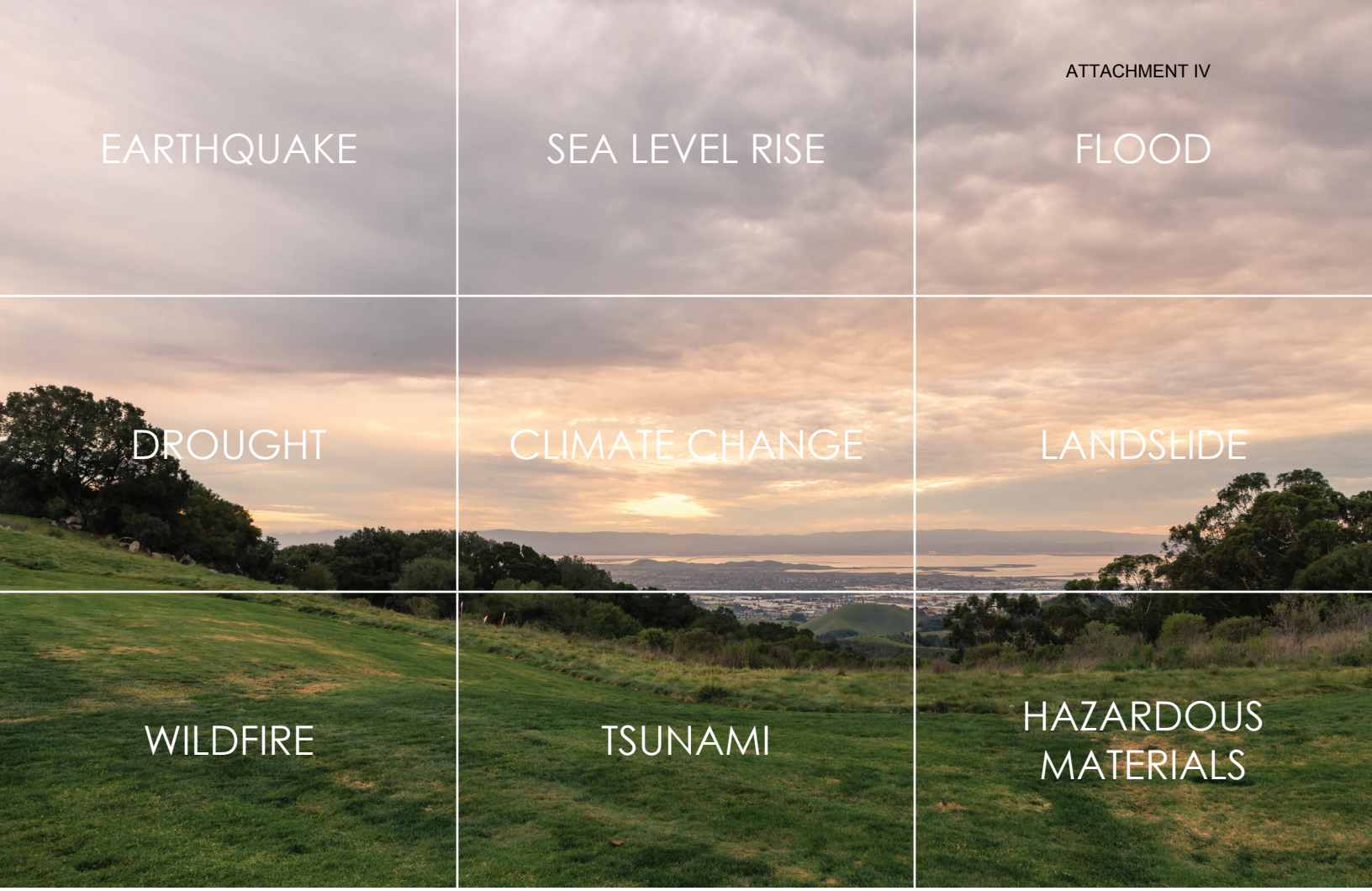
ATTACHMENT IV



LOCAL HAZARD MITIGATION PLAN

2016

CITY OF HAYWARD

HEART OF THE BAY

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EXECUTIVE SUMMARY

The 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. This year, an interdepartmental team participated in a regional effort to update Local Hazard Mitigation Plans led by the Association of Bay Area Governments (ABAG).

The purpose of this Local Hazard Mitigation Plan update 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. In addition, though not required, the Plan covers preparedness activities. The LHMP serves as a guiding document for the City's hazard mitigation activities, and 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.

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 people, buildings, and City infrastructure. 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.

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

- *Review the previous LHMP:* team members reviewed the 2010 Hayward Annex to the Multi-Jurisdictional Hazard Mitigation Plan and reported on the City's progress on implementing the plan's mitigation strategies.

- *Engage community members and stakeholders:* the team reached out to the community through a website, social media, an online survey, tabling at events, and attending community meetings. Representatives from the Hayward planning team attended ABAG's LHMP update workshops and worked with ABAG staff and the East Bay Corridors Initiative group.

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

- *Select and prioritize 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 Hazard Mitigation 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 Association of Bay Area Governments (ABAG), staff created 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 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.

A major earthquake along the Hayward Fault, predicted to have a greater than 70% probability of occurrence in the next 30 years, 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, rare 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

While Hayward is not directly at risk of 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 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.

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 Hayward Annex from the 2010 Multi-Jurisdictional 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.

Working in teams, 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.

Overall, the planning team prioritized organizational preparedness, which would mitigate the effects 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
	Drought	Recycled Water Project
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
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 expires in March of 2016. 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 mitigation activities of the past, while identifying new activities to prepare our community.

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 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 Hazard Mitigation Plan for the incorporated City of Hayward. Though unincorporated areas of Alameda County may benefit from the Local Hazard Mitigation 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 Hazard Mitigation 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 hazards included in this plan are:

- Earthquake
- Fire
- Landslide
- Flood
- Drought
- Hazardous Materials

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 UPDATE

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.

A project kick-off meeting explaining the impetus and timeline driving the plan update was held in July. 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 and preparedness activities 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 2010 plan, and provided input and comment on the community engagement plan and risk assessment.

2.3 COMMUNITY ENGAGEMENT PROCESS

Throughout the planning process, the planning team has worked to engage the community in the update, primarily through the internet and social media. Engagement activities have included:

- Distributing bilingual Local Hazard Mitigation Planning flyers and starting 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 (see http://hayward-ca.wix.com/lhmp) explaining the update process and providing a contact form
- Running a 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, Facebook, and Nextdoor platforms, as well as through existing City mailing lists (see examples of social media posts in Appendix D)

Flyers were also made available at various locations in City Hall, at the Hayward Library, and in local schools.

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

3. CAPABILITY ASSESSMENT

Per the General Plan and the City Council's stated 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 the 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 either have been or are currently being 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	2015	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	2014	Current codes: • 2013 California Building Code Part 1 and two volumes of Part 2 • 2013 California Residential Building Code Part 2.5 • 2013 California Historical Building Code Part 8 • 2013 California Existing Building Code Part 10 • 2013 California Green Building Standards Code Part 11 Used as reference: • 2012 International Code for Property Maintenance based on the 2012 International Building Code and 2012 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.
Flood Plain 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.

3.1.1 National Flood Insurance Program

The City of Hayward has participated in the National Flood Insurance Program since March 1980. In 1981, the City Council adopted the Flood Plain Management Ordinance which promoted the public health, safety, and general welfare of Hayward residents and property owners. The ordinance requires the City to continue to participate in the National Flood Insurance Program (NFIP), and regulates and restricts land use and development in flood hazard areas to prevent uses that are dangerous or increase flood hazard. The City updates the Flood Plain Management Ordinance periodically to ensure compliance with FEMA requirements. In addition to FIRM maps, the City's public-facing GIS system includes flood hazard information that can be accessed through the City of Hayward's website.

The Flood Plain Management Ordinance can be accessed online at the City of Hayward's website.

In the City of Hayward, there is one (1) property that has sustained repetitive loss according to the NFIP. The property is residential and has two (2) claims totaling $25,979.84 for both building and contents.

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.
- Enforces building codes

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 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 Department

- 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.
- Replaces City-maintained landscaping with drought-tolerant, bay-friendly landscaping.

3.2.4 Engineering & Transportation Department

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

3.2.5 Utilities & Environmental Services Department

- 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 Water Pollution Control Facility 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.
- Performs regular drainage system maintenance, including routinely cleaning and repairing stormwater drains
- Monitors City water supply and retrofits water supply systems
- Requires water conservation during drought conditions
- Educates residents on water-saving technique and offers incentives for low-flow retrofits.

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 south east 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 our growing population with the preservation of open space, and the need for economic development.

4.2 DEMOGRAPHICS

Hayward has a total population of 147,163. With a median age of just 33.8 years, the City enjoys a population that is younger than the national median by 3.1 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 (57.5%) is significantly higher than the state average (43.2%), and the percentage of residents with a bachelor's degree or higher (23.6%) is below the Alameda County average. From 2007-2011, Hayward's median household income was $62,115 and the median value of owner-occupied housing units was $381,100.

4.3 ASSETS & FACILITIES

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 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 replaced by the new 21st Century Library and Heritage Plaza, to be completed in 2018.
21st Century Library & Heritage Plaza	Mission Blvd. at C St.	2018	58,200		Forthcoming.
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.
Utilities Center	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 wastewater treatment facilities, solar panels and a cogeneration operation at this location produce renewable energy to both power the plant and return to the grid. The facility's 300 acres include more than 200 acres of former oxidation ponds and former landfills.
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, 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, 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 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. Most recently in 2011 the Hayward Fire Department had to request additional assistance to suppress a vegetation fire just south of the Stonebrae Country Club in the Southeastern corner of the City.

The City of Hayward has not experienced occurrences of major natural disasters over the past five 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

[1] Bay Area Risk Landscapes, Pg 7

winged aircraft, and two helicopters from Cal-Fire and East Bay Regional Parks department responded via air with bulldozers and hand crews on the ground coming from Hollister and Santa Clara. The 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 5 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 1,836 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. 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

Flood hazard zones in Hayward are susceptible to periodic inundation. Parts of the City's western and southern land falls within a 100 year floodplain. Localized flooding affects 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 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. See Table 4: Notable California Droughts 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.
1975 - 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.
1987 - 1992	Statewide	10 to 40	Moderate, continuing through 1989. Most extreme in northern Sierra Nevada.
2007 - 2009	Statewide	N/A	First drought for which statewide emergency proclamation was issued.
2011 - Present	Statewide	N/A	Most severe drought in California history.

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 dichlorosaline 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

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 392,300 passenger trips a day. 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 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 UP 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 15 million people in northern and central California. They have a staff of 20,000 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, 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 the San Bruno rupture, 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 Nevada mountains. 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 investment 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 expected in forthcoming revisions to the San Francisco Local Hazard Mitigation Plan.

5. HAZARD IDENTIFICATION, ANALYSIS, AND ASSESSMENT

5.1 HAZARD RISK ASSESSMENT

5.1.1 Earthquake

Earthquakes occur when two tectonic plates slip past each other beneath the earth's surface, causing sudden and rapid shaking of the surrounding ground. Earthquakes originate on fault planes below the earth's surface, where two or more tectonic plates meet. As the 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 total amount of energy released in an earthquake is described by the earthquake magnitude. The moment magnitude scale (abbreviated as M) is logarithmic, meaning the energy released by an earthquake increases logarithmically with each step of magnitude.[2] 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.

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. In the Bay Area,

[2] USGS (2014)

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 is capable of triggering 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 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.

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 150,000 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.

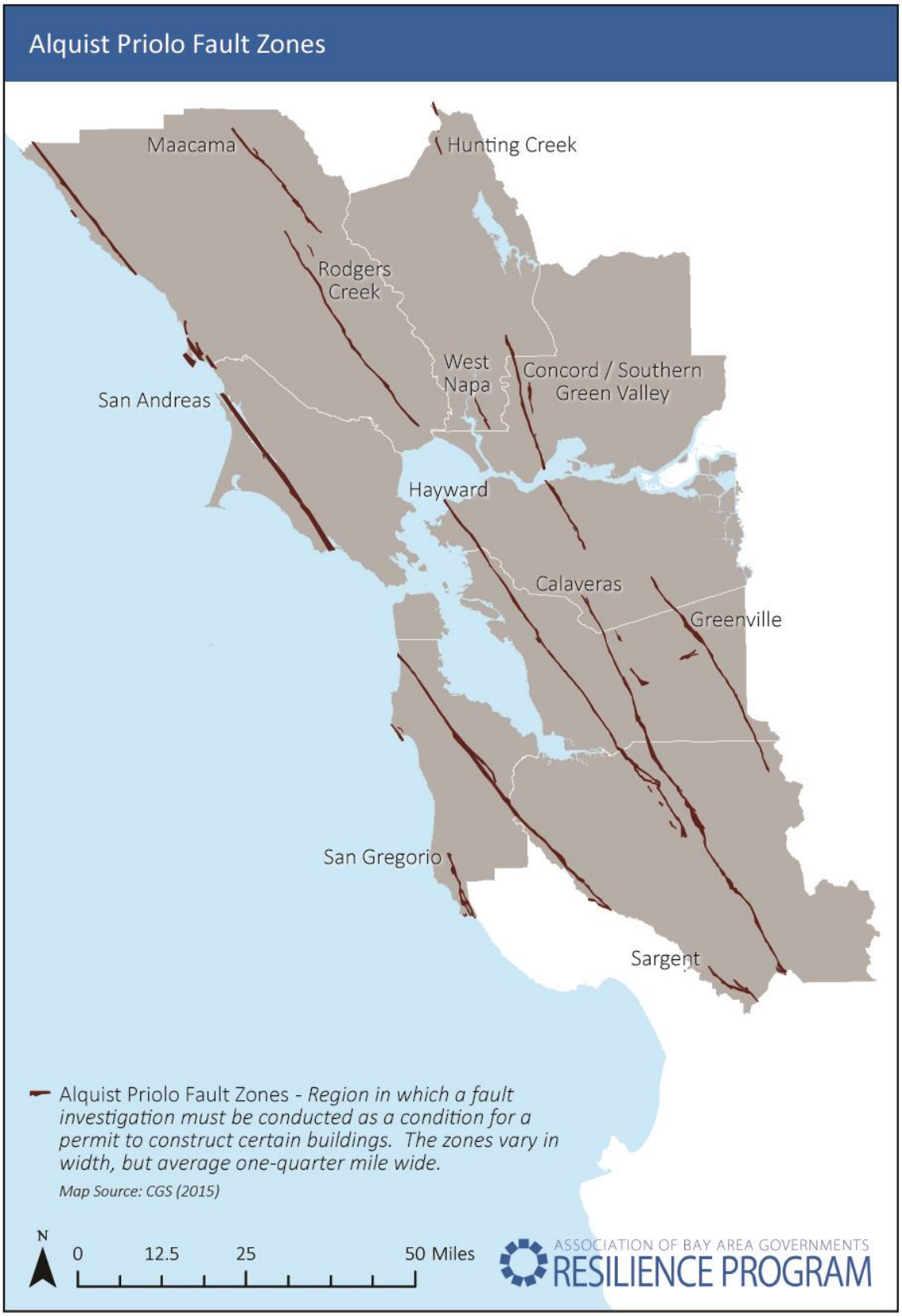

Alquist Priolo Fault Zones
Maacama
Hunting Creek
Rodgers Creek
West Napa
Concord / Southern Green Valley
San Andreas
Hayward
Calaveras
Greenville
San Gregorio
Sargent
Alquist Priolo Fault Zones - Region in which a fault investigation must be conducted as a condition for a permit to construct certain buildings. The zones vary in width, but average one-quarter mile wide.
Map Source: CGS (2015)
N
0
12.5
25
50 Miles
ASSOCIATION OF BAY AREA GOVERNMENTS
RESILIENCE PROGRAM

Figure 1

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 soft, weak, or open-front (SWOF) features that render the building susceptible to collapse in an earthquake. 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 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 collocated buildings and infrastructure.[7]

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

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 rated 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 Table 5: Modified Mercalli Intensity (MMI) Scale) 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.

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, and 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 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.

Both maps 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 Main Branch of the Hayward Library (and the site of the future 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 East, 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, will 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.

Hayward Fault North & South M7.0 Scenario Shakemap

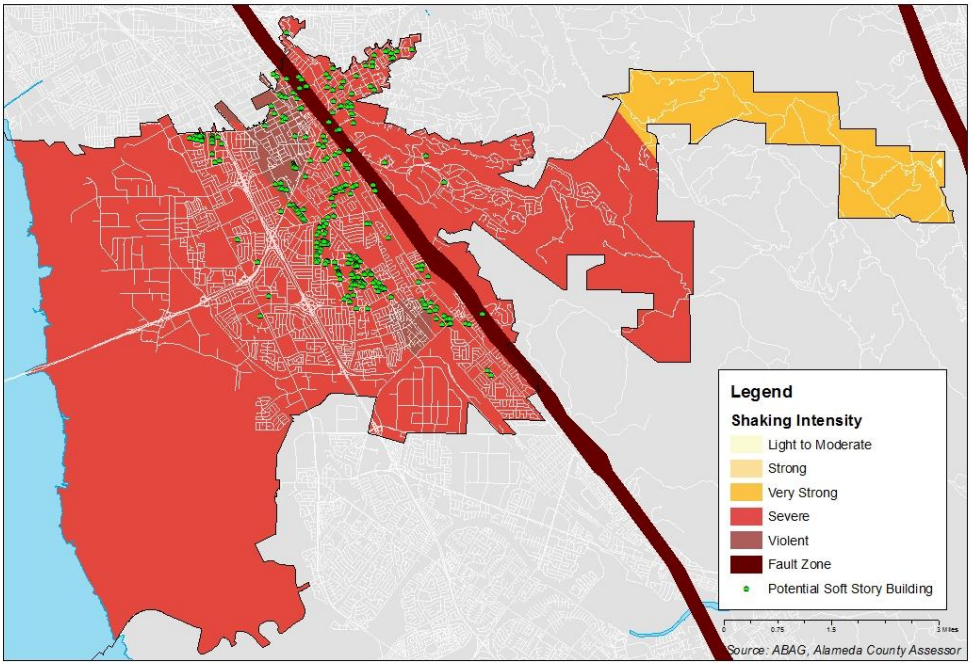


Figure 2

Hayward Fault South M6.8 Scenario Shakemap

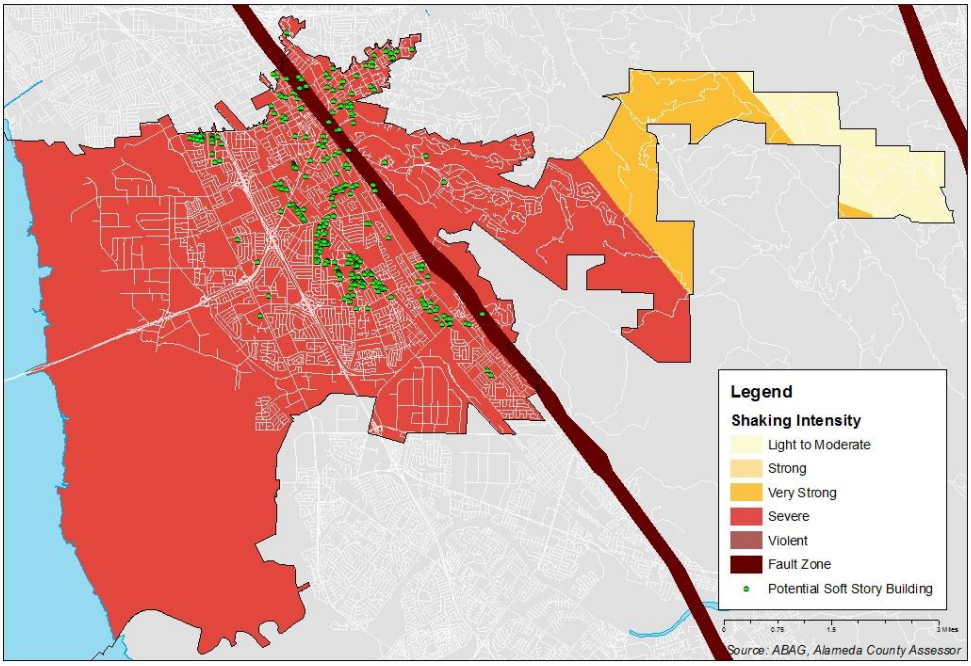


Figure 3

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.

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.

