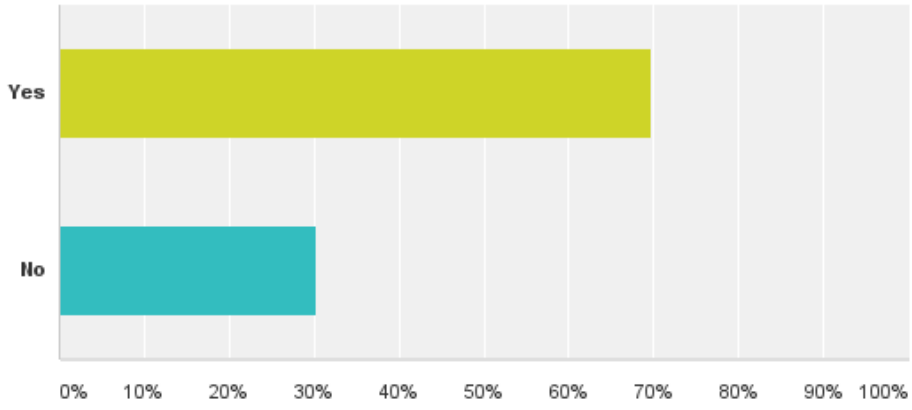
What is the last grade level you completed in school?				
Response 1	Response 2	Response 3	Response 4	Response 5
Elementary school -Middle school	**High school**	**Some college/vocational school or Associate's Degree**	**Bachelor's degree**	**Graduate or professional degree**
5	41	186	219	187
Percentage of Replies				
0.1%	6%	27%	31%	27%
Approximate Change from 2015				
0%	+30%	-6%	0%	0%

2015 SURVEY RESULTS



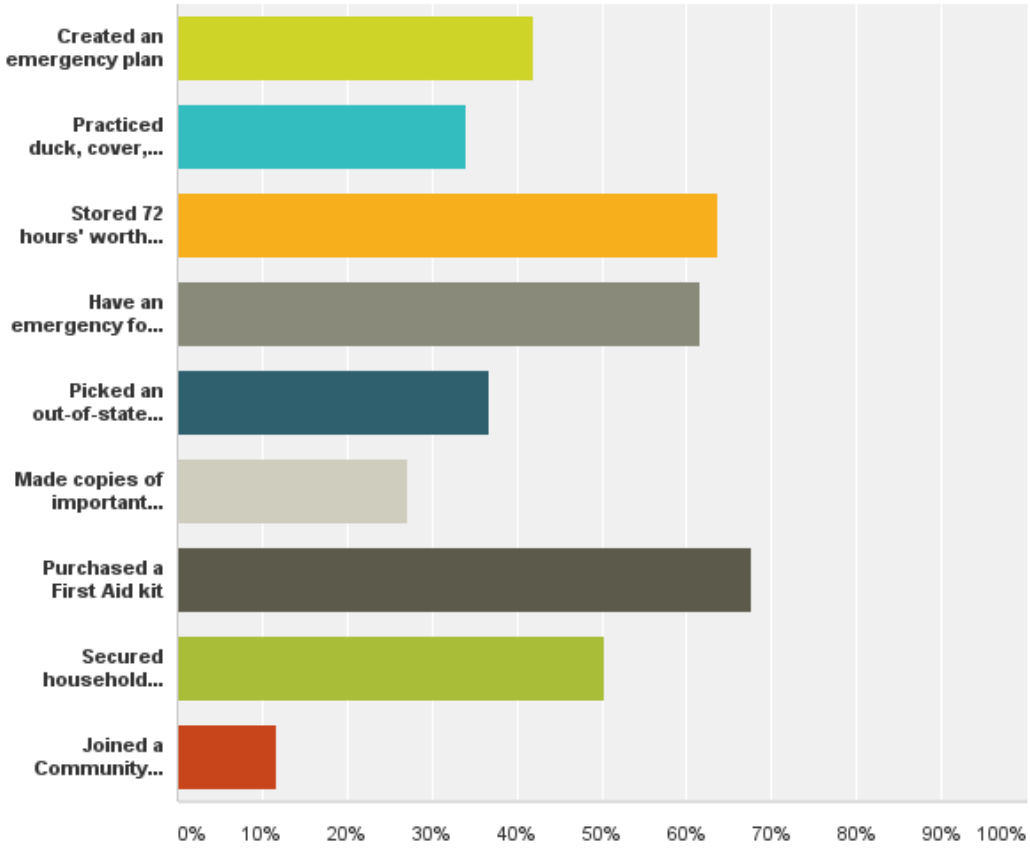
Q2 Have you taken any action to prepare your home, your family, or yourself for the affects of a natural disaster? (For example: retrofitting your home, assembling an emergency kit, or taking a CPR class)

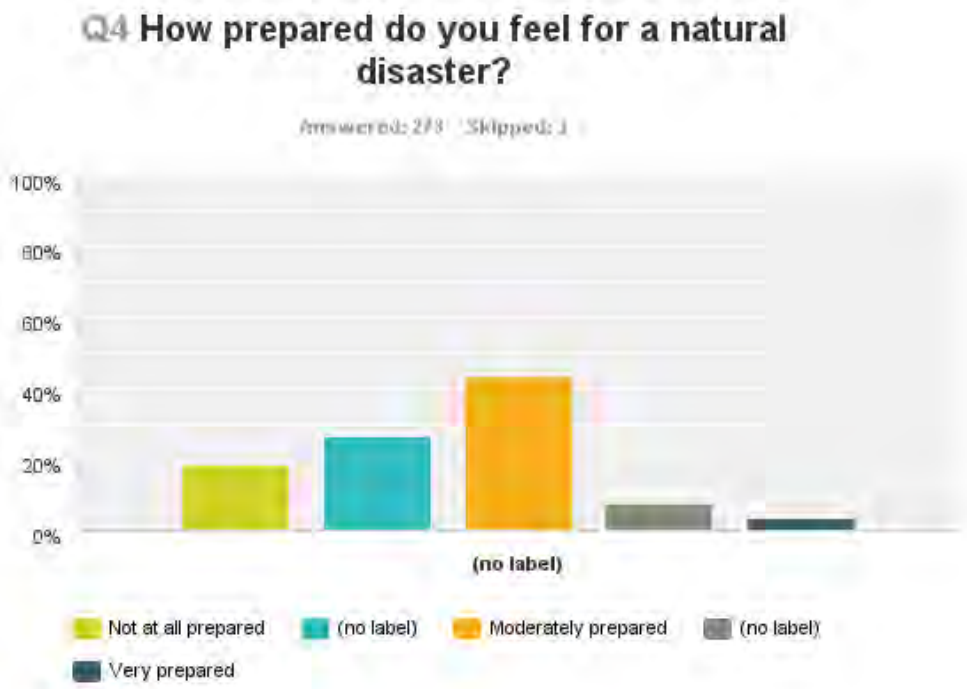
Answered: 275 Skipped: 1



Q3 What have you and your family done to prepare for a natural disaster?

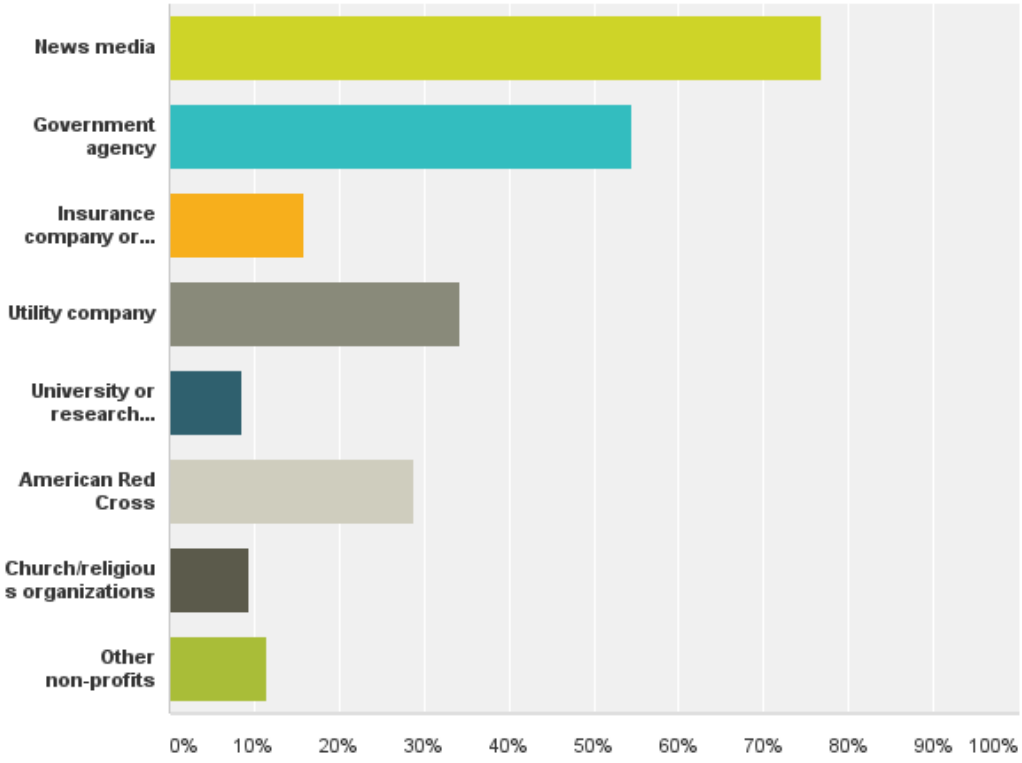
Answered: 250 Skipped: 26




Q4 How prepared do you feel for a natural disaster?
Answered: 273 Skipped: 1
100%
80%
60%
40%
20%
0%
(no label)
Not at all prepared
(no label)
Moderately prepared
(no label)
Very prepared

