City of Mission Viejo Local Hazard Mitigation Plan

Public Review Draft

CHAPTER 1 – INTRODUCTION

PLAN PURPOSE AND AUTHORITY

Hazard events can lead to injuries or death, affect the overall health and safety of a community, damage or destroy public and private property, harm ecosystems, and disrupt key services. Although the hazard event often gets the most attention, it is only part of a larger emergency management cycle.

Key Terms

Hazard Event
"an emergency due to a natural or human-caused event that has the potential to cause harm."

Hazard Mitigation
"any sustained action taken to reduce or eliminate long-term risk to people and property from natural or human-caused hazards and their effects."[1]

Resilience
the "capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience."[2]

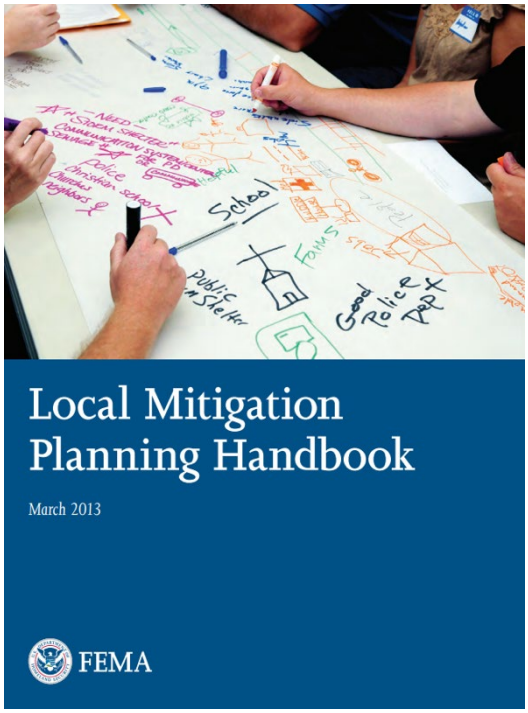
Emergency planners and responders can take steps during the cycle's response, recovery, mitigation, and preparedness phases to minimize the harm caused by a disaster. The City of Mission Viejo 2024 Local Hazard Mitigation Plan (LHMP) focuses on optimizing the mitigation phase of the process. Mitigation involves making a community more resilient so that when hazard events do ultimately occur, the community suffers minor damage and can recover more quickly and effectively. Mitigation differs from preparedness, which involves advanced planning for how best to respond when a disaster occurs or is imminent. For example, a policy to make homes structurally stronger so they suffer minor damage during an earthquake is a mitigation action, while fully equipping emergency shelters to accommodate people who lose their homes in an earthquake is a preparedness action. Some activities may qualify as both.

Like other communities, the City of Mission Viejo (City) could suffer severe harm from hazard events. Although large disasters may cause widespread devastation, minor disasters can have more substantial effects. The City cannot make itself completely immune to hazard events, but this LHMP can help make the community a safer place to live, work, and play. This LHMP provides a comprehensive assessment of the city's threats from natural and human-caused hazard events and a coordinated strategy to reduce these threats. It identifies resources and information to help community members, City staff, and local officials understand local threats and make informed decisions. The LHMP can also support increased coordination and collaboration between the City, other public agencies, local employers, service providers, community members, and other key stakeholders.

[1] California Governor's Office of Emergency Services. 2017. *State of California Emergency Plan*. https://www.caloes.ca.gov/wp-content/uploads/Preparedness/Documents/California_State_Emergency_Plan_2017.pdf
[2] Rodin, J. 2014. The Resilience Dividend: Managing Disruption, Avoiding Disaster, and Growing Stronger in an Unpredictable World. New York: Public Affairs.

Federal Authority

The City is not required to prepare an LHMP, but state and federal regulations encourage it. The federal Robert T. Stafford Disaster Relief and Emergency Act, amended by the Disaster Management Act of 2000, creates a federal framework for local hazard mitigation planning. It states that jurisdictions that wish to be eligible for federal hazard mitigation grant funding must prepare a hazard mitigation plan that meets a specific set of guidelines and submit it to the Federal Emergency Management Agency (FEMA) for review and approval. These guidelines are outlined in the Code of Federal Regulations, Title 44, Part 201, and discussed in greater detail in FEMA's Local Mitigation Plan Review Tool.



FEMA's Local Mitigation Planning Handbook, last updated in 2013, is one of the key guidance documents for local communities in preparing hazard mitigation plans.

State Authority

California Government Code Sections 8685.9 and 65302.6

California Government Code Section 8685.9[3] limits the State of California's share of disaster relief funds paid out to local governments to 75% of the funds not paid for by federal disaster relief efforts except when the jurisdiction has adopted a valid hazard mitigation plan consistent with the Disaster Management Act of 2000. This plan must be incorporated into the safety element in the jurisdiction's general plan. The State may cover more than 75% of the remaining disaster relief costs in these cases.

All cities and counties in California must prepare a general plan, including a safety element that addresses various hazard conditions and other public safety issues. A community may decide to make the safety element a stand-alone chapter or incorporate it into another section of the general plan. California Government Code Section 65302.6 indicates that a community may adopt an LHMP into its safety element if the LHMP meets applicable state requirements. This adoption allows communities to use the LHMP to satisfy state requirements for safety elements. As the General Plan is an overarching long-term plan for community growth and development, incorporating the LHMP creates a stronger mechanism for implementing the LHMP. This LHMP and future updates will be integrated into the City's General Plan Safety Element.

California Government Code Section 65302 (g)(4)

California Government Code Section 65302 (g)(4)[4] requires that the safety element of a community's general plan address the hazards created or exacerbated by climate change. The safety element must identify how climate change is expected to affect the community's hazard conditions and include measures to adapt and be more resilient to these anticipated changes.

Because the LHMP can be incorporated into the safety element, including these items in the LHMP can satisfy the state requirement. SB 379 requires that climate change be addressed in

[3] also known as Assembly Bill (AB) 2140
[4] also known as Senate Bill (SB) 379

the safety element when the LHMP is updated after January 1, 2017, for communities that already have an LHMP, or by January 1, 2022, for communities without one. This LHMP is consistent with current standards and regulations outlined by the California Office of Emergency Services (Cal OES) and FEMA. It uses the best available science, and its mitigation actions/strategies reflect best practices and community values. It meets the requirements of the current state and federal guidelines and makes the city eligible for all appropriate benefits under state and federal law and practices. Note that while FEMA is responsible for reviewing and certifying this LHMP, and Cal OES is responsible for conducting a preliminary review, it does not grant FEMA or Cal OES any increased role in the governance of the city, nor authorize either agency to take any specific action in the community.

Plan Organization and Use

The Mission Viejo LHMP is both a reference document and an action plan. It has information and resources to educate readers and decision-makers about hazard events and related issues and a comprehensive strategy that the City and community members can follow to improve resilience in the city. It is divided into the following chapters:

Chapter 1: Introduction. This chapter describes the Plan's background, goals and objectives, and the process used in its development.

Chapter 2: Community Profile. This chapter discusses Mission Viejo's history, physical setting, land use, demographics, and other important community characteristics.

Chapter 3: Hazard Assessment. This chapter identifies and describes the hazards that threaten Mission Viejo and discusses past and future events and the effects of climate change.

Chapter 4: Vulnerability Assessment. This chapter describes each hazard's threat to Mission Viejo's key facilities and community members, including socially vulnerable individuals.

Chapter 5: Mitigation Strategy. This chapter lists the mitigation actions to reduce Mission Viejo's vulnerability to hazard events and provides an overview of the community's existing capabilities to improve hazard resilience.

Chapter 6: Plan Maintenance. This chapter summarizes implementing, monitoring, and updating the LHMP and opportunities for continued public involvement.

Previous Mission Viejo NHMP

This is an update to the City of Mission Viejo's 2013 Natural Hazards Mitigation Plan (NHMP) and will reinstate the City's eligibility, once approved and adopted, to apply for FEMA grants for hazard mitigation projects and monetary relief during emergency situations. The content from the previous plan has been included in this document and updated accordingly. Key modifications in this plan focus on expanding the risk assessment (understanding potential losses and vulnerable populations) within **Chapter 4** and revised and modified mitigation strategies and actions within **Chapter 5**.

Key updated elements from the previous Mission Viejo NHMP include the following:

- Updated Plan Goals
- Integration of the General Plan, Housing Element, Safety Element, and Climate Adaptation Vulnerability Assessment into the Community Profile, Hazards Assessment, and Vulnerability Assessment chapters of the plan
- Expanded historic events discussions within the plan
- Updated Capabilities Assessment
- Updated Mitigation Actions and Strategies, which include progress on previous actions

Previous Plan Integration

Integration of the 2013 NHMP into other city planning mechanisms did not occur during the previous planning period. In response to this, the City of Mission Viejo initiated this plan update in conjunction with a General Plan Safety Element update to ensure better integration between these two documents as well as including additional guidance in Chapter 6 of this plan on integration into other planning mechanisms.

PLAN GOALS

This Plan was developed to increase resilience in Mission Viejo broadly, relying on the following goals:

Protect Life and Property

- From hazards associated with natural (geologic, flood, and wildfire) and human caused hazards

Enhance Public Awareness

- Through online/in-person methods
- Enhance outreach and engagement with vulnerable populations

Preserve Natural Systems

- To increase water quality and improve watersheds within and surrounding the City

Encourage Partnerships and Implementation

- With neighboring Cities, the County, and other Special Districts

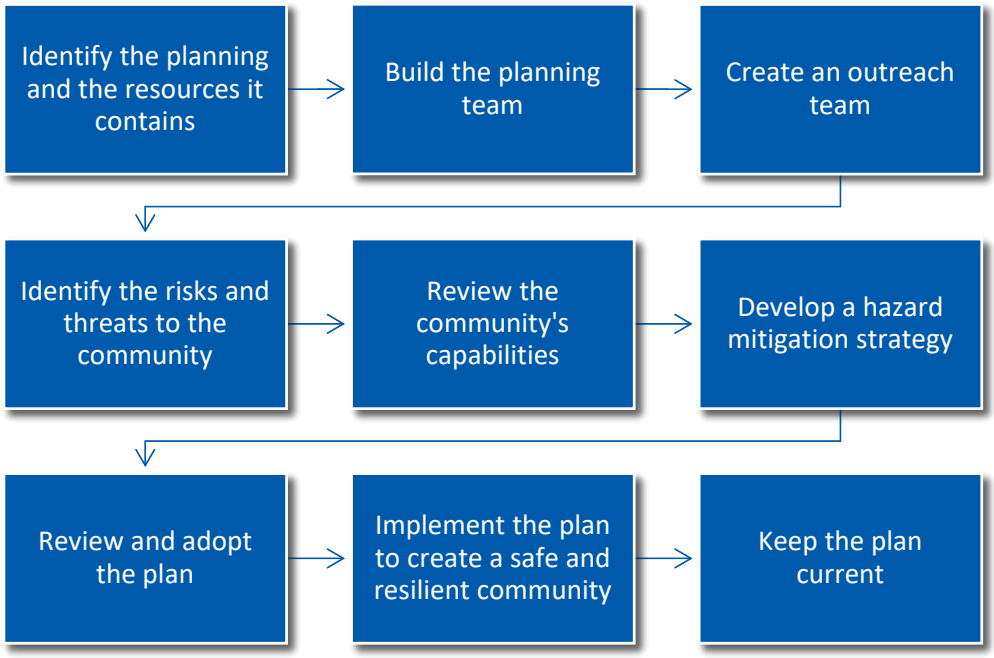
Strengthen Emergency Services

- To maintain emergency and disaster preparedness
- Expand emergency management capabilities

These goals reflect a change in the community's priorities as the City recognized these goals needed to be re-aligned. The previous goals from the 2013 NHMP have been modified to streamline the language, create more consistency with the City's General Plan Safety Element, and were updated to reflect change and align with the community's current priorities. With these updated goals, these new priorities are anticipated to help inform and ensure greater consistency with the City's General Plan Safety Element over the next five years.

PLANNING PROCESS

State and federal guidance for LHMPs does not require that jurisdictions follow a standardized planning process. FEMA encourages communities to create a planning process that reflects local values, goals, and characteristics. FEMA does suggest a general planning process that follows the steps identified below:



The planning process used to create this plan for the City of Mission Viejo is described below.

Hazard Mitigation Planning Committee

The City established a Hazard Mitigation Planning Committee (hereafter referred to as the HMPC). The HMPC comprises representatives from key city departments and stakeholders from local and regional agencies and companies that are key to hazard mitigation activities. **Table 1-1** identifies the members that were invited and/or attended HMPC meetings.

In addition to planning committee members, the following jurisdictions and large employers were invited to participate and engage in the planning process. All jurisdictions and stakeholders were invited via email and/or direct communication via telephone from Mission Viejo's Emergency Manager:

- Orange County Department of Education
- Capistrano Unified School District
- Saddleback Valley Unified School District
- South Orange County Community College District
- Orange County Emergency Management Organization

TABLE 1-1: MISSION VIEJO HAZARD MITIGATION PLANNING COMMITTEE

Name	Title	Department
Paul Catsimanes	Emergency Services Manager	Emergency Services
Paul Melby	Building Official	Building
Tim Martin	Senior Planner	Planning
Corey Gonyea	Public Services Operations Manager	Public Services
Jerry Hill	Director of Public Services	Public Services
Rich Schlesinger	City Engineer	Engineering
Drew Fine	Community Services Manager	Community Services
Cheyne Maule	Division Chief	Orange County Fire Authority
Chris McDonald	Chief of Police Services	Orange County Sheriff's Department
Tobin Anderson	Sergeant	Orange County Sheriff's Department
Aaron Pfannenstiel	LHMP Project Manager	Atlas Planning Solutions
Crystal Stueve	LHMP Planner	Atlas Planning Solutions
Robert Jackson	LHMP Planner	Atlas Planning Solutions

The HMPC held three meetings throughout the plan development process to lay out the plans' methods and approach, draft and review content, make revisions and engage members of the public.

HMPC Meeting #1 (October 6, 2022): The HMPC members confirmed the project goals and responsibilities. They revised the community engagement and outreach strategy, confirmed, prioritized the hazards included in the Plan, and identified critical threat assessment facilities.

HMPC Meeting #2 (January 12, 2023): Members held a detailed discussion about hazard prioritization, results of the hazards assessment and mapping, and the risk assessment that showed the areas, populations, and assets facing elevated risk and vulnerability.

HMPC Meeting #3 (January 23, 2023): The HMPC discussed and reviewed mitigation actions and strategies, made revisions, and assigned priorities.

Invitations to HMPC meetings, and agendas/materials, were provided via email. **Appendix A** contains copies of invitations, meeting agendas, sign-in sheets, and other relevant materials distributed for these meetings.

PUBLIC ENGAGEMENT

Under FEMA guidelines, local hazard mitigation planning processes should create opportunities for the public to be involved in plan development—at a minimum, during the initial drafting stage and plan approval. Due to the COVID-19 pandemic, in-person public workshops and meetings were replaced with virtual workshops, meetings, and discussion groups for health and safety reasons. Several key activities of the LHMP include the following:

Online Engagement

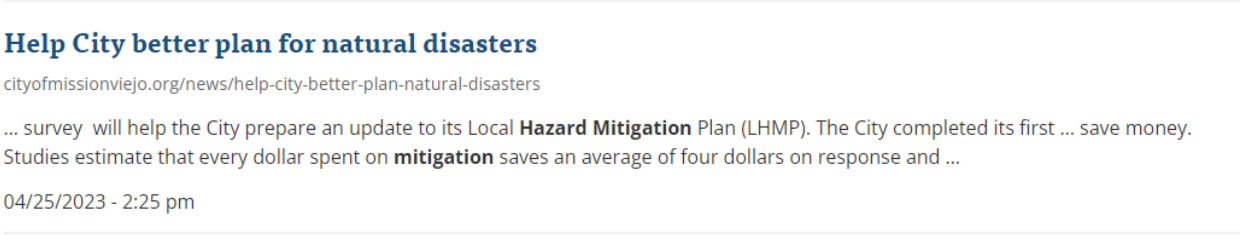
The City has created a local hazard mitigation plan project webpage on the City's webpage, which can be accessed here. From this page, the residents of Mission Viejo can access information on the project, discover the benefits of having a hazard mitigation plan, learn how they can get involved in the plan development process, access the hazard mitigation survey, and learn how to

become better prepared for disasters. Since the website went live in 2023, nearly 300 visits to this webpage have occurred.

In addition to the LHMP project website, the City also used its presence on social media platforms (Facebook, Instagram, Twitter, and Nextdoor) to aid in disseminating project information and updates on project status.

- Facebook: https://www.facebook.com/MissionViejoLife (received 1,115 impressions)
- Twitter: https://twitter.com/MissionViejoCA (received 542 impressions)
- Instagram: https://www.instagram.com/missionviejolife (received 4,227 impressions)
- Nextdoor: https://nextdoor.com/agency/city-of-mission-viejo (received 2,543 impressions)

Finally, the City created a news page where the public could access a brief project synopsis and leave comments if they did not wish to take the hazard mitigation plan survey in its entirety. This page could be accessed here: https://cityofmissionviejo.org/news/help-city-better-plan-natural-disasters and received 101 visits since its creation. In addition, the City's weekly eNewsletter on April 27, 2023 featured this News article and was sent to 21,561 email addresses.


Help City better plan for natural disasters

cityofmissionviejo.org/news/help-city-better-plan-natural-disasters

... survey will help the City prepare an update to its Local **Hazard Mitigation** Plan (LHMP). The City completed its first ... save money. Studies estimate that every dollar spent on **mitigation** saves an average of four dollars on response and ...

04/25/2023 - 2:25 pm

Online Survey

The City released an online survey to community members to gather feedback on the planning process and hazards of concern. The City received 43 responses from community members and stakeholders during the survey period. Responses were received from both zip codes and areas within Mission Viejo, ensuring that the entire City was represented geographically. Based on these responses, the following information was shared with the City:

The top three hazards of concern for Mission Viejo and its communities rank earthquake as the greatest hazard of concern, followed closely by severe weather and wildland fire.

Over 86% of respondents are concerned that earthquakes can affect the city, with approximately 14% indicating they have been affected by this hazard at their residence.

Over 75% of respondents are concerned that climate change may create new hazardous situations in Mission Viejo or worsen existing natural hazards.

Approximately 37% of respondents believe that climate change has already impacted their health, property, livelihood, and overall well-being, about 41% believe that climate change will affect them in the next 5-20 years, while the remaining 22% believe that climate change will not affect them in their lifetime.

About 49% of respondents have taken steps to make their homes less vulnerable to hazards such as earthquakes, floods, and fires.

The results from the survey were provided to the HMPC. The data was then analyzed, reviewed, and incorporated by the HMPC within the LHMP content. The data provided by the survey presented unique local insight into hazard concerns and assessed the overall opinion and perception of the public when it comes to the hazards that affect Mission Viejo. The survey results

are also provided in **Appendix B** of the LHMP, including the survey questions and answers. Below is an advertisement sent out by the City when this survey was released:

Local Hazard Mitigation Plan

cityofmissionviejo.org/departments/police-services/local-hazard-mitigation-plan

... City of Mission Viejo is preparing an update to its Local **Hazard Mitigation** Plan (LHMP). This plan will help create a safer ... the State when disasters do occur. TAKE THE CITY'S LOCAL **HAZARD MITIGATION** SURVEY What is in our LHMP? The City of ...

02/21/2023 - 1:23 pm

Community Meetings

The City provided an overview of the LHMP Planning Process to the Community Emergency Preparedness Academy on April 13, 2023. 32 participants in this event had an opportunity to ask questions, learn about the planning process, and review the maps and hazard prioritization exercise.

Public Review Draft

On February 19, 2024, the City released a draft copy of the LHMP for public review and comment. The document was posted electronically on the City's website. The City distributed notifications about the public review draft through social media accounts and other online sources.

The Public Review Draft period extended from February 19, 2024, through March 6, 2024.

Plan Resources

The City referred to several plans, studies, technical reports, datasets, and other resources to prepare the Plan's hazard assessment, mapping, threat assessment, and other components. **Table 1-2** provides some of the HMPC's primary resources to prepare this Plan.