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

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

Hayward Fault North & South M7.0 Scenario Liquefaction Hazard

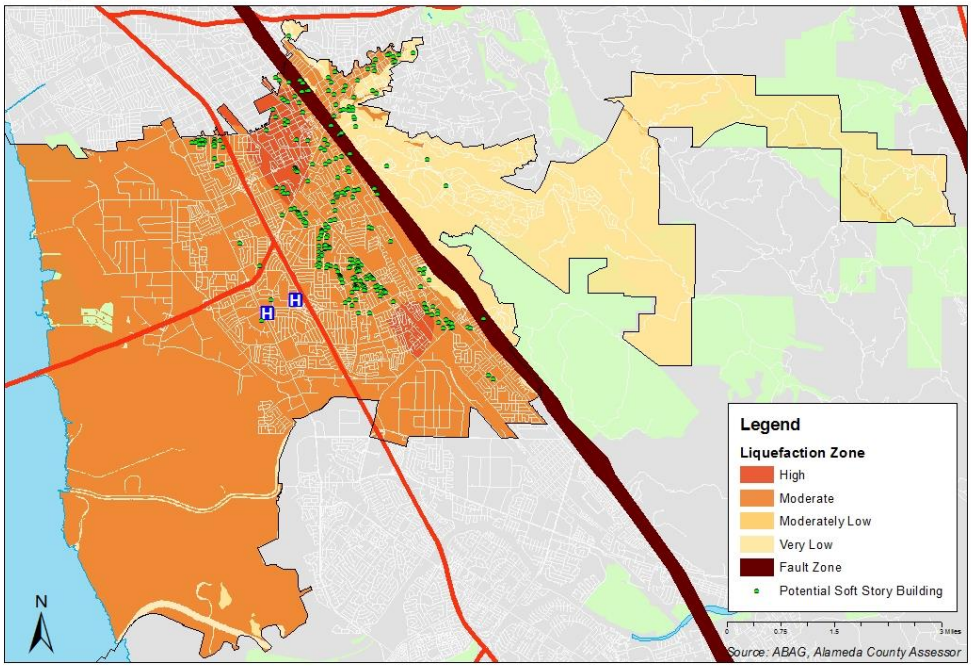


Figure 4

Hayward Fault South M6.8 Scenario Liquefaction Hazard

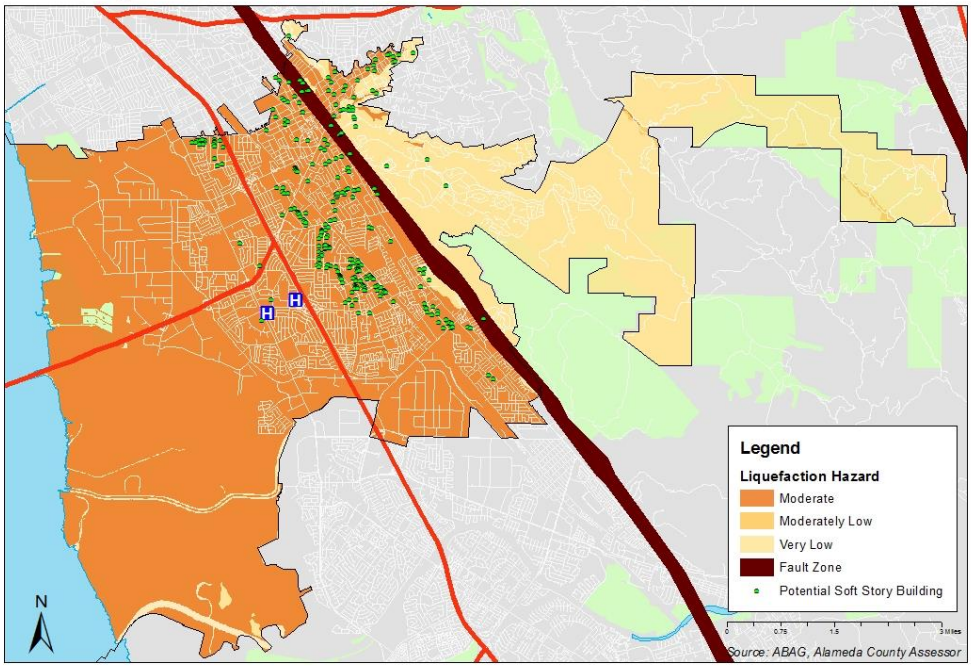


Figure 5

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, largely in areas zoned for open space or agricultural uses, as seen in Figure 6. 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.

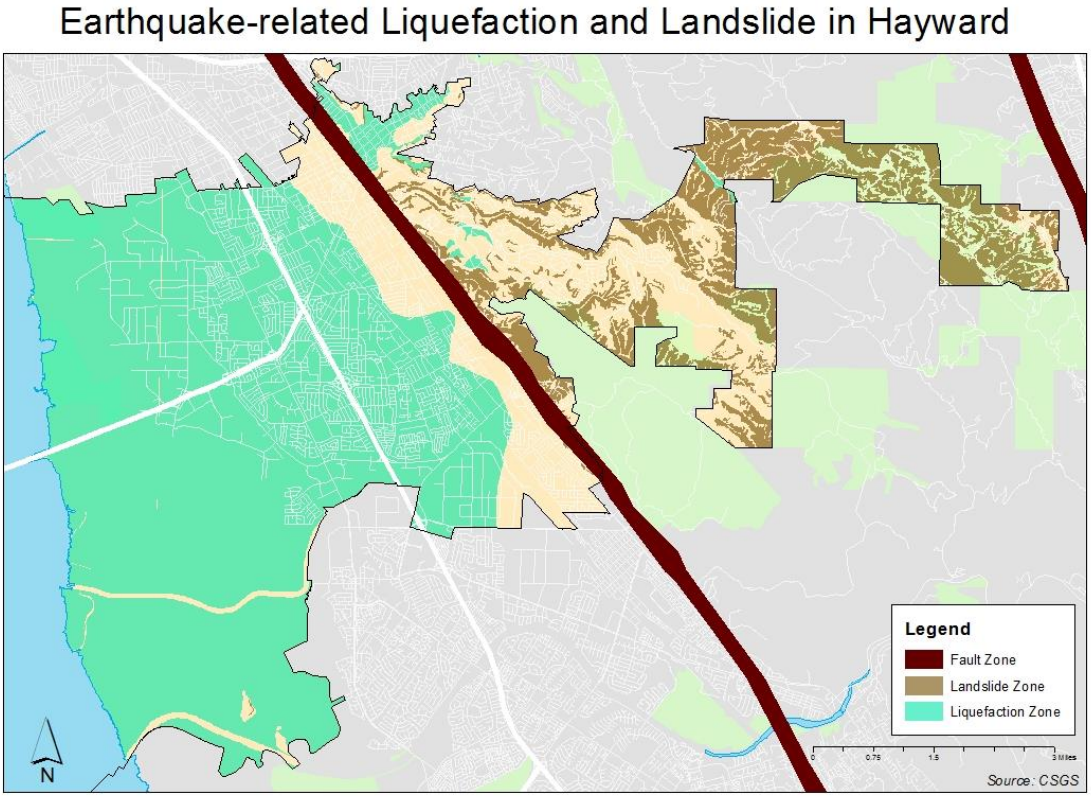


Figure 6

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

[10] Schiff, A. (1990)

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.

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, 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.

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

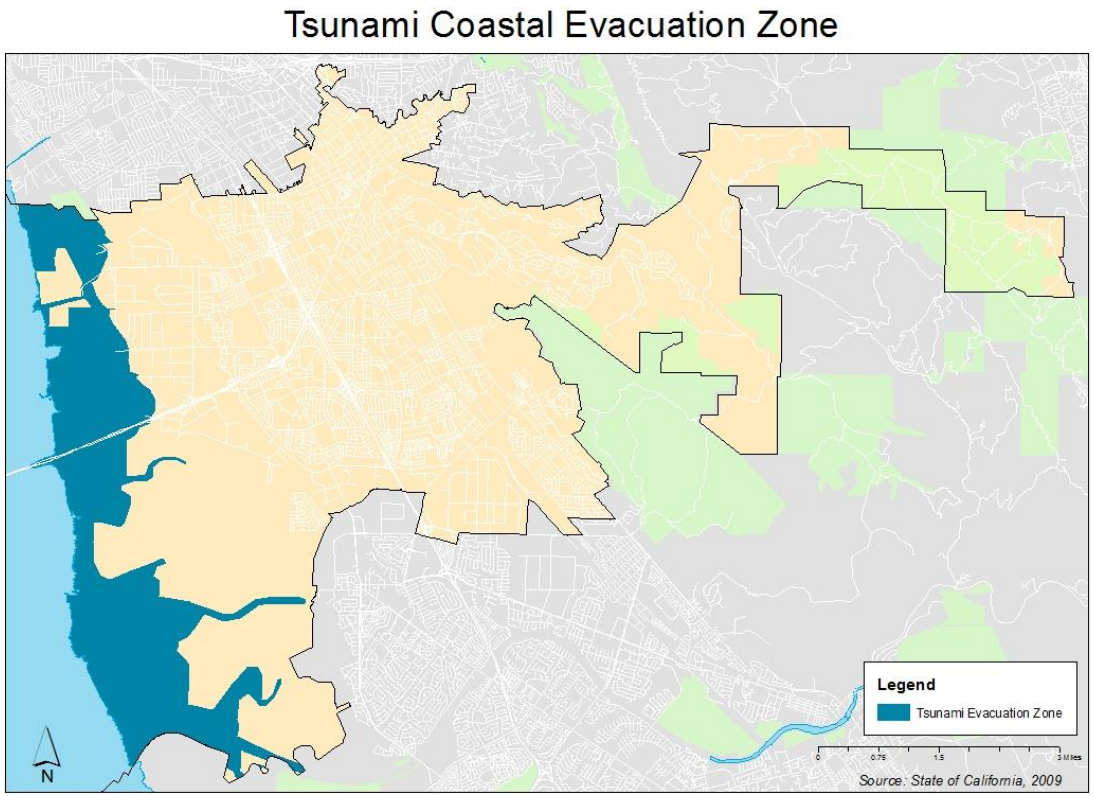


Figure 7

The City of Hayward is susceptible to minimal inundation along the shoreline, primarily in the wetlands. The out of service 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.

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 fire 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. 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 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.

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.

In the Bay Area, fire areas generally fall into two categories – State Responsibility Areas, where 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 wildland-urban interface (WUI) fires in the Hayward hills, as depicted in Figure 8, fire following an earthquake compounded by numerous ignitions and constrained resources, and, in the industrial areas, fire complicated by hazardous materials.

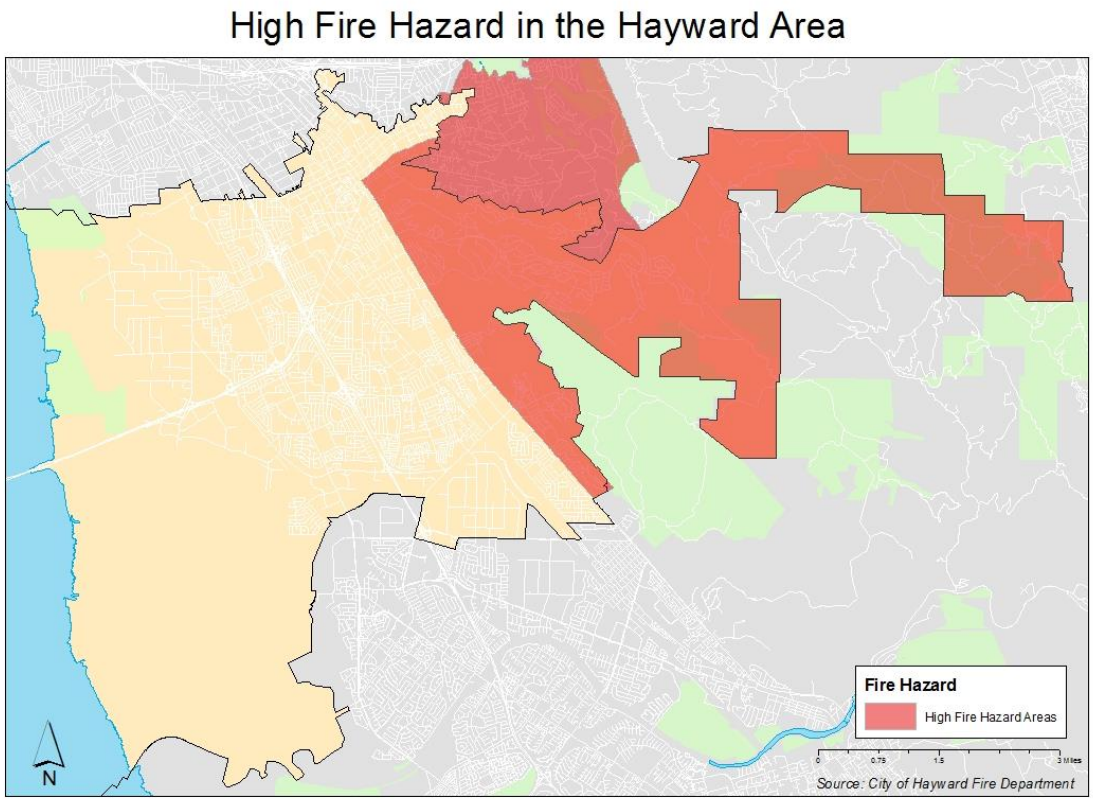


Figure 8

5.1.2.1 CLIMATE CHANGE & FIRE

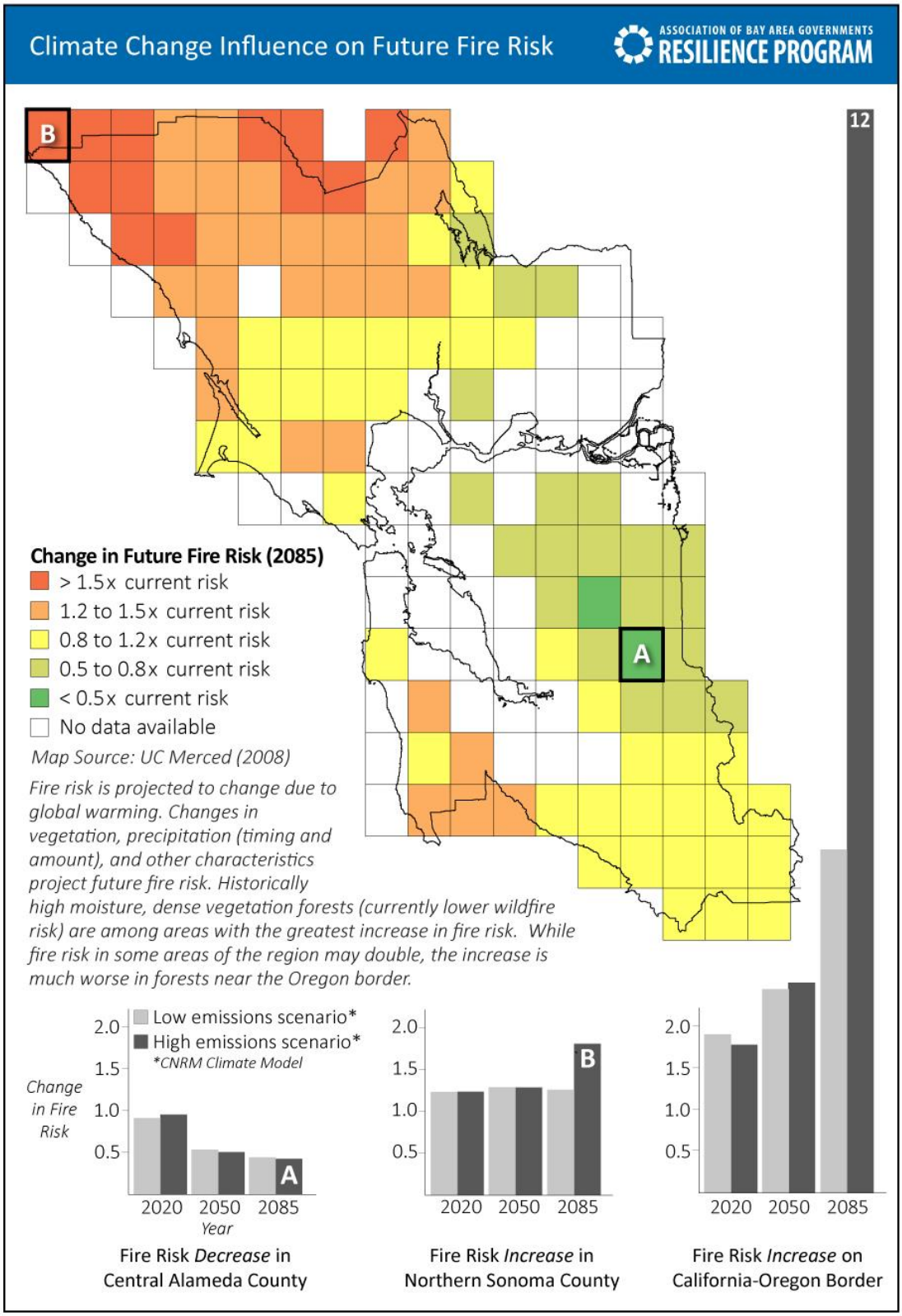
Climate change increases fire risk as temperatures rise and dry periods persist over longer fire seasons. Wildfire risk will also be influenced by potential changes in vegetation as a result of changing rainfall and temperatures.[13]

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.

[13] California Climate Change Center, (2012)
[14] Westerling, A.L., Bryant, B.P. (2008)

Figure 9: Climate Change Influence on Future Fire Risk



5.1.2.2 WILDFIRE

CAL FIRE produces Wildland-Urban Interface 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

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.

For both types of landslides, there are not currently methods available to estimate the probabilities of future landslides at a local or jurisdictional scale. 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.[15] 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 most recent El Nino event.[16]

The USGS has identified the Hayward hills area (Figure 10) as a principal debris-flow source area – a site where intense rainfall is likely to trigger a fast-moving downslope mudflow. 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 the wet El Nino event anticipated this winter[17]), 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.

[15] USGS (1999)

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

[17] As of this writing, the National Weather Service is predicting an approximate 95% chance that El Nino will continue in the Northern Hemisphere through winter 2015-16, with an up to 40% chance of a wetter than average winter in the Bay Area. *(Source: National Weather Service Climate Prediction Center El Nino/Southern Oscillation Diagnostic Discussion, 10 Sept. 2015)*

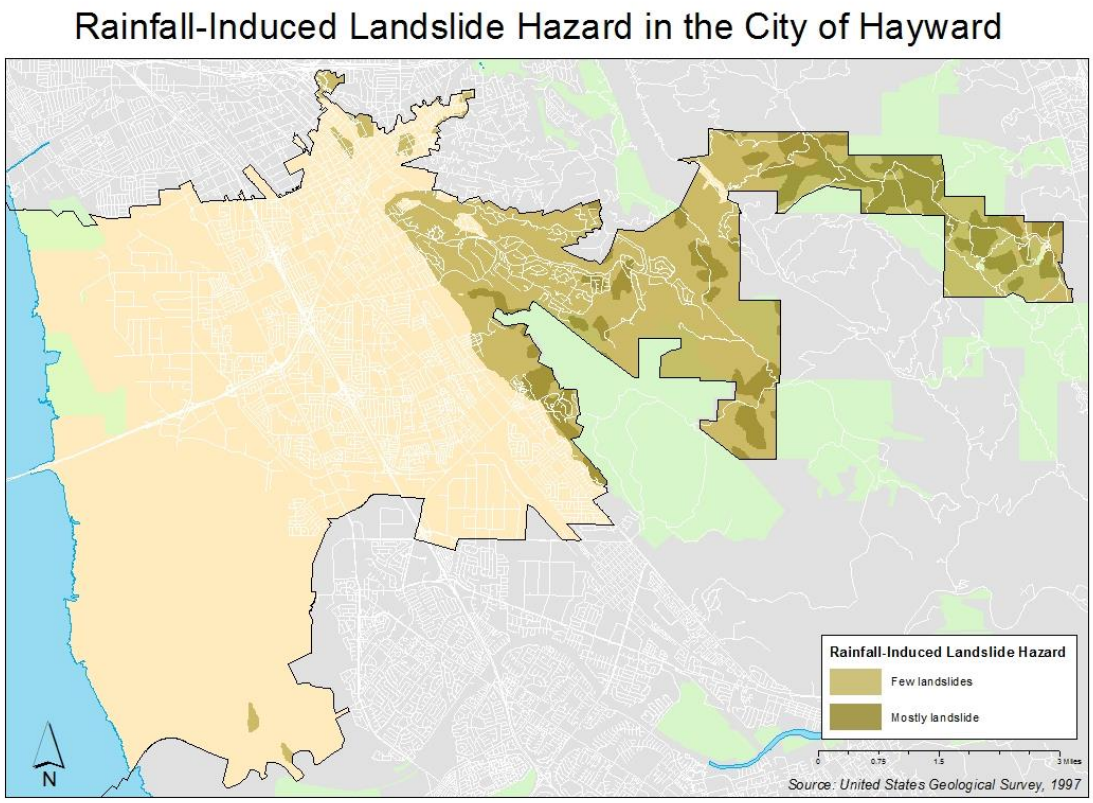


Figure 10

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 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 flats 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.