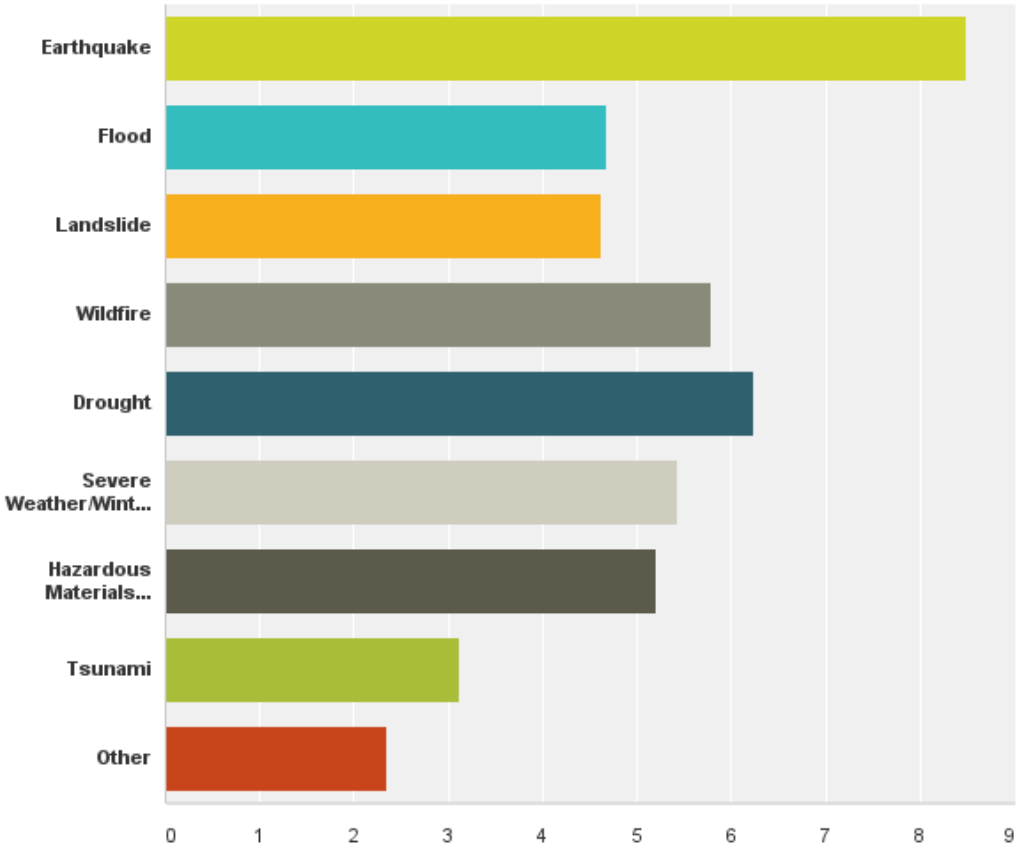
Q5 Where do you get information about how to protect your family, your home, and yourself from natural disasters?

Answered: 246 Skipped: 30



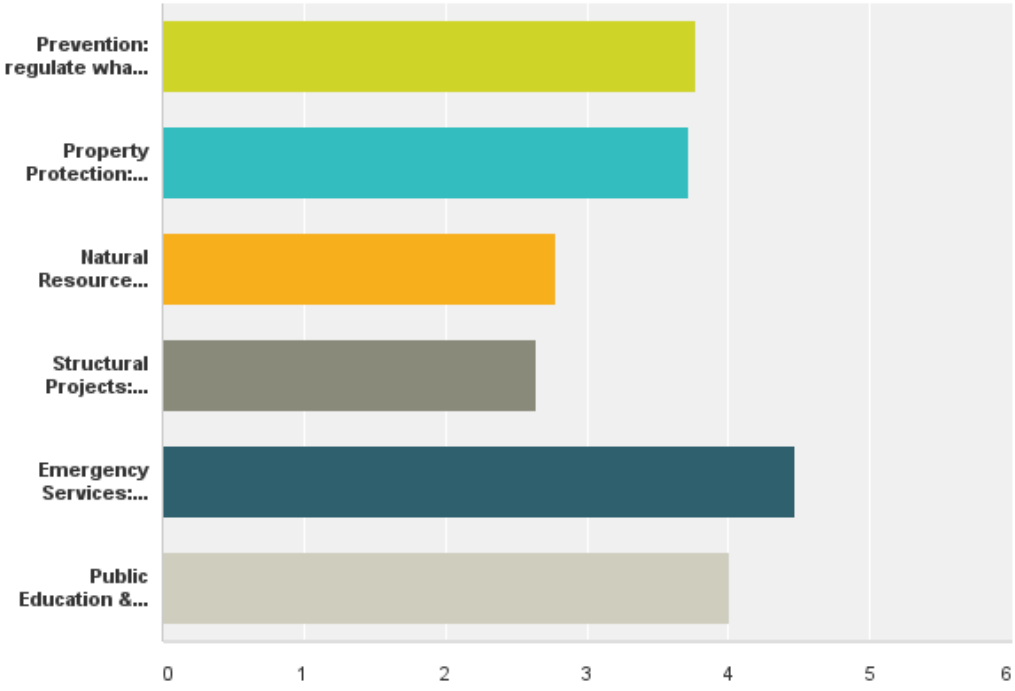
Q6 Please rank the list of hazards below in order of highest concern to you. For example: put "earthquake" at #1 if you are most concerned about an earthquake happening in Hayward.

Answered: 262 Skipped: 14



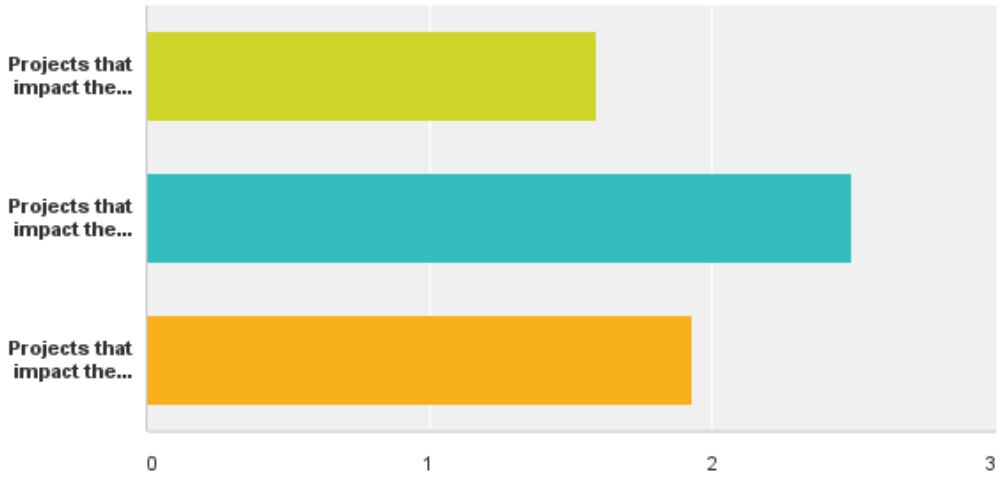
Q7 There are a number of strategies our community can use to decrease the damage caused by natural disasters. Most of these strategies fit into the categories described below. Please rank them in order of your preference, where #1 is the one you prefer the most, and #6 is the one you prefer the least.

Answered: 250 Skipped: 26



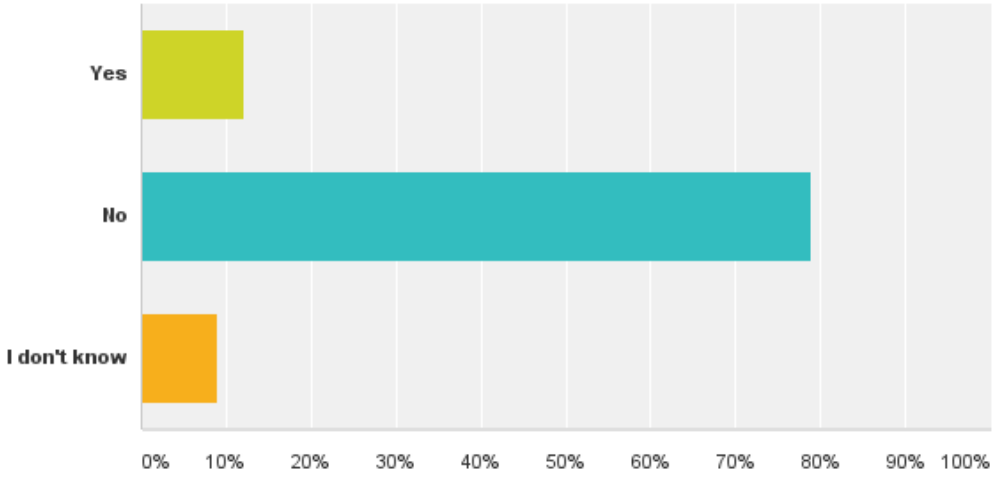
Q8 The City of Hayward is limited in the number and size of natural disaster prevention projects we can complete in the next five years. Please rank the types of projects below, with what you think is most important at #1, and what you think is least important at #3.

Answered: 244 Skipped: 32



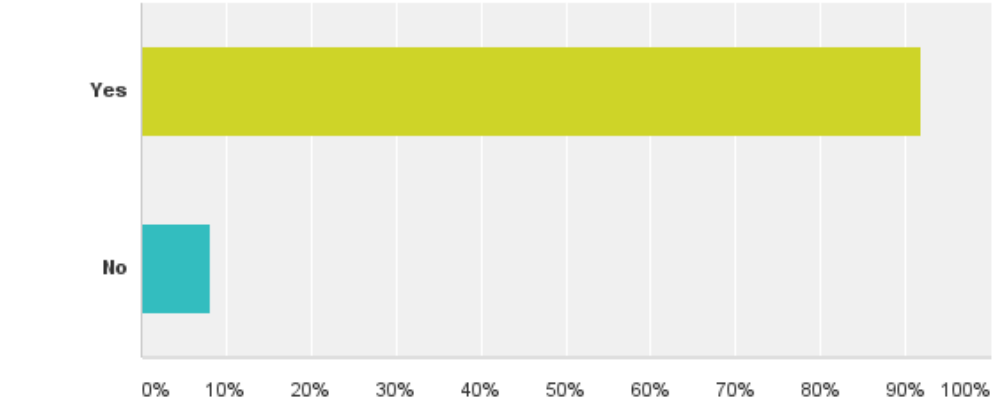
Q10 Based on the description above, do you think you may live or work in a soft story building?