Table 1-2: Key Resources for Planning Development

Section	Key Resources Reviewed	Data Incorporated from Resources
Multiple	• Cal-Adapt • California Department of Conservation • California Geological Survey • California Office of Emergency Services • California State Hazard Mitigation Plan • City of Mission Viejo General Plan • FEMA Local Hazard Mitigation Plan Guidance • National Oceanic and Atmospheric Administration • National Weather Service • US Geological Survey • US Census Bureau 2017-2021 American Community Survey • Orange County Vulnerability Assessment • Orange County Hazard Mitigation Plan	• Science and background information on different hazard conditions • Records of past disaster events in and around Mission Viejo • Current and anticipated climate conditions in and around Mission Viejo • Projections of future seismic conditions and events
Community Profile	• US Census Bureau 2017-2021 American Community Survey • City of Mission Viejo Existing Condition Reports • Noise and Vibration Existing Conditions Report • Air Quality Existing Conditions Report • Economic and Market Trends Existing Condition Report • Greenhouse Gas Emissions and Climate Change Vulnerability Assessment Existing Conditions Report • Community Mobility Existing Condition Report • California Energy Commission	• Demographic information for Mission Viejo and Orange County • History of the region • Economic trends in Mission Viejo • Commute patterns in Mission Viejo • Local land-use patterns • Background information on utilities serving Mission Viejo • Current Climate information in Mission Viejo
Hazard Assessment (Flood Hazards, includes Dam Failure)	• FEMA Map Service Center • Orange County Flood Control District • Orange County Water District • Metropolitan Water District of Southern California • US Army Corps of Engineers • California Department of Water Resources	• Records of past flood events in and around Mission Viejo • Locations of flood-prone areas in Mission Viejo • Mapping of dam failure inundation areas • Profiles and conditions of dams in and around Mission Viejo
Hazard Assessment (Seismic Hazards)	• Southern California Earthquake Data Center • The Third California Earthquake Rupture Forecast (UCERF3) • California Geological Survey	• Location of fault zones • Records of past earthquakes

Hazard Assessment (Severe Weather Hazards)	• Cal Adapt • California Department of Water Resources • US Drought Monitor • Western Regional Climate Center	• Historic drought information • Current drought conditions • Science and background information on extreme weather events • Historical record of extreme weather events in and around Mission Viejo
Hazard Assessment (Wildfire Hazards)	• California Department of Forestry and Fire Prevention • Fire and Resource Assessment Program	• Records of past fire events • Location of fire hazard zones in and around Mission Viejo
Note: Sections not individually mentioned in this table relied primarily on sources identified in multiple sections.		

CHAPTER 2 – COMMUNITY PROFILE

The Community Profile section of the LHMP describes Mission Viejo, including information about the community's physical setting, history, economy and demographics, current and future land uses, and key infrastructure. The Community Profile helps establish the baseline conditions in Mission Viejo, which informs the development of the hazard mitigation strategies and actions in **Chapter 5**.

SETTING AND LOCATION

The City of Mission Viejo is located in southern Orange County, Region I, the Southern Administrative Region of the State Office of Emergency Services. It covers an area of approximately 18.7 square miles with a population of approximately 93,215 (US Census Bureau, 2022 estimate). It offers the benefits of living in a mild, Mediterranean climate, and the City is characterized by the unique and attractive landscape that makes the area so popular. However, the potential impacts of natural hazards associated with the terrain make the environment and population vulnerable to natural disasters.

Mission Viejo is well-situated adjacent to the merger of the Interstate 5 and 405 Freeways and the Foothill and Eastern Transportation Corridors, which provide easy access to Los Angeles, San Diego, and the Inland Empire. Orange County Airport and an Amtrak station are only minutes away. Los Angeles, Long Beach, and San Diego are major ports for Pacific Rim business and are less than an hour away from the city. The city's neighborhoods are set among parks, lakes, and forests against the backdrop of the Cleveland National Forest and Saddleback Mountains. Mission Viejo has safe, stable neighborhoods with a strong family orientation that provides a place to live well. The City does not have its own police or fire department but contracts with the Orange County Sheriff's Department and the Orange County Fire Authority to provide these services. The City also contracts for city attorney services.

The city experiences an average of 283 sunny days per year, compared to a national average of 205 days. There is rarely any recorded snowfall in Mission Viejo, ranking it as one of the least snowy places in California. Mission Viejo experiences about 14 inches of rain yearly, compared to the national average of 38 inches annually.[5] The average temperature in Mission Viejo ranges between 70-85°F for most of the year. Like most of Southern California, Summers in Mission Viejo are hotter on average.

HISTORY

The land upon which Mission Viejo is developed was part of the 52,000-acre Rancho Mission Viejo. The chain of title to the land dates back to July 27, 1769, when a Spaniard named Gaspar de Portola led an expeditionary force from Mexico across the southern border of the ranch and claimed the land for Spain. Seven years later, the ranch witnessed the first attempt to found Mission San Juan Capistrano. Although lack of water forced the friars to relocate and the whereabouts of this old mission remain a mystery, the name Mission Viejo bears testimony to this structure's stay in San Juan Canyon more than two hundred years ago.

After Mexico won independence from Spain in 1821, a new flag flew over California, and a new spirit filled the air. The missions, which had been established to further the spread of the Christian faith, became secularized, and their vast landholdings were granted as ranches to prominent citizens. One man who happened to be standing in the right place at the right time was an English

[5] "Best Places to Live", 2022, https://www.bestplaces.net/climate/city/california/mission_viejo

trader named John Forster. John or Juan, as the name reads on the old land grant, married the Mexican governor's sister and acquired the three ranchos historically known as El Trabuco, Mission Viejo, and Los Potreros. But fate frowned on Don Juan Forster. Fencing 205,000 acres drained his capital, droughts destroyed his cattle, and futile efforts to attract settlers dried up his last remaining credit. When Forster died, his estate was in shambles, and his sons were forced to sell.

In 1907, an Irish cattleman named Richard O'Neill acquired an undivided interest in Rancho El Trabuco and Rancho Mission Viejo. When a 1963 study indicated that urbanization was spreading south from the Los Angeles area, his grandchildren, Richard O'Neill and Alice O'Neill Avery, decided to sell 10,000 acres. Donald Bren, Philip J. Reilly, and James Toepfer purchased the property and organized the Mission Viejo Company.

In 1965, a master plan for Mission Viejo was approved by the Orange County Board of Supervisors. One year later, Forster's dream of attracting settlers became a reality as families stood in line to pay $21,000 for homes on his former cattle range. In April 1966, these pioneering residents moved into the new neighborhoods near the intersection of La Paz Road and Chrisanta Drive.

Minerals and Soils

The characteristics of the minerals and soils present in the City of Mission Viejo indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes, liquefaction, and landslides.

The surface material includes unconsolidated, fine-grained deposits of silt, sand, gravel, and recent floodplain deposits. Torrential flood events can introduce large deposits of sand and gravel. Sandy silt and silt containing clay are moderately dense and firm and are primarily considered to be prone to liquefaction and earthquake-related hazards. Basaltic lava consists mainly of weathered and non-weathered, dense, fine-grained basalt. Though the characteristics of this lava may offer solid foundation support, landslides are common in many of these areas where weathered residual soil overlies the basalt. Understanding the geologic characteristics of Mission Viejo is an important step in hazard mitigation and avoiding at-risk development.

Demographics

The data used in this section comes from the most comprehensive American Community Survey 2016 - 2021(ACS), administered by the United States Census Bureau (U.S. Census) completed in 2022, and the California Department of Finance (DOF). Based on this dataset, Mission Viejo’s projected population is 93,932, with a median age of 45.7. This median age is approximately six and a half years older than the average median age in Orange County (39.2). The percentage of children under the age of 10 is slightly lower at 10.7% compared to the rest of Orange County, which is 11.2%. The percentage of senior residents (65 and older) in the city is 5.3% higher than the rest of Orange County. Mission Viejo residents have a higher median income than the rest of Orange County. In addition, a lower proportion of Mission Viejo’s residents rent their homes (35.4%) than the rest of Orange County residents (43.5%).

Table 2-1 identifies the basic demographics for Mission Viejo and Orange County according to the 2021 ACS 5-year projections. Note that these statistics may vary from the demographic information used in Chapter 4, Threat Profiles, as that data set comes directly from ESRI’s Business Analyst Tool.

TABLE 2-1: BASIC DEMOGRAPHICS—MISSION VIEJO & ORANGE COUNTY

Demographics	Mission Viejo	Orange County
Total Population	93,932	3,182,923
Percent of residents who are less than 10 years old (i.e., children)	10.7%	11.2%
Percent of residents who are senior citizens (65+)	21%	15.7%
Median Age	45.7	39.2
Total households	32,690	1,057,592
Median household income	$126,320	$100,559
Percent of rental households	35.4%	43.5%

Source: American Community Survey, 2016-2021 ACS 2021 5-Year Projections
* 2021 Census projections identify an estimated population of 93,932, which is used in Chapter 4 of this plan.

In terms of its racial and ethnic composition, Mission Viejo is a white-majority city, with 79.2% of all Mission Viejo residents identifying as white. According to the ACS, this population makeup is similar to Orange County as a region, with some variations in the overall percentages. **Table 2-2** shows the racial and ethnic composition of all groups in the Mission Viejo and Orange County region.

TABLE 2-2: DETAILED DEMOGRAPHIC BREAKDOWN—MISSION VIEJO & ORANGE COUNTY

Race & Ethnicity	Mission Viejo		Orange County	
	Population	Percentage	Population	Percentage
White	74,383	79.2%	1,985,424	62.4%
Black	1,932	2.1%	85,503	2.7%
American Indian & Alaskan Native	909	1.0%	47,596	1.5%
Asian	17,573	18.7%	767,609	24.1%
Native Hawaiian & other Pacific Islander	456	0.5%	22,695	0.7%
Some other race alone	8,499	9.0%	596,021	18.7%
Two or more races, non-Hispanic	9,183	9.8%	302,089	9.5%
Hispanic or Latino (of any race) *	17,739	18.9%	1,083,093	34.0%
Total	**93,932**	**100%**	**3,182,923**	**100%**

* The US Census Bureau does not currently count persons identifying as Hispanic or Latino as a separate racial or ethnic category. Persons who identify as Hispanic or Latino are included in the other racial or ethnic categories.
Source: U.S. Census Bureau, 2021 American Community Survey (ACS) – Mission Viejo and Orange County

Mission Viejo residents have attained higher education levels in comparison to Orange County. For example, a higher percentage of the city's population has earned a bachelor's degree (32.7%) compared to the rest of Orange County (26.6%). Similarly, a higher percentage of the city has attained a graduate or professional degree (18.2%) as compared to Orange County (15.5%). Other categories also differ, such as a lower percentage of people not having education past ninth grade and a lower percentage of people not graduating high school. However, a lower percentage of the city's population has a higher High school graduate or equivalent level of education than Orange County. **Table 2-3** shows all levels of educational attainment of residents 25 years of age

or older in both Mission Viejo and Orange County, according to the American Community Survey as of 2021.

TABLE 2-3: EDUCATIONAL ATTAINMENT OF RESIDENTS 25+ YEARS OLD—MISSION VIEJO & ORANGE COUNTY

Level of Education Completed	Mission Viejo		Orange County	
	Number	Percentage	Number	Percentage
Less than 9th grade	1,971	2.9%	159,612	7.3%
9th grade to 12th grade (no diploma)	1,615	2.4%	134,568	6.1%
High school graduate or equivalent	10,191	14.8%	378,888	17.2%
Some college (no degree)	13,771	20.0%	428,349	19.5%
Associate degree	6,182	9.0%	170,409	7.8%
Bachelor's degree	22,500	32.7%	585,008	26.6%
Graduate or professional degree	12,491	18.2%	340,356	15.5%
Total	**68,721**	**100%**	**2,197,190**	**100%**

Source: U.S. Census Bureau, 2019 American Community Survey (ACS) – Mission Viejo and Orange County
Percentage values are rounded to the nearest tenth decimal.

Mission Viejo has a wide range of non-English languages spoken at home among its residents, with varying proficiency levels. Generally, Spanish is the second most spoken language in Mission Viejo, with approximately 34.7% that speak English less than "very well." Asian and Pacific Islander languages are the third most-spoken languages in Mission Viejo, with slightly over 45.7% that speak English less than "very well." This is similar to populations in Orange County, where slightly over 37% of Spanish speakers speak English less than "very well." According to the ACS, **Table 2-4** shows the most spoken languages and the levels of fluency among speakers aged five years and older in Mission Viejo and Orange County**.**

TABLE 2-4: ENGLISH PROFICIENCY & LANGUAGES SPOKEN AT HOME AMONG RESIDENTS AGED 5+ YEARS IN MISSION VIEJO & ORANGE COUNTY

Languages	Mission Viejo			Orange County		
	Number of speakers	% not fluent in English	Speak English "less than very well"	Number of speakers	% not fluent in English	Speak English "less than very well"
English	63,470	_	_	1,648,709	-	-
Spanish	9,566	3,323	34.7%	729,471	272,633	37.4%
Indo-European*	6,733	1,717	25.5%	132,979	32,815	24.7%
Asian & Pacific Islander*	7,809	3,571	45.7%	453,867	227,226	50.1%
All other languages	1,292	321	24.8%	35,912	10,929	30.4%
Total	88,870	8,932	35.2%	3,000,938	543,603	40.2%**

*Census data does not break down the specific languages for languages spoken in these regions.
**Due to these figures only being a percentage of the overall number of speakers, they will not add up to 100%.
Source: U.S. Census Bureau, 2021 American Community Survey (ACS) – Mission Viejo and Orange County

Economy and Commute Patterns

Mission Viejo has a diverse economy of employers from various sectors, including medical services, educational services, retail services, restaurant and entertainment options, City employees, and warehouses. With a total employment base of 48,700 jobs for employees, the top 10 employers in the City include Mission Hospital Regional Medical Center, Saddleback College, Saddleback Unified School District, Target Corporation, James Hardie Building Products, Capistrano Unified School District, Nordstrom Department Store, Amazon Delivery Station, Macy's Department Store, and City of Mission Viejo.[6] These employers account for a little over 15.67% of the workforce within the city. The Shops at Mission Viejo, a regional mall of 1.1 million square feet, is an anchor for the commercial sector within the City. **Table 2-5** shows the top ten employers in Mission Viejo according to the City's 2021/2022 Comprehensive Annual Financial Report.

Table 2-5: 10 Largest Employers in Mission Viejo, as of 2021

Employer	Number of Employees	Percentage of Total City Employment
Mission Hospital Regional Medical Center	2,764	5.58%
Saddleback College	1,429	2.93%
Saddleback Unified School District	917	1.88%
Target Corporation	513	1.05%
James Hardie Building Products	436	0.90%
Capistrano Unified School District	432	0.89%
Nordstrom Department Store	362	0.74%
Amazon Delivery Station	266	0.55%
Macy's Department Store	263	0.51%
City of Mission Viejo	250	0.51%

Source: City of Mission Viejo, Comprehensive Annual Financial Report for FY Ending 2022.

As of 2019, over 46,050 Mission Viejo residents are employed, with approximately 4,024 (8.7%) working within the city. This local workforce accounts for 12.8% of the entire workforce, with the remaining workforce coming from surrounding cities throughout the region. **Table 2-6** shows the top five cities that contribute to Mission Viejo's workforce, accounting for approximately 38.4% of those employed within the city.

Table 2-6: Top 5 Cities-of-Origin for Mission Viejo's Workforce (2021)

Employee City-of-Origin	Number of Employees	Percentage of Total City Employment
Irvine	7,043	15.3%
Mission Viejo	4,024	8.7%
Lake Forest	2,252	4.9%
Los Angeles	2,224	4.8%
Santa Ana	2,145	4.7%
Total	**17,688**	**38.4%**

Source: https://onthemap.ces.census.gov/

While most of Mission Viejo's residents commute outside the city for work, most commuting residents (37.0%) travel less than 10 miles to reach their place of employment. Approximately

[6] City of Mission Viejo, 2021/2022 Annual Comprehensive Financial Report

13.6% of commuters traveled 50 miles or more, with most of those trips heading into the Los Angeles or San Diego areas. The City boasts convenient rail (Metrolink station Laguna Niguel/Mission Viejo Station), airport access (John Wayne International Airport, approximately 14 miles), and freeway access to Los Angeles and San Diego, with routes that connect to Riverside and San Bernardino Counties. **Table 2-7** shows the outflow of workers from Mission Viejo to other worksites in the region.

TABLE 2-7: WORK COMMUTE DISTANCES FOR MISSION VIEJO'S RESIDENTS (2021)

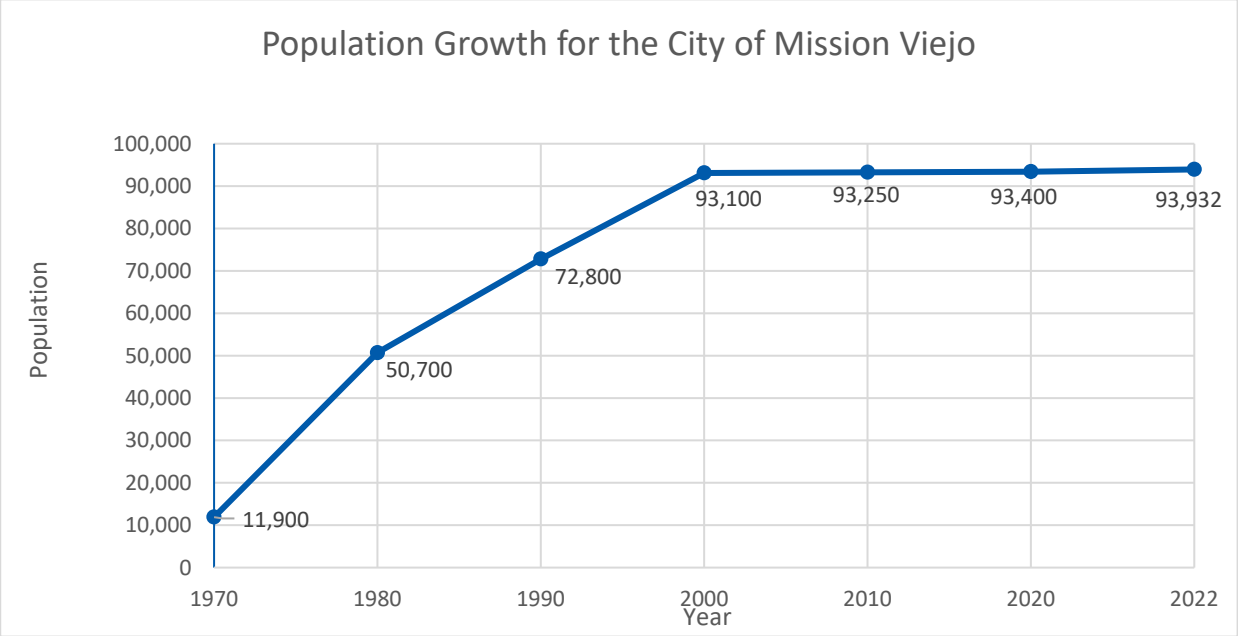
Work Destination for Mission Viejo Residents	Number	Percentage
Less than 10 miles	17,048	37.0%
10 to 24 miles	15,205	33.0%
25 to 50 miles	7,532	16.4%
Greater than 50 miles	6,265	13.6%
Total	**46,050**	**100%**

Source: https://onthemap.ces.census.gov/

DEVELOPMENT TRENDS

Mission Viejo is located within a dense part of northern Orange County that has experienced significant growth and development over the past 50 years. The city's population has grown by approximately 82,000 residents in the past 50 years. According to the California Department of Finance database, the City's 2022 population was around 93,700 residents. With land still available and multiple active developments ongoing within the city, population growth is expected to continue. **Figure 2-1** displays the population growth experienced in Mission Viejo from 1970 to 2022.