The shoreline is at highest risk of 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.

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 the portions of Hayward 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 floods, as are the inland stretches of the San Lorenzo Creek. Industrial, commercial, residential, and civic buildings are all located within the 500-year flood zone.

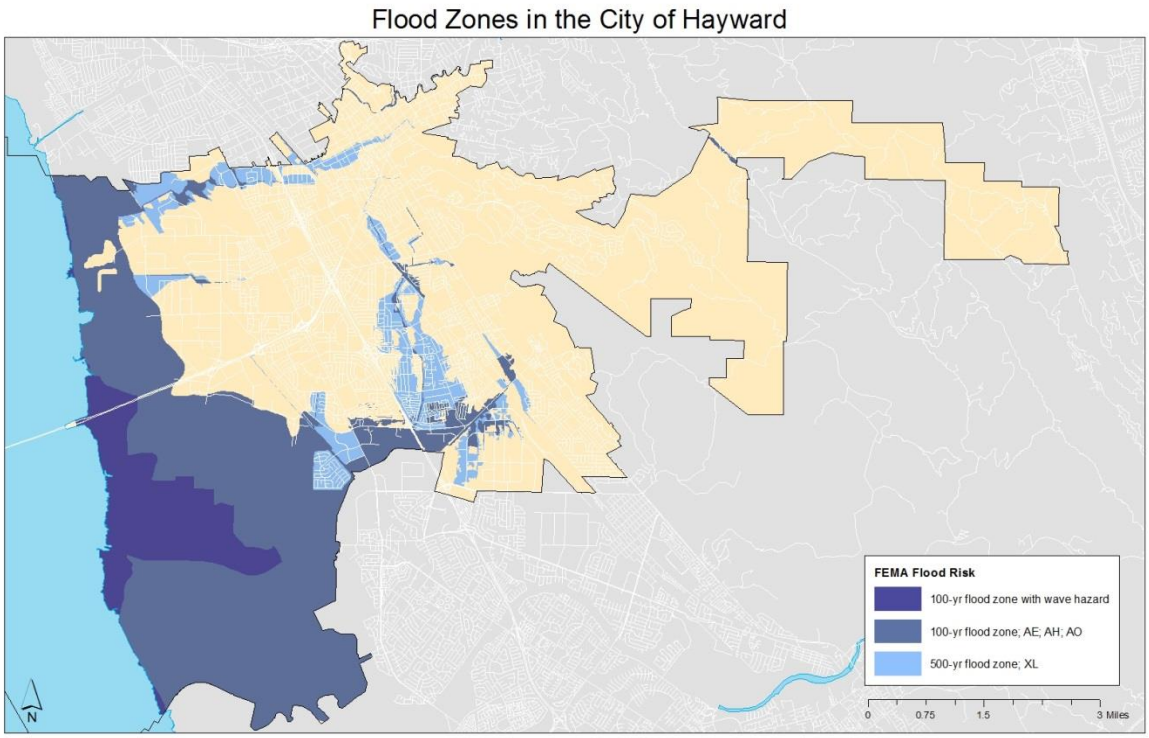


Figure 11

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 6: Regional Sea Level Rise Projections Relative to Year 2000 for the California Coast South of Cape Mendocino.

[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)

Table 6: Regional Sea Level Rise Projections Relative to Year 2000 for the California Coast South of Cape Mendocino[19]

	Sea Level Rise (inches)		
Year	**NRC 2012 Projection** (mean ± the standard deviation for the A1B Scenario[20])	**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

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 to 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. Finally, increase

[19] 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).

[20] 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.

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.

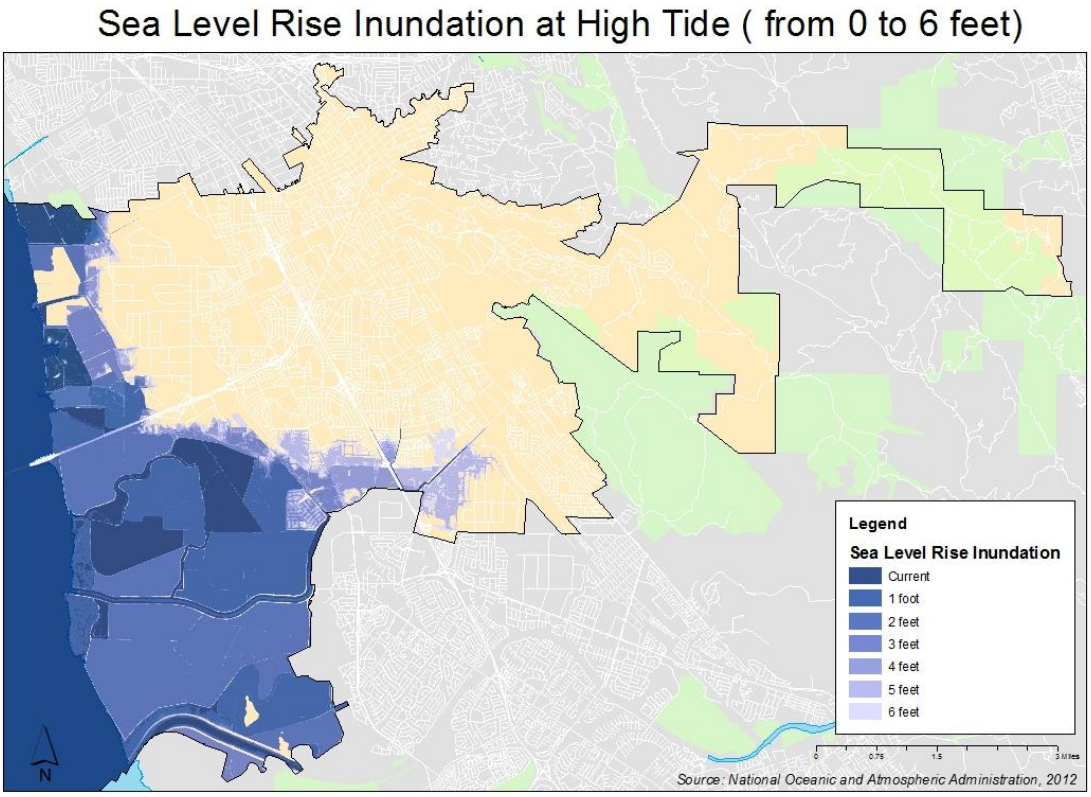


Figure 12

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 12).

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 FEMA, and including existing and preliminary map products for the San Francisco Bay and the Outer Coast of California.[21]

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.

There is only one repetitive loss property in the City of Hayward outside of an identified flood plain that has sustained repetitive loss.

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.

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

[21] http://www.r9map.org/Pages/California.aspx?choState=California

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.[22]

A total water level of 36 inches above mean higher high water (MHHW)[23] 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 King Tide, which is an astronomical tides 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.

The values presented in Table 7 are generally applicable to central San Francisco Bay[24] 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 7 are based on an analysis that does not include the effects of locally wind waves and assumes that future storms will behave like past storms.

[22] 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.
[23] 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.
[24] Existing condition water levels in the first row of Table 7 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 7: Matrix showing combinations of Seal 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 commonly 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 mean higher high water (MHHW). It also illustrates changes in flood frequency and includes visual simulations of flooding at local sites.[25]

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 on Hayward, prolonged periods of drought can cause secondary impacts that can affect the region, including:

- Increased wildfire hazard, including more fire starts and more prolonged conflagrations fueled by excessively dry vegetation and reduced water supply for firefighting purposes.
- Reduced water supply for crops and livestock feed, impacting the economy centered around the agriculture industry.
- 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 a larger expanse of western states. This has been the case in California since 2013 (see Figure 13). While the drought exists in every county, the impacts of the drought are locally unique, based on local water supply systems, soil conditions, and the typical climate and vegetation land covering. The effects of drought are managed in the Bay Area through the importation of water and the storage of water in reservoirs.

The *United States Drought Monitor* is produced by the National Oceanic and Atmospheric Administration (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.[26] The maps project temperature and precipitation twelve months out – describing the conditions as likely below, above, or average.

In response to the current[27] drought, 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 educating and incentivizing residents to do the same through a public education campaign. As a result, Hayward has been

[25] coast.noaa.gov/slr/

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

[27] As of this writing

able to reduce water consumption by 26% as of this writing -- handily outperforming the Governor’s mandated 8% reduction.

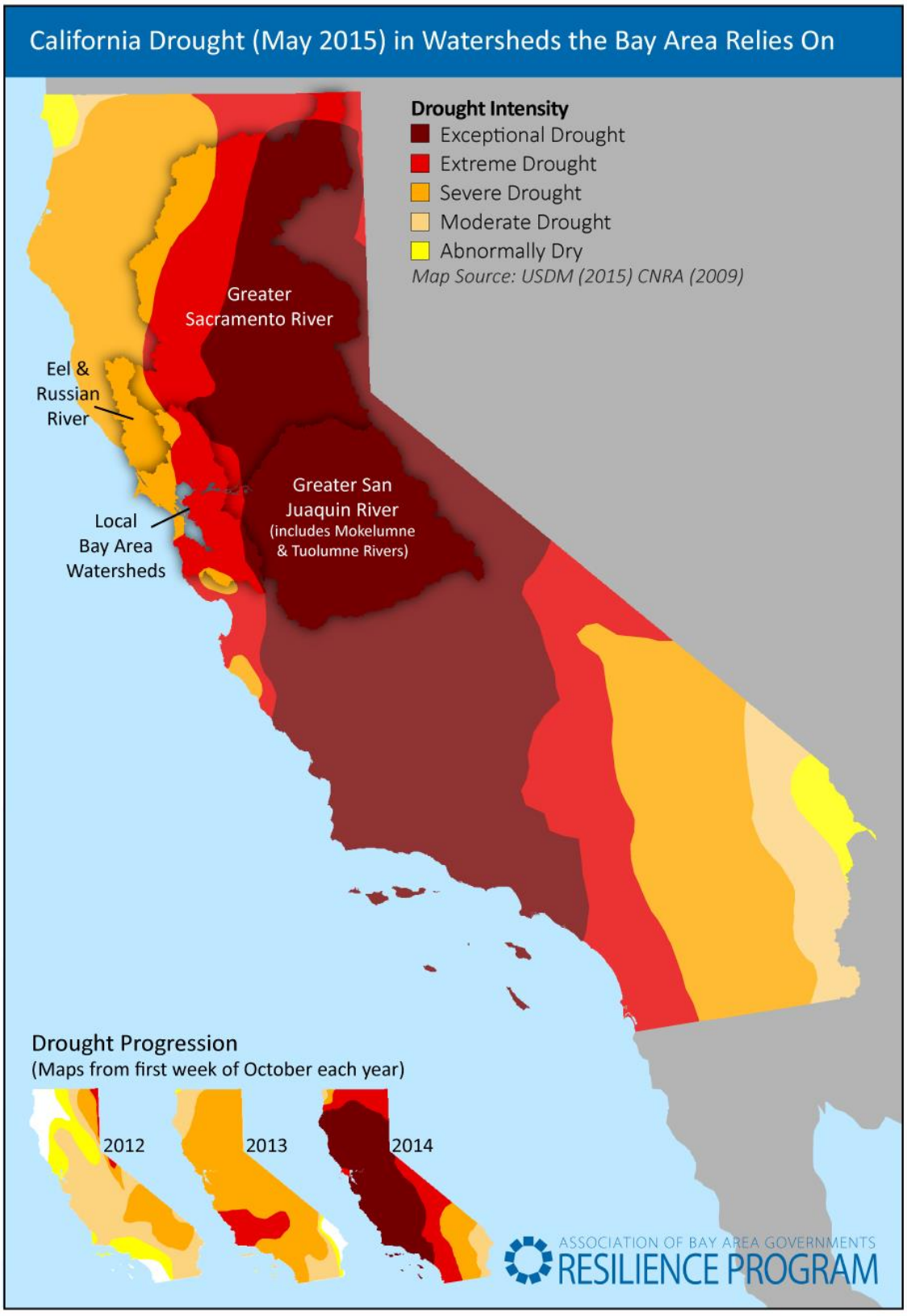

California Drought (May 2015) in Watersheds the Bay Area Relies On
Drought Intensity
Exceptional Drought
Extreme Drought
Severe Drought
Moderate Drought
Abnormally Dry
Map Source: USDM (2015) CNRA (2009)
Greater Sacramento River
Eel & Russian River
Greater San Juaquin River
(includes Mokelumne & Tuolumne Rivers)
Local Bay Area Watersheds
Drought Progression
(Maps from first week of October each year)
2012
2013
2014
ASSOCIATION OF BAY AREA GOVERNMENTS
RESILIENCE PROGRAM

Figure 13

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 snow pack 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 snow pack 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.

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 (LPG) 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

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

[29] Scripps Institute of Oceanography (2012)

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.

5.2 SUMMARY OF EXPOSURE TO ALL HAZARDS

As was included in the 2010 Annex to the Multi-Jurisdictional Hazard Mitigation Plan, the updated table below (Table 8) identifies the acreage of urban land exposed to various hazards covered in this plan.

Table 8: Exposure of Urban Land to Multiple Hazards (Acres)

Hazard	Plan Year 2005	Plan Year 2010	Plan Year 2015
Total acres of urban land	19,200	21,760	17,659[30]
Earthquake Faulting	-	618	736
Earthquake Shaking (Extreme, Violent, or Severe)	-	17,086	17,659
Earthquake-Induced Landslide	-	1,038	1,143
Liquefaction (Moderate, High, or Very High)	-	13,998	12,003
Flooding (100-year floodplain)	-	3,113	1,020
Flooding (500-year floodplain)	-	1,765	1,377
Wildfire	-	811	9,442
Dam inundation	-	4,172	4,335
Sea Level Rise (≤3 feet)	-	-	327
Tsunamis (in inundation zone)	-	200	223
Drought	19,200	21,760	17,659

5.2.1 Changes in Development Since Last Plan Update

The City of Hayward is almost entirely built out and as such there have been few changes in development since the last plan update. New housing developments, primarily comprised of single family homes, have been constructed in the Hayward hills, with the effect of moving the wildland-urban interface further inland without appreciably increasing risk. Other developments in the past five years have been urban infill or redevelopment projects, which typically increase density in the built-out areas of the City. These developments increase density, but also replace or rehabilitate older buildings to the standards of the current building code.

[30] Please note that the 2015 total urban acreage value is correct, though total urban acreage has continued to grow over the past 10 years. Values for 2005 and 2010 are incorrect and were generated in error.

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 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.

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 people, buildings, and City infrastructure. 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.

These goals were not included in the 2010 ABAG Multi-Jurisdictional Hazard Mitigation Plan, which was created by jurisdictions throughout the Bay Area and was not specific to the City of Hayward.

6.2 ANALYSIS OF MITIGATION MEASURES

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 via a series of meetings (see Appendix B pp.103-5). 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." Participants then ranked the mitigations strategies based on their total score. These rankings were weighted and aggregated into a final score. The highest scoring strategies were categorized as Very High priority, while the remaining strategies scoring greater than half the possible high score were identified as High priority. Those scoring less than half the possible high score were identified as Medium or Low priority strategies.

In the course of selecting and evaluating mitigation activities, the plan update team identified natural groupings for activities included in this plan:

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 mitigating and 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 mitigate hazards and prioritize and speed disaster response and recovery efforts.

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 plans to undertake these strategies as soon as practicable, or has already begun to plan implementation. High priority mitigation strategies may already be in the planning stages.

Table 9 offers an overview of the mitigation strategies organized by priority. Table 10 does the same for key mitigation activities. Mitigation strategies and activities by hazard, including more in-depth description of each strategy and its implementation, are listed in subsequent sections of this plan.

The mitigation strategies outlined in this plan align with the goals and land use designations of the City of Hayward's 2014 General Plan update, which also includes climate adaptation strategies. 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	Mitigation Strategy[31]
Very High	Preparedness
	MU-14 Increase Hazard Education and Risk Awareness
	MU-15 Improve Household Disaster Preparedness
High	MU-16 Promote Private Mitigation Efforts
	EQ-6 Implement Structural Mitigation Techniques
	EQ-9 Provide Information on Structural and Non-Structural Retrofitting
	MU-10 Incentivize Hazard Mitigation
	EQ-5 Protect Critical Facilities and Infrastructure
	WF-7 Create Defensible Space Around Structures and Infrastructure
	EQ-3 Map and Assess Community Vulnerability to Seismic Hazards
	SLR-1 Map and Assess Vulnerability to Sea Level Rise
	SLR-4 Protect Buildings and Infrastructure
	SLR-6 Protect and Restore Natural Buffers
	SLR-5 Preserve High-Hazard Areas as Open Space
	D-7 Retrofit Water Supply Systems
Medium	MU-7 Strengthen Land Use Regulations
	MU-9 Create Local Funding Mechanisms for Hazard Mitigation
	SLR-2 Manage Development in High-Risk Areas
	LS-3 Prevent Impacts to Roadways
Low	WF-1 Map & Assess Vulnerability to Wildfire
	EQ-4 Conduct Inspections of Building Safety

[31] Mitigation Strategies drawn from FEMA. D = Drought, EQ = Earthquake, LS = Landslide, MU = Multiple Hazards, SLR = Sea Level Rise, and WF = Wildfire.

Table 10: Mitigation Activities by Priority

Priority Level	Activity Group	Activities
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
	Drought	Recycled Water Project
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
Low	Administrative Programs	Building Occupancy Resumption Program 911 Registry Priority Inspection List

6.3.1 Multiple Hazards

Mitigation Strategy*	N/A - Preparedness						
Activity	**Employee Education:** Develop and implement an employee preparedness program to increase employee knowledge and preparedness.						
Problem Statement*	Hayward's Emergency Management Plan is 6 years old, and recent turnover means many 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, HR						
Partners*	FEMA, CalOES, Alameda County, HARD, 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.						
Staff Lead	Emergency Management Specialist, Fire Department Public Education & Information Officer, PIO						
Cost Estimate*†	Low						
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 the						
Potential Funding Sources*	General Fund, HMGP, PDM						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	N/A - Preparedness						
Activity	**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 6 years old, and recent turnover means many 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.						
Staff Lead	Emergency Management Specialist						
Cost Estimate*†	Low						
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*	To be determined.						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	N/A - Preparedness						
Activity	**Exercises:** Establish regular tabletop and field exercises to improve organizational response capacity and preparedness.						
Problem Statement*	Hayward's Emergency Management Plan is 6 years old, and recent turnover means many 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, RACES, and other members of the public.						
Staff Lead	Emergency Management Specialist						
Cost Estimate*†	Low						
Benefits (losses avoided)*	Improved organizational response capacity and experience in preparation for an emergency.						
Potential Funding Sources*	HMGP, PDM, to be determined.						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA MU-14 Increase Hazard Education and Risk Awareness FEMA MU-15 Improve Household Disaster Preparedness FEMA MU-16 Promote Private Mitigation Efforts
Activity	**Public Education:** Create and implement a public outreach program (like SF72 or do1thing) to educate community members about hazard risks, help "nudge" residents into being prepared and provide information on available city resources.
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.
Staff Lead	Emergency Management Specialist, Fire Department Public Education & Information Officer, PIO
Cost Estimate*†	Medium
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*	HMGP, PDM, General Fund
Timeline*	To be determined.
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA MU-14 Increase Hazard Education and Risk Awareness FEMA MU-15 Improve Household Disaster Preparedness
Activity	**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
Staff Lead	Fire Department Public Education/Information Officer
Cost Estimate*†	Low to Medium; 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*	HMGP, PDM, General Fund
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	N/A – Preparedness
Activity	**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.
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*	IT/Fire
Partners*	PD, Alameda County
Priority (Evaluation Score)*	High
Actions/ Activities	Identify, repair, purchase, or install communications redundancies in City of Hayward facilities
Staff Lead	Emergency Management Specialist
Cost Estimate*†	High
Benefits (losses avoided)*	Prevents breakdown of communications systems in an emergency, improving ability to assess damage, prioritize, and deploy resources effectively.
Potential Funding Sources*	HMGP, General Fund, Capital Improvement Fund
Timeline*	To be determined.
Related Policies*	General Plan Goal CS-5.11 Mass Communications Device

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	N/A – Preparedness
Activity	**Diversify Partnerships & MOUs:** Develop partnerships with suppliers and other jurisdictions for supplies and mutual aid following a region-wide disaster. (Preparedness)
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.
Staff Lead	Emergency Management Specialist
Cost Estimate*†	Low
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	N/A – Preparedness/Recovery						
Activity	**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.						
Staff Lead	Emergency Management Specialist						
Cost Estimate*†	Low to Medium; in-house or consultant.						
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, PDM, General Fund						
Timeline*	To be determined.						
Related Policies*	City Council “Safe” and “Thriving” priorities						