Answered: 256 Skipped: 20



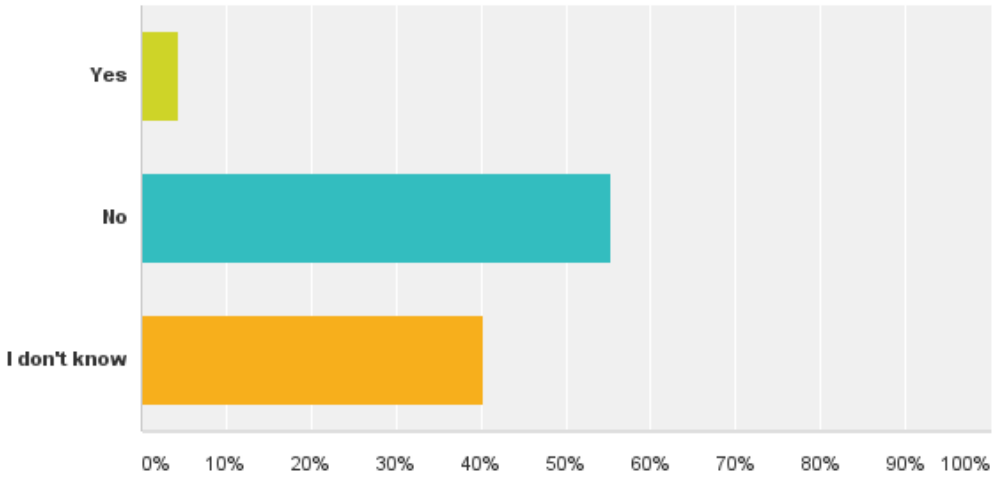
Q11 Oakland, San Francisco, Berkeley, and Alameda have all required owners of confirmed soft story structures to reinforce their buildings so that they are safer in an earthquake. Do you think the city of Hayward should consider a similar requirement?

Answered: 255 Skipped: 21



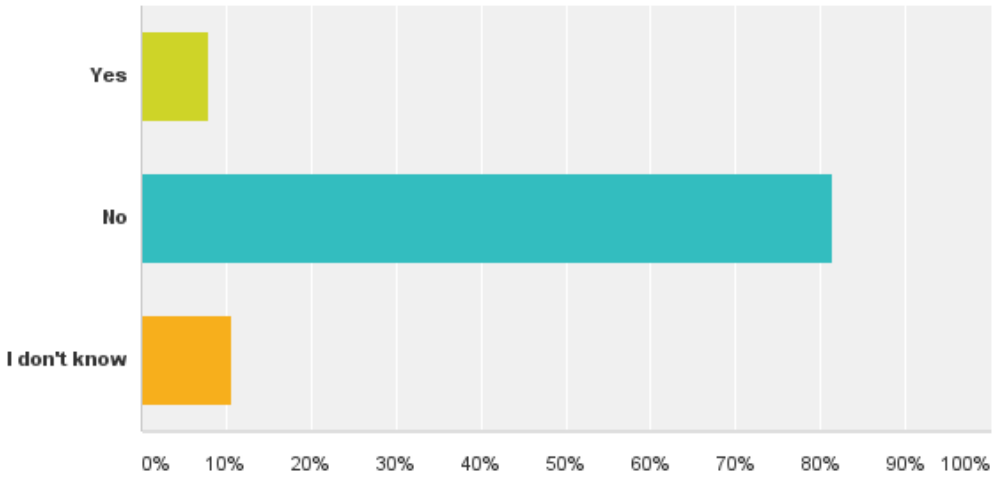
Q12 Is your home on a FEMA-designated floodplain?

Answered: 253 Skipped: 23



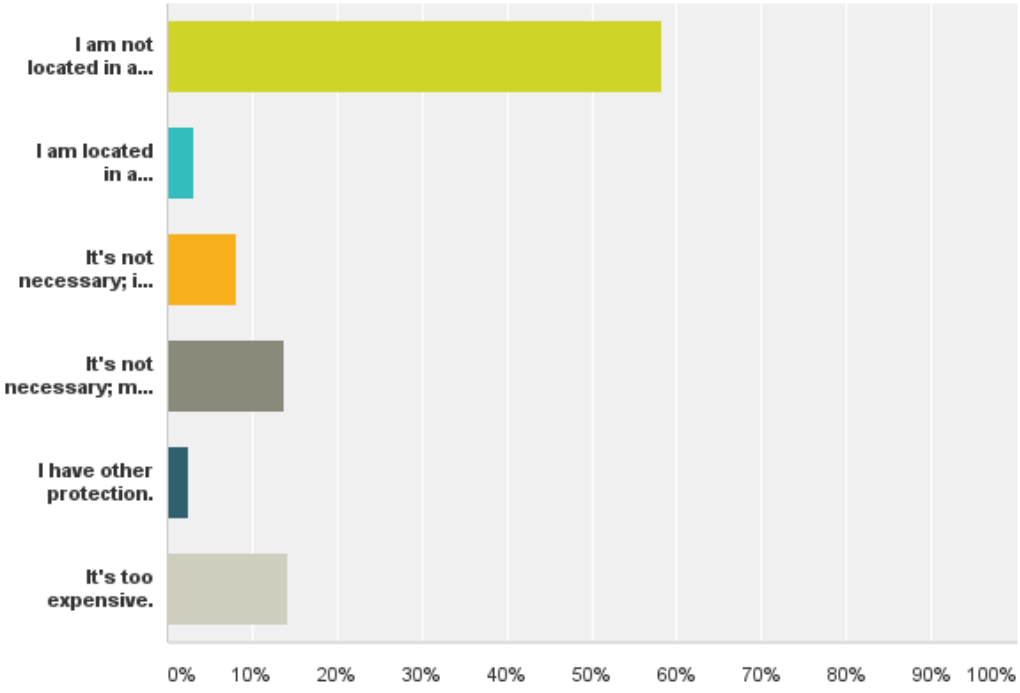
Q13 Do you have flood insurance?

Answered: 252 Skipped: 24



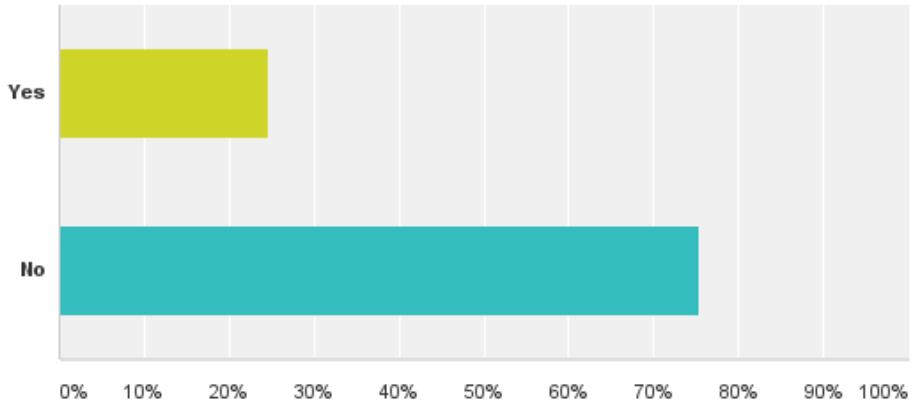
Q14 If you do not have flood insurance, why not?

Answered: 196 Skipped: 80



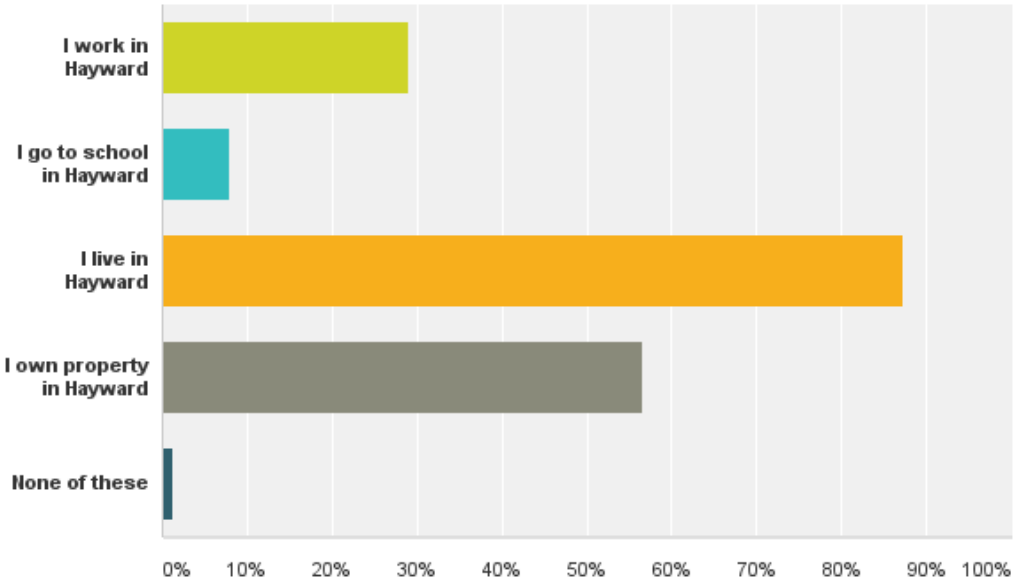
Q15 Have you or someone in your household directly experienced a natural disaster (such as an earthquake, wildfire, flood, etc.) in Hayward in the past five years?

Answered: 248 Skipped: 28



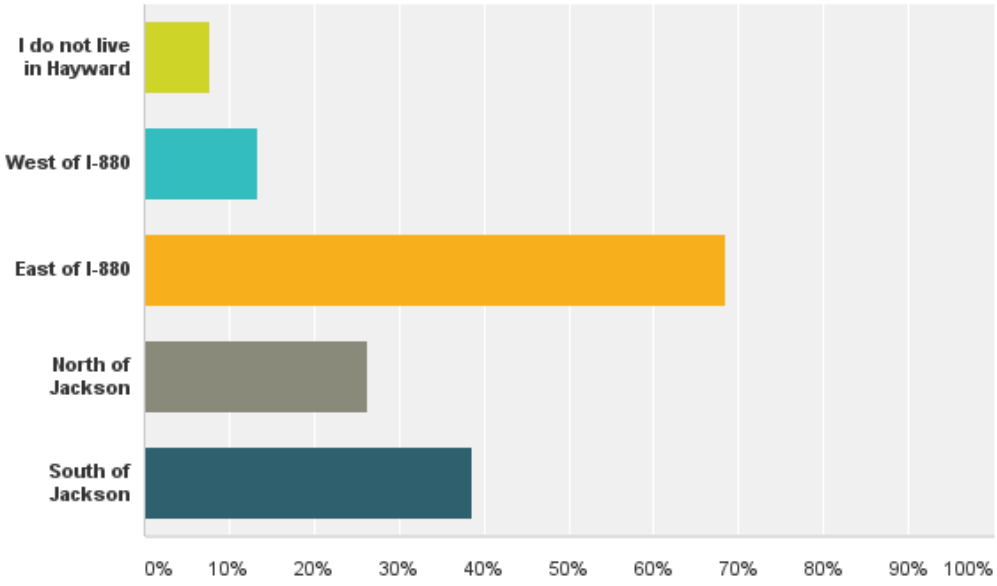
Q17 What is your relationship to the City of Hayward? (Select all that apply)