FIGURE 2-1: POPULATION GROWTH OF MISSION VIEJO FROM 1970 -2022



Source: World Population Review: Mission Viejo

According to the 2021-2029 City of Mission Viejo Housing Element, the city has a state housing development requirement of 2,217 units. Currently, between the City's identified Vacant sites, Underutilized sites, and Potential Accessory Dwelling Units (ADUs), Mission Viejo not only meets

the State requirement but has an identified surplus of potential units available for development. **Appendix B,** Residential Land Inventory, of the 2021-2029 Housing Element provides a detailed analysis of this and can be accessed here. This appendix identifies all current residential development, anticipated future residential development, and the overall residential development capacity within the city.

The development potential anticipated in the Housing Element recognizes the various environmental constraints like seismic hazards, flooding, and wildfires. These hazards will be addressed during the development process and approvals for many of the new developments built in the next housing element cycle. However, a small portion of the new housing constructed in the City may be accessory dwelling units, which could be located in high-hazard areas (wildfire hazard zones). While the newly constructed units will comply with the latest building requirements, other parts of the existing community may not. As a result, many of the mitigation actions identified in this plan are intended to assist existing areas of the community in addressing these potential vulnerabilities.

Major Community Components

Open Space and City Parks

The City of Mission Viejo prides itself on its beautiful scenery, open spaces, and 47 immaculate city parks. The undeveloped area of Mission Viejo, in the eastern portion of the City, contains natural resources, such as steep slopes, canyons, and drainage courses associated with the land's physical characteristics. These natural resources can act as constraints to development and define the area's environmental character. The unincorporated lands to the north and east of Mission Viejo contain natural resources significant to the sub-region. The Conservation and Open Space Element of the General Plan was developed to assist the City by providing direction when planning development in and adjacent to these open spaces. The goals and supporting policies included in the Element are concerned with specific issues and opportunities to conserve the city's remaining sensitive lands and to enhance the open space within the City.

Lake Mission Viejo

A reservoir created for recreation in the City. The reservoir was formed by an earth fill dam built across the canyon of Oso Creek, which is part of the Trabuco Creek and San Juan Creek drainage basin. The lake is not fed by urban runoff and is maintained to be safe for contact. The Lake Association owns and operates the Lake facilities, including approximately 124 surface acres of water and 50 acres of land, including Playa del Norte (North Beach) and Marina, Playa del Este (East Beach), parking facilities, and Market on the Lake Dock and dam. Recreational facilities available for Lake Association members include the Lake, two large beaches and picnic areas, clubhouse rental, boat launching facility, and shoreline fishing area.

Marty Russo Youth Athletic Park

The Marty Russo Youth Athletic Park is over 41 acres of space for youth athletic programs. The park is the main place in Mission Viejo for youth soccer and baseball. The park features 3 lighted baseball fields, 2 lighted soccer/football fields, 5 baseball fields, 3 soccer/football fields, 4 batting cages, restrooms, 2 picnic structures, 15 picnic tables, and 2 BBQ areas.

The Shops at Mission Viejo

The Shops at Mission Viejo are South Orange County's main shopping destination and is one of the main elements of the city's commercial sector. With over 150 shops and restaurants, this massive indoor shopping mall is over 1.2 million square feet, anchored by two Macy's locations,

Nordstrom, Apple, and Dicks Sporting Goods. Combined, it is one of the largest employers in the City and remains a destination for shoppers throughout the region.

Infrastructure Assessment

Infrastructure plays a vital role in mitigating the effects of hazard events. When infrastructure fails, it can exacerbate the effects of a hazard event or create complications for rescue workers trying to reach victims. For example, fallen utility poles resulting from strong winds or seismic activity can obstruct roadways and prevent emergency vehicles from reaching affected areas. The following are Mission Viejo's electrical, gas, water and wastewater, and infrastructure transportation networks.

Electricity Service

Electricity is provided to the City by Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E). Both SCE's and SDG&E's infrastructure projects are designed to deliver the greatest good for the most people across the region. When possible, they use existing utility corridors to reduce environmental impacts and select power line methods that align with the most affordable industry standards for cost-effective construction and maintenance. They are committed to delivering power reliably every day of the year, even during unusual events like heat waves.

Natural Gas

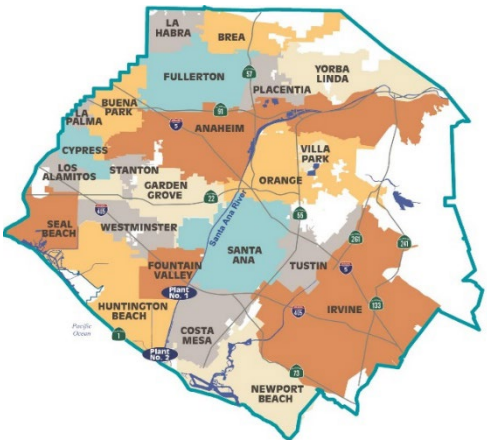
The Southern California Gas Company (SoCalGas) provides natural gas to Mission Viejo and surrounding jurisdictions. SoCalGas owns and operates transmission lines throughout Orange County to ensure sufficient natural gas throughout the region. If these lines are damaged, there is the potential to interrupt the flow and delivery of natural gas throughout the region. Additionally, natural gas ignites easily. Any rupture in a transmission line could cause additional damage to properties in the vicinity of the leak due to fire from the escaped natural gas. The presence of this infrastructure creates unique challenges for the city from an emergency management perspective. The inclusion of hazards associated with damage to this infrastructure is an important element of an effective response to future incidents involving natural gas use and transmission.

Water Service

Water for City residents is supplied by the Santa Margarita Water District (SMWD), which serves the eastern portion of the City, the Moulton-Niguel Water District (MNWD), which serves the western portion of the City, and the El Toro Water District (ETWD), which serves the western area formerly in Community Service Area 12. The three districts treat and distribute water purchased from the Metropolitan Water District, which imports water from northern California and the Colorado River. As with sewer lines, water transmission, pumping, and storage facilities are expanded as necessary to accommodate future growth. Domestic water supply is not expected to limit development during the planning period.

Wastewater Treatment

Sewage collection and treatment in Mission Viejo is provided by the Santa Margarita Water District (SMWD), the Moulton-Niguel Water District (MNWD), and the El Toro Water District (ETWD). The Santa Margarita and Moulton-Niguel Water Districts operate water reclamation plants that provide reclaimed water for use on greenbelts and golf courses in the City. Most sewage generated in Mission Viejo is treated at the South East Regional Reclamation Authority (SERRA) treatment facility in Dana Point. Sewer infrastructure improvements are typically installed in conjunction with new developments, and sewer lines are extended as necessary. Sewage treatment capacity is available to serve the City's remaining developable area and therefore does not constrain development.



Orange County Sanitation District Service Area. OC San Map

Storm Water Drainage

The City maintains a Master Drainage Plan which identifies existing facilities and deficiencies and outlines a program to correct known problem areas. The Orange County Flood Control District (OCFCD) is responsible for the regional flood control system and maintains several facilities within Mission Viejo. The City works closely with OCFCD to identify improvements needed to accommodate proposed development projects. Development proposals are reviewed for consistency with approved development plans and with the Master Drainage Plan. With these existing facilities and review procedures in place, the City's flood control system is not expected to limit development during the planning period.

Transportation System

Private automobiles are the dominant means of transportation in Southern California and in the City of Mission Viejo. However, the City of Mission Viejo meets its public transportation needs through a mixture of a regional transit system (OCTA), Metrolink rail system, and various city-contracted transportation services for seniors and access and functional needs patrons. According to the U.S. Census Bureau, about 91% of employed Mission Viejo residents worked in Orange County, and approximately 25% of all workers were employed within the city limits.

There are a total of three highways that provide access to Mission Viejo and access to the greater region from the City. The largest is Interstate 5 (I-5), which has five exits servicing the City, Avery Parkway, Crown Valley Parkway, Oso Parkway, La Paz Road, and Alicia Parkway. California State Route 241 (SR-241) offers one intersection with the City at Los Alisos Boulevard. County Route S18, also known as El Toro Road, travels within Mission Viejo's city limits between Marguerite Parkway / Saddleback Church and Glen Ranch Canyon Road in the most northern part of the city.

CHAPTER 3 – HAZARD ASSESSMENT

HAZARD PROFILES

This chapter discusses the types of hazards that might reasonably occur in Mission Viejo. It describes these hazards and how they are measured, where they may occur, a history of these hazards in and around the city, and the future risk they pose. The discussion of future risks includes changes to the frequency, intensity, and/or location of these hazards due to climate change. This chapter also discusses how the HMPC selected and prioritized this Plan's hazards.

Hazard Identification

FEMA guidance identifies several hazards that communities should evaluate for inclusion in a hazard mitigation plan. Communities may also consider additional hazards for their plans. The HMPC reviewed an extensive list of hazards and excluded those that do not pose a significant threat to Mission Viejo. **Table 3-1** lists the hazards considered and explains the reasoning for inclusion/exclusion. For context, this table also shows if a hazard is recommended for consideration by FEMA if it is included in the 2018 California State Hazard Mitigation Plan (SHMP) and if it is included in the Orange County Hazard Mitigation Plan (OC HMP). This table does not include all potential impacts; the table is based on FEMA and State guidance and the most probable impacts within Mission Viejo. As a result, some hazards like war or foreign invasion are better addressed at the Federal level.

TABLE 3-1: HAZARD EVALUATION FOR MISSION VIEJO LHMP

Hazard	Recommended for Consideration	Included in this LHMP?	Reason for Inclusion or Exclusion
Agricultural Pests	SHMP	No	Mission Viejo has minimal agricultural uses within the city that contribute to the economy. Concerns regarding agricultural pests are not a significant concern citywide.
Air Pollution	SHMP	No	Air pollution is a state and regional issue that is addressed through plans and regulations administered by the South Coast Air Quality Management District and/or California Air Resources Board. Since the City has little control over regulating air quality, this hazard was not included.
Aircraft Incident	SHMP	No	The City is located approximately 14 miles from John Wayne Airport. Given the distance and lack of history associated with this hazard in the city, it was determined that this hazard should not be included in the plan.
Aquatic Invasive Species	SHMP	No	The only major body of water in Mission Viejo is the Lake Mission Viejo reservoir, created for recreation. There have not been any reports of invasive species, and it isn't a concern for the City.
Avalanche	FEMA guidance SHMP	No	There is no potential for avalanches to occur within the city.
Civil Disturbance or Riot	SHMP	No	The City does not contain any major tourist destinations or facilities that allow large crowds of people to assemble. This is not a concern for the City.
Climate Change	SHMP OC HMP	Yes	Climate change is a concern identified by the HMPC and has been included within each hazard profile where relevant.

Coastal Flooding and Storm	FEMA guidance SHMP	No	Based on its distance from the coast, coastal flooding and storms are not a concern for the city.
Cyber Threats	SHMP	No	Since this type of hazard is not considered a natural hazard and the types of grant funding opportunities available with this plan would not fund cyber mitigation, the City did not feel this plan was appropriate for addressing this hazard. The City does have dedicated cyber security staff and proactively trains employees on cyber safety as part of their risk reduction measures associated with this hazard.
Dam Failure	FEMA guidance SHMP OC HMP	Yes	The Upper Oso, El Toro Reservoir, and Lake Mission Viejo are located within the city and have the potential to inundate the city if failure were to occur. Due to this potential, the HMPC identified dam failure as a hazard of concern.
Drought	SHMP OC HMP	No	Droughts are a recurring hazard in Mission Viejo and Southern California and can affect city water supplies. The City's water supply comes from multiple water districts, which purchase water from other sources/purveyors. Drought is addressed in the Urban Water Management Plans and Hazard Mitigation Plans for these water districts and supported by the city. The Mission Viejo City municipal code chapter 8.12 outlines the water efficient landscape regulations put in place by the city to aid in drought mitigation. As the water supply for the city is out of their control, and current policies are in place by both the city and the water districts', drought was not identified as a hazard that should be addressed in the City's Hazard Mitigation Plan.
Energy Shortage	SHMP	No	Mission Viejo's electrical power is provided by Southern California Edison and San Diego Gas and Electric, which have a long history of reliability, and therefore the HMPC decided that this is not a concern for the city.
Epidemic, Pandemic, Vector-Borne Disease	SHMP	No	Being a largely residential community and lack of tourism, The HMPC did not identify this as a hazard of concern for the City.
Erosion	FEMA guidance SHMP	No	The City has not experienced many major cases of erosion; the HMPC decided it was not a concern for the city.
Expansive Soil	FEMA guidance	No	The City does not experience a significant issue with expansive soils.
Extreme Cold	FEMA guidance SHMP	No	Temperatures in Mission Viejo do not fall to a level that would be considered a danger to public safety.
Extreme Heat	FEMA guidance SHMP	Yes	Extreme heat conditions have occurred in the city and are expected to be a future recurring issue.
Fault Rupture	FEMA guidance SHMP OC HMP	No	There are no known active faults located within the city; however, the HMPC did not identify fault rupture as a potential hazard of concern.
Flooding	FEMA guidance SHMP	Yes	The City experiences periods of heavy rainfall between October and April, combined with the hilly topography, these flood zones are focused and a recurring concern in the City.
Fracking	SHMP	No	Fracking does not occur in Mission Viejo.
Hail	FEMA guidance	No	Hail that is severe enough to pose a threat to people and property is not a concern identified by the HMPC.
Hazardous Materials release	SHMP	No	As a primarily residential community, the threat posed by hazardous materials release incidents occurring is low. It is not a hazard concern for the city.
Hurricane	FEMA guidance SHMP	No	Hurricanes do not occur in Mission Viejo.

Infrastructure Failure	SHMP	No	Infrastructure failure poses a threat to people and property in Mission Viejo. A discussion of infrastructure failure is discussed as a function of other hazards.
Landslide	FEMA guidance SHMP	Yes	Areas in the eastern portions of the city have varying degrees of landslide potential. As a result, the HMPC identified this as a hazard of concern within the plan.
Levee Failure	SHMP	No	The HMPC identified flooding and dam failure as hazards of concern; given the lack of levees within the city this was not identified as a hazard of concern.
Lightning	FEMA guidance	No	Although lightning occasionally occurs in Mission Viejo, it does not pose a significant threat to people or property.
Liquefaction	FEMA guidance SHMP OC HMP	Yes	According to the California Geological Survey, portions of the city are located within liquefaction-prone areas. Based on this mapping, the HMPC identified liquefaction as a hazard of concern.
Methane-containing Soils	OC HMP	No	The City does not have a history of incidents involving methane-containing soils and is not a hazard of concern identified by the HMPC.
Natural Gas Pipeline Hazards	SHMP	No	Natural gas transmission pipelines are located within the city and could pose a danger to people and property if they breach and release their contents into the community. However, the HMPC did not identify this as a hazard of concern to the city.
Oil Spills	SHMP	No	This is not a hazard of concern for the city as there is no oil drilling within the city,
Power Failure	SHMP	No	Mission Viejo's electrical power is provided by Southern California Edison and San Diego Gas and Electric, which have a long history of reliability, and therefore the HMPC decided that this is not a concern for the city.
Radiological Accidents	SHMP	No	There are no known major radiation sources in Mission Viejo or the immediate surrounding area that could seriously threaten the community.
Sea-level Rise	FEMA guidance SHMP	No	Mission Viejo is not located within close proximity to the ocean.
Seiche	FEMA guidance SHMP	No	There are large bodies of water in Mission Viejo that could be subjected to seiche though they are not identified as a concern by the HMPC.
Seismic Shaking	FEMA guidance SHMP OC HMP	Yes	Mission Viejo is in a seismically active area where shaking can be severe enough to damage property or cause loss of life. For this reason, the HMPC determined it should be addressed in this plan.
Severe Wind	FEMA guidance	Yes	Windstorms are a common occurrence within the city and southern California. This hazard is included in the Severe Weather profile, referred to as windstorms, including discussions of extreme heat and drought. Severe wind events typically occur during Santa Ana wind conditions.
Severe Weather and Storms	FEMA guidance SHMP OC HMP	Yes	Severe Weather includes discussions regarding extreme heat, severe wind (windstorms), and rain, which are weather-related hazards that are most common in Mission Viejo. This is discussed as Winter/Coastal Storms in the plan.
Storm Surge	FEMA guidance	No	The HMPC did not identify this as a hazard of concern since the city is not located near the California coastline.
Subsidence	FEMA guidance	No	The HMPC did not identify subsidence as a hazard of concern for the city.
Mass-Casualty Incident (Terrorism)	SHMP	Yes	The HMPC identified mass-casualty incidents and terrorism as potential threats of concern. This hazard is addressed in the Human-Caused Hazards section.

Thunderstorm	SHMP	No	Thunderstorms that cause damage and endanger public safety are rare in the Southern California region.
Tornadoes	FEMA guidance SHMP	No	Tornadoes were not considered a hazard that could impact the city and were not included in this LHMP.
Transportation Accidents	SHMP	No	The lack of major transportation routes through the city, the HMPC did not identify this hazard as a concern for this plan.
Tree Mortality	SHMP	No	While the city's tree inventory is a significant asset at risk, it was not identified as a hazard of concern by the HMPC.
Tsunami	FEMA guidance SHMP	No	The HMPC did not identify tsunamis as a hazard of concern since the city is not located near the California coastline.
Urban Fire	SHMP OC HMP	Yes	The HMPC identified urban fires as a risk to property and life in Mission Viejo and therefore was included in this plan as a part of the wildfire hazard discussion.
Volcano	SHMP	No	There are no volcanoes near Mission Viejo to pose a reasonable threat.
Wildfire	FEMA guidance SHMP	Yes	The HMPC identified wildfire as a major threat to the city, especially the eastern portions of Mission Viejo, and therefore was included in this plan.

After the HMPC made hazard evaluation and the organizational changes, this Plan discusses eight broad hazard types with their respective sub-categories, including climate change, which is discussed in each hazard profile:

Hazard Type	Sub-Categories
Wildland/Urban Fire	
Earthquake	Seismic Shaking, Liquefaction
Severe Weather	Windstorms, Extreme Heat, Winter/Coastal Storms
Dam Failure	
Landslide	
Flooding	
Climate Change	Discussed in each Hazard Profile

Hazard Scoring and Prioritization

The HMPC followed FEMA guidance for hazard mitigation plans and prioritized each of the eight hazards and their respective subcategories. In the initial step, it assigned a score of 1 to 4 for each of the hazards for the following criteria:

Probability: The likelihood that the hazard will occur in Mission Viejo in the future.

Magnitude/Severity: The severity of the direct damage of the hazard to Mission Viejo.

Warning Time: The time the city has before a disaster event/hazard impacts Mission Viejo.

Duration: The time that the disaster event will affect Mission Viejo.

The HMPC assigned a weighting value to each criterion, giving a higher weight to the criteria deemed more important, and multiplied the score for each criterion by weighing the factor in determining the overall score for each criterion.

FEMA recommended the weighting values:

Probability: 45%
Warning Time: 15%
Magnitude/Severity: 30%
Duration: 10%

After calculating the total impact score for each hazard (sum of the probability, magnitude/severity, warning time, and duration). FEMA guidance recommends multiplying the total impact score by the overall probability to determine the final score for each hazard. A final score between 4.0 (High Threat) and 0.0 (No Threat) is calculated using the weighted scale provided in **Table 3-2** to determine each hazard's overall level of threat to Mission Viejo. Any hazard ranked from 4.0 to 3.0 is considered a high threat to the city, 2.9 to 2.0 is considered a medium threat, 1.9 to 1.0 is considered a low threat, and a score of 0.9 to 0.0 is considered an extremely low/negligible threat to the city.

Earthquakes are high priority hazards because they are likely to happen, affect a wide area, and can be very damaging.

Source Image: LA Times.

Table 3-2 shows the Criterion Scoring used to assign a score for each criterion.