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	N/A – Preparedness						
Activity	**Renewable Emergency Energy Sources:** Install microgrid technology or purchase 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 and Environmental Services						
Partners*	FEMA, Alameda County, CEC						
Priority (Evaluation Score)*	Moderate						
Actions/ Activities	Design, purchase, install, and maintain microgrid infrastructure or portable solar generators at City facilities						
Staff Lead	Emergency Management Specialist, Environmental Services Manager						
Cost Estimate*†	High						
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*	To be determined						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA EQ-5 Protect Critical Facilities and Infrastructure						
Activity	**ABAG Regional Lifelines Council:** Participate in the ABAG Regional Lifelines Council to mitigate and prepare for hazards effecting regional utilities, transportation, and other critical infrastructure.						
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, impending 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, DHS IP						
Priority (Evaluation Score)*	High						
Actions/ Activities	Participate in Regional Lifelines Council.						
Staff Lead	Emergency Management Specialist						
Cost Estimate*†	Low						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

6.3.2 Earthquakes

Mitigation Strategy*	FEMA EQ-6 Implement Structural Mitigation Techniques FEMA EQ-9 Provide Information on Structural and Non-Structural Retrofitting FEMA MU-10 Incentivize Hazard Mitigation
Activity	**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 to assist 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*	HUD, CEA
Priority (Evaluation Score)*	Medium
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.
Staff Lead	Deputy Director of Development Services Department, Senior Property Rehabilitation Specialist
Cost Estimate*†	Medium to High – based on number of participants.
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 EBB Program, HMGP, PDM
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA EQ-6 Implement Structural Mitigation Techniques FEMA EQ-9 Provide Information on Structural and Non-Structural Retrofitting FEMA MU-10 Incentivize Hazard Mitigation						
Activity	**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.						
Staff Lead	Deputy Director of Development Services, Building Official						
Cost Estimate*†	Medium to High – based on incentives and number of soft story buildings.						
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, PDM						
Timeline*	5 years						
Related Policies*	General Plan Goal HAZ-2.9 Seismic Retrofits						

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA EQ-4 Conduct Inspections of Building Safety
Activity	**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*	EERI
Priority (Evaluation Score)*	Low
Actions/ Activities	To be determined.
Staff Lead	Building Official
Cost Estimate*†	Low
Benefits (losses avoided)*	Assists with economic recovery and prevents loss of life.
Potential Funding Sources*	No additional funding necessary.
Timeline*	To be determined.
Related Policies*	City Council “Safe” and “Thriving” priorities

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA EQ-6 Implement Structural Mitigation Techniques FEMA EQ-9 Provide Information on Structural and Non-Structural Retrofitting FEMA MU-10 Incentivize Hazard Mitigation						
Activity	**Mobile Home Retrofits:** Develop a retrofit program to assist mobile homeowners with purchase or installation of Earthquake Resistant Bracing Systems (ERBS), Engineered Tie-Down Systems (ETS) 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.						
Staff Lead	Building Official						
Cost Estimate*†	Low to Medium – based on incentives offered and number of participating residents.						
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, PDM						
Timeline*	To be determined.						
Related Policies*	General Plan Goal HAZ-2.9 Seismic Retrofits						

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA EQ-3 Map and Assess Community Vulnerability to Seismic Hazards						
Activity	**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, DSD, ABAG, CalOES, EERI, FAA						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify funding,						
Staff Lead	Airport Manager						
Cost Estimate*†	Medium						
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*	CIP, HMGP						
Timeline*	To be determined.						
Related Policies*	General Plan Goal HAZ-2.10 City Facilities						

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

6.3.3 Fire

Mitigation Strategy*	N/A – Preparedness						
Activity	**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						
Staff Lead	Fire Chief						
Cost Estimate*†	High						
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*	1-5 Years						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA WF-7 Create Defensible Space Around Structures and Infrastructure						
Activity	**Defensible Space Programs:** Continue to expand and support vegetation management and defensible space programs in the Hayward hills.						
Problem Statement*	The Hayward hills are 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, EBRPD, HARD						
Priority (Evaluation Score)*	High						
Actions/ Activities	Identify funding, purchase necessary equipment and expand programs.						
Staff Lead	Fire Chief						
Cost Estimate*†	High						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA EQ-3 Map and Assess Community Vulnerability to Seismic Hazards						
Activity	**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 for better understand community vulnerability to seismic hazards.						
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.						
Staff Lead	To be determined						
Cost Estimate*†	Low to Medium						
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*	To be determined.						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA WF-1 Map & Assess Vulnerability to Wildfire
Activity	**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.
Staff Lead	Fire Marshal
Cost Estimate*†	Low
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*	To be determined.
Timeline*	To be determined.
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

6.3.4 Landslide

Mitigation Strategy*	FEMA LS-3 Prevent Impacts to Roadways						
Activity	**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*	Department of 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.						
Staff Lead	Director of Public Works – Engineering & Transportation						
Cost Estimate*†	High						
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*	To be determined.						
Related Policies*	City Council “Safe” and “Thriving” priorities						

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

6.3.5 Flooding, Tsunami, & Sea Level Rise

Mitigation Strategy*	FEMA SLR-4 Protect Buildings and Infrastructure FEMA SLR-5 Preserve High-Hazard Areas as Open Space FEMA SLR-6 Protect and Restore Natural Buffers						
Activity	**Implement Adapting to Rising Tides:** Implement recommendations and take mitigation measures from the Adapting to Rising Tides report when complete.						
Problem Statement*	The Hayward shoreline, including infrastructure and businesses, 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*	Department of Utilities and Environmental Services						
Partners*	ABAG, BCDC, 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.						
Staff Lead	Water Pollution Control Facility Manager						
Cost Estimate*†	Low to High, depending on mitigation measure.						
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, Capital Improvement Program, Facilities Capital Fund						
Timeline*	To be determined.						
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA SLR-1 Map and Assess Vulnerability to Sea Level Rise FEMA SLR-2 Manage Development in High-Risk Areas FEMA SLR-4 Protect Buildings and Infrastructure FEMA SLR-6 Protect and Restore Natural Buffers
Activity	**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*	Development Services Department
Partners*	Department of Utilities and Environmental Services, 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.
Staff Lead	Senior Planner
Cost Estimate*†	Medium (for plan) to High (for implementation)
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, 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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA SLR-1 Map and Assess Vulnerability to Sea Level Rise FEMA SLR-2 Manage Development in High-Risk Areas FEMA SLR-4 Protect Buildings and Infrastructure FEMA SLR-6 Protect and Restore Natural Buffers
Activity	**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*	Development Services Department
Partners*	Department of Utilities and Environmental Services, 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.
Staff Lead	Senior Planner
Cost Estimate*†	Low
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*	To be determined.
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA SLR-1 Map and Assess Vulnerability to Sea Level Rise
Activity	**SR-92 Study:** Work with 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*	Development Services Department
Partners*	Department of Utilities and Environmental Services, 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.
Staff Lead	Senior Planner
Cost Estimate*†	Low
Benefits (losses avoided)*	Production of knowledge to drive future capital infrastructure mitigation activities.
Potential Funding Sources*	No additional funding required.
Timeline*	To be determined.
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA SLR-2 Manage Development in High-Risk Areas
Activity	**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 forum for sea level rise mitigation planning and action.
Problem Statement*	Temporary flooding and permanent inundation will affect Hayward's shoreline and flood-vulnerable areas. The City of Hayward is poorly positioned to address these problems.
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*	Department of Utilities and Environmental Services, 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.
Staff Lead	Senior Planner
Cost Estimate*†	Medium
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*	To be determined.
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA F-7 Improve Flood Risk Assessment
Activity	**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*	Department of 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.
Staff Lead	Utilities and Environmental Services Engineering and Transportation
Cost Estimate*†	Medium
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.

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

6.3.6 Drought

Mitigation Strategy*	D7 – Retrofit Water Supply Systems
Activity	**Recycled Water Project:** Establish a recycled water distribution system that provides treated water from the Water Pollution Control Facility to commercial customers.
Problem Statement*	The State of California has experienced extreme drought for the past five years, effecting every jurisdiction's water supply. Cycles of extreme drought are expected to occur with greater frequency as the climate continues to change.
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*	Utilities & Environmental Services
Partners*	State Water Resources Control Board (SWRCB)
Priority (Evaluation Score)*	High
Actions	Identify funding, create a plan, build infrastructure, and implement.
Staff Lead	Utilities & Environmental Services
Cost Estimate*†	High
Benefits (losses avoided)*	Preserves the limited supply of potable water, provides drought relief by providing alternative sources of water for non-potable uses, and increase reliability and sustainability of the City's potable water system.
Potential Funding Sources*	Water Recycling Funding Program, HMGP
Timeline*	To be determined.
Related Policies*	General Plan Policy: NR-2 Recycled Water Program

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

6.3.7 Hazardous Materials

Mitigation Strategy*	N/A – Preparedness/Response						
Activity	**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	Identify funding, purchase equipment, created a training plan, put together a team, execute training plan and ongoing refresher training.						
Staff Lead	Fire Chief, Hazardous Materials Coordinator						
Cost Estimate*†	High						
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*	HMGP, HMEP, Hazardous Materials Impact Fee						
Timeline*	To be determined.						
Related Policies*	Hazardous Materials Area Plan						

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

Mitigation Strategy*	FEMA MU-9 Create Local Funding Mechanism for Hazard Mitigation
Activity	**Hazardous Materials Fee Study:** Conduct an evaluation of the estimated costs of hazmat mitigation programs and 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	Identify funding and hire consultant to conduct study and make recommendations for impact fee.
Staff Lead	Fire Chief, Hazardous Materials Coordinator
Cost Estimate*†	Medium
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*	To be determined.
Related Policies*	City Council “Safe” and “Thriving” priorities

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

† All costs based on rough estimates. Low: ≤$10,000; Medium: >$10,000 and <$200,000; High: ≥$200,000.

7. PLAN MAINTENANCE PROCEDURES

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

7.1 IMPLEMENTATION, UPDATING, AND ENHANCEMENT

The Local Hazard Mitigation 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.

Implementation will be 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. Upcoming budget cycles will 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.

In 2020, Hayward will begin the next plan update in per federal regulations. The update will address all sections of the plan, following a similar course to the 2015 Plan Update:

- The City Manager, Director of Development Services, and Fire Chief will convene an interdepartmental update team and select project leads.

- Staff will work closely with ABAG's resilience team, if possible, or consult with other hazard experts to evaluate the accuracy of the hazard and risk analysis. 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

The Emergency Management Specialist will monitor and encourage progress toward implementing and completing the mitigation strategies in the plan, and note the status of each strategy and emergence of additional strategies annually.

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
CAL FIRE	California Department of Forestry and Fire Protection
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
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.
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
PDM	Pre-Disaster Mitigation
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
WUI	Wildland-Urban Interface
WWCIP	Wastewater Capital Improvements Plan

APPENDICES

APPENDIX A: PARTICIPATING STAFF

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

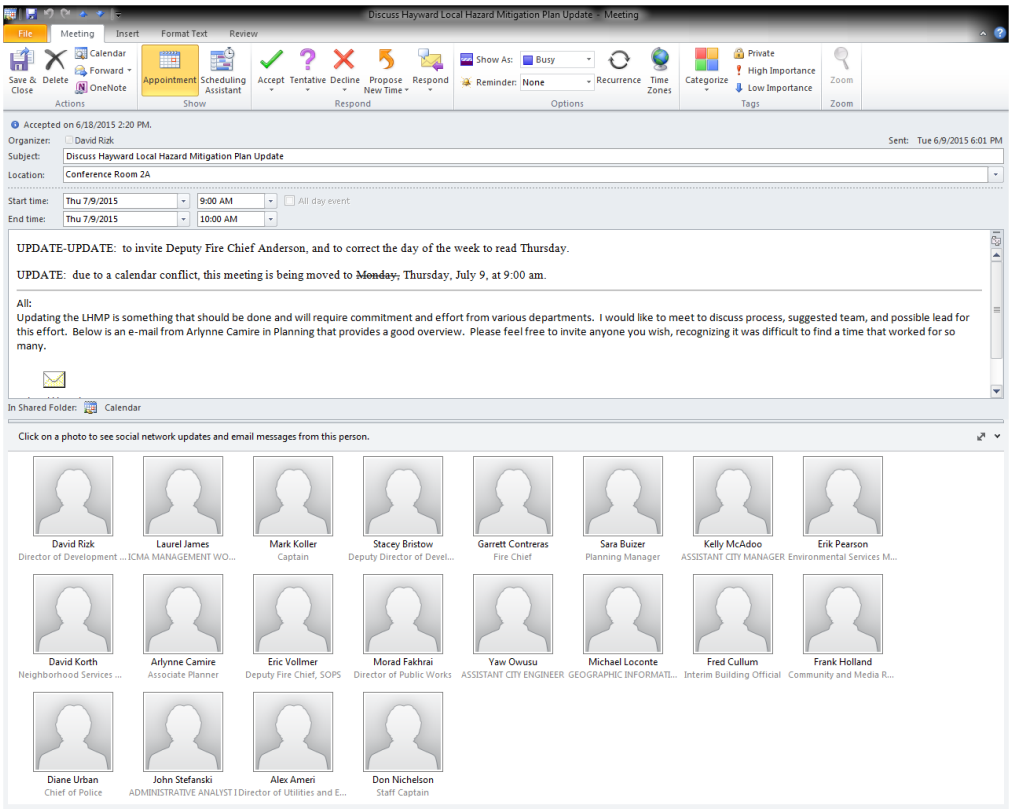
Yaw Owusu, Assistant City Engineer
Fred Kelley, Transportation Manager
Douglas McNeeley, Airport Manager

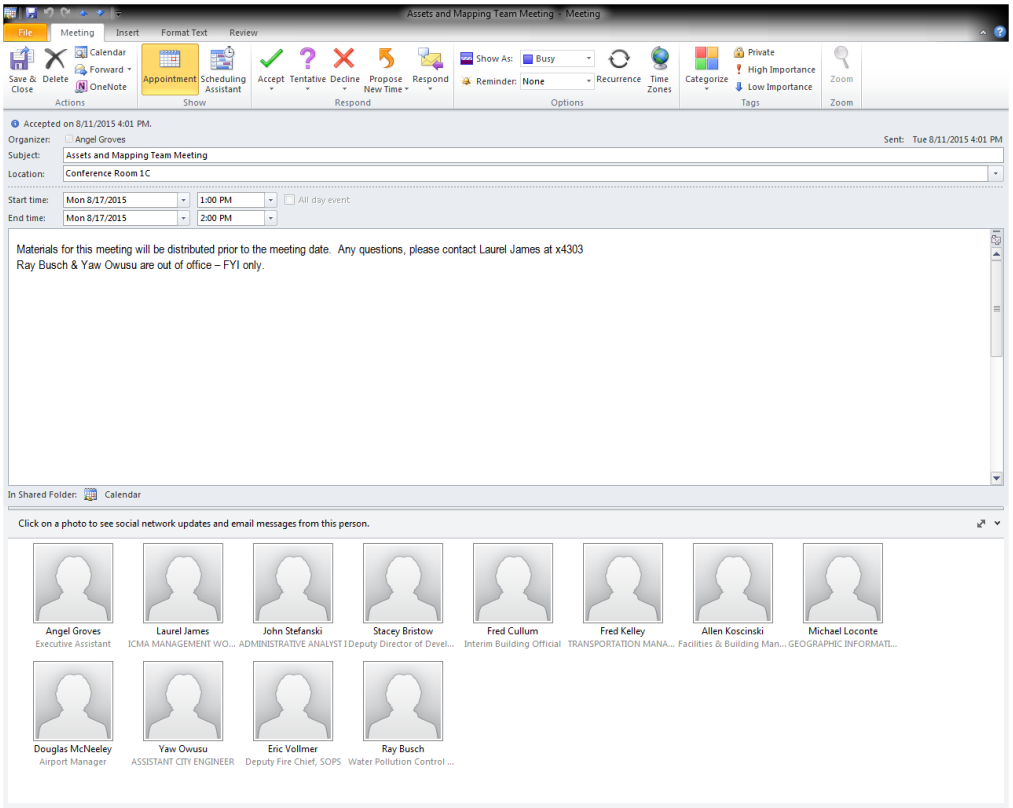
Allen Koscinski, Facilities Manager
Liz Sanchez, Management Analyst

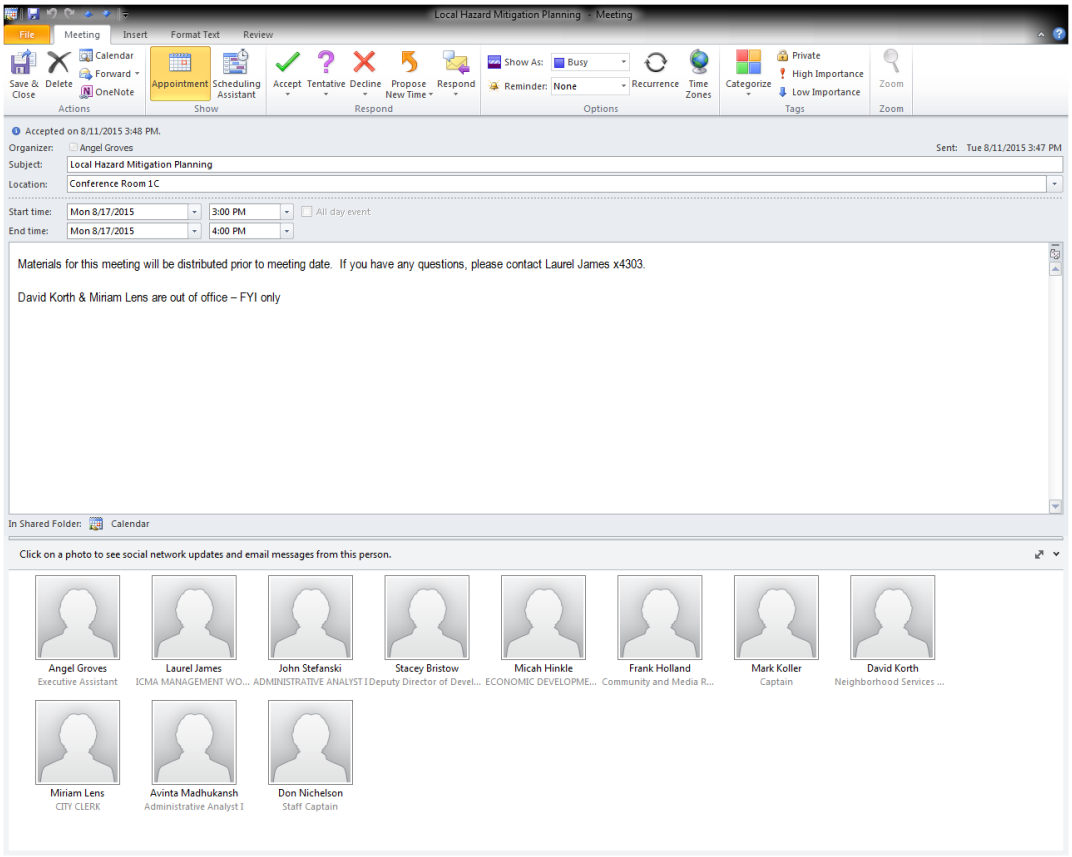
Avinta Madhukansh, Management Analyst

Michael Loconte, GIS Specialist

APPENDIX B: MEETING ROSTERS & TIMELINE



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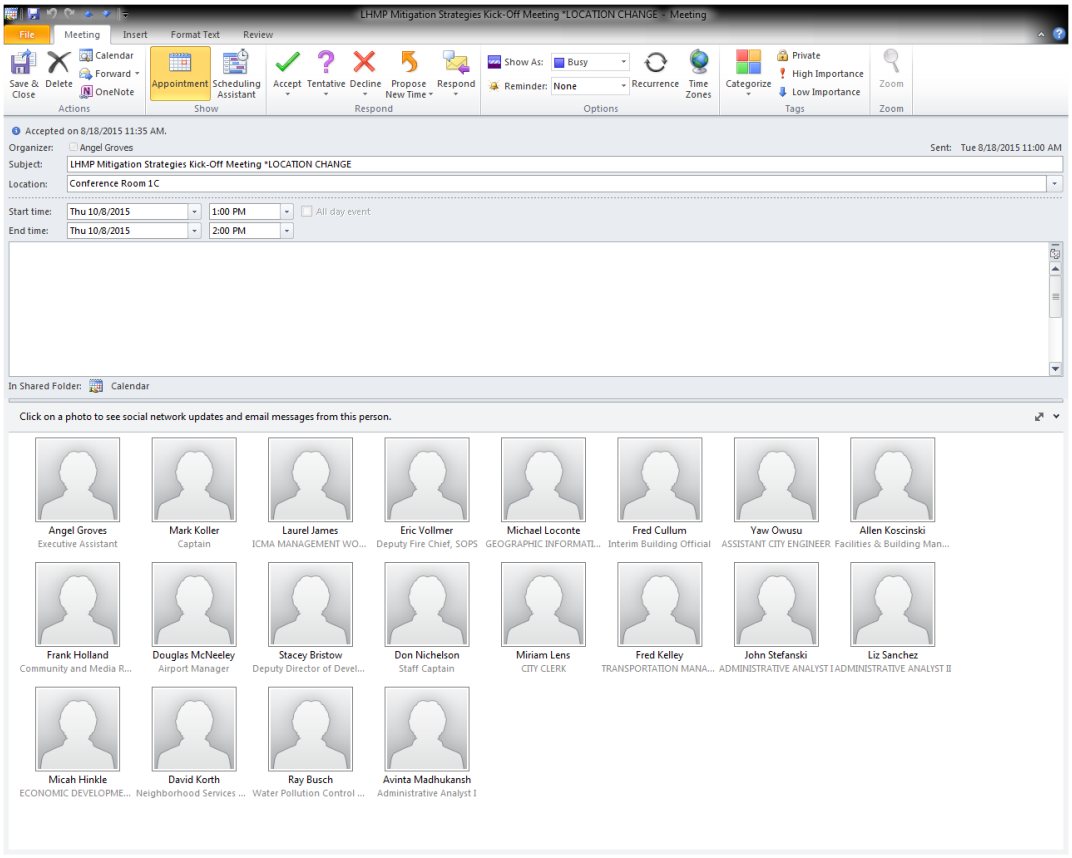
Zoom
Accepted on 8/11/2015 3:48 PM.
Organizer: Angel Groves
Sent: Tue 8/11/2015 3:47 PM
Subject: Local Hazard Mitigation Planning
Location: Conference Room 1C
Start time: Mon 8/17/2015 3:00 PM
End time: Mon 8/17/2015 4:00 PM
All day event
Materials for this meeting will be distributed prior to meeting 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 WO...
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 Nichelson
Staff Captain