Answered: 251 Skipped: 25



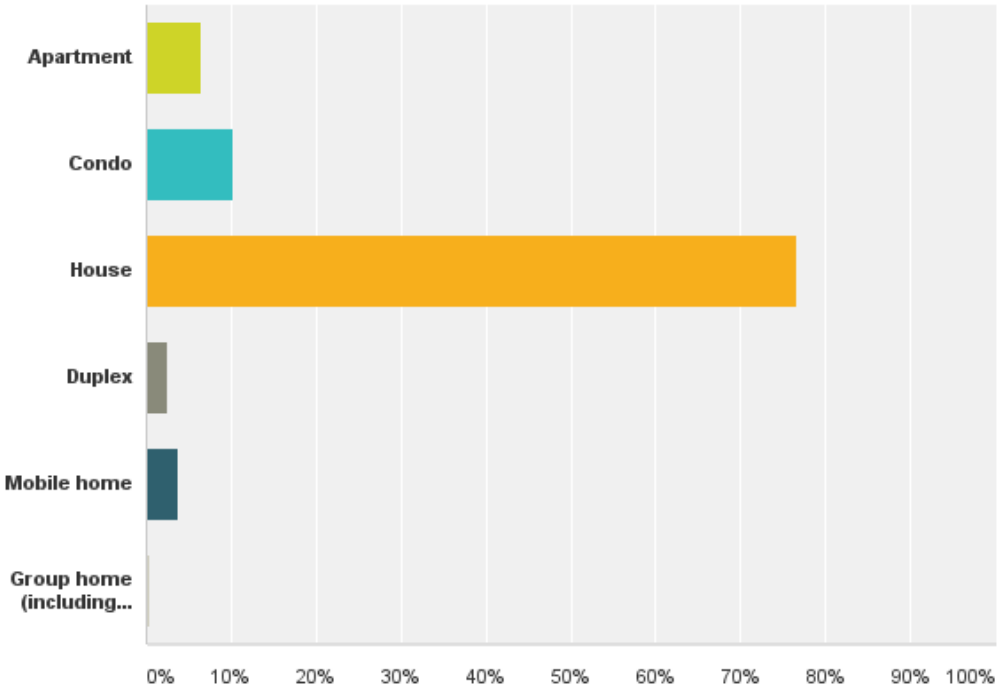
Q18 Where do you live in Hayward? (Select all that apply)

Answered: 248 Skipped: 28



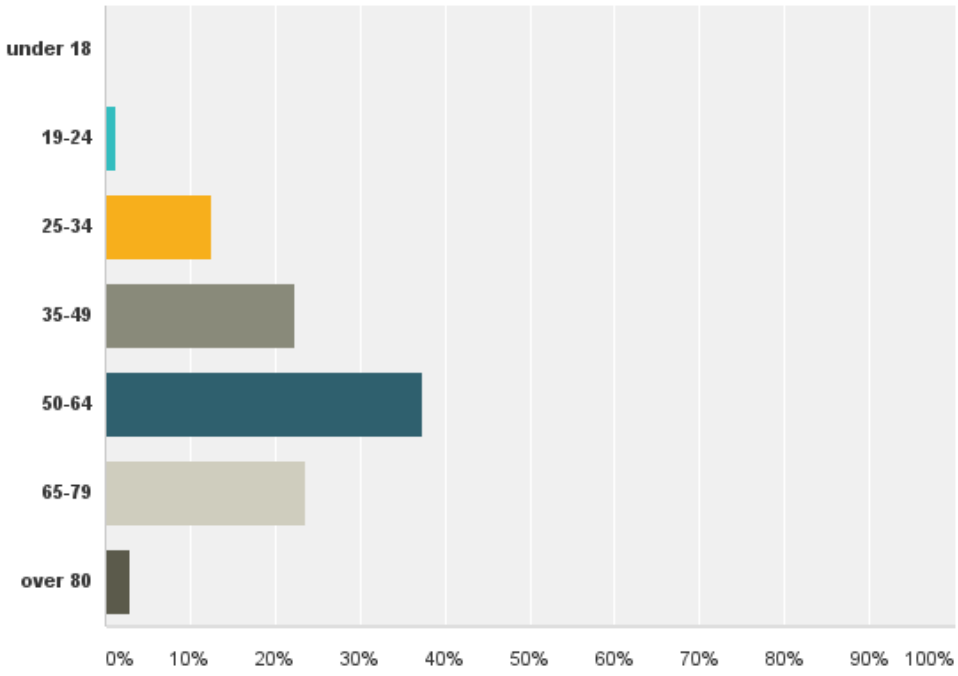
Q19 What kind of home do you live in?

Answered: 244 Skipped: 32



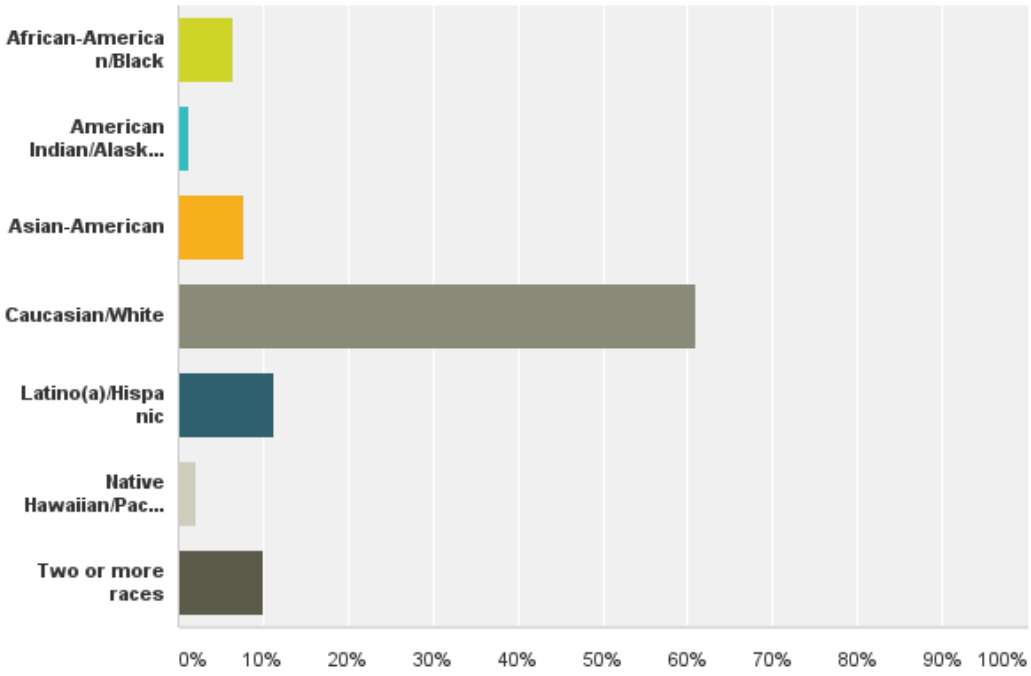
Q20 How old are you?

Answered: 246 Skipped: 30



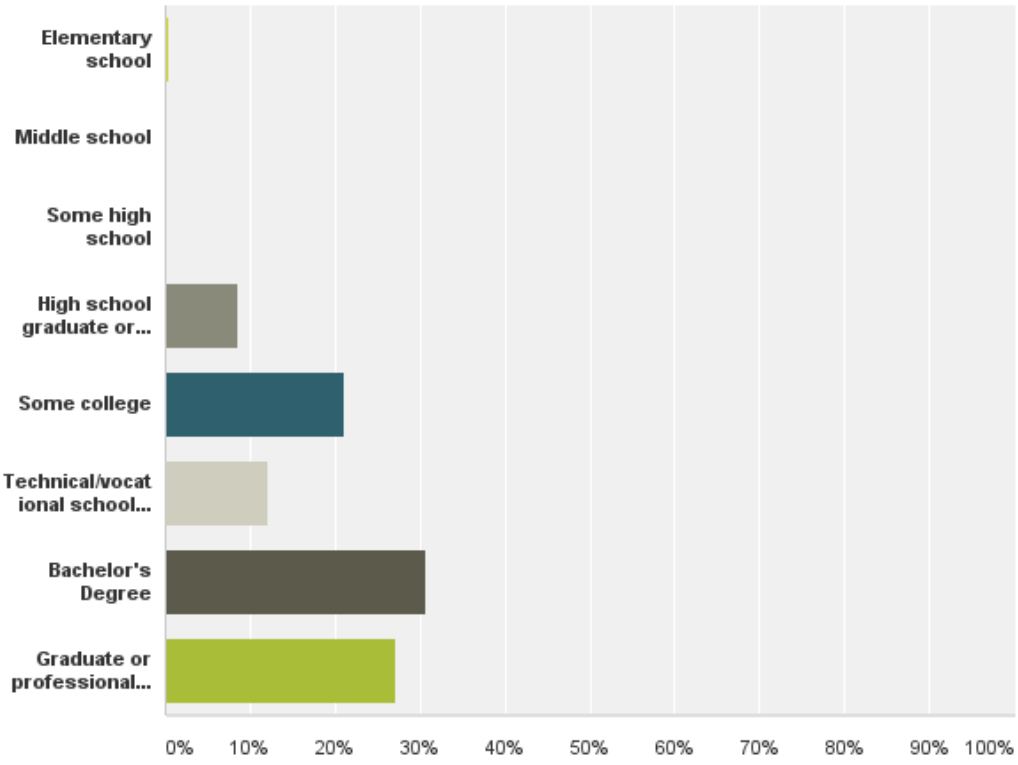
Q21 What ethnic group do you consider yourself to be a part of or feel closest to?

Answered: 231 Skipped: 45



Q22 What is the last grade level you completed in school?