TABLE 3-2: CRITERION SCORING

CPRI Category	Degree of Risk Chart			Assigned Weight Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 0.001	1	**45%**
	Possible	Extremely rare with no documented history of occurrences or events. Annual probability of between 0.01 and 0.001	2	
	Likely	Occasional occurrence with at least two or more documented historic events. Annual probability of between 0.1 and 0.01	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability of greater than 0.1	4	
Magnitude/Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure) Injuries or illnesses are treatable with first aid and there are no deaths Negligible quality of life lost Shut down of critical facilities for less than 24 hours	1	**30%**
	Limited	Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructures) Injuries and illnesses do not result in permanent disability and there are no deaths Moderate quality of life lost Shut down of critical facilities for more than 1 day and less than 1 week	2	
	Critical	Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructures) Injuries or illnesses result in permanent disability and at least one death Shut down of critical facilities for more than 1 week and less than 1 month	3	
	Catastrophic	Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure) Injuries or illnesses result in permanent disability and multiple deaths Shut down of critical facilities for more than 1 month	4	
Warning Time	Less than 6 hours	Population will receive less than 6 hours of warning	4	**15%**
	6 to 12 hours	Population will receive between 6-12 hours of warning	3	
	12 to 24 hours	Population will receive between 12-24 hours of warning	2	
	More than 24 hours	Population will receive greater than 24 hours of warning	1	
Duration	Less than 6 hours	Disaster event will last less than 6 hours	1	**10%**
	Less than 24 hours	Disaster event will last between 6-24 hours	2	
	Less than one week	Disaster event will last between 24 hours and 1 week	3	
	More than one week	Disaster event will last more than 1 week	4	

Disaster Declaration Connections

Since the previous update the following major disasters, emergency declarations, and fire management events have been issued by the FEMA. Past events identified in this plan have been identified in connection with these events in the "Past Events" sections within each Hazard Profile.

Disaster Declaration - Orange County (2018-2023)					
Year	**Declaration Number**	**Declaration Title**	**Incident Type**	**Affected the City**	**Activated EOC / Requested PA**
2023	EM-3591-CA	Severe Winter Storms, Flooding, and Mudslides	Flood	Yes	No
2023	EM-3592-CA	Severe Winter Storms, Flooding, Landslides, and Mudslides	Flood	Yes	No
2022	FM-5439-CA	Coastal Fire	Fire	No	No
2021	FM-5383-CA	Bond Fire	Fire	No	Yes
2021	FM-5381-CA	Blue Ridge Fire	Fire	No	No
2021	FM-5380-CA	Silverado Fire	Fire	Yes	Yes
2020	EM-3428-CA	Covid-19	Biological	Yes	Yes
2020	DR-4482-CA	Covid-19 Pandemic	Biological	Yes	Yes
2018	FM-5223-CA	Canyon 2 Fire	Fire	No	No
2018	DR-4344-CA	Wildfires	Fire	No	No

DR	Major Disaster
EM	Emergency Declaration
FM	Fire Management

Table 3-3 shows each hazard's criterion scores, final score, and threat level based on the above prioritization process.

TABLE 3-3: HAZARD SCORES AND THREAT LEVEL

Hazard Type	Probability (1-4)	Severity (1-4)	Warning Time (1-4)	Duration (1-4)	Priority Ranking (1-4)
Severe Weather (Windstorms)	4	3	4	4	3.7 (High)
Earthquake	3	4	4	4	3.55 (High)
Wildfire	2	4	3	4	2.95 (Medium)
Winter Coastal Storms	3	2	3	4	2.8 (Medium)
Severe Weather (Extreme Heat)	4	1	1	4	2.8 (Medium)
Landslide (Earth Movement)	3	2	2	3	2.55 (Medium)
Flooding (Includes Dam Inundation)	3	1	4	2	2.45 (Medium)

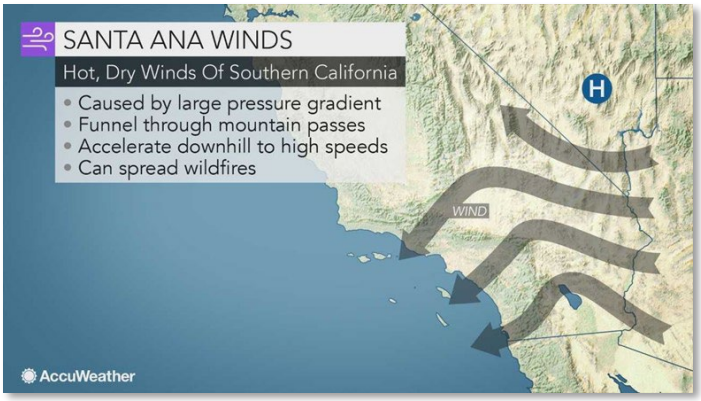
SEVERE WEATHER (WINDSTORM, EXTREME HEAT, WINTER/COASTAL STORMS)

Description

WINDSTORMS

Windstorms and severe weather pose a risk to life and property in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds occasionally cause tornado-like damage to local homes and businesses. Severe windstorms can present a very destabilizing effect on the dry brush that covers local hillsides and urban wildland interface areas. High winds can have destructive impacts, especially on trees, power lines, and other utility services. In Mission Viejo, severe weather patterns, such as Santa Ana Wind conditions, are a recognized hazard.

Wind is simply the movement of air caused by differences in atmospheric temperature. High-pressure air will naturally move to areas of low pressure. Usually, the distance between these high- and low-pressure zones is far; however, on occasion, these low- and high-pressure zones may be near one another. When this happens, air will flow dramatically, creating high-speed winds. The most common wind events in southern California are the "Santa Ana" wind conditions that typically occur in the fall and winter.



Typical Santa Ana Wind Event

When winds are fast enough, they can cause property damage to homes, public facilities, utilities, and other infrastructure. They can also uproot or topple mature trees or pick up debris and send it careening through the air. This debris can injure or even kill bystanders who may find themselves stranded outside. High-speed winds can also deposit this debris in the middle of rights-of-way, such as roads, freeways, and railways, blocking exit routes for would-be evacuees or impeding access to first responders trying to reach wounded people.

EXTREME HEAT

Extreme heat is a period when temperatures are abnormally high relative to a designated location's normal temperature range. There are generally three types of extreme heat events:

Extreme Heat Days: A day during which the maximum temperature surpasses 98% of all historic high temperatures for the area, using the time between April and October from 1961 to 1990 as the baseline.

Warm Nights: A day between April and October when the minimum temperature exceeds 98% of all historic minimum daytime temperatures observed between 1961 and 1990.

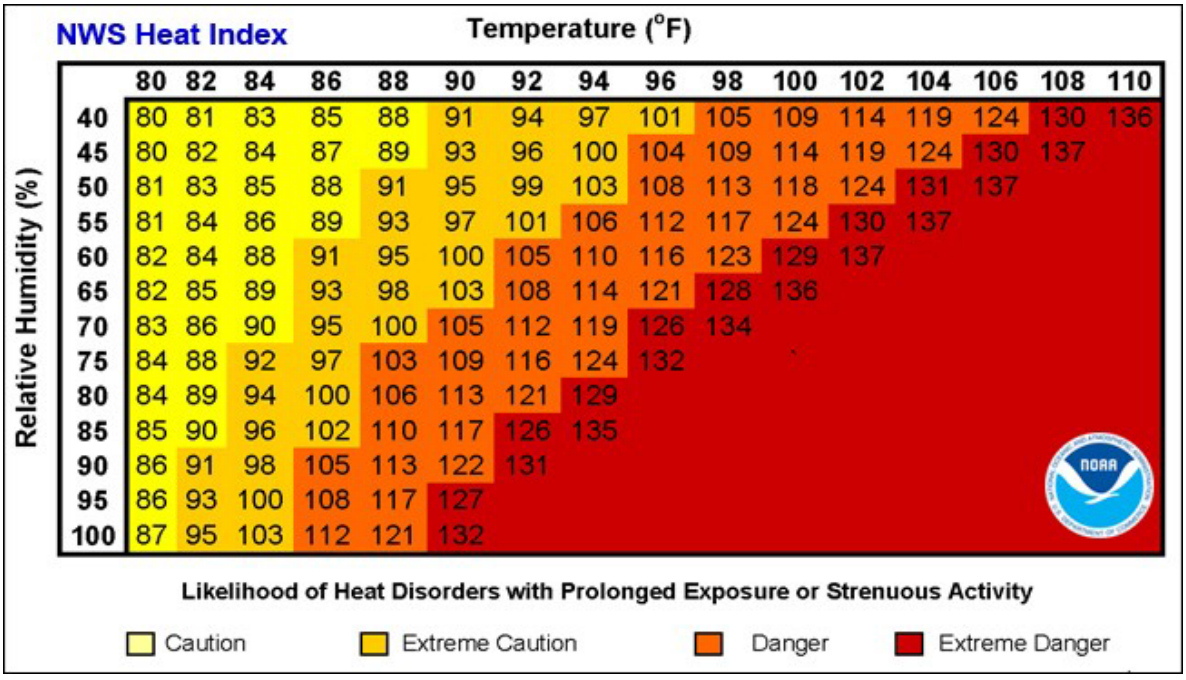
Extreme Heat Waves: A successive series of extreme heat days and warm nights where extreme temperatures do not abate. Although there is no universally accepted minimum length of time for a heatwave event, Cal-Adapt considers four successive extreme heat days and warm nights to be the minimum threshold for an extreme heatwave.

Extreme heat events will have unique metrics from region to region since different areas have different historic high temperatures. For example, an extreme heat day on the coast will have lower temperatures than an extreme heat day in the High Desert.

Humidity plays a factor in people's perception of heat, as humid conditions will make a day feel hotter than a non-humid day, even though the temperature may be the same on both days. The difference between the perceived and actual temperatures is known as the "heat index." To illustrate the effect of the heat index, a 90-degree day with 50% humidity feels like 95°F, whereas a 90°F with 90% humidity feels like 122°F. **Figure 3-1** shows National Oceanic and Atmospheric Administration (NOAA)'s National Weather Service Heat Index.

Extreme heat poses several dangers to public health. The human body is vulnerable to long periods of high temperatures and will eventually enter a state of heat exhaustion and dehydration if exposure to heat is extended. If exposure to high temperatures is particularly prolonged to the point that internal body temperature surpasses 105°F, heatstroke may occur, and organ failure and death may soon follow without intervention.

FIGURE 3-1: NOAA'S NATIONAL WEATHER SERVICE HEAT INDEX



WINTER/COASTAL STORMS

Winter/Coastal storms are also known as thunderstorms. A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. The typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. A thunderstorm is formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air, such as a warm and cold front, a sea breeze, or a mountain. During severe weather events such as thunderstorms, rain can fall at such a high rate that it cannot drain

away fast enough. The resulting heavy rain can cause flooding, leading to inundation and potential damage to buildings, road networks, public areas, utilities, and other critical pieces of infrastructure. In California, heavy rainfall events are often short, intense bursts of rain, but in some cases, heavy rain can persist for multiple days.

All thunderstorms are dangerous. About 10% of the thunderstorms that occur each year in the United States are classified as severe. (A thunderstorm is considered severe if it produces hail at least 3/4 inch in diameter, winds 58mph or greater, or tornadoes.) Heavy rain from thunderstorms can lead to flash flooding (which is the number one thunderstorm killer.) Strong winds, hail, and tornadoes are also dangers associated with some thunderstorms.

Location and Extent

Windstorm

In Southern California, the most common type of severe wind event is called the Santa Ana wind. During the fall and winter months, high pressure over Nevada and Utah forces air currents down from the high desert toward the ocean. As the winds descend, they heat up and increase in speed, sometimes carrying particulate matter and aggravating the respiratory health of those who have allergies.[7]

The entirety of the City can be affected by windstorms. Usually, they cause minimal damage; however, severe storms can cause massive damage to City and personal property. Santa Ana winds blowing through the Santa Ana Mountain range often affect Mission Viejo. Santa Ana winds are a leading cause of wildfires in California.

Generally, winds are measured using the Beaufort scale, developed in 1805, categorizing wind events on a force scale from 0 to 12 using their speed and impacts. Any wind that is classified as force nine or above is generally considered a severe wind event. **Table 3-4** details how the Beaufort scale classifies wind events.

Extreme Heat

Extreme heat events are not limited to any part of the City. They occur with the same intensity and duration at the same time across all locations in Mission Viejo. The minimum threshold for an extreme heat day in Mission Viejo is 90.7°F. The minimum threshold for a warm night in Mission Viejo is 64.3°F. These values are displayed below as Extreme Heat Day (**Table 3-5**) and Warm Night (**Table 3-6**).

Cal-Adapt uses an emissions scenario when determining the data in its projections. An emissions scenario is a representation of future greenhouse gas emissions and resulting atmospheric concentrations through time. An emissions scenario illustrates a plausible future so that climate projections for that emissions scenario can be generated, used to inform analysis and decision-making, and compared to other scenarios. The data for these scenarios use what are called representative concentration pathways, or RCPs (which are different scenarios for the future severity of climate change) and come from California's *Fourth Climate Change Assessmen*t which uses two RCPs from the Fifth Intergovernmental Panel on Climate Change (IPCC) Assessment Report on Climate Change.[8]

[7] Monroe, Robert. 2016. "Climate Change May Suppress Santa Ana Winds, Particularly in Fall." https://scripps.ucsd.edu/news/climate-change-may-suppress-santa-ana-winds-particularly-fall

[8] https://cal-adapt.org/tools/extreme-heat

RCP 4.5 (medium emissions scenario): A mitigation scenario where greenhouse gas (GHG) emissions peak by 2040 and decline. In California, annual average temperatures under this scenario are projected to increase 2°C - 4°C (35.60°F – 39.2°F) by the end of this century, depending on the location.

RCP 8.5 (high emissions scenario): A no-mitigation scenario where global GHG emissions continue to rise throughout the 21st century. In California, annual average temperatures under this scenario are projected to increase 4°C - 7°C (39.2°F- 44.60°F) by the end of this century.

TABLE 3-4: BEAUFORT SCALE

Force	Speed (mph)	Description
1	0 to 1	Calm: Smoke rises vertically, and the sea is flat
2	1 to 3	Light air: The direction of wind is shown by smoke drift, but not wind vanes
3	4 to 7	Light breeze: Wind is felt on the face, leaves rustle, and wind vanes are moved. Small wavelets appear on the ocean, but do not break
4	8 to 12	Gentle breeze: Leaves and small twigs are in motion, and light flags are extended. Large wavelets appear on the ocean, and crests begin to break
5	13 to 18	Moderate breeze: Dust and loose paper become airborne, and small branches are moved. Small waves appear on the ocean
6	19 to 24	Fresh breeze: Small trees begin to sway and moderate waves form
7	25 to 31	Strong breeze: Large branches are in motion, and using an umbrella becomes difficult. Large waves begin to form
8	32 to 38	Near gale: Whole trees are in motion and walking against the wind can be hard. Foam from breaking waves is blown in streaks
9	39 to 46	Gale: Walking is difficult, and twigs break off trees
10	47 to 54	Severe gale: Slight structural damage. Crests of waves begin to topple
11	55 to 63	Storm: Trees are uprooted and considerable damage to structures. Very high waves form in long, overhanging crests
12	63 to 72	Violent storm: Widespread damage. Exceptionally high waves form, and the ocean is completely covered in foam

*Source: https://www.weather.gov/mfl/beaufort.

TABLE 3-5: AVERAGE NUMBER OF EXTREME HEAT DAYS

Scenario	Historic (1961-1990)	Projected (2035-2064)	Projected (2070-2099)
RCP 4.5	2	8	11
RCP 8.5	2	11	25

TABLE 3-6: AVERAGE NUMBER OF WARM NIGHTS

Scenario	Historic (1961-1990)	Projected (2035-2064)	Projected (2070-2099)
RCP 4.5	5	27	40
RCP 8.5	5	38	85

WINTER/COASTAL STORMS

The location and size of a rain event vary depending on regional geography and regional and global weather events. For example, small precipitation events may occur in only one section of Mission Viejo. In contrast, a large rain event could inundate most of Orange County and other parts of southern California.

California's precipitation varies from year to year, depending on how much moisture the state receives from atmospheric rivers. Atmospheric rivers are corridors along which wet air travels from the tropics to continents. When the moisture arrives in California, it may precipitate as rain or snow. One of California's most known atmospheric rivers is the "Pineapple Express," which brings moist air from the ocean surrounding Hawaii to California. An immense amount of moisture may be transported along the atmospheric rivers that cross over California during certain years, leading to severe rains. [9]

Another weather phenomenon influencing rainfall in southern California is "El Niño," officially referred to as the "Southern Oscillation" or "El Niño-Southern Oscillation (ENSO)." ENSO can cause increased rainfall, particularly during the winter months, caused by the warming of the surface of the eastern tropical Pacific Ocean, leading to the evaporation of warm, moist air into the atmosphere. Winds bring this moisture to the eastern Pacific and the American continents, where it falls as rain. ENSO does not always lead to increased rainfall by default, but in general, it can increase the chances of winter with higher-than-usual precipitation. [10, 11]

Rain events are usually measured by the amount of precipitation that falls.[12] **Table 3-7** categorizes rain events by the amount of precipitation per hour.

TABLE 3-7: RAIN EVENTS CATEGORIZED BY PRECIPITATION PER HOUR

Rain Type	Description
Heavy Rain	More than 4 mm per hour but less than 8 mm per hour
Very Heavy Rain	Greater than 8 mm per hour
Moderate Shower	Greater than 2 mm, but less than 10 mm per hour
Heavy Shower	Greater than 10 mm per hour, but less than 50 mm per hour
Violent Shower	Greater than 50 mm per hour

Source: https://water.usgs.gov/edu/activity-howmuchrain-metric.html
mm = millimeter

Past Events

WINDSTORM

Several strong wind events have been recorded around the City of Mission Viejo. **Table 3-8** depicts some of these Santa Ana winds and other major windstorm events in Mission Viejo and the surrounding region. Santa Ana Wind events have been and will continue to be a hazard of concern for the city. [13]

[9] NOAA. 2023. "Atmospheric Rivers: What are they and how does NOAA study them?" https://research.noaa.gov/2023/01/11/atmospheric-rivers-what-are-they-and-how-does-noaa-study-them/#:~:text=Atmospheric%20rivers%20are%20long%2C%20concentrated,landfall%2C%20especially%20over%20mountainous%20terrain.
[10] NOAA. 2014. "What Is the El Niño–Southern Oscillation (ENSO) in a Nutshell? https://www.climate.gov/news-features/blogs/enso/what-el-ni%C3%B1o%E2%80%93southern-oscillation-enso-nutshell
[11] NOAA. 2016. "El Niño and La Niña: Frequently Asked Questions." https://www.climate.gov/news-features/understanding-climate/el-ni%C3%B1o-and-la-ni%C3%B1a-frequently-asked-questions
[12] https://www.climate.gov/enso
[13] National Oceanic and Atmospheric Administration. May 2017. "A History of Significant Weather Events in Southern California." https://www.weather.gov/media/sgx/documents/weatherhistory.pdf

TABLE 3-8: MAJOR LOCAL/REGIONAL WINDSTORMS

Date	Location	Damage
11/9/1982	Seven tornadoes touched down in the LA Basin. Three of the tornadoes began as waterspouts at Pt. Mugu, Malibu, and Long Beach. Another tornado reached F2 strength in Van Nuys. Two other tornadoes were in Garden Grove and Mission Viejo.	Property damage and downed trees.
1/18/1988	Tornadoes hit Mission Viejo and San Clemente	Property damage, A baseball dugout was blown 150 yards into the middle of a city street.
1/6/1997	Storm winds: gust 99 mph at Fremont Canyon, 58 mph elsewhere.	Tree damage was widespread, with more than 1,000 trees downed in Mission Viejo alone. The regional power grid was also interrupted hit, with more than 900,000 people losing power, the largest interruption in service since 1983. Several TV and radio stations were knocked off the air.
2/6/2000	A tornado is recorded in Mission Viejo Hills.	Destroyed property and damaged power lines.
3/31/2000	Santa Ana winds blew through the Inland Empire and Orange County during the early morning. Top gusts were 93 mph at Mission Viejo and 67 mph in Anaheim Hills.	Property damage, downed trees.
4/1/2000	Santa Ana Wind: gust 93 mph at Mission Viejo, 67 Anaheim Hills	Downed trees, minor property damage.
1/6/2003	One of the strongest Santa Ana Windstorms in a decade. Major winds in Mission Viejo.	26 power poles toppled in Orange, power out to thousands
1/21/2010	Severe windstorm, a tornado, and 90 mph winds struck much of Orange County, including Mission Viejo. Damage occurred throughout the county.	In Mission Viejo, trees fell on cars along Marguerite and Crown Valley Parkways.
12/2010 – 1/2011	Massive winter storm system strikes the region and Mission Viejo; the storm was extensive and destructive enough to result in a Presidential Disaster Declaration (DR 1952)	Mission Viejo experienced citywide damage from the Winter Storms of 2010/2011. The damage to City facilities included erosion and undermining of the Aliso Creek Bike Trail Bridge (located on a tributary to the Aliso Creek), erosion and damage to the Jeronimo Creek RIP/RAP and concrete pipe structure along the drainage channel flowing into Jeronimo Creek (near Arbolitos Road), and erosion of the RIP/RAP structure along the drainage facility that flows into Jeronimo Creek, near Silleros Road
4/2/2012	A severe thunderstorm hit Mission Viejo Hills; gusts of 63 mph were reported.	Damaging a shopping center in nearby Fremont Canyon.
10/16/2018	Gusts of over 66 mph in Mission Viejo and windstorms throughout Orange County.	Toppled trees downed power lines that disrupted power to over 16,000 residents and resulted in one fatality in Tustin when a eucalyptus tree was

		toppled and crushed a woman inside of her car.
12/28/2018	Major wind event in Mission Viejo with guts from 50-70 mph.	A large eucalyptus tree is downed and blocks all westbound traffic on Jeronimo.
1/29/2020	High winds and warm temperatures expected across Orange County. Winds, blowing at a sustained 20 to 30 miles per hour, could gust at up to 60 miles per hour.	In Mission Viejo, a large tree completely blocked La Mancha, just west of Salinas Lane.
11/24/2021	In Orange County, gusts of 40 to 50 mph, occasionally reaching 60 mph in mountain canyons.	PSPS circuits were powered off to avoid potential wildfire complications, leaving thousands without power.
11/4/2022	60 mph gusts in Mission Viejo	Property damage
1/23/2023	Winds of 30-40 mph and gusts from 60-70 mph blow throughout the Orange County Foothills, including Mission Viejo.	Major winds cause more than 25,000 customers in Mission Viejo to be without power early Monday, though Southern California Edison crews are still working to determine the cause and to restore power.