LHMP Mitigation Strategies Kick-Off Meeting *LOCATION CHANGE - Meeting
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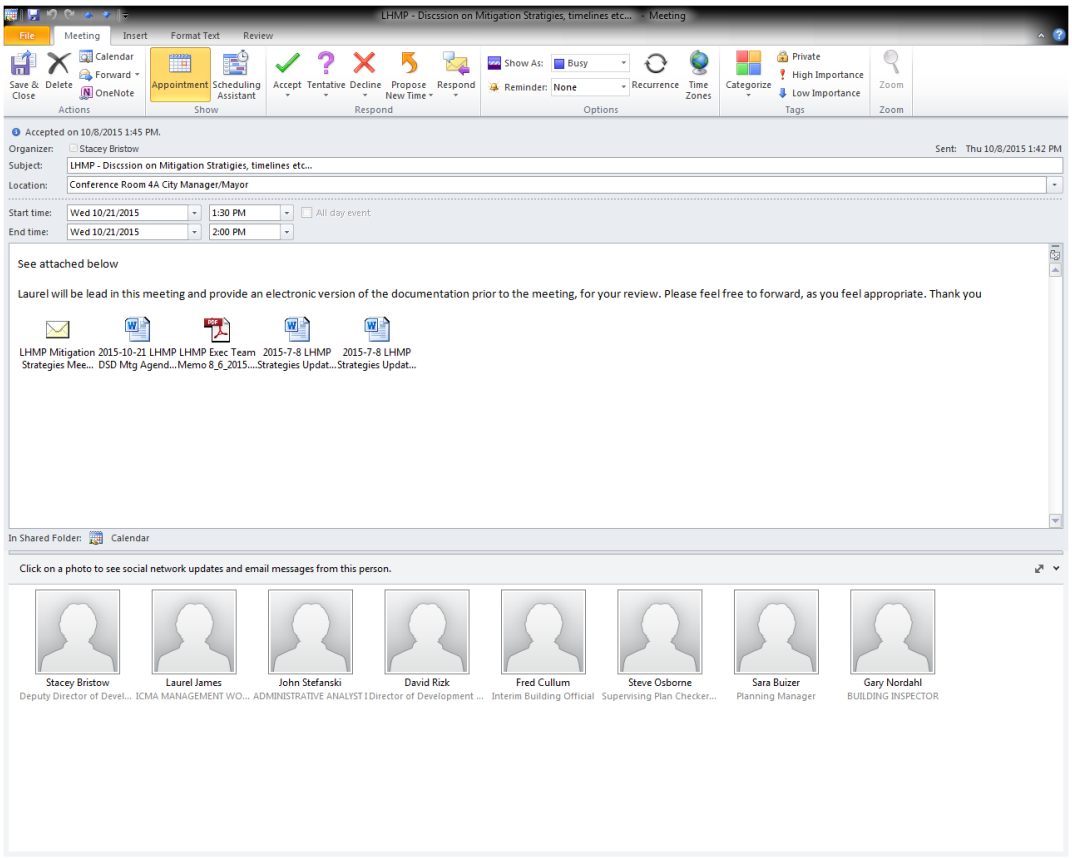
Organizer: Angel Groves
Sent: Tue 8/18/2015 11:00 AM
Subject: LHMP Mitigation Strategies Kick-Off Meeting *LOCATION CHANGE
Location: Conference Room 1C
Start time: Thu 10/8/2015 1:00 PM
End time: Thu 10/8/2015 2:00 PM
All day event
In Shared Folder: Calendar
Click on a photo to see social network updates 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 Nichelson
Staff Captain
Miriam Lens
CITY CLERK
Fred Kelley
TRANSPORTATION MANA...
John Stefanski
ADMINISTRATIVE ANALYST I
Liz Sanchez
ADMINISTRATIVE ANALYST II
Micah Hinkle
ECONOMIC DEVELOPME...
David Korth
Neighborhood Services ...
Ray Busch
Water Pollution Control ...
Avinta Madhukansh
Administrative Analyst I


LHMP - Discssion on Mitigation Stratigies, timelines etc... - Meeting
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Accepted on 10/8/2015 1:45 PM.
Organizer:
Stacey Bristow
Sent: Thu 10/8/2015 1:42 PM
Subject:
LHMP - Discssion on Mitigation Stratigies, timelines etc...
Location:
Conference Room 4A City Manager/Mayor
Start time:
Wed 10/21/2015
1:30 PM
All day event
End time:
Wed 10/21/2015
2:00 PM
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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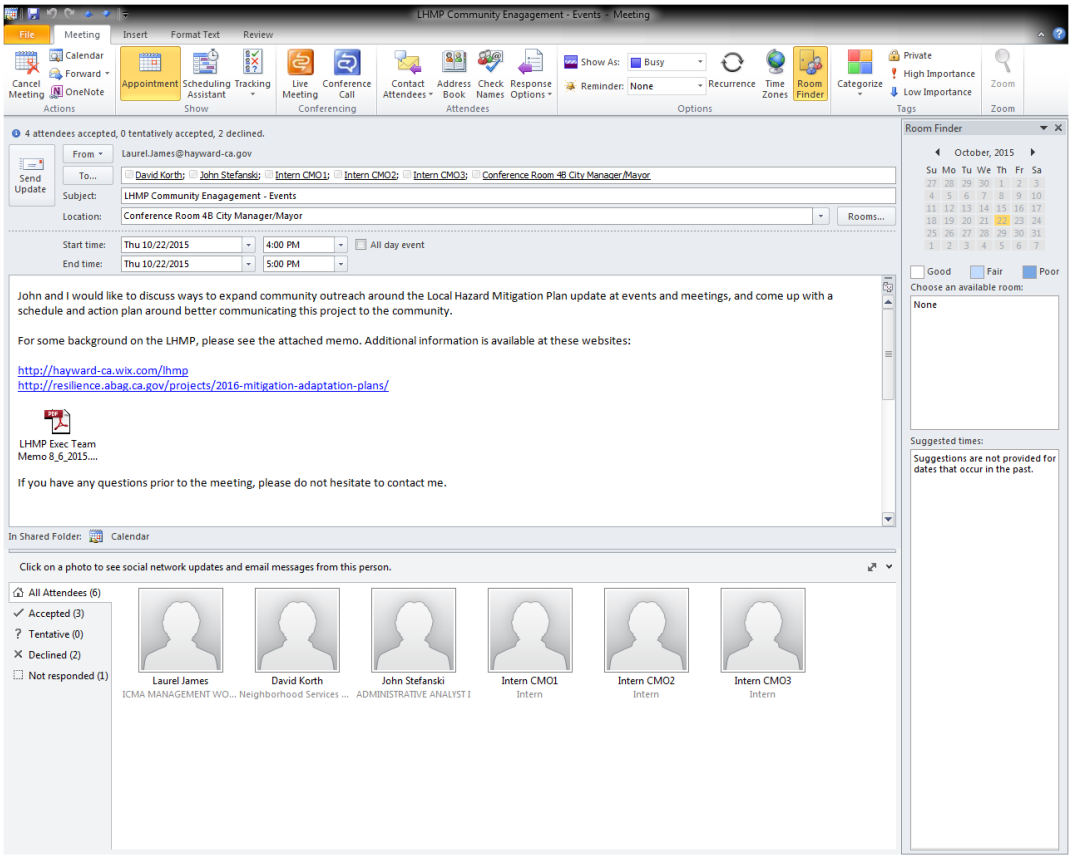
Laurel James
ICMA MANAGEMENT WO...
John Stefanski
ADMINISTRATIVE ANALYST I
David Rizk
Director of Development ...
Fred Cullum
Interim Building Official
Steve Osborne
Supervising Plan Checker...
Sara Buizer
Planning Manager
Gary Nordahl
BUILDING INSPECTOR


LHMP Community Engagement - Events - Meeting
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Show As:
Busy
Reminder:
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Time Zones
Room Finder
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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.
In Shared Folder:
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All Attendees (6)
Accepted (3)
Tentative (0)
Declined (2)
Not responded (1)
Laurel James
ICMA MANAGEMENT WO...
David Korth
Neighborhood Services ...
John Stefanski
ADMINISTRATIVE ANALYST I
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Intern
Intern CMO2
Intern
Intern CMO3
Intern
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October, 2015
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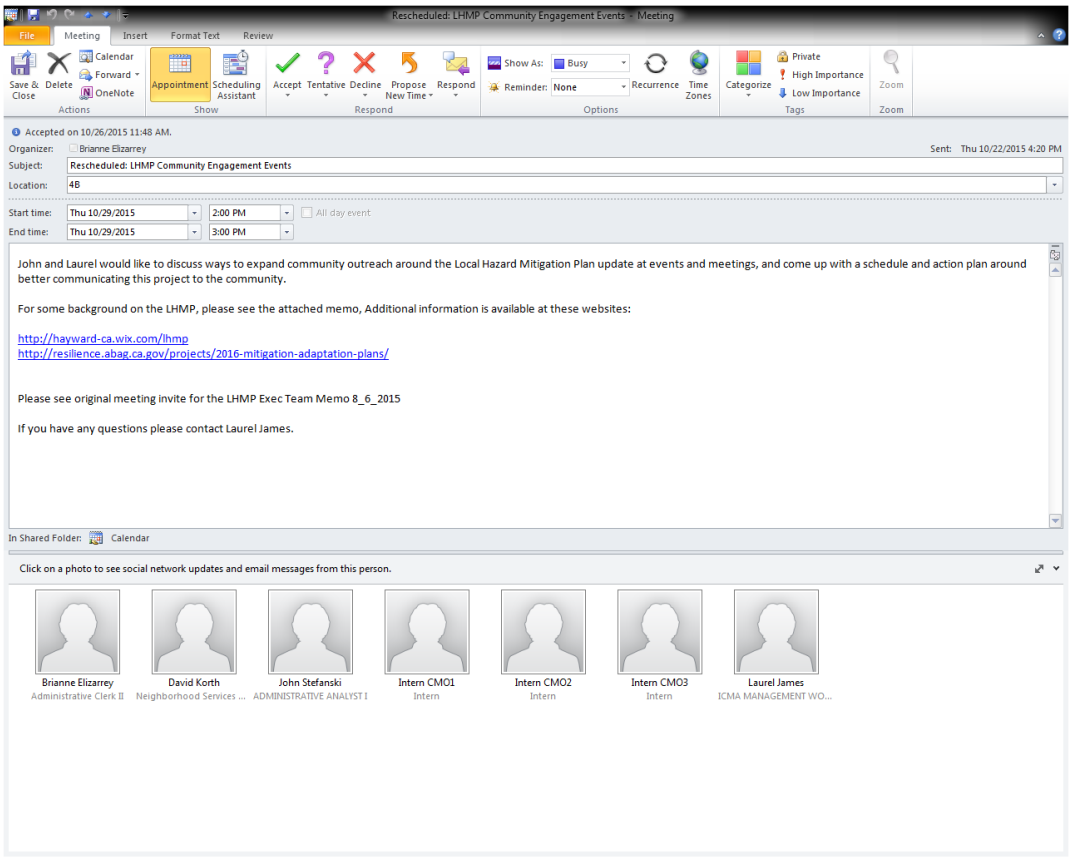
Rescheduled: LHMP Community Engagement Events - Meeting
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Propose New Time
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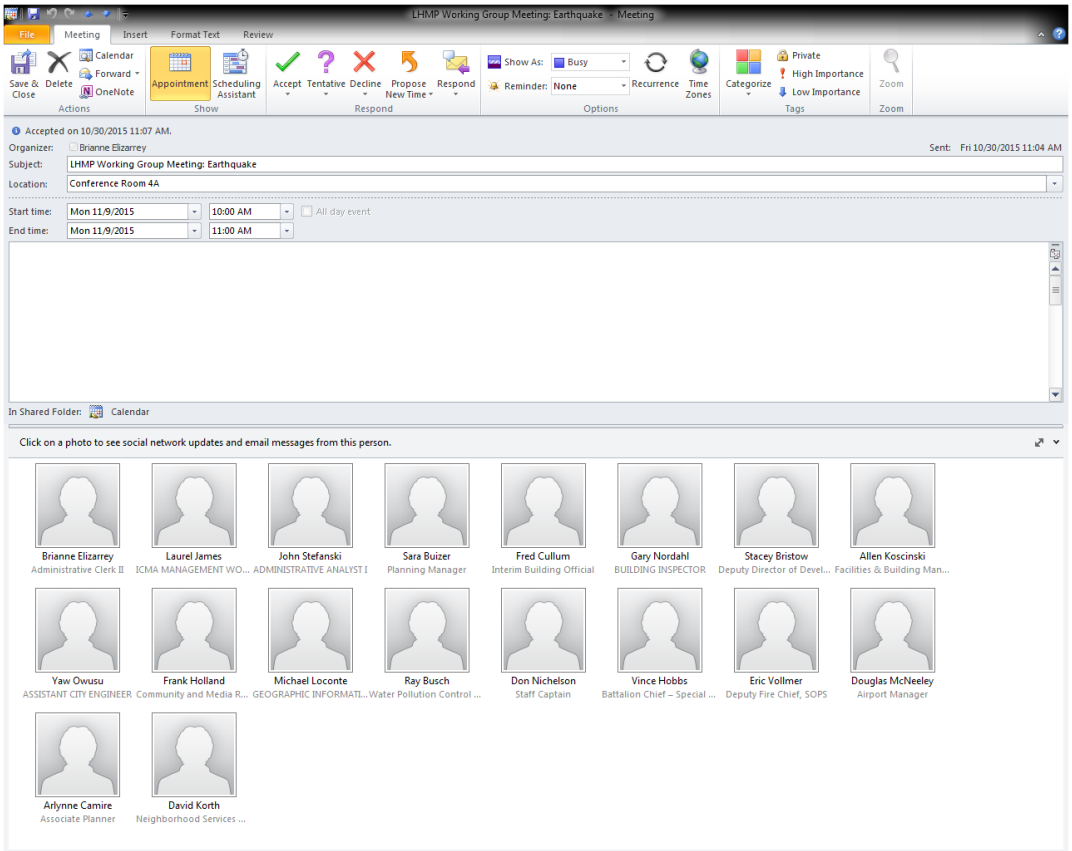
Respond
Show As:
Busy
Reminder:
None
Recurrence
Time Zones
Options
Categorize
Private
High Importance
Low Importance
Tags
Zoom
Zoom
Accepted on 10/26/2015 11:48 AM.
Organizer:
Brianne Elizarrey
Sent:
Thu 10/22/2015 4:20 PM
Subject:
Rescheduled: LHMP Community Engagement Events
Location:
4B
Start time:
Thu 10/29/2015
2:00 PM
All day event
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
File
Meeting
Insert
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Calendar
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OneNote
Actions
Appointment
Scheduling Assistant
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Reminder:
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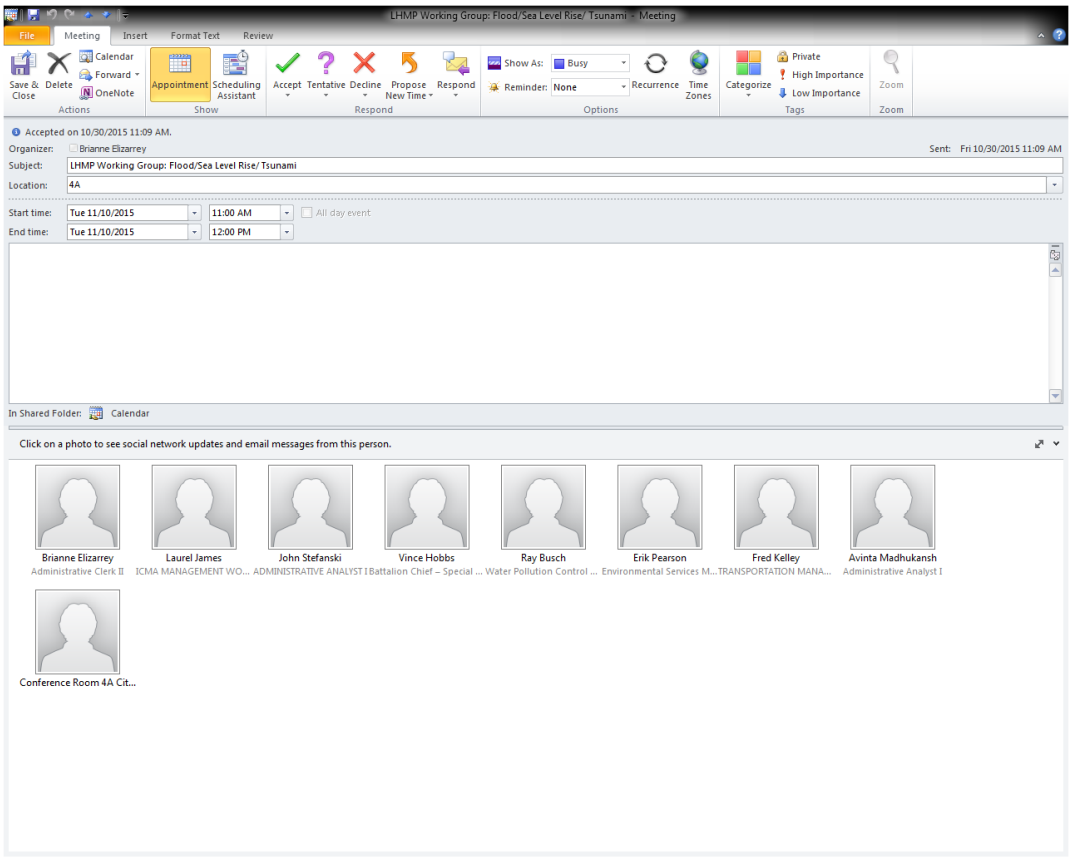
Zoom
Zoom
Accepted on 10/30/2015 11:07 AM.
Organizer:
Brianne Elizarrey
Sent:
Fri 10/30/2015 11:04 AM
Subject:
LHMP Working Group Meeting: Earthquake
Location:
Conference Room 4A
Start time:
Mon 11/9/2015
10:00 AM
All day event
End time:
Mon 11/9/2015
11:00 AM
In Shared Folder:
Calendar
Click on a photo 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 I
Sara Buizer
Planning Manager
Fred Cullum
Interim Building Official
Gary Nordahl
BUILDING INSPECTOR
Stacey Bristow
Deputy Director of Devel...
Allen Koscinski
Facilities & Building Man...
Yaw Owusu
ASSISTANT CITY ENGINEER
Frank Holland
Community and Media R...
Michael Loconte
GEOGRAPHIC INFORMATI...
Ray Busch
Water Pollution Control ...
Don Nichelson
Staff Captain
Vince Hobbs
Battalion Chief – Special ...
Eric Vollmer
Deputy Fire Chief, SOPS
Douglas McNeeley
Airport Manager
Arlynne Camire
Associate Planner
David Korth
Neighborhood Services ...