Answered: 247 Skipped: 29

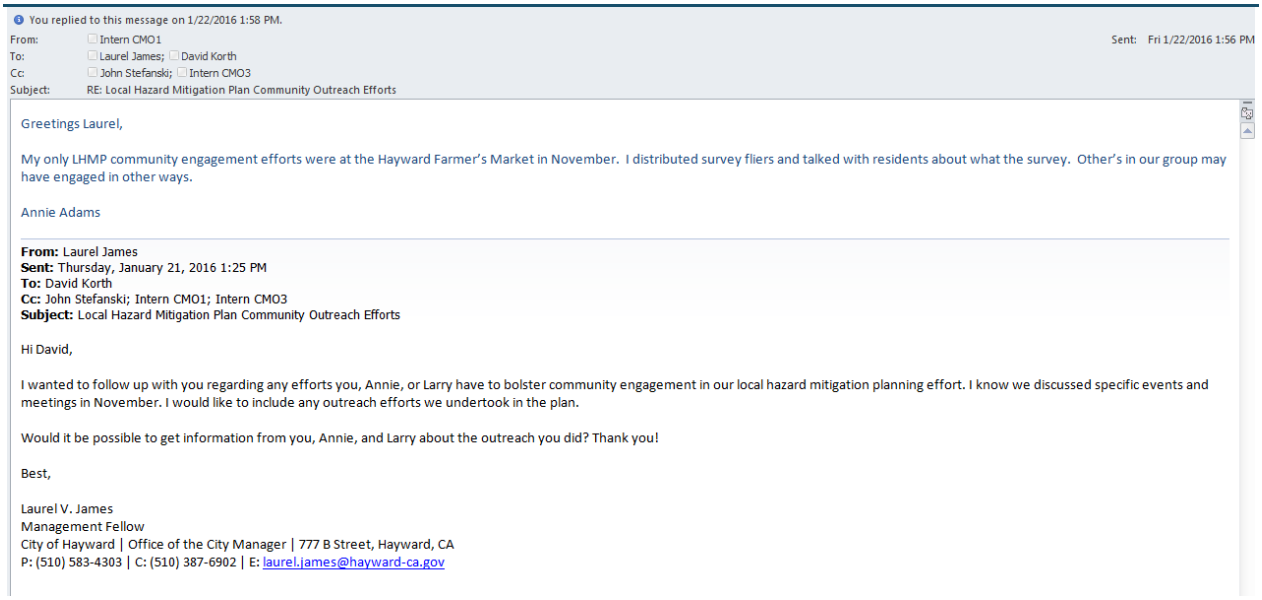


APPENDIX G: FLYERS

APPENDIX H: WEBSITE

(**2021 update:** the web site taken down following completion of the initial 2015 survey)

APPENDIX I: COMMUNITY MEETINGS & EVENTS



You replied to this message on 1/22/2016 1:58 PM.

From: Intern CMO1 Sent: Fri 1/22/2016 1:56 PM
To: Laurel James; David Korth
Cc: John Stefanski; Intern CMO3
Subject: RE: Local Hazard Mitigation Plan Community Outreach Efforts

Greetings Laurel,

My only LHMP community engagement efforts were at the Hayward Farmer's Market in November. I distributed survey fliers and talked with residents about what the survey. Other's in our group may have engaged in other ways.

Annie Adams

From: Laurel James
Sent: Thursday, January 21, 2016 1:25 PM
To: David Korth
Cc: John Stefanski; Intern CMO1; Intern CMO3
Subject: Local Hazard Mitigation Plan Community Outreach Efforts

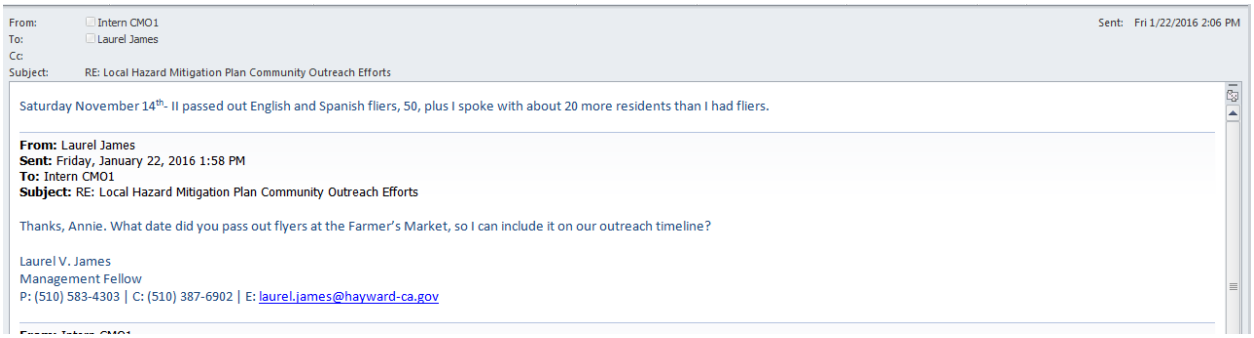
Hi David,

I wanted to follow up with you regarding any efforts you, Annie, or Larry have to bolster community engagement in our local hazard mitigation planning effort. I know we discussed specific events and meetings in November. I would like to include any outreach efforts we undertook in the plan.

Would it be possible to get information from you, Annie, and Larry about the outreach you did? Thank you!

Best,

Laurel V. James
Management Fellow
City of Hayward | Office of the City Manager | 777 B Street, Hayward, CA
P: (510) 583-4303 | C: (510) 387-6902 | E: laurel.james@hayward-ca.gov



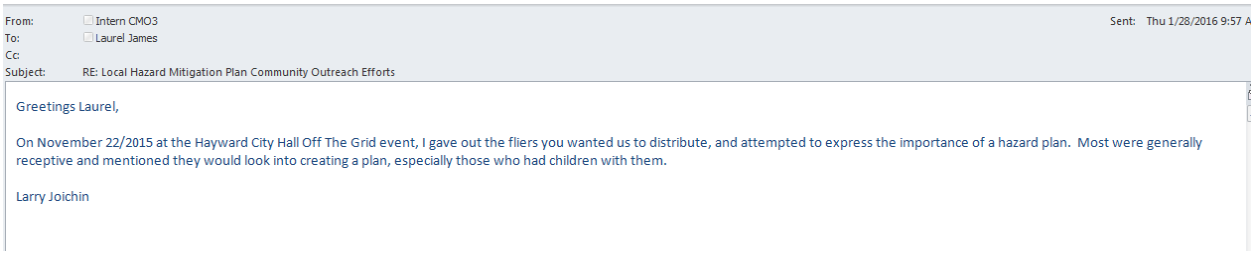
From: Intern CMO1 Sent: Fri 1/22/2016 2:06 PM
To: Laurel James
Cc:
Subject: RE: Local Hazard Mitigation Plan Community Outreach Efforts

Saturday November 14th- II passed out English and Spanish fliers, 50, plus I spoke with about 20 more residents than I had fliers.

From: Laurel James
Sent: Friday, January 22, 2016 1:58 PM
To: Intern CMO1
Subject: RE: Local Hazard Mitigation Plan Community Outreach Efforts

Thanks, Annie. What date did you pass out flyers at the Farmer's Market, so I can include it on our outreach timeline?

Laurel V. James
Management Fellow
P: (510) 583-4303 | C: (510) 387-6902 | E: laurel.james@hayward-ca.gov



From: Intern CMO3 Sent: Thu 1/28/2016 9:57 A
To: Laurel James
Cc:
Subject: RE: Local Hazard Mitigation Plan Community Outreach Efforts

Greetings Laurel,

On November 22/2015 at the Hayward City Hall Off The Grid event, I gave out the fliers you wanted us to distribute, and attempted to express the importance of a hazard plan. Most were generally receptive and mentioned they would look into creating a plan, especially those who had children with them.

Larry Joichin

You replied to this message on 1/29/2016 2:47 PM.
This message was sent with High importance.

From: David Korth
To: Laurel James
Cc: John Stefanski
Subject: RE: Local Hazard Mitigation Plan Community Outreach Efforts
Sent: Fri 1/29/2016 9:55 AM

Hi Laurel:

Sorry for the delay.

I understand that you heard from both Annie and Larry at this point, so they may have added more than what is provided below.

Unfortunately, I cannot offer links or agendas that describe the outreach we did. Either the efforts were at public community events with no agenda, or if there was an agenda, the distribution of the "Are we Prepared" survey info. was an ad lib add-on, not written into the agenda. That said, this is what we did in terms of announcing of the LHMP survey and distribution of the info. flyers:

11/6: DK shared info. at the Hayward Promise Neighborhood Implementation Team Mtg. – Approx. 15 community agency partners were present; each took a supply to distribute to those that they serve.
11/6: DK and Larry share info. at the meeting of the Eden Area Village – a group of Hayward Older Adults who are developing a neighborhood network to enable older adults to "Age in Place" (i.e., stay in their homes).
11/12: DK Shared info. at the South Hayward Community Meeting to discuss the Phase II - Rt. 238 Improvement Project (approx.. 50 South Hayward residents were present).
11/13: DK Shared info. at the South Hayward Fire House / Health Clinic Open House (approx.. 200 people were present).
11/14: Annie distributed info. at the Downtown Hayward Famer's Market.

Please let me know if you have any questions.

Thanks,
David Korth, x4227

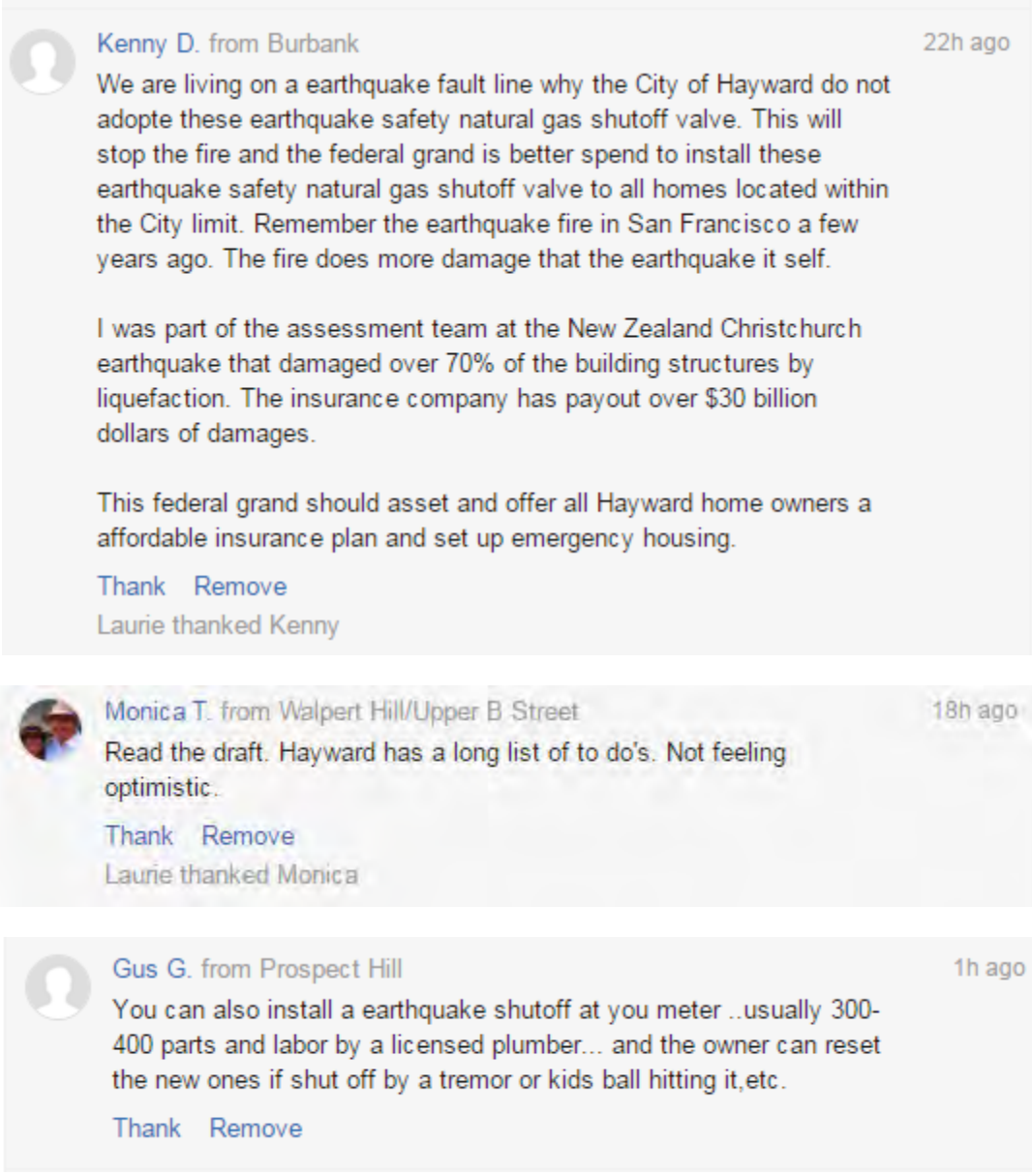
2021 Update: Due to concerns about public gatherings during the two year Covid-19 pandemic no community meetings were held as part of the 2021 update. Community members were able to provide any new comments via the public survey and email.