Source: "A History of Significant Weather Events in Southern California" https://www.weather.gov/media/sgx/documents/weatherhistory.pdf

Extreme Heat

Local data from Mission Viejo is unavailable; however, nearby Daugherty Field at the Long Beach Municipal Airport has been recording weather data since 1949. The data indicates that the average maximum temperature for the area from all years between 1949 and 2016 is 83.9°F, occurring in the month of August. In addition, data from a weather station at the Santa Ana Fire Station also indicates an average maximum temperature of 84.7°F for the same time frame. Given that the minimum threshold for an extreme heat day in Mission Viejo is 90.7F, it is rare that the temperature exceeds this threshold on a regular basis. Still, extreme heat events have occurred in the region, which occasionally impact the City as well. **Table 3-9** displays some significant historical extreme heat events in the City and Orange County:

More recent extreme heat events have also affected the greater region surrounding Mission Viejo:

October 2017 - Southern California experienced two extreme heat days. The weather monitoring station near Long Beach Airport indicates that temperatures reached 105°F those days.

July 2018 - Throughout the month, extreme heatwaves occurred throughout Southern California, including Mission Viejo. The hottest day of the heat waves occurred on July 6, when temperatures reached 114°F in Santa Ana, CA. A second but less intense extreme heatwave occurred on July 25, when regional temperatures went above 100°F in Burbank and surrounding areas. While local temperature data for Mission Viejo is not available, the weather monitoring station near Long Beach Airport indicates that the temperature reached 95°F that day.

Winter/Coastal Storms

Mission Viejo and Orange County as a region are no strangers to severe weather and thunderstorms. **Table 3-10** lists some of the recent major storm events in the City and Orange County.

TABLE 3-9: EXTREME HEAT EVENTS IN MISSION VIEJO

Temperature (°F)	Response
September 1963	The temperature reached 113°F at the Marine Corps Air Station El Toro, and the surrounding region, including coastal areas, was hot as well. Temperatures in Carlsbad and Oceanside reached 108°F. Schoolchildren and employees were sent home due to the heat, and some crops were destroyed.
April 1989	Daily high-temperature records were set for all weather monitoring stations in Southern California. Los Angeles and Riverside set records at 106°F and 104°F, respectively.
September 28, 2010	During an extreme heat wave in Southern California, the Orange County Register reported that temperatures in Mission Viejo reached 109.3°F.
September 19, 2019	Autumn heat wave in Southern California sees temperatures in Mission Viejo reach 96°F.
October 22, 2019	A week-long autumn heat wave hits Southern California; temperatures reached 99°F in Mission Viejo.
September 4, 2020	Temperatures reached a reported 113°F in Mission Viejo during an extreme heatwave.
April 5, 2022	Temperatures reach 100°F in Mission Viejo during an unusual heat wave in the Spring.

TABLE 3-10: MAJOR LOCAL/REGIONAL WINDSTORMS

Date	Location	Damage
08/22/1988	A strong thunderstorm (a rare event for summer) rolled through Orange County.	Power was knocked out to 40,000 people.
12/6-8/1997	A stationary line of thunderstorms brought the heaviest rain in 70 years to portions of Orange County. Widespread 4 to 8” rainfall totals, with as much as 10” in Mission Viejo.	Widespread flooding in Orange County. Mudslides and coastal erosion.
09/02/1998	Strong winds from thunderstorms in Orange County with gusts to 40 mph.	Large fires in Orange County.
02/11/2001	Heavy winter storm. 2-5” of rainfall in Orange County and the City.	Extensive urban flooding and mudslides. Trees and power lines were knocked down throughout the County.
05/22/2008	Heavy rain from thunderstorms was produced by a very cold and unstable storm from the north.	Several debris flows occurred. In the Santiago burn area of eastern Orange County, damage was done to homes and businesses.
01/15/2019	A winter storm brought a band of very heavy rain to northwest Orange County. Seal Beach, Huntington Beach, and Fountain Valley each reported roughly 2” of rain in 2 hours.	The intense rain produced flash flooding. The Pacific Coast Highway was closed for over a day in Huntington Beach.
04/08-10/2020	A warm front moved through the region on 4/8 and brought waves of showers from south to north. Following the warm front, an upper low moved into the California Bight and stalled on 4/9, bringing 3”-5” of rain to Orange County.	Numerous flash floods and floods resulted.
01/29/2021	A powerful winter storm and atmospheric river brought heavy rain.1.5” of rain fell across Santiago Canyon in eastern Orange County.	Many areas flooded, including Santiago Canyon, where mud and debris flows covered roads and damaged homes.
03/11/2021	A powerful storm in eastern Orange County contained a heavy burst of rain that struck the Bond Fire burn scar in Silverado Canyon. 0.20” of rain fell in 15 minutes.	A debris flow went over roads and into homes, damaging six homes and eight vehicles in Silverado Canyon. The flow also closed a stretch of Silverado Canyon Road.

Source: “A History of Significant Weather Events in Southern California” https://www.weather.gov/media/sgx/documents/weatherhistory.pdf

Risk of Future Events

WINDSTORM

Given Mission Viejo's history of severe wind events in nearby cities, it is very likely that wind events will continue to impact the city. The most probable source of wind events in the future will likely originate from the Santa Ana winds or extreme storms. All expectations are that the probability of windstorm events occurring again in the future is highly likely. As discussed in **Table 3-2**, a probability of "highly likely" indicates a greater than ten percent chance of windstorms occurring annually.

EXTREME HEAT

As extreme heat events are an occasional occurrence in the City of Mission Viejo, they can only be expected to continue into the future. All expectations are that the probability of extreme heat events occurring again in the future is highly likely. As discussed in **Table 3-2**, a probability of "highly likely" indicates that there is a greater than ten percent chance of extreme heat events occurring annually.

WINTER/COASTAL STORMS

There is no indication that rainfall or severe rain hazards will abate either in Costa Mesa or the greater region of Southern California in the future. While Costa Mesa may experience prolonged periods of dry or wet years, all expectations are that the probability they will occur again in the future is highly likely and anticipated to increase in the future is highly likely. As identified in **Tables 3-2 and 3-3**, the future probability for this hazard is more than 90 percent chance each year.

Climate Change Considerations

WINDSTORM

It is anticipated that the atmospheric rivers that deliver storms to Southern California may intensify because of climate change. While the average number of storms in Southern California will remain the same, storms are expected to increase in intensity between 10 and 20 percent.[14] This increase in storm intensity may also bring more intense winds to the Southern California region, including Mission Viejo.

Studies indicate that climate change may affect Santa Ana wind events in varying ways, but it is unknown whether the frequency and intensity of events may be some of those ways. According to one study that examined two global climate models, there is a projected increase in future Santa Ana events. However, other studies have found that the number of Santa Ana events may decrease by about 20% in the future.[15] Given the anticipated increases in temperatures throughout the region, future events are anticipated to become more severe in some cases, even if the number of events decreases.

EXTREME HEAT

The primary effect of climate change is warmer average temperatures. The warmest decade on record is 2011-2020, with the warmest three years on record occurring in 2016, 2019, and 2020. As climate change accelerates in the 21st century, extreme heat events are anticipated to become more frequent and intense in California. In Mission Viejo specifically, the projected average

[14] Oskin, B. (2014). Atmospheric Rivers to Soak California as Climate Warms. Live Science. https://www.livescience.com/49225-atmospheric-rivers-double-climate-change.html

[15] Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). 2018. Los Angeles Summary Report. California's Fourth Climate Change Assessment. https://www.energy.ca.gov/sites/default/files/2019-11/Reg%20Report-%20SUM-CCCA4-2018-007%20LosAngeles_ADA.pdf

number of extreme heat days per year could increase from 2 to 11 (in 2100), assuming global greenhouse gas emissions peak around 2040, then decline. If global greenhouse gas emissions continue to rise until 2100, the number of extreme heat days could increase to as many as 25 days per year. The number of warm nights could increase from 5 to 40 (in 2100), assuming an emissions peak and decline in 2040 but could increase to as many as 85 if emissions continue to rise until 2100.[16]

Winter/Coastal Storms

Climate change is expected to alter rainfall patterns in southern California, including Mission Viejo. As the climate warms, rain events are predicted to become more intense. Mission Viejo will likely experience more rain inundation events that lead to flooding and erosion and increase the threat of dam failure, landslides, and other potential hazards within the community and surrounding area.

Earthquake Hazards (Seismic Shaking, Liquefaction)

Description

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and can cause massive damage and extensive casualties after just a few seconds. Common effects of earthquakes are ground motion and shaking surface fault ruptures, and ground failure. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. This sudden discharge of energy into the crust can lead to rupturing of land that sits on top of fault lines, liquefaction in areas with wet soil, or landslides in hilly or mountainous areas.

Seismic Shaking

Seismic shaking is the motion felt on the earth’s surface caused by an earthquake. In most cases, earthquakes are not powerful enough to feel the shaking. However, particularly powerful earthquakes can generate significant shaking, causing widespread destruction and resulting in property damage.

Liquefaction

Occurs when seismic energy is released within an area with low-density, fine-grain soil, like sand or silt, which is saturated with water. Liquefaction takes place when loosely packed, water-logged sediments at or near the ground surface lose their strength in response to strong ground shaking.[17] During liquefaction events, the liquified soil can lose most of its stability, which can cause damage to buildings and infrastructure built upon it. In severe cases, some buildings may completely collapse. Pipelines or other utility lines running through a liquefaction zone can be breached during a liquefaction event, potentially leading to flooding or the release of hazardous materials.

Location and Extent

Earthquakes are considered a major threat to the City of Mission Viejo due to the proximity of several fault zones, notably the San Andreas Fault Zone, the San Joaquin Hills Fault Zone, the

[16] Extreme Heat Days & Warm Nights. CalAdapt. https://cal-adapt.org/tools/extreme-heat/
[17] USGS Definition of Liquefaction

Newport-Inglewood Fault Zone, Elsinore Fault. A significant earthquake along one of the major faults could cause substantial casualties, extensive damage, and other threats to life and property. The shaking of the ground can also damage or destroy underground utilities or pipelines, potentially leading to releases of hazardous materials and flooding if water lines are breached.

Depending on the magnitude and duration of an earthquake along one of the faults in the region, Mission Viejo can expect to see varying degrees of damage citywide. Fortunately, most of the City's housing and commercial building stock is post-1970 construction. There are no unreinforced masonry buildings in the City. However, there are areas of the City that were constructed on engineered slopes that were built on 2:1 grade. These areas may be subject to earthquake-induced landslides. Furthermore, there are areas located primarily in the southwestern portion of the City, where much of the area is built on clay soil, such as Niguel and Capistrano formations, and are located in liquefaction zones that would be more susceptible to damage in a medium to large earthquake.

Seismic Shaking

Southern California, including Mission Viejo, is a highly seismic area due to the major faults that run through the region and is subject to experiencing seismic shaking. The intensity of seismic shaking is usually measured with the Modified Mercalli Intensity (MMI) scale, which is based on the amount of observed damage. The MMI scale has replaced the Richter scale, which is no longer used since it loses effectiveness when measuring larger earthquakes. Since the degree of shaking, and consequently damage, generally decreases as the seismic energy travels further away from the fault rupture's point of origin, different sections of a city or region can report different MMI measurements in different locations. The MMI scale uses Roman numerals on a 12-point scale to measure each degree of shaking intensity. **Table 3-11** shows the MMI scale, while **Table 3-12** lists the earthquake faults that can impact the City.

Another scale for measuring seismic shaking is the moment magnitude scale (MMS, denoted Mw or simply M). The MMS measures the energy released by the fault rupture beginning at 1.0 and increasing as the earthquake's energy grows. The MMS is a logarithmic scale, meaning that the difference between numbers on the scale multiplies as they increase. An earthquake with 5.0 M is approximately 1.4 times greater than 4.9 M, 32 times greater than 4.0 M, and 1,000 times greater than 3.0 M.

Seismic shaking can also be measured in relationship to the force of Earth's gravity (g), or percent g. This method is useful for geographically displaying areas of seismic shaking potential. Percent g is computed by determining the acceleration of the earthquake's motion relative to the force of gravity. The acceleration of gravity is 980 centimeters per second, so if, for example, an earthquake's acceleration is measured at 765 centimeters per second, the shaking is modeled as 765/980, or .781 g (78.1% g). **Figure 3-2** shows the seismic hazard zones and associated faults in and around Mission Viejo, while **Figure 3-3** shows the seismic shaking potential in the City.

TABLE 3-11: MODIFIED MERCALLI INTENSITY SCALE

Intensity	Description	Description
I	Instrumental	Felt only by very few people under especially favorable conditions.
II	Feeble	Felt only by a few people at rest, especially on the upper floors of buildings.
III	Slight	Noticeable by people indoors, especially on upper floors, but not always recognized as an earthquake.
IV	Moderate	Felt by many indoors and by some outdoors. Sleeping people may be awakened. Dishes, windows, and doors are disturbed.
V	Slightly strong	Felt by nearly everyone, and many sleeping people are awakened. Some dishes and windows broken, and unstable objects overturned.
VI	Strong	Felt by everyone. Some heavy furniture is moved, and there is slight damage.
VII	Very strong	Negligible damage in well-built buildings, slight to moderate damage in ordinary buildings, and considerable damage in poorly built buildings.
VIII	Destructive	Slight damage in well-built buildings, considerable damage and partial collapse in ordinary buildings, and great damage in poorly built buildings.
IX	Ruinous	Considerable damage in specially designed structures. Great damage and partial collapse in substantial buildings, and buildings are shifted off foundations.
X	Disastrous	Most foundations and buildings with masonry or frames are destroyed, along with some well-built wood structures. Rail lines are bent.
XI	Very disastrous	Most or all masonry structures are destroyed, along with bridges. Rail lines are greatly bent.
XII	Catastrophic	Damage is total. The lines of sight are distorted, and objects are thrown into the air.

Source: United States Geological Survey. 2019. The Modified Mercalli Intensity Scale.
https://www.usgs.gov/media/images/modified-mercalli-intensity-mmi-scale-assigns-intensities

TABLE 3-12: EARTHQUAKE FAULTS THAT IMPACT THE CITY OF MISSION VIEJO

Fault Name	Magnitude	Modified Mercalli Ranking	Perceived Shaking	Potential Damage	Threat Issues
San Joaquin Hills	6.6	VIII	Severe	Moderate to Heavy	**Major Threat** due to: (1) proximity to the fault, (2) severe shaking and moderate to heavy damage, (3) heavy impact on public safety and resource shortages, (4) prediction of up to 91 dead and 3,491 injured in Orange County (OC), (5) extensive fires, (6) up to 3,200 displaced households in OC, (7) 35% of households no water, and(8) potential for structural damage over $14 Billion in OC.
San Andreas	7.8	VI	Strong	Light	**Moderate Threat** to all of Southern CA due to (1) earthquake probability, (2) impacts most of southern CA, (3) extensive population impact of 10 million people, (4) catastrophic fires in OC & LA, (5) major infrastructure disruptions inland which will impact supply lines for months to years.
Newport-Inglewood	6.9	VI	Strong	Light	**Moderate Threat** due to: (1) the catastrophic and deadly impact to coastal and north Orange County (2) heavy impact on OC public safety causing resources shortages, (3) prediction of up to 45 dead and 1,950 injured in OC, (4) extensive fires, (5) up to 3,300 displaced households, (6) 20% of households no water and (7) potential for structural damage of over $8.3 Billion in OC plus severe damage to LA.
Elsinore	6.8	VI	Strong	Light	**Moderate Threat**
Puente Hills	7.1	VI	Strong	Light	**Moderate Threat**
Palos Verde	7.1	VI	Strong	Light	**Moderate Threat**
Whittier	6.8	VI	Strong	Light	**Moderate Threat**
San Jacinto	6.7	V	Moderate	Very Light	**Minor Threat**

This table uses county-wide data, which includes the City of Mission Viejo. The estimates for deaths, injuries, fires, displaced households, households with no water, and structural damage are Orange County estimates.