LHMP Working Group: Flood/Sea Level Rise/ Tsunami - Meeting
File
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Insert
Format Text
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Calendar
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OneNote
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Appointment
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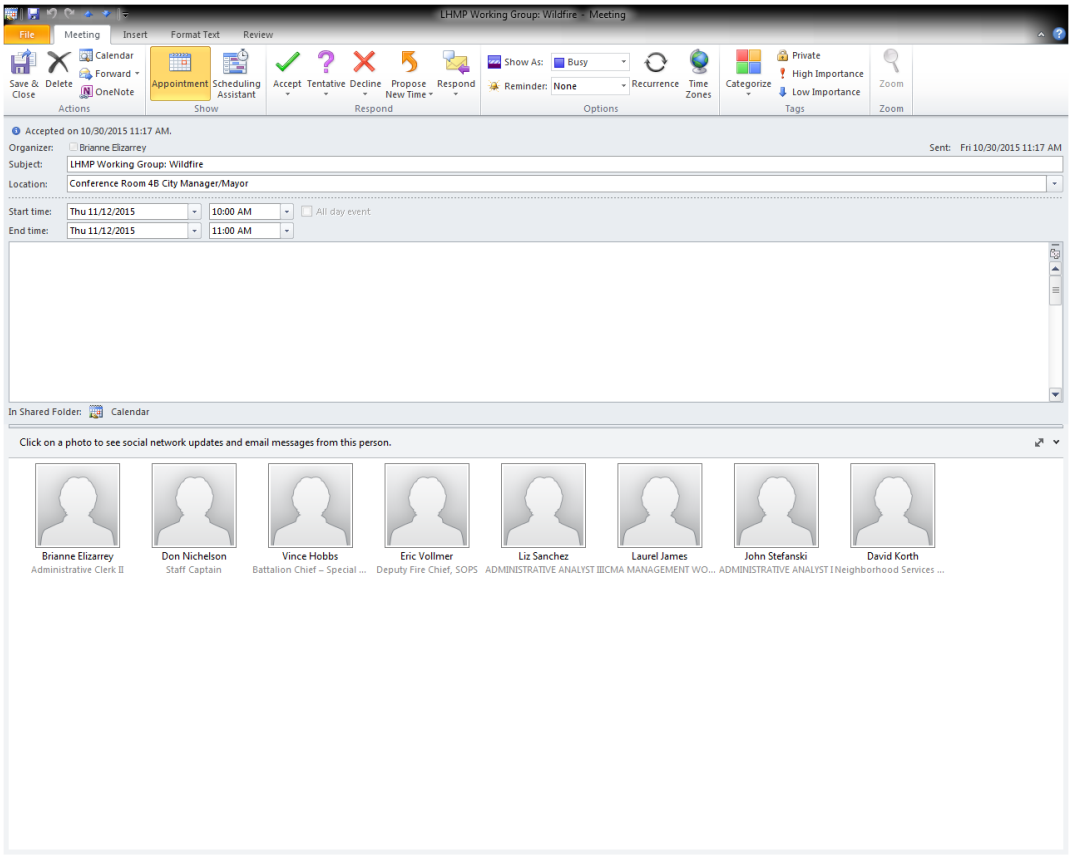
Busy
Reminder:
None
Recurrence
Time Zones
Options
Categorize
Private
High Importance
Low Importance
Tags
Zoom
Accepted on 10/30/2015 11:09 AM.
Organizer:
Brianne Elizarrey
Sent: Fri 10/30/2015 11:09 AM
Subject:
LHMP Working Group: Flood/Sea Level Rise/ Tsunami
Location:
4A
Start time:
Tue 11/10/2015
11:00 AM
All day event
End time:
Tue 11/10/2015
12:00 PM
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 I
Vince Hobbs
Battalion Chief – Special ...
Ray Busch
Water Pollution Control ...
Erik Pearson
Environmental Services M...
Fred Kelley
TRANSPORTATION MANA...
Avinta Madhukansh
Administrative Analyst I
Conference Room 4A Cit...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File
Meeting
Insert
Format Text
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Actions
Appointment
Scheduling Assistant
Show
Accept
Tentative
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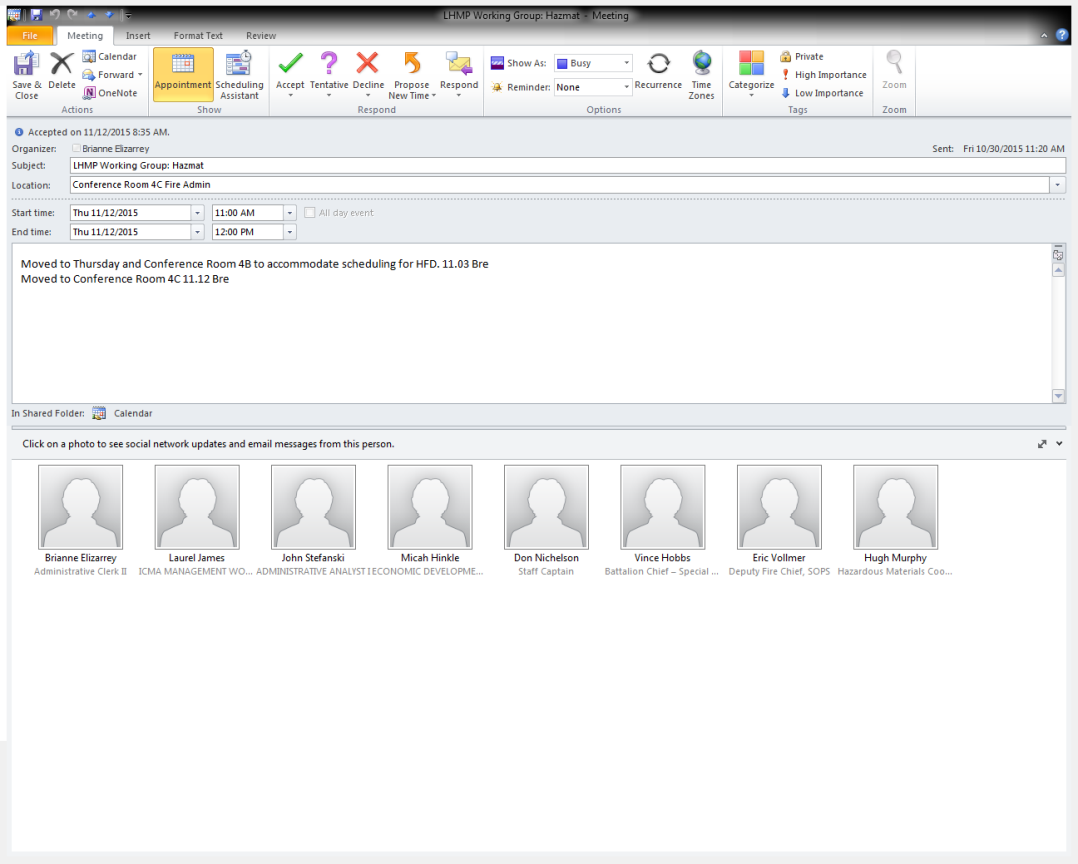
Busy
Reminder:
None
Recurrence
Time Zones
Options
Categorize
Private
High Importance
Low Importance
Tags
Zoom
Accepted on 10/30/2015 11:17 AM.
Organizer:
Brianne Elizarrey
Sent: Fri 10/30/2015 11:17 AM
Subject:
LHMP Working Group: Wildfire
Location:
Conference Room 4B City Manager/Mayor
Start time:
Thu 11/12/2015
10:00 AM
All day event
End time:
Thu 11/12/2015
11:00 AM
In Shared Folder:
Calendar
Click on a photo to see social network updates and email messages from this person.
Brianne Elizarrey
Administrative Clerk II
Don Nichelson
Staff Captain
Vince Hobbs
Battalion Chief – Special ...
Eric Vollmer
Deputy Fire Chief, SOPS
Liz Sanchez
ADMINISTRATIVE ANALYST III
Laurel James
ICMA MANAGEMENT WO...
John Stefanski
ADMINISTRATIVE ANALYST I
David Korth
Neighborhood Services ...


LHMP Working Group: Hazmat - Meeting
File
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Insert
Format Text
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Save & Close
Delete
Calendar
Forward
OneNote
Actions
Appointment
Scheduling Assistant
Show
Accept
Tentative
Decline
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Reminder:
None
Recurrence
Time Zones
Options
Categorize
Private
High Importance
Low Importance
Tags
Zoom
Zoom
Accepted on 11/12/2015 8:35 AM.
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
All day event
End time:
Thu 11/12/2015
12:00 PM
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 I
Micah Hinkle
ECONOMIC DEVELOPME...
Don Nichelson
Staff Captain
Vince Hobbs
Battalion Chief – Special ...
Eric Vollmer
Deputy Fire Chief, SOPS
Hugh Murphy
Hazardous Materials Coo...

LOCAL HAZARD MITIGATION PLANNING

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 niot)
- □ 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 niot)
- □ 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

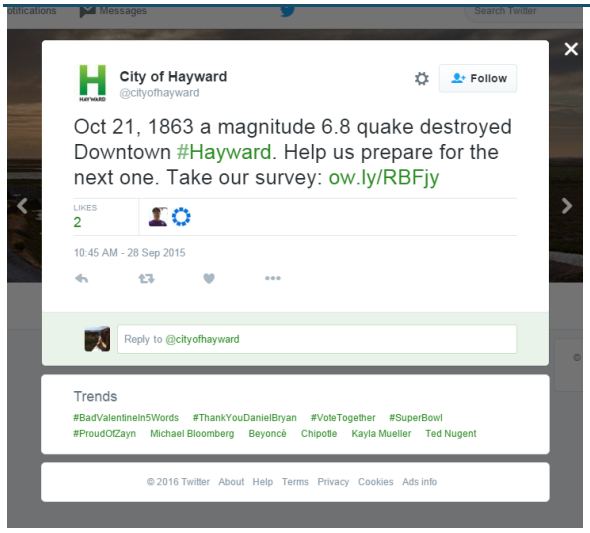
Handouts

- Strategy Development Worksheet
- Mitigation Strategies Evaluation Worksheet

Action Items

- □ Complete Mitigation Strategies Update Form (for those who have niot)
- □ 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



City of Hayward - Government
Published by Brianne Elizarrey [?] · September 30, 2015 ·

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!... See More

lhmp
HOME
HAYWARD-CA.WIX.COM

1,006 people reached Boost Post

Like Comment Share

City of Hayward - Government
Published by Brianne Elizarrey [?] · October 1, 2015 ·

COLINAS SUAVES. COSTA HERMOSA.

ESPACIOS ABIERTOS.

¿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

See Translation

Local Hazard Mitigation Planning Survey en Espanol
Web survey powered by SurveyMonkey.com. Create your own online survey now with SurveyMonkey's expert certified FREE templates.
SURVEYMONKEY.COM

697 people reached Boost Post

Like Comment Share

Nadia Isabel Alcota, Michael Vasquez, Isabeluka Gonzalez and 4 others like this. Top Comments

Write a comment...

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

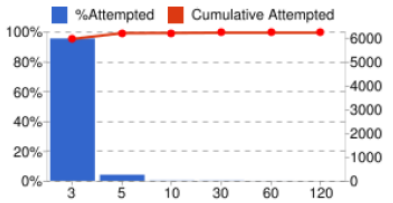
6,259 Recipients

✓ 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

APPENDIX E: 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

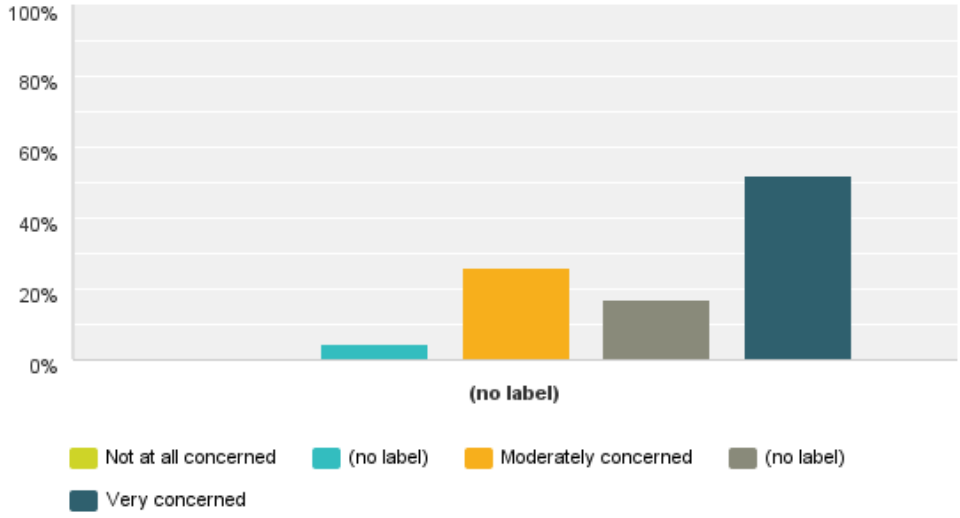
22. What is the last grade level you completed in school? (Radio buttons)

- 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)

APPENDIX F: SURVEY RESULTS

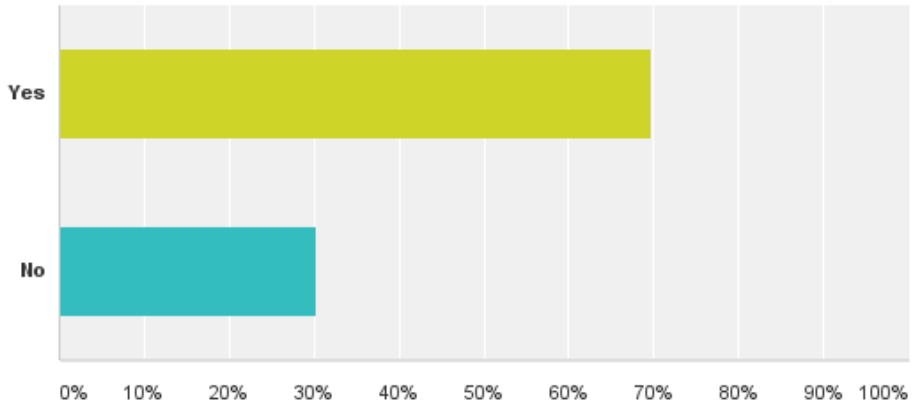
Q1 How concerned are you by the possibility of your neighborhood being impacted by a natural disaster?

Answered: 274 Skipped: 2



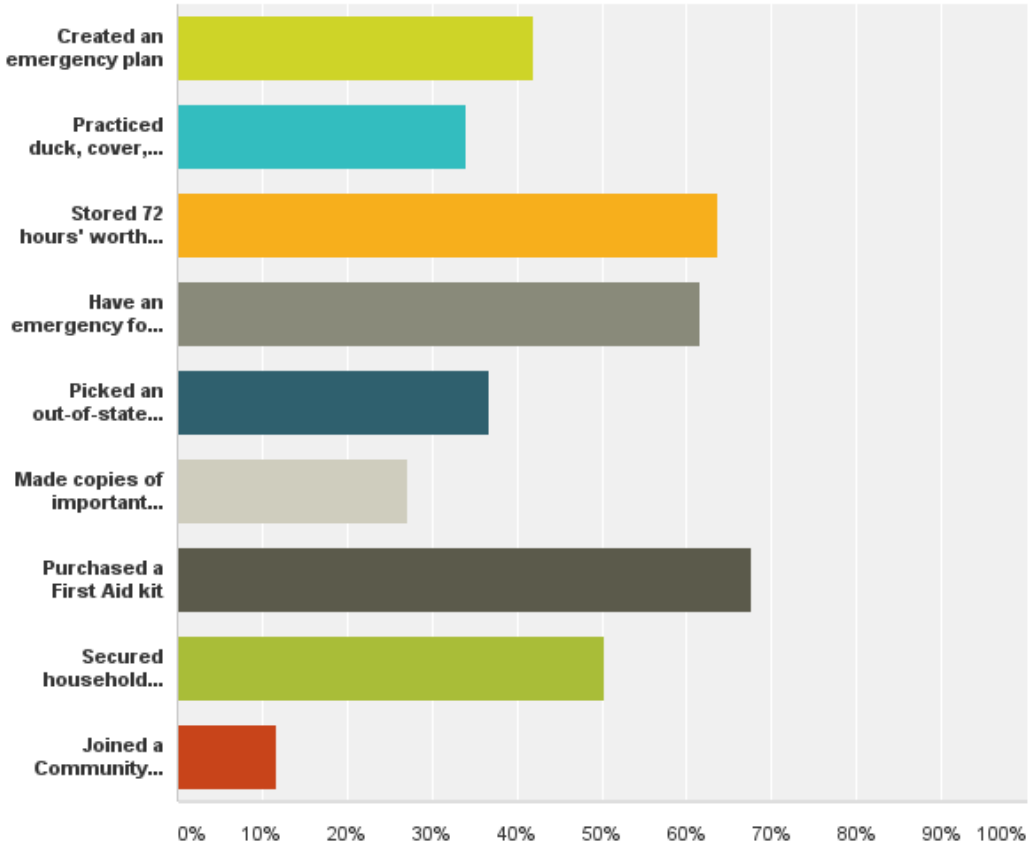
Q2 Have you taken any action to prepare your home, your family, or yourself for the affects of a natural disaster? (For example: retrofitting your home, assembling an emergency kit, or taking a CPR class)

Answered: 275 Skipped: 1



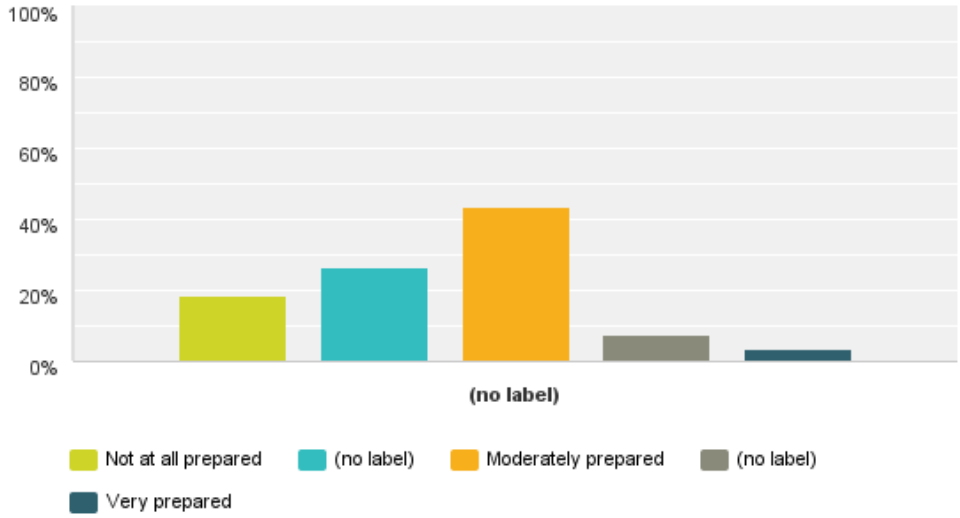
Q3 What have you and your family done to prepare for a natural disaster?

Answered: 250 Skipped: 26



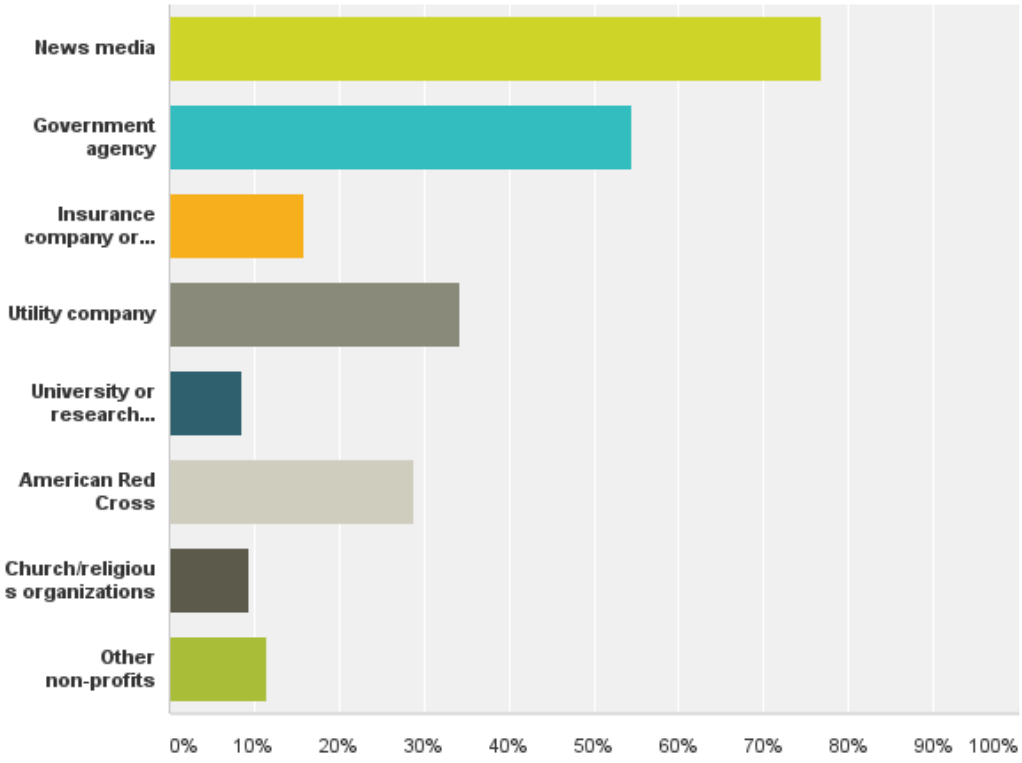
Q4 How prepared do you feel for a natural disaster?