APPENDIX J: PUBLIC COMMENT PERIOD

In 2015 the initial Hayward Local Hazard Mitigation Plan was posted on the dedicated LHMP update website for public review. The public review period was advertised through social media and an existing list of survey respondents who requested to be further involved in the process.

The public comment period was open from Tuesday, February 16th through Wednesday, February 24th. The comments below were received.

The following comments were posted on Nextdoor:



Kenny D. from Burbank — 22h ago

We are living on a earthquake fault line why the City of Hayward do not adopte these earthquake safety natural gas shutoff valve. This will stop the fire and the federal grand is better spend to install these earthquake safety natural gas shutoff valve to all homes located within the City limit. Remember the earthquake fire in San Francisco a few years ago. The fire does more damage that the earthquake it self.

I was part of the assessment team at the New Zealand Christchurch earthquake that damaged over 70% of the building structures by liquefaction. The insurance company has payout over $30 billion dollars of damages.

This federal grand should asset and offer all Hayward home owners a affordable insurance plan and set up emergency housing.

Thank Remove

Laurie thanked Kenny

Monica T. from Walpert Hill/Upper B Street — 18h ago

Read the draft. Hayward has a long list of to do's. Not feeling optimistic.

Thank Remove

Laurie thanked Monica

Gus G. from Prospect Hill — 1h ago

You can also install a earthquake shutoff at you meter ..usually 300-400 parts and labor by a licensed plumber... and the owner can reset the new ones if shut off by a tremor or kids ball hitting it,etc.

Thank Remove


Notifications
Messages
City of Hayward
@cityofhayward
Follow
It is the final day for public comment on #Hayward's Hazard Mitigation Plan! Let us know what you think: ow.ly/YFmvA
10:49 AM - 23 Feb 2016
Reply to @cityofhayward
City of Hayward
Feb 22
It's Monday; are you sure you want to cook tonight? Enjoy @otgsf at

New message via your Wix website, from cwmorgan@hotmail.com

no-reply@parastorage.com

Sent: Tue 2/16/2016 4:25 PM

To: John Stefanski

Retention Policy: 60 Day Delete - Inbox (60 days) Expires: 4/16/2016

You have a new message:

Via: http://hayward-ca.wix.com/lhmp

Message Details:

- **Name** Carol Morgan
- **Subject** hazard mitigation planning
- **Message** Looks good to me.
- **Email** cwmorgan@hotmail.com

Sent on: 16 February, 2016

Thank you for using Wix.com!

You have a new message:

Via: http://hayward-ca.wix.com/lhmp

Message Details:

- **Name** Sally Holt
- **Subject** Disaster Mitigation Plan
- **Message** Plan looks well considered. thank you.
- **Email** nole62@pacbell.net

Sent on: 16 February, 2016

Thank you for using Wix.com!

New message via your Wix website, from helenjshoemaker@yahoo.com

no-reply@parastorage.com

Sent: Wed 2/17/2016 4:57 AM

To: John Stefanski

Retention Policy: 60 Day Delete - Inbox (60 days) Expires: 4/17/2016

You have a new message:

Via: http://hayward-ca.wix.com/lhmp

Message Details:

- **Name** Helen Shoemaker
- **Subject** asbestos abatement
- **Message** Are there any current city or county tax incentives for asbestos abatement in private dwellings?
- **Email** helenjshoemaker@yahoo.com

Sent on: 17 February, 2016

Thank you for using Wix.com!

(**2021 update:** No new public comments were received on the 2021 update, likely because the 2015 effort was a large, new plan for the City and little has changed with respect to hazard mitigation other than the progress made on all mitigation projects.)

APPENDIX K: UPDATES TO 2015 LHMP STRATEGIES

For the sake of simplicity and clarity, LHMP mitigation strategies that could be easily combined into a single category were. Existing programs were confirmed and removed from update forms to streamline the process. Mitigation strategies that had been categorized as “not applicable”, “not appropriate”, or assigned to another jurisdiction were removed from the plan update. “Soft” strategies that required “knowing”, “acknowledging”, “recognizing”, or immaterially “supporting” as their central action were also removed, as they had been completed by the adoption of the 2010 multijurisdictional plan.

The remaining mitigation strategies were divided by responsible department and provided to each department for status updates. The results of this update have been compiled and are listed below. Please note that the 2021 status is the reported status by department, not the result of the mitigation strategy selection and prioritization process undertaken for the 2021 plan update.

Ongoing programs will continue to be supported and are considered to be mitigation strategies included in this plan.

2009 Code	Description	2009 Status	2021 Status
HEAL-b-1 HEAL-b-2 HEAL-b-3	Identify and work with ancillary health-related facilities to develop mitigation and business continuity plans	High Priority	Moderate Priority
ENVI-b-3	Adopt & enforce land use policies that reduce sprawl, preserve open space, and create walkable compact urban communities	High Priority	Ongoing
ENVI-b-13	Help educate the public about reducing global warming	High Priority	Ongoing
ENVI-b-12	Maintain healthy urban forests	High Priority	Ongoing
ENVI-b-4	Promote alternative transportation options	High Priority	Ongoing
ECON-c-2 ECON-d-3	Offer 1+ of the following to incentivize retrofits: waivers/reduction of permit fees, below-market loans, local tax breaks, grants, land use waivers, TA	Low Priority	High Priority
ECON-d-1 HSNG-e-2	Inventory non-ductile, tilt-up, and other vulnerable concrete buildings	Low Priority	Low Priority
ECON-b-3 HSNG-c-3	Educate owners/staff/engineers/contractors on soft-story retrofit procedures and incentives	Low Priority	Under Review

GOVT-c-2	Encourage employees to have a family disaster plan	Moderate Concern	High Priority
HEAL-a-1 HEAL-a-2 HEAL-a-3 HEAL-a-4 HEAL-a-5 HEAL-a-6 HEAL-a-7	Work with local hospitals to ensure structural adequacy, establish BORP, continuity of care, and general disaster preparedness	Moderate Concern	Moderate Priority
ECON-j-3	Work with private businesses to develop continuity plans	Moderate Concern	Moderate Priority
GOVT-c-15	Conduct periodic tests of the alerting and warning system	Moderate Concern	Ongoing
GOVT-d-9	Conduct/promote attendance at local or regional hazard conferences, events, and workshops	Moderate Concern	Ongoing
HSNG-g-4	Create or ID model properties showing defensible space and structural survivability in wildland-urban interface or fire threatened communities	Moderate Concern	Ongoing
GOVT-d-1	Promote interjurisdictional information sharing	Moderate Concern	Ongoing
LAND-b-1	Require new homes in fire-threatened communities to be constructed of fire-resistant materials and incorporate fire-resistant design	Moderate Concern	Ongoing
HSNG-k-10	Train homeowners to locate and shut off gas valves if they smell or hear gas leaking	Moderate Concern	Ongoing
HSNG-g-11	Work with residents in rural-residential areas to ensure adequate plans are developed for access/evacuation in wildland interface communities	Moderate Concern	Ongoing
GOVT-c-18	Establish regional protocols for response to NOAA Monterey weather forecasts	Moderate Concern	Under Review
GOVT-c-9	Purchase command vehicles for EOC if current vehicles are unsuitable/inadequate	Moderate Concern	Under Review
LAND-a-5	Consider imposing Alquist-Prioto regulations on buildings essential to economic recovery	New	Not Yet Considered
LAND-a-4	Ensure development near faults with history of complex surface rupture has setback >50 ft.	New	Ongoing
GOVT-c-10	Maintain EOC in state of readiness	Not funded	Underfunded
HEAL-c-4	Plan for hazardous materials issues related to a natural disaster	Not Yet Considered	Moderate Priority

ENVI-a-8	Require hazardous materials in the flood zone be elevated/protected	Not Yet Considered	Moderate Priority
GOVT-a-3, INFR-b-9	Clarify the extent to which critical facilities are expected to perform at a life safety level or remain functional	Not Yet Considered	Not Yet Considered
GOVT-b-5	Create emergency relocation plan for recovery - critical government facilities	Not Yet Considered	Not Yet Considered
INFR-b-10	Develop a water-based transportation system across the Bay	Not Yet Considered	Not Yet Considered
INFR-a-10	Develop pedestrian rights-of-way as walkways for additional evacuation routes	Not Yet Considered	Not Yet Considered
HSNG-g-21	Work with insurance companies to create a PPI to provide discounts on insurance premiums for residents who mitigate hazards to a set standard	Not Yet Considered	Not Yet Considered
LAND-f-4	Work with non-profits and others to protect areas susceptible to extreme hazards through open space preservation	Not Yet Considered	Not Yet Considered
HSNG-h-10 HSNG-k-4	Develop a public education campaign on the cost, risk, and benefits of earthquake, flood, and other hazard insurance as compared to mitigation	Not Yet Considered	Not Yet Considered
LAND-g-1 ECON-e-7 ECON-e-8 HSNG-g-10	Establish special funding (fire abatement district) for mitigation (vegetation management, high fire danger patrols)	Not Yet Considered	Not Yet Considered
ECON-f-7 HSNG-h-8	Encourage private landowners to participate in building elevation programs within floodplain	Not Yet Considered	Ongoing
GOVT-c-3 INFR-g6	Offer CERT to employees	Not Yet Considered	Ongoing
GOVT-c-1	Develop plan for short-term and long-term sheltering of employees	Not Yet Considered	Under Review
ECON-e-11 HSNG-g-19	ID and manage gas-related risks of soft-story mixed-use buildings (work with State Fire Marshal, PEER, etc.)	Not Yet Considered	Under Review