FIGURE 3-2: FAULT SYSTEMS IN AND AROUND MISSION VIEJO

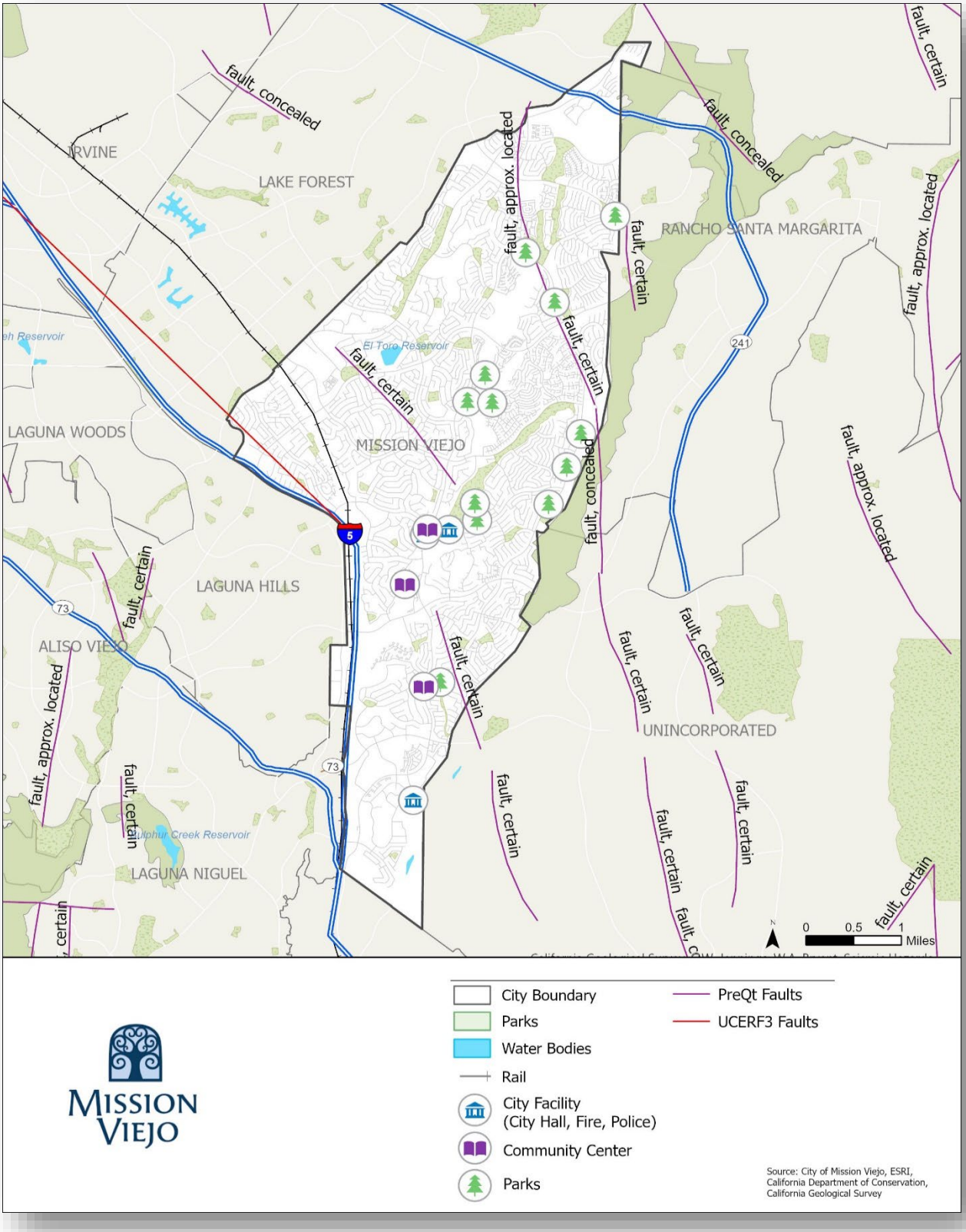
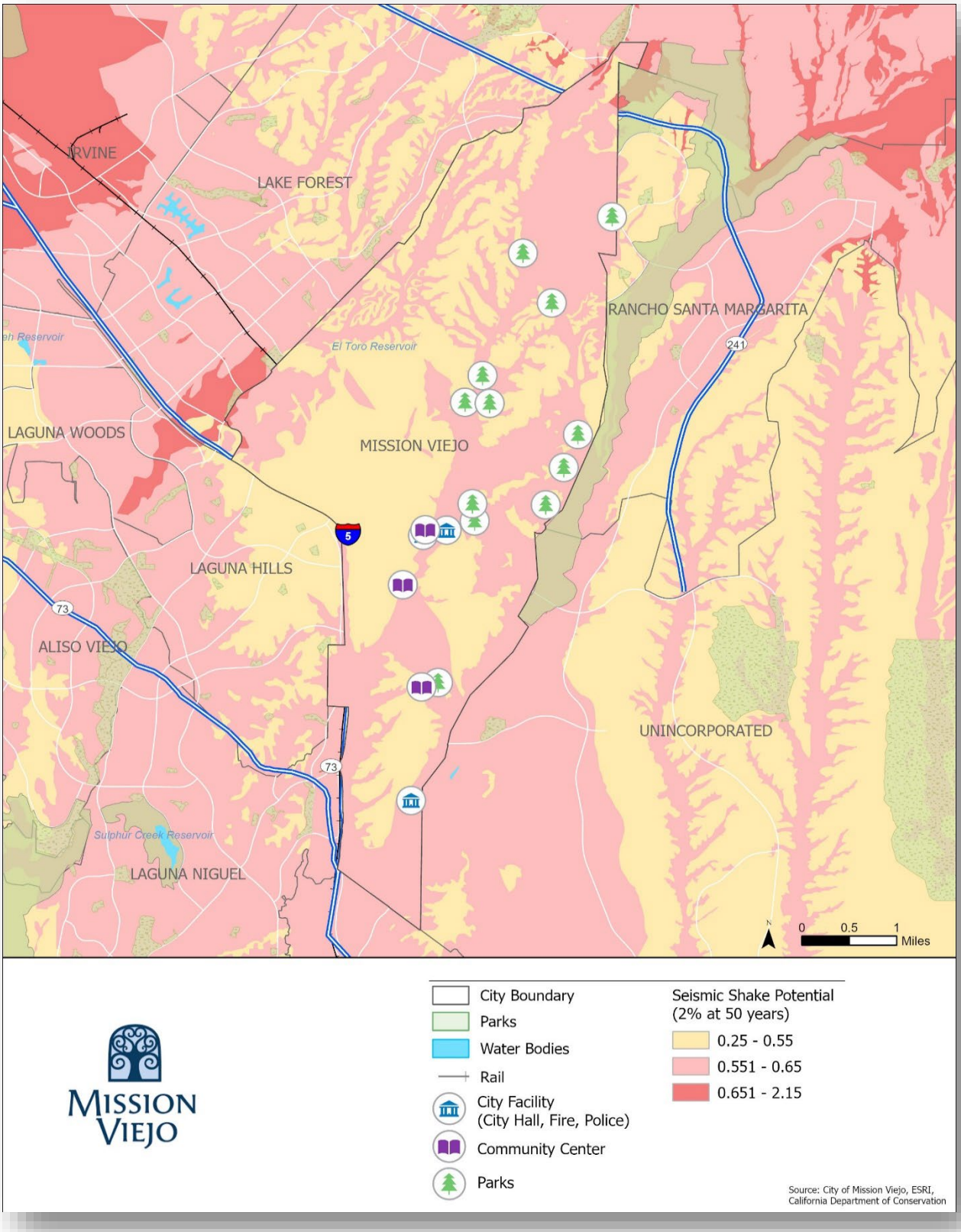
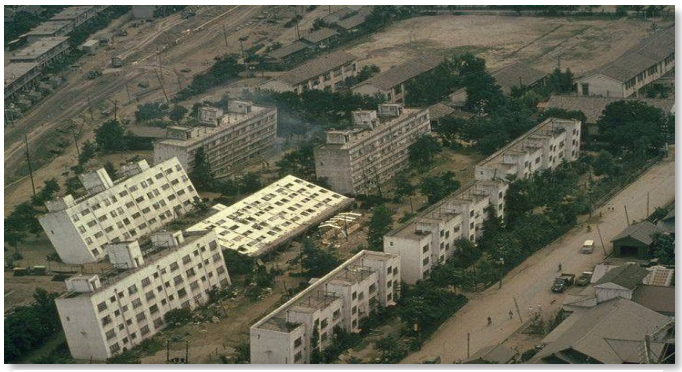


FIGURE 3-3: SEISMIC SHAKING POTENTIAL IN MISSION VIEJO



LIQUEFACTION

Occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Liquefaction generally occurs during significant earthquake activity, and structures located on soils such as silt or sand may experience significant damage during an earthquake due to the instability of structural foundations and the moving earth. Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases, this ground may be subject to liquefaction, depending on the depth of the water table. Figure 3-4 shows the liquefaction zones in Mission Viejo as designated by the California Geological Survey.



Liquefaction caused by the 1964 Niigita, Japan earthquake caused these apartment blocks to experience severe leaning. Image from the University of Washington.

Past Events

Since seismologists started recording and measuring earthquakes, there have been tens of thousands of recorded earthquakes in Southern California, most with a magnitude below three. No community in Southern California is beyond the reach of a damaging earthquake. **Table 3-13** shows all earthquakes in Southern California with a magnitude of 5.0 or higher.

TABLE 3-13: EARTHQUAKE EVENTS IN THE SOUTHERN CALIFORNIA REGION (5.0+ MW)

1812 Wrightwood	1940 Imperial Valley	1987 Whittier Narrows
1812 Santa Barbra Channel	1941 Santa Barbra	1991 Sierra Madre
1857 Fort Tejon	1942 Fish Creek Mountains	1992 Joshua Tree
1892 Laguna Salada	1947 Manix	1992 Big Bear
1899 Cajon Pass	1948 Desert Hot Springs	1994 Northridge
1899 San Jacinto Fault Zone	1952 Kern County	2001 West Hollywood
1910 Elsinore	1954 San Jacinto Fault (Arroyo Salada)	2008 Chino Hills
1915 Imperial Valley	1968 Borrego Mountain	2010 Baja CA
1918 San Jacinto	1971 San Fernando	2012 Brawley
1923 North San Jacinto Fault	1978 Santa Barbra	2014 La Habra
1925 Santa Barbra	1979 Imperial Valley	2016 Borrego Springs
1927 Lompoc	1986 North Palm Springs	2019 Ridgecrest
1933 Long Beach	1986 Oceanside	2021 Antelope Valley

Source: https://www.earthquakeauthority.com/California-Earthquake-Risk/California-Earthquake-History-Timeline

Seismic Shaking

Seismic shaking primarily affects unreinforced masonry buildings, as seen here with this Long Beach middle school damaged by the 1933 Long Beach earthquake. Image from Los Angeles Times.

While no significant earthquake has originated within Mission Viejo or Orange County within the last 100 years, Mission Viejo has felt the shaking of regional earthquakes. The nearest earthquake to Mission Viejo that caused significant damage throughout Southern California was the 1933 Long Beach earthquake. The actual epicenter of the quake was in the City of Huntington Beach; however, most of the damage occurred in areas north of the epicenter. The event caused more than $50 million in property damage and resulted in the deaths of 120 people. Most of the deaths and damage from the 1933 Long Beach Earthquake occurred because of collapsing unreinforced masonry buildings. Other strong, regional earthquakes have occurred in Southern California, but their epicenters have been so distant from Mission Viejo that seismic shaking generated by the earthquake did not cause significant property damage or harm to the City.

The most recent significant earthquake affecting Southern California was the Northridge Earthquake. On January 17, 1994, a moderate but very damaging earthquake of 6.7 struck the San Fernando Valley. Thousands of aftershocks occurred in the following days and weeks, causing additional damage to affected structures. Fifty-seven people were killed, and more than 1,500 people were seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas, and nearly 50,000 had little or no water. Approximately 15,000 structures were moderately to severely damaged, leaving thousands of people temporarily homeless; 66,500 buildings were inspected, nearly 4,000 were severely damaged, and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but the earthquake triggered liquefaction, and dozens of fires also caused additional severe damage. This extremely strong ground motion in large portions of Orange County resulted in record economic losses. **Table 3-14** shows significant earthquakes – magnitude 6.0 Mw or greater – that have occurred within 100 miles of Mission Viejo since the beginning of the 20th century. Although Mission Viejo had no significant damage, authorities made disaster declarations in Orange County for the 1994 Northridge Earthquake and 1987 Whittier Narrows Earthquake.

Liquefaction

Limited information is available on past liquefaction events in Mission Viejo. Since these events occur in conjunction with strong earthquakes, the nearest and most recent liquefaction event would have occurred near the mouth of the San Gabriel River at Alamitos Bay because of the Long Beach Earthquake in 1933. It was reported that pavement buckled, cracks appeared in the ground, and “mud volcanoes” erupted in the Los Alamitos area. [18]

[18] California Geological Survey. 1998. “Seismic Hazard Zone Report for the Los Alamitos 7.5-Minute Quadrangle, Los Angeles and Orange Counties, California.” http://gmw.conservation.ca.gov/SHP/EZRIM/Reports/SHZR/SHZR_019_Los_Alamitos.pdf

FIGURE 3-4: POTENTIAL LIQUEFACTION ZONES IN MISSION VIEJO

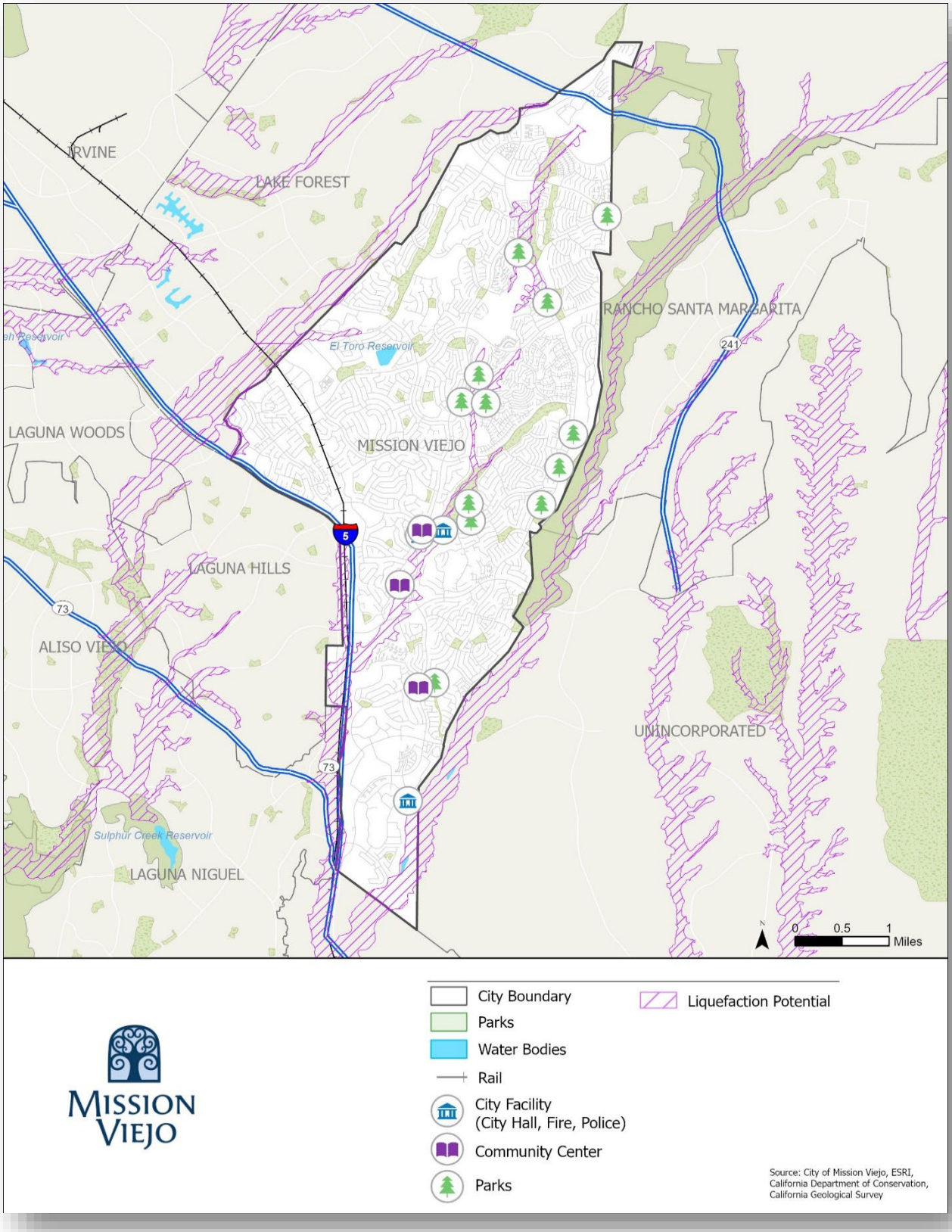


TABLE 3-14: SIGNIFICANT EARTHQUAKES (6.0+ MW) WITHIN 100 MILES OF MISSION VIEJO

Event Name	Distance (Miles)*	Magnitude
1812 San Juan Capistrano	40	6.9
1855 Los Angeles	21	6.0
1899 Lake Elsinore Earthquake	53	6.4
1918 San Jacinto Earthquake	57	6.8
1933 Long Beach Earthquake	15	6.3
1971 San Fernando Earthquake	49	6.5
1986 North Palm Springs Earthquake	76	6.0
1992 Joshua Tree Earthquake	92	6.3
1992 Big Bear Earthquake	67	6.7
1992 Yucca Valley	88	7.6
1994 Northridge Earthquake	44	6.7

***Distance between the epicenter and Mission Viejo City Hall**
Source: Southern California Earthquake Data Center. 2011. Earthquake Catalogs SCSN Catalog Search (1932-Present). http://service.scedc.caltech.edu/eq-catalogs/radius.php

Risk of Future Events

SEISMIC SHAKING

Historical and geological records show California has a long history of seismic events. Southern California is probably best known for the San Andreas Fault, a 400-mile-long fault running from the Mexican border to a point offshore, west of San Francisco. Geologic studies show that over the past 1,400 to 1,500 years, large earthquakes have occurred at about 130-year intervals on the Southern San Andreas Fault. As the last large earthquake on the Southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades. The Third Uniform California Earthquake Rupture Forecast (UCERF3) was released in 2015 and is the most recent assessment of the probability of a major earthquake on various faults between 2015 to 2044. **Table 3-15** shows the results for Mission Viejo's nearby and regional fault lines.

TABLE 3-15: EARTHQUAKE PROBABILITIES FOR KEY FAULTS NEAR MISSION VIEJO (2015–2044)

Fault	Distance (Miles)*	Estimated Probabilities			
		6.7+ Mw	7.0+ Mw	7.5+ Mw	8.0+ Mw
San Joaquin Hills	0.96	0.42%	0.40%	0.24%	Negligible
San Andreas	46.66	19.21%	12.86%	10.21%	3.24%
Newport- Inglewood	10.48	0.73%	0.65%	0.19%	Negligible
Elsinore	14.98	3.17%	1.71%	0.91%	<0.01%
Puente Hills	25.39	0.59%	0.52%	0.19%	Negligible
Palos Verde	25.88	3.17%	2.79%	0.09%	Negligible
Whittier	16.31	1.41%	1.23%	0.68%	<0.01
San Jacinto	38.83	5.46%	5.45%	5.25%	2.73%

*** Distance between Mission Viejo City Hall and the nearest point of the fault. All distances are approximate. † Southern California segments only.**
Note: UCERF3 results consist of two individual models (3.1 and 3.2), each of which provides rupture probabilities for each segment of the fault. This table shows the maximum probability for a section of the fault in either model.
Source: Working Group on California Earthquake Probabilities. 2015. The Third California Earthquake Rupture Forecast (UCERF3). http://www.wgcep.org/ucerf3

The U.S. Geological Survey scenarios show that the San Joaquin Fault could cause the strongest seismic shaking in Mission Viejo, followed by San Andreas and the Newport-Inglewood faults. The more distant faults, like the San Jacinto and San Andreas faults, can produce more intense earthquakes but are less like to cause damage in Mission Viejo due to their greater distance from the City. However, as noted in **Table 3-15**, the likelihood of a powerful earthquake occurring along the majority of these faults within the next 25 years is exceptionally low (excluding the San Andreas).

LIQUEFACTION

Soil liquefaction is a seismically induced form of ground failure, which has been a significant cause of earthquake damage in southern California. During the 1971 San Fernando and 1994 Northridge earthquakes, significant damage to roads, utility pipelines, buildings, and other structures in the Los Angeles area was caused by liquefaction. Research and historical data indicate that loose, granular materials situated at depths of less than 50 feet with fine (silt and clay) contents of less than 30%, which are saturated by a relatively shallow groundwater table, are most susceptible to liquefaction. These geological and groundwater conditions exist in parts of southern California and Mission Viejo, typically in valley regions and alluvial floodplains.

For liquefaction to occur, three general conditions must be met. The first condition – strong ground shaking of relatively long duration – can be expected to occur in the Mission Viejo area because of an earthquake on any of the several active faults in the region. The second condition – loose or unconsolidated, recently deposited sediments consisting primarily of silt and sand – occurs in a large portion of the valley floors and the larger canyon bottoms prevalent throughout Orange County. The third condition is water-saturated sediments within about 50 feet of the surface. Liquefaction could occur, but defining the precise likelihood isn't possible. Refer to **Table 3-15** for the probability of a major earthquake occurring in faults close to Mission Viejo.

Climate Change Considerations

SEISMIC SHAKING

There is no direct link between climate change and seismic activity, so climate change is not expected to cause any changes to the frequency or intensity of seismic shaking. Some research indicates that climate change could result in "isostatic rebounds," or a sudden upward movement of the crust because of reduced downward weight caused by glaciers. As glaciers are known to melt when global temperatures increase, climate change could indirectly lead to increased seismicity in Southern California.[19]

LIQUEFACTION

While climate change may not impact seismic shaking, it can directly impact liquefication. Climate change is anticipated to change the usual precipitation patterns in Southern California. Periods of both rain and drought are anticipated to become more intense and frequent. This means more precipitation will likely occur during rainy periods, and drought is expected to last longer. As a result, the water table in Mission Viejo could rise during intense periods of precipitation. Alternatively, a longer-lasting drought may lead to more groundwater withdrawal and could lower the water table. Therefore, climate change could potentially increase or decrease the risk of liquefaction in Mission Viejo, depending on the circumstances. Prolonged droughts can decrease

[19] Masih, A. January 2018. "An Enhanced Seismic Activity Observed Due to Climate Change: Preliminary Results from Alaska." IOP Conference Series: Earth and Environmental Science. doi :10.1088/1755-1315/167/1/012018. https://iopscience.iop.org/article/10.1088/1755-1315/167/1/012018/pdf

groundwater levels if additional water extraction occurs, decreasing the liquefaction potential. While an increase in precipitation intensity and frequency could increase groundwater levels, potentially increasing liquefaction potential.