Answered: 273 Skipped: 3



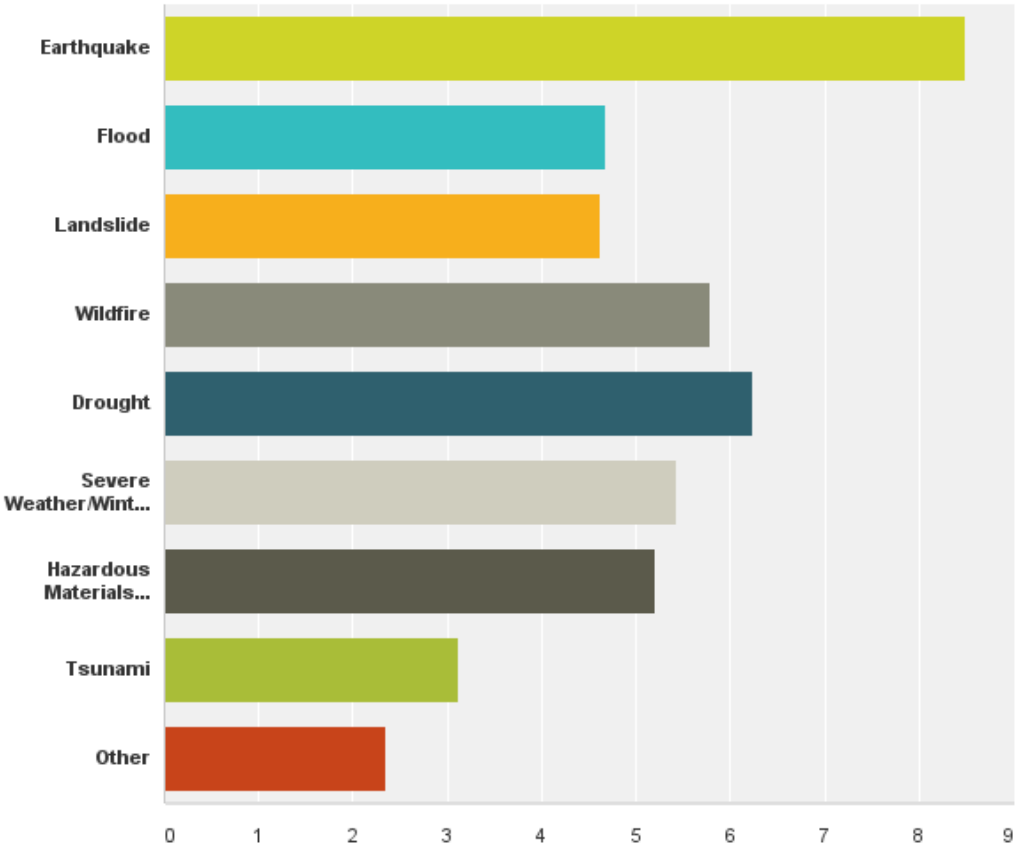
Q5 Where do you get information about how to protect your family, your home, and yourself from natural disasters?

Answered: 246 Skipped: 30



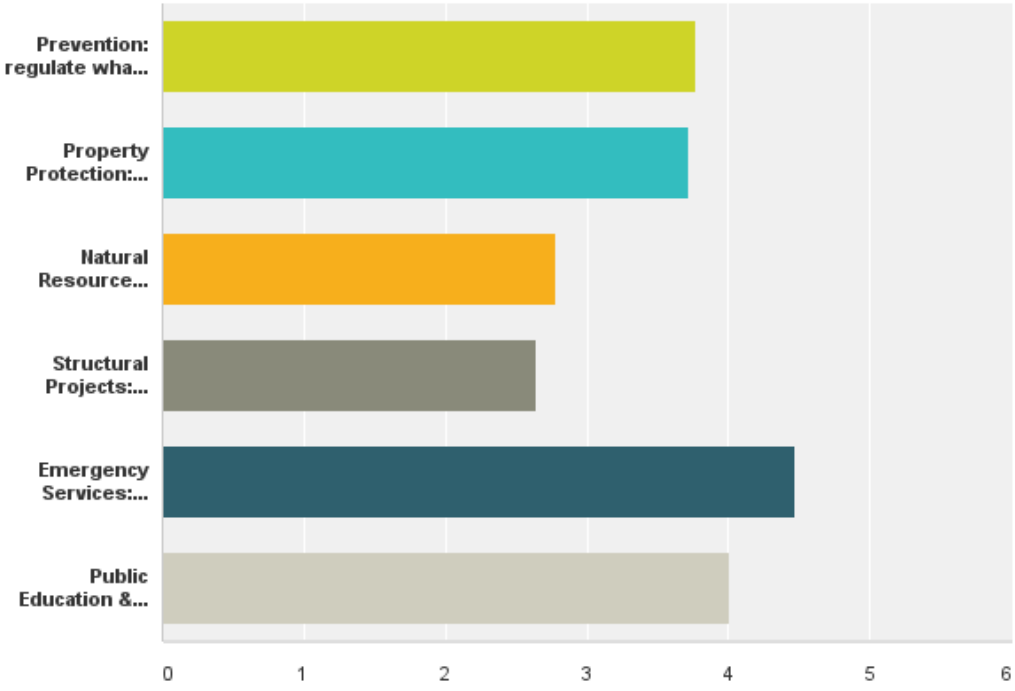
Q6 Please rank the list of hazards below in order of highest concern to you. For example: put "earthquake" at #1 if you are most concerned about an earthquake happening in Hayward.

Answered: 262 Skipped: 14



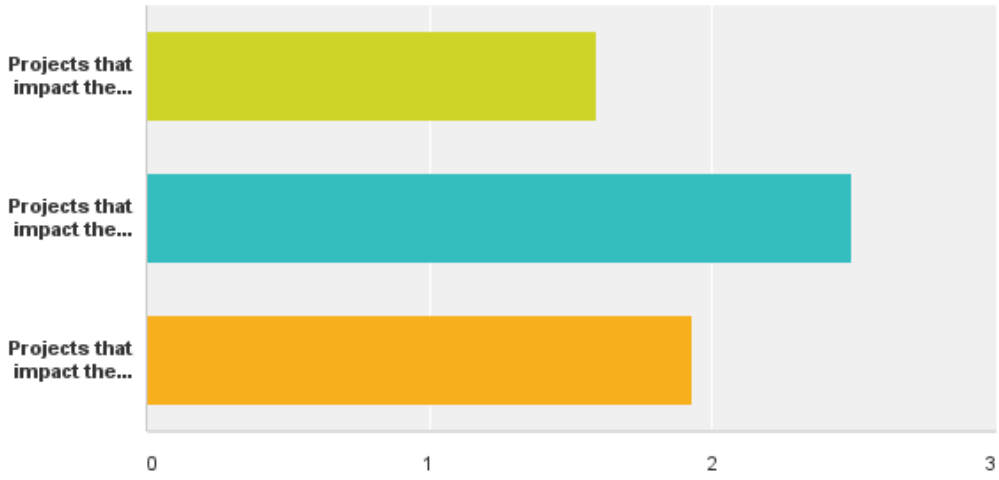
Q7 There are a number of strategies our community can use to decrease the damage caused by natural disasters. Most of these strategies fit into the categories described below. Please rank them in order of your preference, where #1 is the one you prefer the most, and #6 is the one you prefer the least.

Answered: 250 Skipped: 26



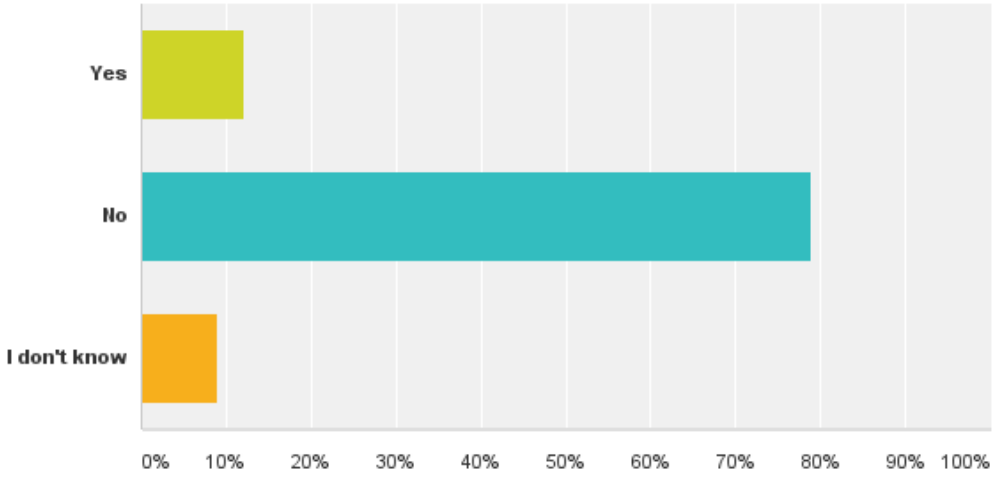
Q8 The City of Hayward is limited in the number and size of natural disaster prevention projects we can complete in the next five years. Please rank the types of projects below, with what you think is most important at #1, and what you think is least important at #3.

Answered: 244 Skipped: 32



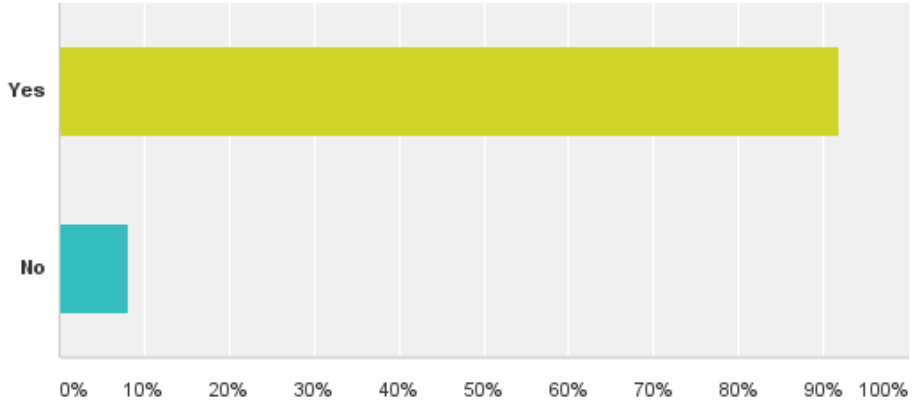
Q10 Based on the description above, do you think you may live or work in a soft story building?

Answered: 256 Skipped: 20



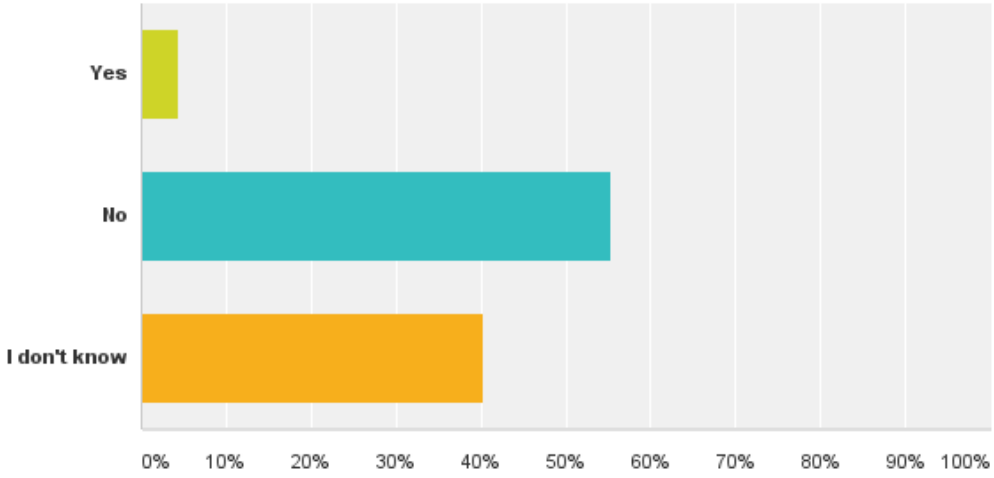
Q11 Oakland, San Francisco, Berkeley, and Alameda have all required owners of confirmed soft story structures to reinforce their buildings so that they are safer in an earthquake. Do you think the city of Hayward should consider a similar requirement?

Answered: 255 Skipped: 21



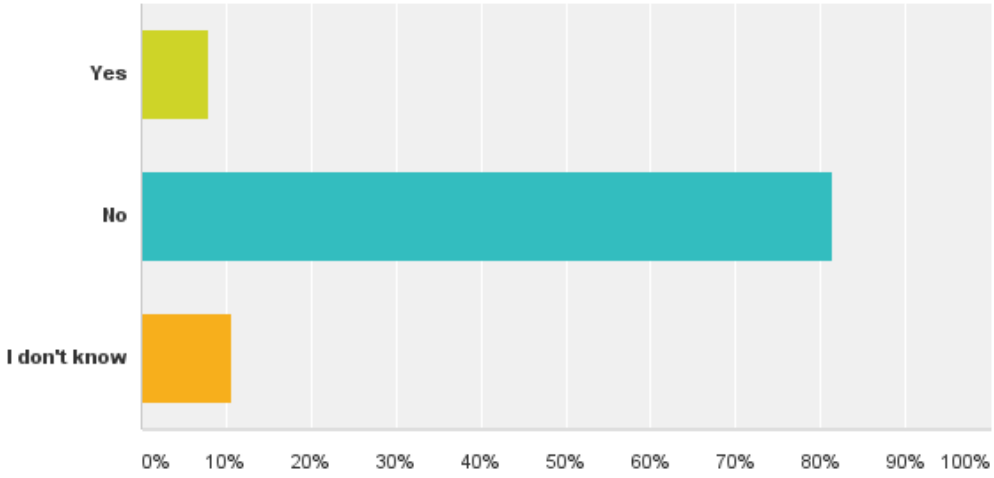
Q12 Is your home on a FEMA-designated floodplain?

Answered: 253 Skipped: 23



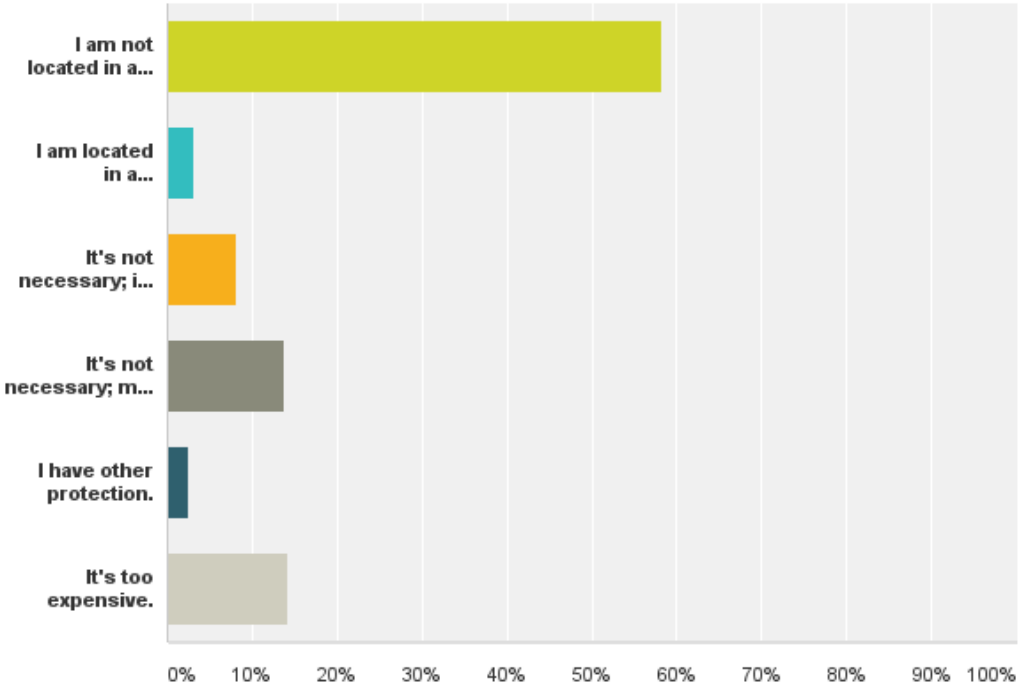
Q13 Do you have flood insurance?

Answered: 252 Skipped: 24



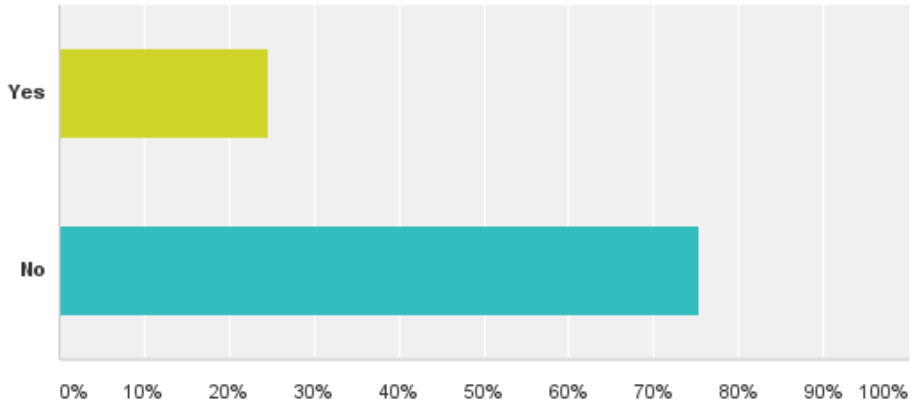
Q14 If you do not have flood insurance, why not?

Answered: 196 Skipped: 80



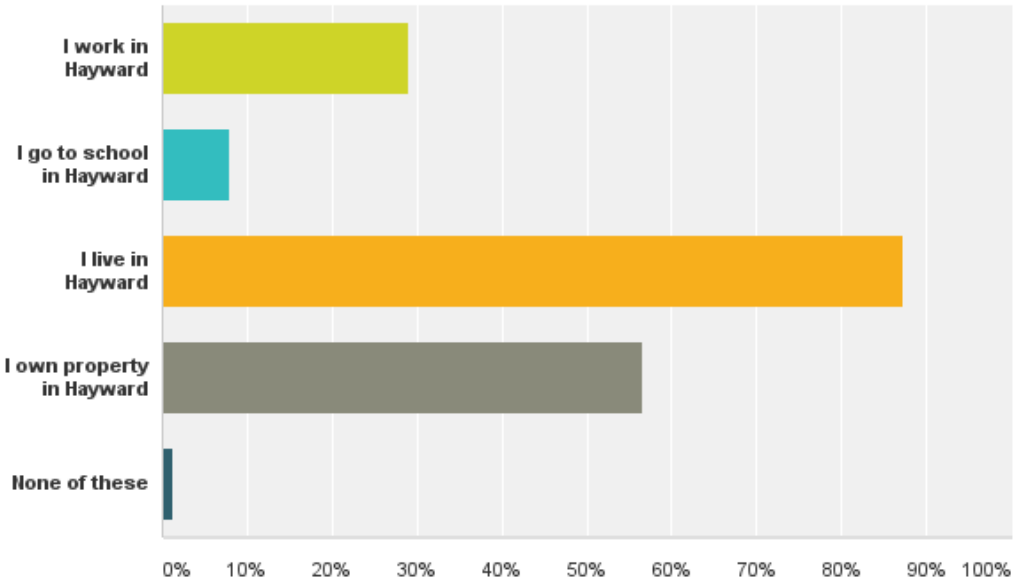
Q15 Have you or someone in your household directly experienced a natural disaster (such as an earthquake, wildfire, flood, etc.) in Hayward in the past five years?