INDFR-d-1 INFR-d-3	Conduct a watershed analysis to determine areas of insufficient capacity in storm drain and natural creek systems	Ongoing	Not Yet Considered
INFR-d-5	Pursue funding for the design and construction of storm drainage projects to protect vulnerable properties	Ongoing	Not Yet Considered
ECON-b-1 ECON-d-2 HSNG-c-2 HSNG-e-3	Adopt 2009 International Existing Building Code	Ongoing	Ongoing
HSNG-b-1	Adopt a retrofit standard including plan sets and construction details for bolting homes to foundations and strengthening cripple walls	Ongoing	Ongoing
ECON-e-4 ECON-h-1 HSNG-f-1 HSNG-g-6 HSNG-i-1	Adopt, amend, and enforce updated versions of CA Building and Fire Code	Ongoing	Ongoing
ECON-f-6 HSNG-h-6	Apply floodplain management regulations for private development in the floodplain/floodway	Ongoing	Ongoing
ECON-a-1 HSNG-a-1	Assist in enforcing hazard disclosure requirements by working with real estate agents	Ongoing	Ongoing
ENVI-a-6	Comply with National Pollution Discharge Elimination System permit	Ongoing	Ongoing
INFR-d-7	Continue maintenance efforts to keep waterways clear while retaining vegetation	Ongoing	Ongoing
INDFR-d-6 INFR-d-7	Continue to repair, keep clear, and make structural improvements to storm drains, pipelines, etc. as part of regular maintenance activities	Ongoing	Ongoing
INFR-d-14	Determine vulnerability of wastewater treatment plants to flooding and take mitigation measures	Ongoing	Ongoing
HSNG-a-3	Develop a plan w/ Red Cross for short-term shelter of residents	Ongoing	Ongoing
INFR-d-9	Develop a watercourse bank protection strategy (assessment, stabilization, depth management, and removal of coffer dams)	Ongoing	Ongoing

INFR-d-2	Develop watershed analysis procedures for new developments to determine downstream impacts	Ongoing	Ongoing
HSNG-b-4 HSNG-b-5 HSNG-f-2	Encourage local gov building inspectors and private contractors to take continuing education classes on retrofitting/plan set A/construction standards	Ongoing	Ongoing
GOVT-d-8	Encourage staff to participate in efforts by professional orgs to mitigate disaster losses	Ongoing	Ongoing
ENVI-a-1	Enforce CEQA so hazard mitigation doesn't impact environment	Ongoing	Ongoing
ENVI-a-3	Enforce CEQA to minimize air pollution	Ongoing	Ongoing
LAND-a-1	Enforce requirement for site-specific geologic reports be prepared for development	Ongoing	Ongoing
ENVI-a-9	Enforce/comply with California Certified Unified Program Agency hazardous materials requirements	Ongoing	Ongoing
INFR-c-7	Ensure adequate fire road access to developed and open space areas	Ongoing	Ongoing
ECON-f-3 HSNG-h-3	Ensure private development pays for storm drain upgrades (impact fee)	Ongoing	Ongoing
HSNG-h-7	Ensure utilities in new developments are constructed to minimize flooding and flood damage	Ongoing	Ongoing
INFR-d-13	Ensure utility systems in new developments are constructed in ways that reduce or eliminate flood damage	Ongoing	Ongoing
GOVT-b-3	Establish a goal for resumption of government services	Ongoing	Ongoing
LAND-d-5	Establish zoning ordinances placing constraints on hillside development in areas where roads may be washed out due to landslide	Ongoing	Ongoing
INFR-c-5	For new development, enforce 20-ft road width with 10-ft shoulder clearance on roads >50 ft in length	Ongoing	Ongoing
INFR-c-4	For new development, require at minimum a T intersection turnaround sufficient for wildfire equipment	Ongoing	Ongoing
INFR-d-11	ID critical locally-owned bridges effected by flooding and mitigate their vulnerability	Ongoing	Ongoing
LAND a-3	Identify and require geologic reports in areas adjacent to locally-specific faults	Ongoing	Ongoing

INFR-b-3	Include vulnerability to ground failure in criteria used for determining a pipeline replacement schedule	Ongoing	Ongoing
ECON-e-1	Increase fire mitigation in private developments through improving design, vegetation management, code enforcement, and public education	Ongoing	Ongoing
ENVI-b-11	Increase recycling rates in local government operations and in the community	Ongoing	Ongoing
ENVI-b-5	Increase use of clean, alternative energy	Ongoing	Ongoing
ECON-c-1 HSNG-d-2 HSNG-d-3 HSNG-d-4	Maintain list of unreinforced masonry buildings and notify owners of structures on the list	Ongoing	Ongoing
GOVT-c-12	Maintain/update SEMS plan, NIMS plan, and submit NIMSCAST repost	Ongoing	Ongoing
INFR-a-11	Minimize the likelihood that power interruptions with adversely impact critical utility systems or facilities	Ongoing	Ongoing
GOVT-c-17	Monitor weather during times of high fire risk	Ongoing	Ongoing
GOVT-d-5 ECON-f-1	Participate in NFIP	Ongoing	Ongoing
ENVI-b-6	Prioritize energy efficiency through building code, retrofitting city facilities, urging employees to conserve	Ongoing	Ongoing
INFR-g-4 INFR-g-5	Provide materials to the public related to coping with reduction/contamination of water supply, disrupted storm drains, sewage lines, and wastewater treatment beyond statutory requirements	Ongoing	Ongoing
HSNG-k-2 HSNG-k-3	Provide public education and outreach on emergency preparedness, hazard mitigation, and disaster response	Ongoing	Ongoing
LAND-c-4 ECON-f-1	Regulate construction within flood zones to comply with NFIP CRS	Ongoing	Ongoing
GOVT-c-16	Regulate/enforce street address numbers and minimize naming of short streets leading to single homes	Ongoing	Ongoing
GOVT-d-4	Request FEMA update National Flood Insurance Program info/GIS maps to reflect mitigation measures	Ongoing	Ongoing

HSNG-b-3	Require engineered plan sets for retrofitting of homes on steep hillsides	Ongoing	Ongoing
ECON-b-1 HSNG-b-2 HSNG-c-1	Require engineered plan sets for retrofitting soft story buildings and two-story homes with living area over garages and split-level homes (those not covered by plan set A)	Ongoing	Ongoing
HSNG-g-18	Require fire mitigation measures in homes (braced water heaters, flexible gas couplings, bolting homes to foundations, reinforcing cripple walls)	Ongoing	Ongoing
HSNG-g-14	Require fire sprinklers in all mixed use development to protect residential uses from fires started in non-residential areas	Ongoing	Ongoing
HSNG-g-12	Require fire sprinklers in homes at wildland-urban interface or >1.5 miles/5-minute response time from a fire station	Ongoing	Ongoing
LAND-d-1	Require geotechnical/soil studies to prevent creating unstable slopes (Municipal Code Ch. 10, Article 8 - Grading and Clearing, CBC)	Ongoing	Ongoing
LAND-d-3	Require grading permits/plans to control erosion/sedimentation prior to development approval (Municipal Code Ch. 10, Article 8 - Grading and Clearing, CBC)	Ongoing	Ongoing
ECON-e-3 HSNG-g-3	Require new buildings be constructed of fire-resistant materials and use fire-resistant design	Ongoing	Ongoing
INFR-c-6	Require new development in high fire danger areas to provide adequate access roads, onsite fire protection, evacuation signage, and fire breaks	Ongoing	Ongoing
LAND-a-8 LAND-d-2	Require review of geotechnical/soil studies be conducted by trained/credentialed personnel (Municipal Code Ch. 10, Article 8 - Grading and Clearing, CBC)	Ongoing	Ongoing
LAND-d-1	Require site-specific geologic or geotechnical reports for re/development in areas subject to earthquake-induced landslides (BCB Reso 93-037 City of Hayward Hillside Design and Urban/Wildland Interface Guidelines, Subdivision Map Act)	Ongoing	Ongoing
HSNG-k-6	Sponsor community CERT training	Ongoing	Ongoing
ECON-e-2 HSNG-g-2	Tie public education, defensible space ordinance to field enforcement	Ongoing	Ongoing
HSNG-k-5	Use disaster anniversaries to remind the public of mitigation activities	Ongoing	Ongoing
LAND-d-4	Use water management ordinances to control erosion/sedimentation (Municipal Code Ch. 10, Article 8 - Grading and Clearing, CBC)	Ongoing	Ongoing

ENVI-a-11	When remodeling existing infrastructure, remove asbestos	Ongoing	Ongoing
HSNG-g-8 INFR-c-1 INFR-c-2	Work to ensure reliable source of water for fire suppression	Ongoing	Ongoing
GOVT-d-7	Work with major employers/hazmat agencies to coordinate mitigation	Ongoing	Ongoing
LAND-d-5	Zone for hillside development constraints especially in areas of existing landslide (Municipal Code Ch. 10, Article 8 - Grading and Clearing, CBC)	Ongoing	Ongoing
ECON-i-5 HSNG-j-1	Develop a repair and reconstruction ordinance for damaged buildings following a disaster that requires simultaneous retrofit	Ongoing	Ongoing
INFR-c-8	Maintain fire roads and/or public right-of-way roads and keep them passable at all times	Ongoing	Ongoing
HSNG-g-13	Require fire sprinklers in all new or substantially remodeled multifamily housing	Ongoing	Ongoing
ECON-e-5 HSNG-g-7	Require smoke detector installation for finalizing permits or as a condition for the transfer of property	Ongoing	Ongoing
GOVT-d-6	Participate in multi-agency efforts to mitigate fire threat	Ongoing	Ongoing and Under Review
GOVT-b-4	Establish a recovery plan that specifies roles/priorities/responsibilities of departments and process for policy-making by elected/appointed	Ongoing	Underfunded
INFR-b-1	Expedite funding/retrofit of seismically-deficient bridges and road structures	Ongoing	Underfunded
ECON-e-10 HSNG-g-16	Conduct periodic fire safety inspections of privately-owned commercial, industrial, and multifamily buildings	Under Study	Ongoing
ECON-j-6 HSNG-k-13	Develop a maintain-a-drain type program	Under Study	Ongoing
ECON-j-12 HSNG-k-15	Inform shoreline property owners of the possible long-term economic threat posed by rising sea levels	Under Study	Ongoing
ECON-a-2 HSNG-a-2	Create incentives for owners of historic/architecturally significant buildings to retrofit to minimize likelihood of demolition	Under Study	Under Review
ECON-b-9	Provide technical assistance for seismically strengthening soft-story buildings	Under Study	Under Review