WILDFIRE

Description

Wildfires are fires that burn in largely undeveloped and natural areas and are a regular feature of ecosystems throughout California. These fires help to clear brush and debris from natural areas and are necessary for the health of many ecosystems and various species' life cycles. However, since the early twentieth century, the common practice was to suppress naturally occurring fires in wildland areas, allowing dry plant matter and other fuels to build up.

At the same time, human activity has caused changes in the buffer zone between urbanized and undeveloped areas, known as the wildland-urban interface (WUI). The more natural setting of a WUI can make these zones highly desirable places to live. In many parts of California, the WUIs have become developed, albeit at lower densities than fully urbanized areas. However, this development activity has brought more people into wildfire-prone areas. The availability of fuel and increasing encroachment into the WUI, together with a changing climate, have made wildfires among California's most common and dangerous natural hazards.

Lightning, accidents, or arson can spark wildfires. The size and severity of any fire depend on fuel, weather conditions, and topography availability. However, wildfires in the WUI do not need to be large to be damaging. In Oakland, the 1991 Tunnel Fire was relatively small, only 1,600 acres, but it was one of California's deadliest and most destructive wildfires.[20] The flames from wildfires create severe risks to property and lives. Smoke and other particulate matter from wildfires pose a health risk, even to those not near the blaze. Burned areas can be more susceptible to flooding and landslides because wildfires destroy the vegetation that helps slow down water runoff and hold slopes together.[21] The ground may repel water rather than absorb it when faced with ash deposits. Due to the change in the landscape structure after a fire, repelled water can carry debris into water reservoirs.[22]

Location and Extent

Wildfires are not measured on a specific scale and are usually classified by size (e.g., acres burned) or impact (buildings destroyed or damaged, injuries or deaths, cost of damage, etc.). The California Department of Forestry and Fire Protection (Cal Fire) defines the wildfire hazard zones on a three-tier scale of fire hazard severity zones (FHSZs): very high, high, and moderate. These zone classifications do not correspond to a specific risk or intensity of fire but are qualitative terms that consider many factors. Fire-prone areas are also classified by the agency responsible for fire protection. Federal Responsibility Area (FRA) falls to federal agencies such as the US Forest Service, the Bureau of Land Management, and the National Park Service. State Responsibilities Area (SRA), which includes unincorporated land within counties with statewide watershed value, falls to the Cal Fire. Local Responsibility Area (LRA), which includes portions of incorporated cities with identified wildfire hazard zones, falls to local governments.

[20] Cal FIRE. 2020. https://www.fire.ca.gov/media/5512/top20_deadliest.pdf
[21] EPA. 2019. “Wildfires: How Do They Affect Our Water Supplies?” https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies
[22] Bichell, R. 2019. “How Wildfires May Muck Up the West’s Reservoirs.” Colorado Public Radio. https://www.cpr.org/2019/09/25/how-wildfires-may-muck-up-the-wests-reservoirs/

Due to the Santa Ana Mountains' foothill topography, Mission Viejo is susceptible to wildfires. The community of Mission Viejo is located in the Santa Ana Mountain foothills, and portions of the City are located within the wildland-urban interface (WUI). The WUI is the zone of transition between the wilderness and human-developed lands. Wildfires present a significant threat to the city and the County located in or near the WUI, as it is a region of relatively high temperatures, low humidity, and low precipitation during the summer. The fall brings the Santa Ana winds, exacerbating the area's already dry conditions and increasing the foothills' susceptibility to wildfire. Fire threat assessment and Geographic Information System (GIS) mapping for Mission Viejo identifies the WUI as the area within the city with the highest fire risk. **Figure 3-5** identifies portions of the City located within the WUI as well as historic fire perimeters in the City.

According to Cal Fire FHSZ mapping of the City, the city's eastern border is located within a Very High Fire Hazard Severity Zone (VHFHSZ), falling under the jurisdictional responsibility of the City as it is located in the LRA. The potential for wildfire is even greater considering that this same eastern border is also adjacent to the VHFHSZs and HFHSZs o the SRA along the city limits. The potential for a wildfire to begin in the SRA and spread into the city's LRA is highly probable if the fire cannot be contained with the SRA. **Figure 3-6** identifies the fire hazard zones within the city and the surrounding area, including the state responsibility areas (SRA) and the local responsibility areas (LRA). The zones depicted include the SRA, which is primarily unincorporated Orange County, under the jurisdiction of CAL Fire, while the LRA is under the control of the Orange County Fire Authority (OCFA). The city’s sphere of influence extends into the SRA and the Very High Fire Hazard Severity Zones (VHFHSZ) associated with this area. Development requirements within this area are regulated and must meet the development requirements for areas located within VHFHSZs.

A fire can only ignite if three elements are present: heat, fuel, and oxygen. If any one of these elements is removed, the fire will extinguish itself. In Mission Viejo, there are copious amounts of fuel given to the thousands of structures which makes them extremely flammable. Activity that creates intense heat that is unmonitored or unregulated may lead to the ignition of a fire. The National Institute of Standards and Technology, Fire Research Division, has developed a scale that measures the increase in temperature and the kind of fire response that develops. **Table 3-16** shows the progression of temperature relative to fire response.

Once a fire has been ignited, it could conceivably grow indefinitely if abundant fuel and oxygen are available. For example, a fire that ignites in one house could spread to other adjacent houses if there was enough fuel to link the structures together. Fires in confined spaces may burn so intensely that they consume all the oxygen available and burn out before they can expand.

TABLE 3-16: FIRE SUSCEPTIBILITY BASED ON TEMPERATURE INCREASE

Temperature (°F)	Response
98.6 °F	Average normal human oral/body temperature.
101 °F	Typical body core temperature for a working firefighter.
109 °F	Human body core temperature that may cause death.
111 °F	Human skin temperature when pain is felt.
118 °F	Human skin temperature causing a first-degree burn injury.
130 °F	Hot water causes a scald burn injury with 30 s exposure.
131 °F	Human skin temperature with blistering and second-degree burn injury.
140 °F	Temperature when burned human tissue becomes numb.
162 °F	Human skin temperature at which tissue is instantly destroyed.
212 °F	Temperature when water boils and produces steam.
482 °F	Temperature when charring of natural cotton begins.
>572 °F	Modern synthetic protective clothing fabrics begin to char.
≥752 °F	Temperature of gases at the beginning of room flashover.
≈1832 °F	Temperature inside a room undergoing flashover.

FIGURE 3-5: WILDLAND URBAN INTERFACE (WUI) AND HISTORICAL WILDFIRE PERIMETERS

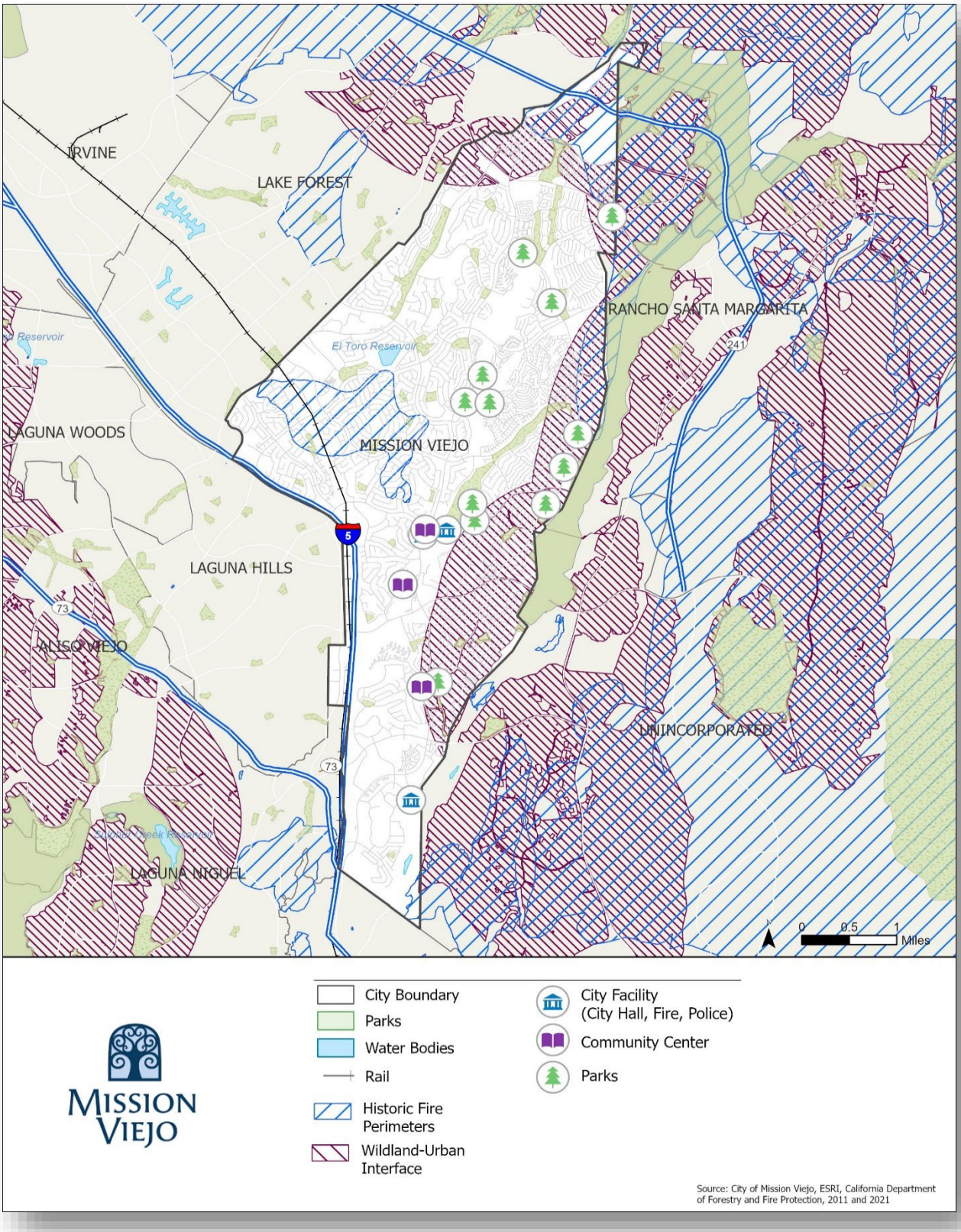
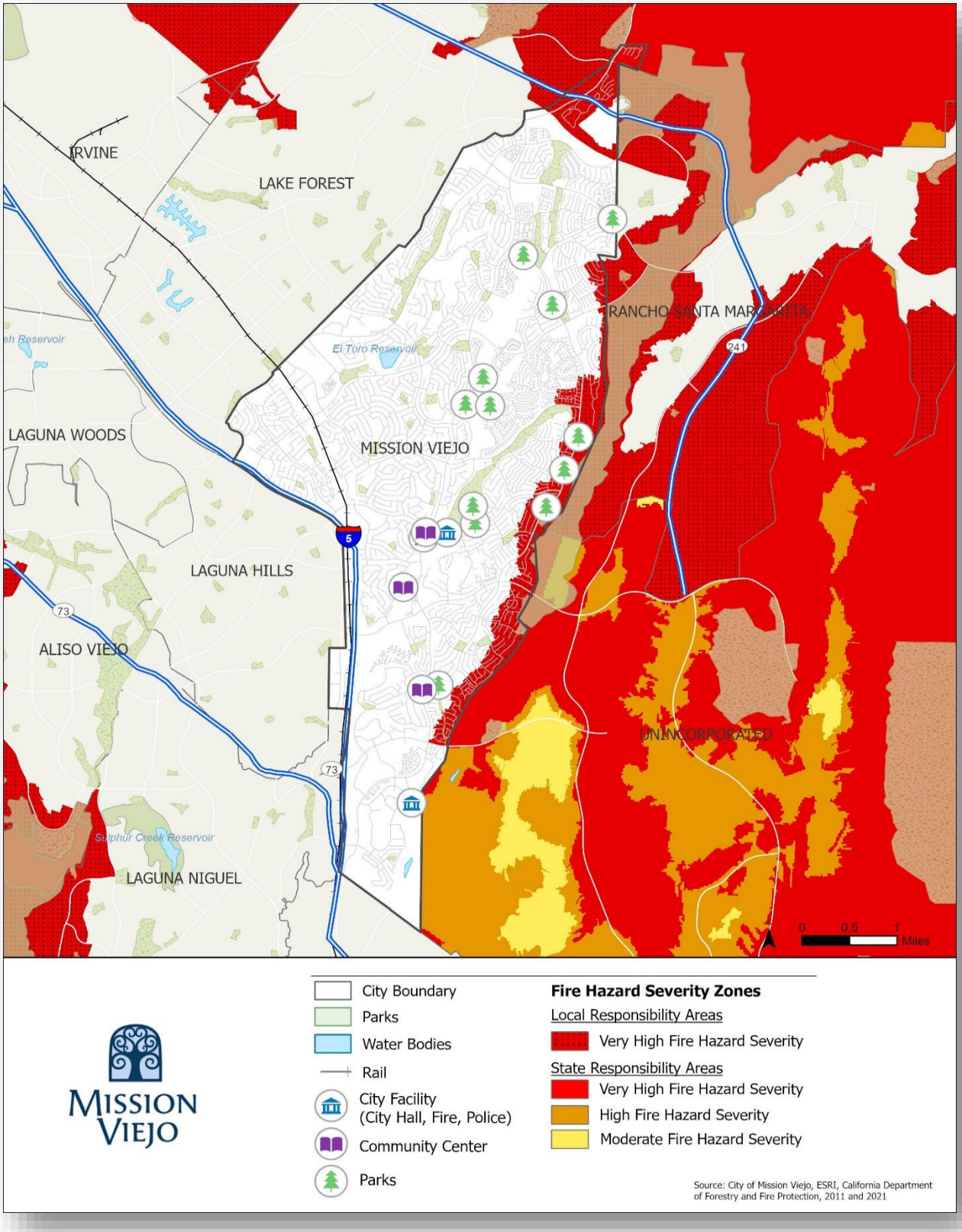


FIGURE 3-6: VERY HIGH FIRE HAZARD SEVERITY ZONES (LRA & SRA)



Past Events

Since incorporation in 1988, no wildland fire started outside the City has spread to and entered into the City. However, as recently as January 2007, a fire started in the Arroyo East of the City near Oso Parkway and threatened homes along the city limits. This area remains susceptible to large wildfires during low moisture and high heat conditions. Approximately 1000 homes are adjacent to the historic fire corridor and are subject to wildfires. **Table 3-17** lists the recent major wildfires near the City and the immediate region.

TABLE 3-17: MAJOR WILDFIRE EVENTS IN AND AROUND MISSION VIEJO

Date	Event
October 21, 2007	Orange County's Santiago Fire burned 28,400 acres, and 15 homes were lost and 8 damaged. Fortunately, there were no deaths in Orange County. The City of Mission Viejo activated its Emergency Operations Center (EOC) for the Santiago Fire that threatened the City's North end. The EOC was set up and operational during the week. Orange County Sheriff's Department Personnel serving the City were deployed to help with fire watch duty to look for hot spots in coordination with Orange County Fire Authority (OCFA) personnel. City command staff attended a briefing at the Lake Forest EOC, and City staff visited the El Toro High School Red Cross Shelter to learn about shelter operations. WebEOC was monitored around the clock for updates. Fortunately, there was no damage in the City of Mission Viejo.
September 6, 2016	Trabuco Fire resulted in a 20-25 acre blaze adjacent to the Arroyo Trabuco Golf Club, near Interstate 5, in Mission Viejo. Firefighters on the ground and in the air stopped the fire before any structural damage occurred. Investigators determined the fire started from sparks when a golfer's club struck a rock.
October 26, 2020	The Silverado Fire burned from October 26 until finally being one hundred percent contained on November 7. The Silverado Fire required the Orange County Fire Authority (OFCA) to initiate evacuation warnings for over 90,000 residents, including residents of Mission Viejo. The wildfire consumed over 13,300 acres in southern Orange County, 2 firefighters were injured during the blaze, and the fire destroyed 1 structure, 2 minor structures, and caused damage to 5 others.

Risk of Future Events

The history of wildfires in Orange County and Mission Viejo and development within the City's WUI, including the very high fire hazard severity zones (VHFHSZ), indicates that wildfire events are likely to occur. Since 1982, five major wildfire events have affected the city, equating to a return interval of approximately one fire every eight years. This risk is expected to remain highest in the undeveloped land in the foothills within both the city and the county's unincorporated areas and National Forest lands that border the city and its sphere of influence (SOI).

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to cause an increase in temperatures and more frequent and intense drought conditions. This increase will likely increase the amount of dry plant matter available for fuel, increasing wildfire risk statewide. Climate change is expected to increase the number of acres burned annually in the foothills of the Santa Ana Mountains, which are already highly prone to wildfires. However, increases in fuel supplies could cause wildfires to move faster or spread into more-developed areas, increasing the future threat to Mission Viejo.

LANDSLIDE

Description

Landslides are a serious geologic hazard in almost every state in America. Nationally, landslides cause 25 to 50 deaths each year. The best estimate of direct and indirect costs of landslide damage in the United States ranges between $1 and $2 billion annually. As a seismically active region, California has had a significant number of locations impacted by landslides. Some landslides damage private property, and other landslides impact transportation corridors, fuel and energy conduits, and communication facilities. They can also pose a serious threat to human life.

Landslides occur when slopes become destabilized, typically after heavy rains. If precipitation saturates soils, they can become unstable, or landslides can occur when significant erosion from rainfall destabilizes the ground. Slopes that have recently burned face a greater risk from rain-induced landslides, as the loss of vegetation can destabilize the earth. Earthquakes may also be a source of landslides as the shaking can destabilize steep hillsides covered in loose soils and weak rock layers.

Landslides can be broken down into two categories: (1) rapidly moving (generally known as debris flows) and (2) slow-moving. Rapidly moving landslides or debris flows present the greatest risk to human life, and people living in or traveling through areas prone to rapidly moving landslides are at increased risk of serious injury. Slow-moving landslides can cause significant property damage but are less likely to result in serious human injuries.

Location and Extent

Identifying hazardous locations is an essential step toward implementing more informed mitigation activities. The City's foothill areas are vulnerable to slope instability. Further, some residential construction in the foothills of Mission Viejo occurred before the development and enforcement of stronger grading codes in the 1970s, and before heightened awareness of slope stability issues that resulted from the periodic intense rainstorms of the last 30 years. Consequently, older residences built in or near natural drainage courses and steep slopes may be at risk from slope failures. The Seismic Hazard Map below includes areas of earthquake-induced landslides in Mission Viejo.

In the City of Mission Viejo, land sliding and debris flows are the dominant geologic hazard risks. This is based on abundant shales and siltstones that underlie the City's highly porous hills and do not hold together well when wet. This can lead to slope instability and landslides. In addition, factors that contribute to slope instability and landslides include rainfall, the City's complex water distribution system, and earthquakes. Debris flows can occur rapidly and without warning during periods of exceptionally high rainfall. Although rockfall hazards are low in the City, mudflows are more likely to occur.

The potential for slope failure is dependent on many factors and their interrelationships. Some of the most important factors include slope height, slope steepness, sheer strength, orientation of weak layers in the underlying geologic unity, and poor water pressures. Joints and shears, which weaken the rock fabric, allow water penetration, leading to deeper weathering of the rock along with increasing the pressures, the plasticity of weak clays, and the weight of the landmass. These factors are combined in calculations to determine if a slope meets a minimum safety standard for the engineering of earth materials. The generally accepted standard is a factor of safety of 1.5 or greater, where (1.0 equilibrium and less than 1.0 is failure). Although existing landslides are not widespread in the area, it is probable that many of the steeper hillsides do not meet the minimum factor of safety, and slope stabilization may be needed if development reaches these areas.