Answered: 248 Skipped: 28



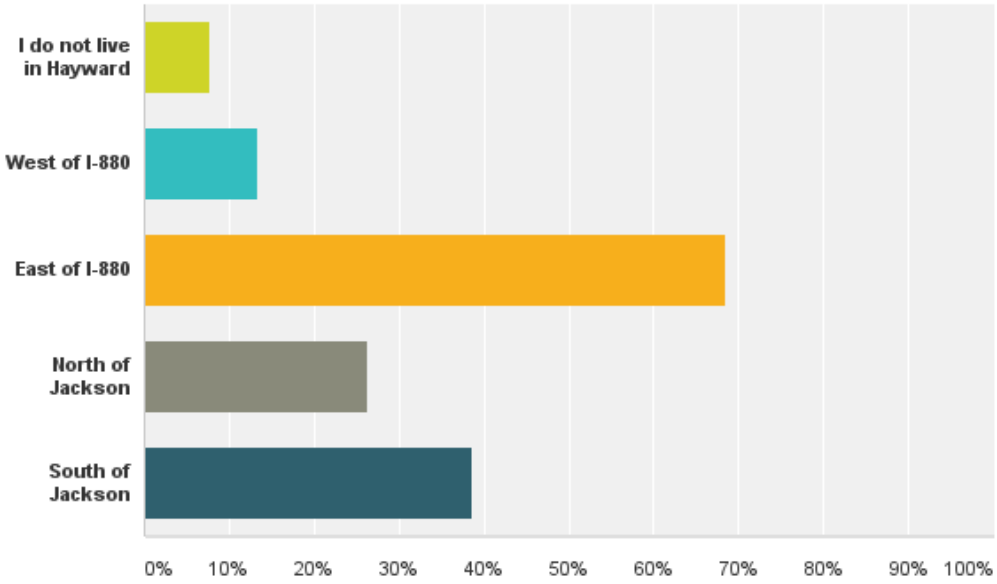
Q17 What is your relationship to the City of Hayward? (Select all that apply)

Answered: 251 Skipped: 25



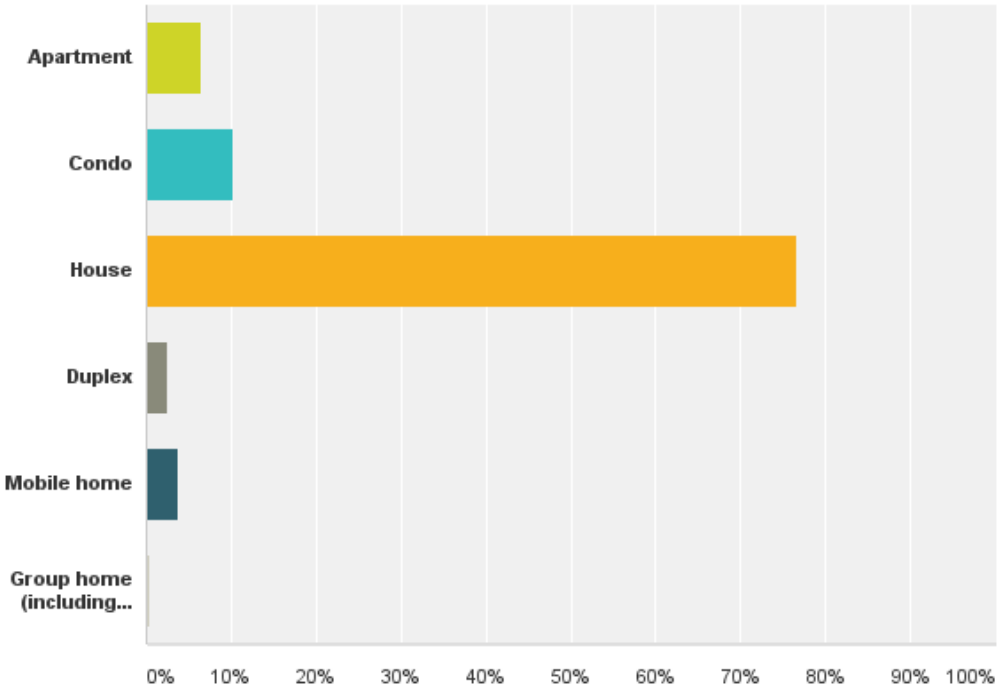
Q18 Where do you live in Hayward? (Select all that apply)

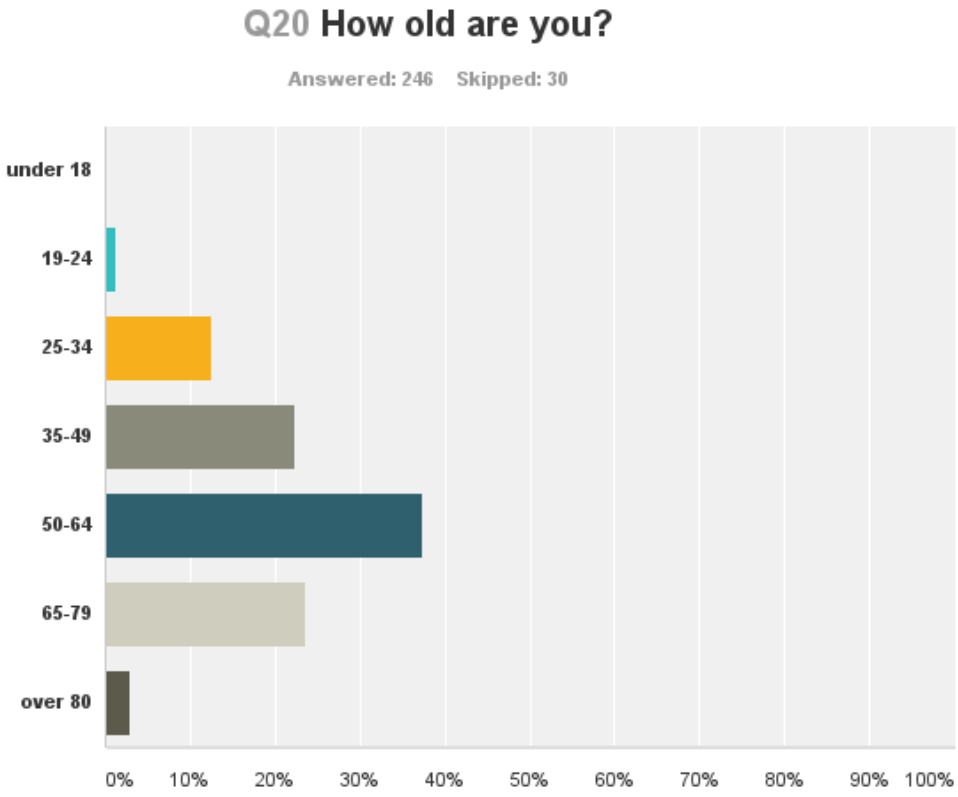
Answered: 248 Skipped: 28



Q19 What kind of home do you live in?

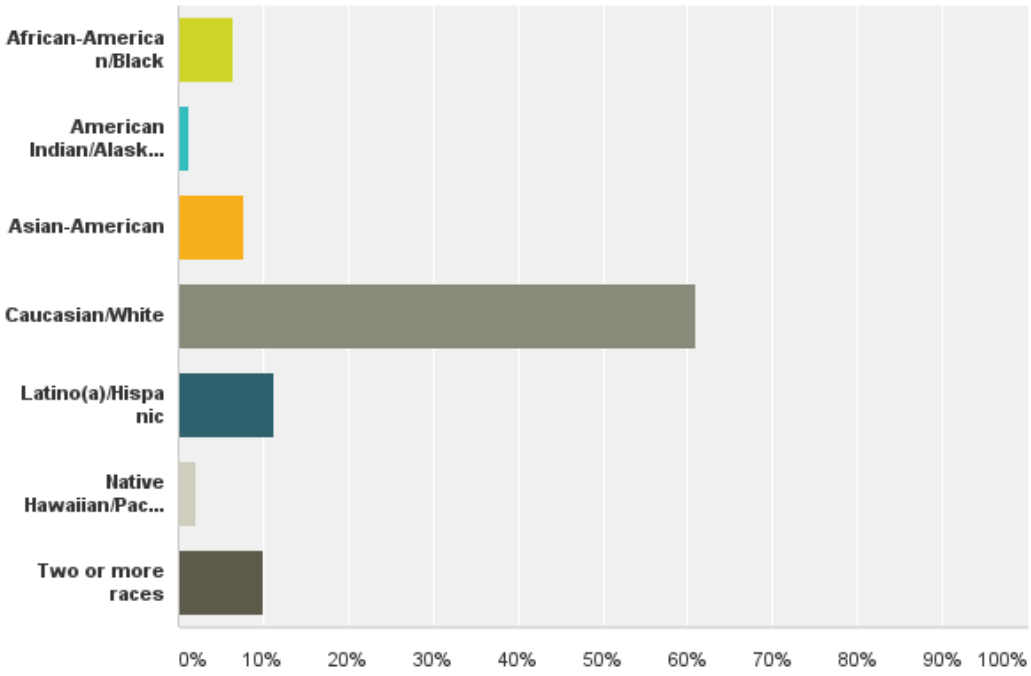
Answered: 244 Skipped: 32




Q20 How old are you?
Answered: 246 Skipped: 30
under 18
19-24
25-34
35-49
50-64
65-79
over 80
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

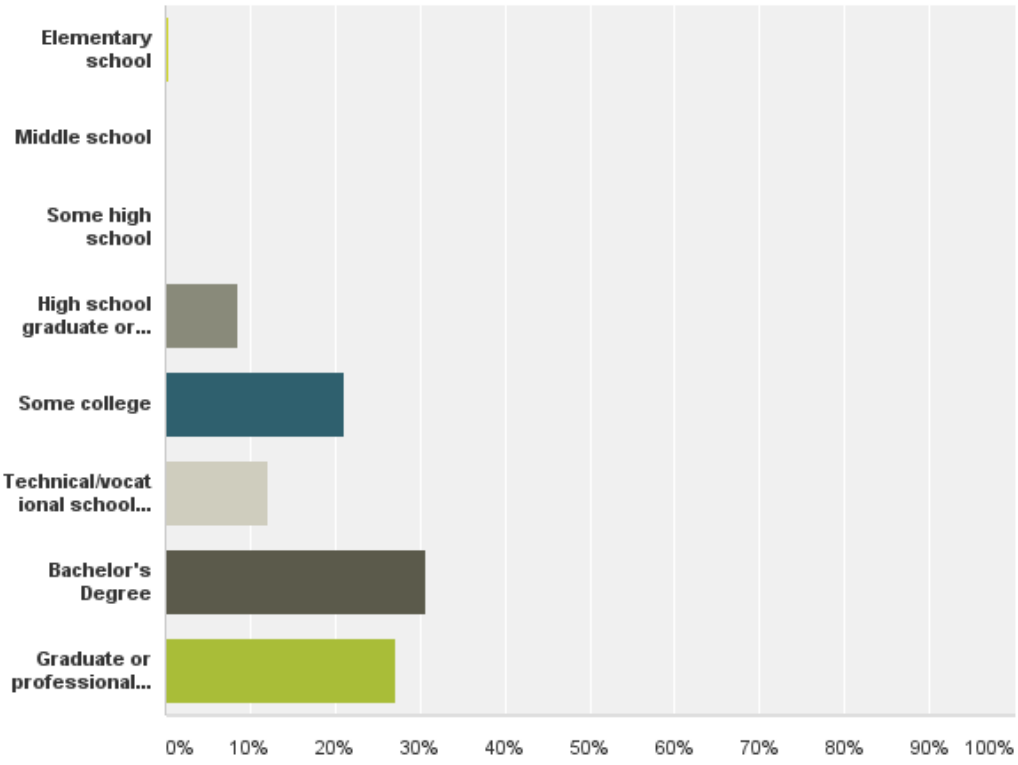
Q21 What ethnic group do you consider yourself to be a part of or feel closest to?

Answered: 231 Skipped: 45

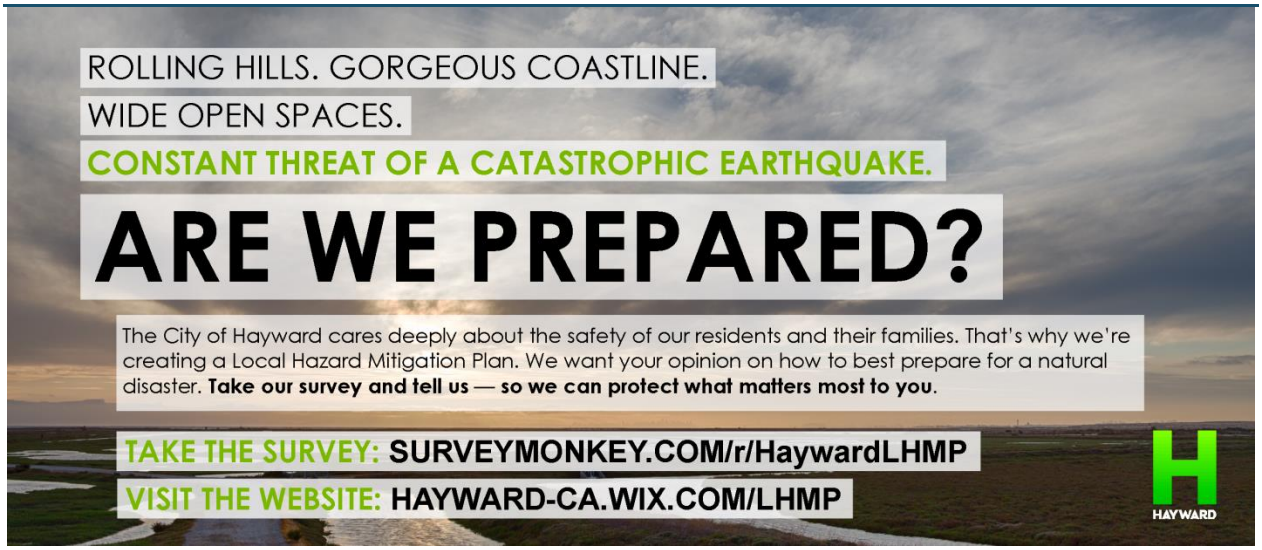


Q22 What is the last grade level you completed in school?

Answered: 247 Skipped: 29

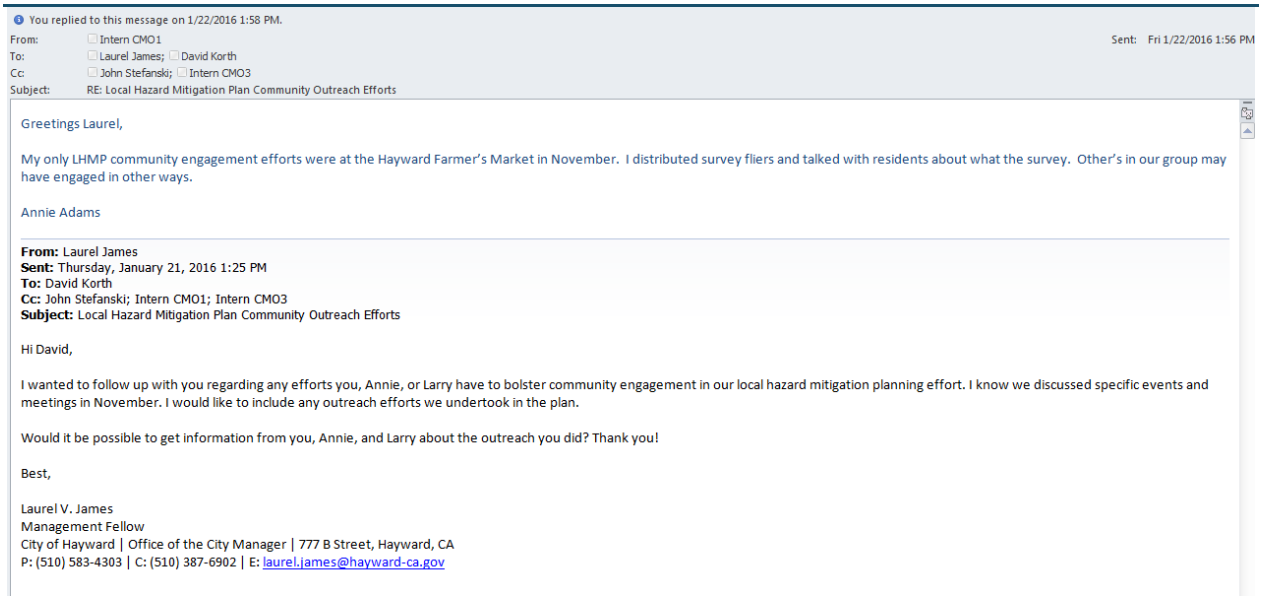


APPENDIX G: FLYERS



APPENDIX H: WEBSITE

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

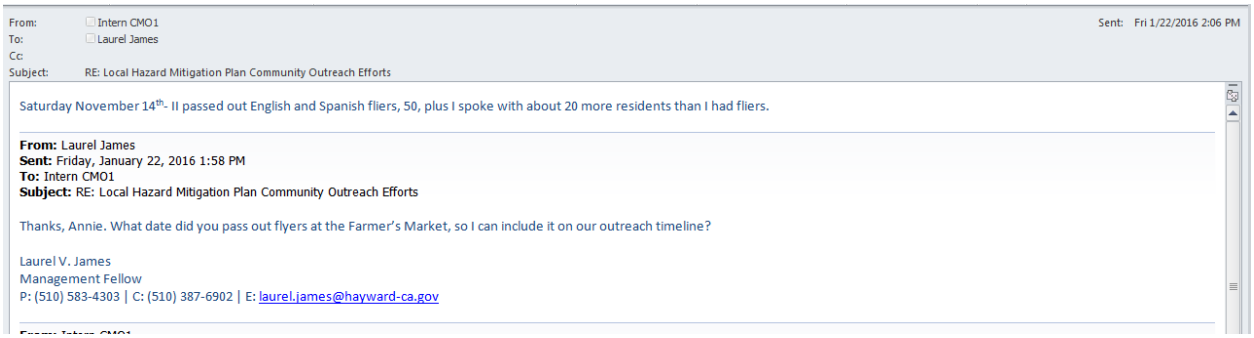
Hi David,

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



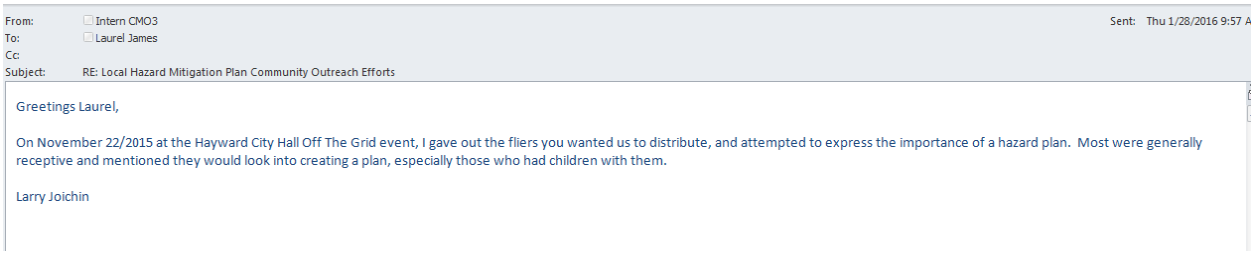
From: Intern CMO1 Sent: Fri 1/22/2016 2:06 PM
To: Laurel James
Cc:
Subject: RE: Local Hazard Mitigation Plan Community Outreach Efforts

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

APPENDIX J: PUBLIC COMMENT PERIOD

Additionally, the 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
Search Twitter
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 @cityofhayward · 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!

APPENDIX K: UPDATES TO 2010 LHMP STRATEGIES

For the sake of simplicity and clarity, where 2010 LHMP mitigation strategies 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 2009 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 2015 status is the reported status by department, not the result of the mitigation strategy selection and prioritization process undertaken for the 2015 plan update.

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

Prior to the 2015 Local Hazard Mitigation Plan update, the City of Hayward had participated in the 2010 Association of Bay Area Governments Multi-Jurisdictional Hazard Mitigation Plan. The priorities and mitigation strategies listed in the previous plan were based on limited involvement in a regional hazard mitigation plan. The priorities listed below, and in the Mitigation Strategies section of this document, are focused specifically on the City of Hayward.

2009 Code	Description	2009 Status	2015 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	New	Ongoing

	>50 ft.		
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	Under Review

		Considered	
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	Ongoing	Ongoing

	mitigation measures		
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	Ongoing	Ongoing

	Code Ch. 10, Article 8 - Grading and Clearing, CBC)		
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	Underfunded	Not Yet

	GIS to determine locations for creek monitoring gauges		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