ECON-e-9 HSNG-g-15	Create list of high-occupancy, high fire risk buildings for expedited inspection	Under Study	Underfunded
ECON-c-3 ECON-c-4 HSNG-d-3 HSNG-d-4	Require owners of unreinforced masonry buildings to inform tenants and make them aware of any retrofitting	Underfunded	Complete
ECON-c-2	Work with owners to retrofit unreinforced masonry buildings (structural analyses, obtain funding, mandatory program, penalties)	Underfunded	Complete
GOVT-c-25	Coordinate with Red Cross to ID facilities for distribution of supplies	Underfunded	Under Review
LAND-f-2 LAND-f-3	Assist with retrofit of homes in older urban neighborhoods	Underfunded	High Priority
ECON-b-4 HSNG-c-4	Conduct a soft-story inventory	Underfunded	High Priority
ECON-j-3	Develop printed materials, outreach encouraging private business employees to have family disaster plans	Underfunded	High Priority
GOVT-c-6	Ensure emergency personnel have adequate radios/breathing apparatuses/protective gear/etc for disaster response	Underfunded	High Priority
ECON-b-6 ECON-d-3 HSNG-b-9 HSNG-c-7 HSNG-e-4	Investigate/adopt appropriate financial/procedural/land use incentives to facilitate fragile building retrofits	Underfunded	High Priority
ECON-i-1 ECON-i-2 ECON-i-3 ECON-i-4	Establish a Building Occupancy Resumption Program	Underfunded	Low Priority
ECON-f-9	Require annual inspection of approved flood-proof buildings to ensure flood-proofing is in good conditions and key employees are aware of emergency plans	Underfunded	Not Yet Considered

INFR-d-18	Use EPA criteria to inventory assets, condition, and necessary improvements through GIS to determine locations for creek monitoring gauges	Underfunded	Not Yet Considered
ECON-h-3	Let building owners know that seismic retrofits also protect against explosion, and air ducts can be designed to contain airborne biological contaminants	Underfunded	Not Yet Considered
GOVT-a-1	Assess vulnerability of critical facilities and make recommendations for appropriate mitigation	Underfunded	Ongoing
INFR-b-8	Comply with building code, fire code, and Alquist-Priolo Act when constructing or remodeling public buildings	Underfunded	Ongoing
HSNG-g-5	Consider fire safety/evacuation/emergency vehicle access when reviewing proposals for additions or second units in wildland-urban interface regions	Underfunded	Ongoing
ECON-e-6 HSNG-g-1 INFR-c-3	Develop a defensible space vegetation program	Underfunded	Ongoing
LAND-e-2	Discourage/mitigate/prevent new or major construction on slopes greater than set percentage	Underfunded	Ongoing
ECON-g-2 HSNG-i-2	Educate design professionals on landslide/erosion mitigation strategies	Underfunded	Ongoing
ECON-j-9	Encourage formation of community- and neighborhood-based programs for wildfire education	Underfunded	Ongoing
INFR-d-8	Enforce provisions intended to keep waterways clear of obstructions to conform to Regional Water Quality Control Board's Best Management Practices	Underfunded	Ongoing
INFR-a-9	Ensure critical intersection traffic lights function following loss of power	Underfunded	Ongoing
LAND-c-3	Ensure development proposals by floodways referred to flood control/wastewater for review (consistent with NPDES)	Underfunded	Ongoing
INFR-a-1 INFR-a-20	Establish plans for delivery of fuel to/from critical infrastructure providers	Underfunded	Ongoing
ECON-i-6 HSNG-j-2	Establish requirements for repair and reoccupancy of historically significant structures (shoring/stabilization, consult with preservationist, expedited permits)	Underfunded	Ongoing

LAND-e-1	For new development, require a buffer between residential properties and landslide/wildfire hazard areas	Underfunded	Ongoing
ENVI-b-9	Increase fleet fuel efficiency, reduce # of fleet vehicles, convert diesel to bio-diesel, employee anti-idling education	Underfunded	Ongoing
GOVT-c-19	Increase local patrolling during high fire danger	Underfunded	Ongoing
HSNG-k-3	Inform residents of comprehensive home mitigation activities through workshops, publications, and media announcements/events	Underfunded	Ongoing
INFR-b-7	Install earthquake-resistant connections where pipes enter or exit bridges	Underfunded	Ongoing
INFR-b-6	Install portable facilities to allow pipelines to bypass failure zones	Underfunded	Ongoing
INFR-b-4	Install specially-engineered pipelines in areas vulnerable to earthquakes	Underfunded	Ongoing
INFR-a-8	Pre-position emergency power generation capacity in critical buildings	Underfunded	Ongoing
GOVT-a-12	Prior to acquisition of property for critical facilities, evaluate structural/site hazards	Underfunded	Ongoing
LAND-f-1	Prioritize retrofit of infrastructure serving urban areas over outlying areas	Underfunded	Ongoing
INFR-b-2	Prioritize retrofit over expansion of transportation and infrastructure systems	Underfunded	Ongoing
ECON-f-4 ECON-f-5 HSNG-h-4 HSNG-h-5	Provide information, sandbags and plastic sheeting to residents and businesses at multiple locations in advance of a rainstorm, and deliver to vulnerable populations upon request	Underfunded	Ongoing
ENVI-b-7	Purchase only EnergyStar appliances for city use	Underfunded	Ongoing
INFR-b-5	Replace or retrofit structurally deficient water retention structures	Underfunded	Ongoing
LAND-b-1	Review new development for fire mitigation and safety	Underfunded	Ongoing
ECON-j-5	Sponsor CERT training for employees of private businesses	Underfunded	Ongoing
EDUC-b-1	Work with Red Cross, county, and non-profit to set up MOU for use of school facilities in a disaster	Underfunded	Ongoing
GOVT-c-13	Continue to participate in mutual aid/cooperative response agreements with neighboring jurisdictions	Underfunded	Ongoing
LAND-f-5	Create/preserve buffers between development and hazardous materials; mitigate existing areas w/o buffers	Underfunded	Ongoing

LAND-b-2	Develop a regulatory framework for managing wildland-urban interface using best practices	Underfunded	Ongoing
ECON-j-13 HSNG-k-16 INFR-g-7	Develop/distribute culturally appropriate mitigation and preparedness materials	Underfunded	Ongoing
HSNG-g-9	Expand vegetation management to include chipping, mechanical fuel reduction equipment, goats, selective harvesting, and controlled burning	Underfunded	Ongoing
GOVT-c-7	Participate in system of interjurisdictional communications	Underfunded	Ongoing
HSNG-k-7	Include flood fighting technique session based on CA Dept of Water Resources training in CERT program	Underfunded	Under Review
GOVT-c-14	Install alert/warning systems for evacuation and shelter-in-place	Underfunded	Under Review
GOVT-b-2	Prepare a basic Recovery Plan	Underfunded	Under Review
ECON-b-5 HSNG-c-5 HSNG-c-6	Use inventory to require owners to inform existing/future tenants that they may live/work in a soft-story building	Underfunded	Under Review
ECON-j-11	Encourage joint meetings of security/operations personnel at major private employers to develop ways to work together for increased safety and security	Underfunded	Underfunded
INFR-a-12	Encourage undergrounding facilities through planning approval process	Underfunded	Underfunded
GOVT-c-8	Harden emergency response communications	Underfunded	Underfunded
LAND-c-2	Incorporate FEMA guidelines into plans/procedures for managing flood hazards	Underfunded	Underfunded
HSNG-k-9 HSNG-k-12	Offer a tool lending library for mitigation activities	Underfunded	Underfunded
INFR-a-4	Retrofit or replace vulnerable critical/lifeline infrastructure facilities and/or backup facilities	Underfunded	Underfunded
GOVT-a-2	Retrofit/replace vulnerable critical facilities	Underfunded	Underfunded

INFR-d-12	Support or conduct the repair or replacement of levees vulnerable to collapse in an earthquake	Underfunded	Underfunded
INFR-a-21	Designate a backup EOC with redundant communications systems	Underfunded	Underfunded

APPENDIX L: MITIGATION STRATEGY EVALUATION FORM

Strategy Name	Feasibility						Social benefits*					
	Funding	**Political support**	**Local Champion**	**Administrative**	**Technical**	**Legal**	**Access**	**Life Safety**	**Awareness**	**Social Capacity**	**Vulnerable Residents**	**Recreation**
	With existing or expected funding sources	Likelihood of political support	Supported by a strong advocate or local champion	With existing operations or procedures	With existing technology or know-how	With existing authorities or policies	Protects access to jobs or services	Protects residents lives and prevents injuries	Increases public awareness	Builds social networks and community capacity	Protects especially vulnerable community members	Maintains recreational or educational opportunities

Scoring Key	
+1	Criteria definitely met
0	Unsure/don't know
-1	Criteria not met/negative effects

Economic Benefits				Environmental Improvement					Community Objectives		Total Score
Jobs	**Commuter Movement**	**Reduces Disruptions**	**Reduces Damage**	**Habitats and Biodiversity**	**Water Quality**	**GHG**	**Water Use**	**Energy Use**	**Community Objectives**	**Existing Plans**	
Promotes or retains jobs	Maintains commuter movement	Reduces service or network disruptions	Reduces asset damage, e.g., to structures or infrastructure	Creates or maintains habitat and biodiversity	Maintains or improves water quality	Reduces GHGs	Reduces water use	Reduces energy use	Advances other community objectives	Supports existing plan objectives, i.e., general plan policies	

Scoring Key	
+1	Criteria definitely met
0	Unsure/don't know
-1	Criteria not met/negative effects