Natural slopes, graded slopes, or graded/natural slope combinations must meet these minimum engineering standards where they impact planned homes, subdivisions, or other types of developments. Slopes adjacent to areas where the risk of economic losses from land sliding is small, such as parks and mountain roadways, are often allowed a lesser safety factor. **Figure 3-7** shows the areas of the city mapped as landslide hazard zones.

While no definitive scale for measuring landslides exists, landslide events are usually measured using the amount of displaced material (i.e., the cubic feet of earth that moved). In addition, to these landslide hazards, the California Geological Survey has mapped deep-seated landslide hazards, which uses a scale of landslide susceptibility that is based on slope steepness and the strength of the underlying rock, with 0 being no susceptibility and 10 being the highest susceptibility. **Figure 3-8** identifies these categories and their location within the City.

Past Events

Mission Viejo is located in the Saddleback Valley in the Santa Ana Mountain foothills. The hilly topography of the City and the surrounding area make it susceptible to landslides. Given this topography, there have been major landslides within the City and the region. **Table 3-18** lists some of these major landslide events.

TABLE 3-18: MAJOR LANDSLIDE EVENTS IN AND AROUND MISSION VIEJO

Date	Event
10/02/1978	**Bluebird Canyon, Laguna Beach -** Unusually heavy rains in March of 1978 may have contributed to the initiation of the landslide. Although the 1978 slide area was approximately 3.5 acres, it is suspected to be a portion of a larger, ancient landslide. Sixty houses were destroyed or damaged, causing over $52 million in damages at the time.
01/19/1993	**Anaheim Hills** - Following a major El Niño weather event, a bluff in east Anaheim Hills slid and prompted the evacuation of dozens of families, destroyed over 30 homes, and impacted over 200 other nearby structures.
12/06/1997	**Orange County** - Four homes were condemned and evacuated due to a mudslide and rockfall in Silverado Canyon. Floods and mudslides were reported in Costa Mesa, Irvine, Lake Forest, San Juan Capistrano, and Laguna Beach. Mudslides occurred in Black Star, Baker, and Santiago Canyons. Many road closures were reported along the Santa Ana Freeway at Laguna Freeway, Laguna Canyon Road, and Pacific Coast Highway in Newport Beach and Huntington Beach.
12/23/1997	**Anaheim Hills** - Movement of an active landslide in Anaheim Hills accelerated. The landslide, located within a mapped landslide, had been active for the past two years. This "Vista Summit Way" landslide damaged two to three houses and affected three city blocks.
03/19/1998	**Laguna Niguel** - During the 1997/1998 El Nino Season, heavy rainfall increased movement on the site of an ancient landslide in Laguna Niguel. The storms in December 1997 had accelerated its movement, and in early 1998, a crumbling hillside forced the evacuation of 10 hilltop homes and more than 10 condominium units resting below. Ultimately four of the hilltop homes collapsed, falling down the hillside into the void created by the slide area. The

	condominium complex has since been demolished, and the site sits as an open space.
1999	**Mission Viejo -** As a result of the El Nino storm event in the winter of 1998/99, a slope failure occurred along the Mojave Slope/Open Space in the City. No structures were damaged; however, the failure threatened homes in the neighboring City of Lake Forest.
Early 2005	**Anaheim Hills** - Three new multi-million-dollar homes along Ramsgate Drive were destroyed by this slow-moving landslide in 2004-05.
01/06/2005	**Mission Viejo** - The City experienced a large residential landslide between Ferrocarril and Encorvado Lane during the 2005 winter storms. This landslide consisted of an approximate 300-foot wide by 70-foot-high slope failure that occurred due to extreme rains that fell during the winter months. The failure occurred along a deep-seated slide plan along a clay bed that was lubricated by water saturation.
2007-2008 Post-Santiago Fire and 2014-2015 Post-Silverado Fire Debris Flows	**Orange County Canyon Communities** - Following the 2007 Santiago Fire that stripped the vegetation bare in the canyon communities of Orange County, a debris flow task force was convened to address the potential impact that post-fire winter storms could have on the slopes in the burn areas. There have been several cases of mudslides that have damaged homes. It is expected that preparedness and mitigation measures will have to be instituted for up to five years after the fire. Following the Silverado Fire in 2014, similar conditions were generated in the Silverado Canyon area of Orange County. While no major debris flows have been recorded in the year following the event, the threat will remain for several more years.

Risk of Future Events

The potential for landslides will continue to exist in areas of the city, especially those areas in Mission Viejo located along the canyons and hillier sections of the City. All expectations are that the probability of a landslide occurring again in the future is likely. As discussed in **Table 3-2**, a probability of “likely” indicates between a one and ten percent chance of a landslide occurring annually.

Climate Change Considerations

Due to the wide variety of factors that can lead to landslides, it is possible that climate change could indirectly affect the conditions for landslides. Increased frequency and more intense storms may cause more moisture-induced landslides. Warmer temperatures and more frequent drought conditions may lead to more fires, destabilizing soils and making future landslide events more likely.

FIGURE 3-7: LANDSLIDE HAZARD ZONES IN MISSION VIEJO

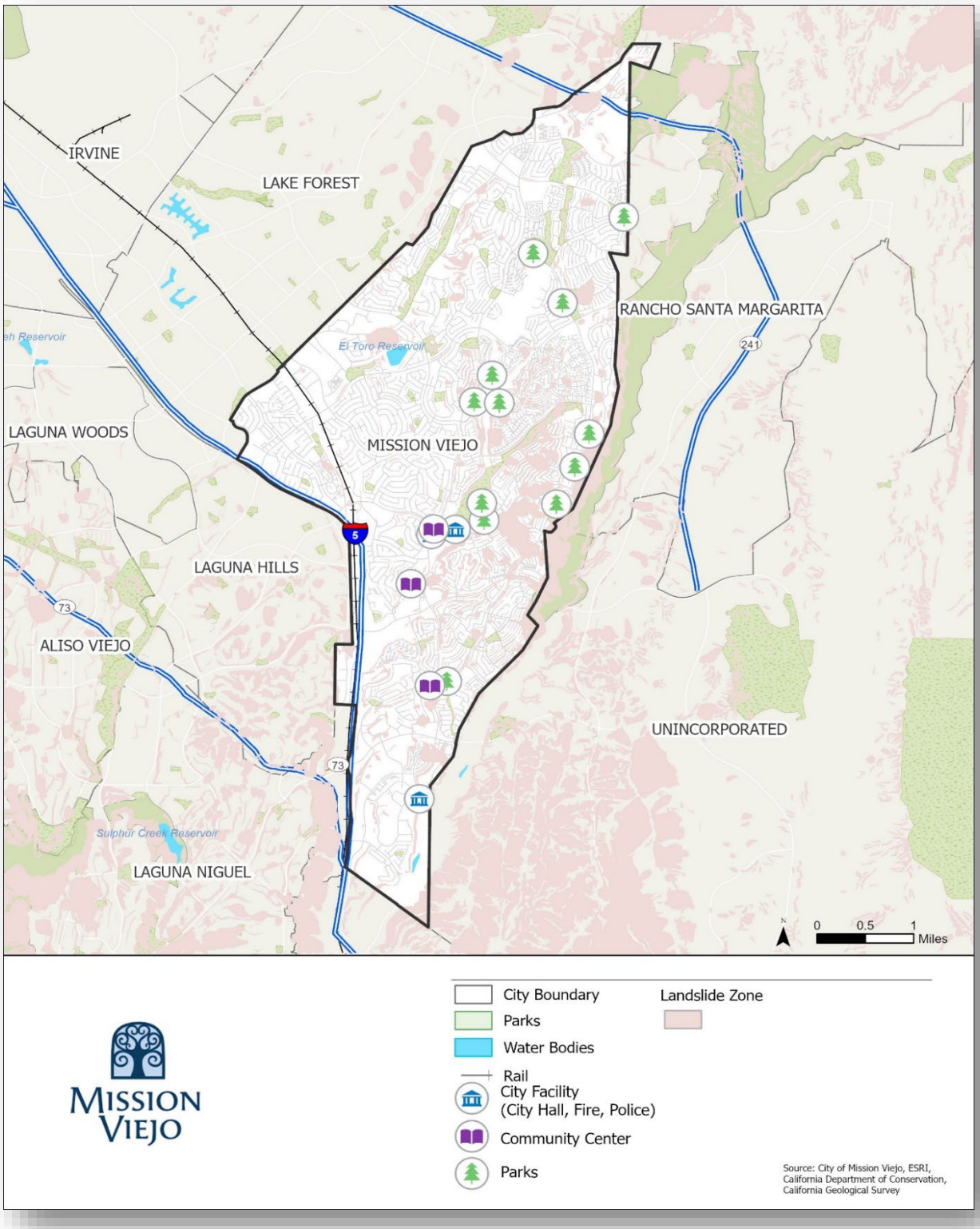
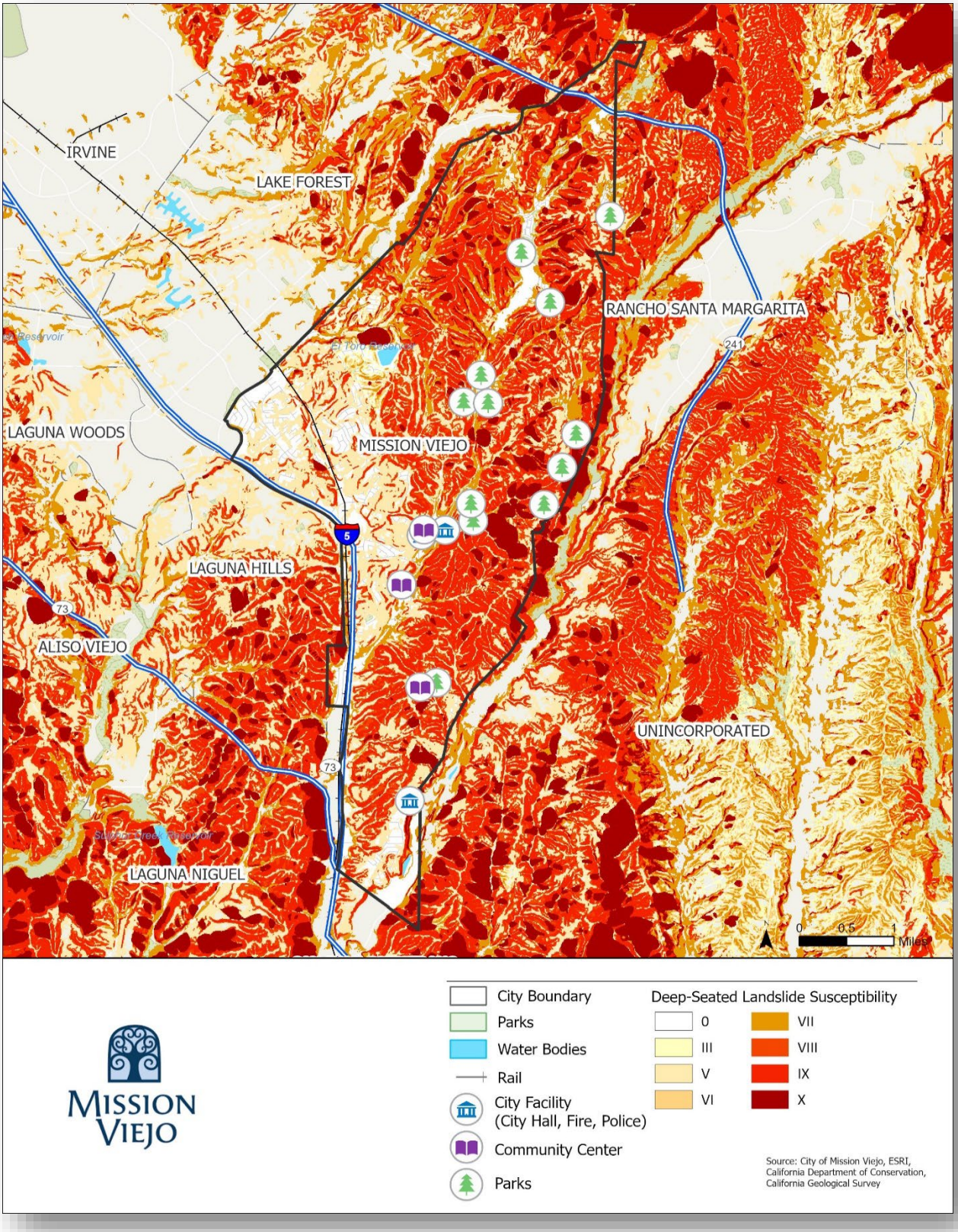


FIGURE 3-8: LANDSLIDE SUSCEPTIBILITY AREAS IN MISSION VIEJO



FLOODING (INCLUDING DAM FAILURE)

Description

FLOOD

Flooding occurs when an area becomes inundated with more water than it can drain in a specified period. This can range from a small, confined area, such as a grassy field in a park that floods for a few hours after a rainstorm, to whole city sections, such as streets becoming impassable because of floodwaters. When floods are small, they may only represent a minor inconvenience as some recreational pathways and curb cuts become flooded. These smaller instances of flooding where water collects into a pool of standing water are referred to as "ponding." On the other hand, larger flood events can hamper a city's operations. For example, if multiple streets flooded simultaneously, the results could prevent emergency workers from reaching victims in need of assistance. Flooding also has the destructive potential to damage critical infrastructure. For instance, unprotected electronic equipment can short-circuit if it becomes inundated by floodwaters. This could lead to outages in street lighting, traffic signals, and even city and government computer systems.

Flooding has the potential to occur from multiple sources. In Southern California, the primary cause of flooding is usually heavy rain occurring during the winter storm season. Most precipitation in California arrives either via atmospheric rivers or the ENSO cycle. Atmospheric rivers are channels of moist air located high in the atmosphere. The ENSO cycle is a regional meteorological phenomenon in the southern Pacific Ocean consisting of ocean water and air temperature variations. These variations give rise to two distinct phases: El Niño, the warm and wet phase, and La Niña, the dry and cold phase. When the El Niño phase is active, California will likely receive higher than normal precipitation levels. These higher-than-normal levels of rainfall can quickly overwhelm the capacity of certain sections of land to drain the precipitation before the rainwater begins to pool effectively.

A failure in infrastructure may also cause flooding. For example, a water main or sewage pipeline that bursts could cause flooding if left uncontained for a significant period of time. A more serious infrastructure failure, such as the failure of dams, reservoirs, or levees, could cause extensive flooding. Please refer to this chapter's Dam / Reservoir / Levee Failure section for more information on this type of hazard.

DAM FAILURE

Dam, reservoir, and levee failure can result from several causes, such as earthquakes, rapidly rising floodwaters, and structural design flaws. These hazards can occur instantaneously or very gradually, depending on the source of the failure. Inundation associated with these events can cause loss of life, damage property, and result in other impacts, such as displacement of persons residing in the inundation path and loss of critical infrastructure.

Location and Extent

FLOOD

The Federal Emergency Management Agency (FEMA) designates which areas in the United States are susceptible to flooding and how likely they are to experience flooding. FEMA uses a complex classification system to categorize the level of risk for each section of land. The two most well-known measures of flood event likelihood are the 100-year flood and 500-year flood zones. These designations do not refer to floods that occur every 100 or 500 years but to the likelihood of occurring yearly. For example, a 100-year flood zone has a 1 in 100—or 1% chance—of

occurring in any given year, while a 500-year zone has a 1 in 500—or 0.2% chance—of occurring in any given year. These likelihood measures are combined with each locale's specific geography to produce specific flood "zone" designations. **Table 3-19** shows a detailed list of all the flood zone categories used by FEMA.

TABLE 3-19: FEMA FLOODPLAIN ZONES

Zone	Description
A	Within a 100-year flood plain, but the water height of the 100-year flood is not known.
A1-30 or AE	Within a 100-year flood plain and the water height of the 100-year flood is known.
AO	Within a 100-year flood plain, and the water height of the 100-year flood is between one and three feet but not specifically known.
A99	Within a 100-year flood plain, protected by flood protection infrastructure such as dams or levees.
AH	Within a 100-year flood plain, and the water height of the 100-year flood is between one and three feet and is specifically known.
AR	Within a 100-year flood plain, protected by flood protection infrastructure that is not currently effective, but is being rebuilt to provide protection.
V	Within a 100-year flood plain for coastal floods, but the water height of the flood is not known.
V1-30 or VE	Within a 100-year flood plain for coastal floods and the water height of the flood is known.
VO	Within a 100-year flood plain for shallow coastal floods with a height between one and three feet.
B	Within a 500-year flood plain or within a 100-year flood plain with a water height less than one foot (found on older maps)
C	Outside of the 500-year flood plain (found on older maps)
X	Outside of the 500-year flood plain (found on newer maps)
X500	Within a 500-year flood plain or within a 100-year flood plain with a water height less than one foot (found on newer maps)
D	Within an area with a potential and undetermined flood hazard.
M	Within an area at risk of mudslides from a 100-year flood event.
N	Within an area at risk of mudslides from a 500-year flood event.
P	Within an area at risk of mudslides from a potential and undetermined flood event.
E	Within an area at risk of erosion from a 100-year flood event.

FEMA also uses Base Flood Elevation (BFE) to determine the minimum depth of the floodwaters during one of these flood events. An area with a BFE of three feet, for example, means that area can expect to see a minimum floodwater depth of three feet with potentially additional depth in particularly severe flood events.

FEMA has designated the vast majority of Mission Viejo as lying within Zone "X," generally meaning the City is not in danger of a 500-year flood. The majority of 100-year flood zones in the city are located along the base of the canyons and hills. The City is at risk of flooding due to surface drainage through the streets and storm drains. The drainage pattern in the City varies, with most runoff conveyed on street surfaces and local storm drain facilities maintained by the Public Works department, to the regional facilities owned and maintained by the Orange County Flood Control District. Ponding events occur on any flat surfaces where sufficient drainage is unavailable. These include parking lots, landscaped areas or lawns, or roadways. Since ponding is so small in scale, it is impossible to predict exactly where in the City they will occur or how severe they will be. **Figure 3-9** depicts the city's 100-year and 500-year flood zones as mapped by FEMA. These areas include Arroyo Trabuco and Tijeras Canyon in the eastern portion of the City, Oso Creek in the central, Aliso Creek along the northwest boundary, and the area along the Orange County Transportation Authority (OCTA) and Metro Link Railroad Line from Alicia Parkway south of the Oso Parkway/Interstate 5 interchange. Floods along any of these major creeks are possible. Although considerable development has occurred near the City's creeks over

the years, most of the creeks have not been channelized with hard concrete sides or bottoms, which are designed to reduce the risk of flooding. Per the City's General Plan, channelizing is inadequate to mitigate a 100-year flood.

Dam Failure

Inundation from the following three dams/reservoirs could potentially result in flooding in Mission Viejo in the event of failure:

Upper Oso Reservoir - one of the largest recycled water reservoirs in Orange County, has been in operation since 1979. It is located near the 241 Toll Road in the cities of Mission Viejo and Rancho Santa Margarita. The reservoir holds up to 1.3 billion gallons of recycled and runoff water used for outdoor irrigation in the surrounding communities, conserving over a billion gallons of drinking water yearly.

El Toro Reservoir - El Toro Reservoir was built in 1967 to serve the growing population in the District with a capacity of 233 million gallons of safe, reliable drinking water. In 2002, the reservoir was expanded to 275 million gallons and regionalized. El Toro Water District (ETWD) owns and operates the reservoir sharing capacity with Santa Margarita Water District and Moulton Niguel Water District. The reservoir serves the ETWD customers and as emergency storage by our partner agencies.

Lake Mission Viejo - A reservoir created for recreation in Mission Viejo, Orange County, California. The reservoir is formed by an earth fill dam across the canyon of Oso Creek, which is part of the Trabuco Creek and San Juan Creek drainage basin. The lake is not fed by urban runoff; it is maintained to be safe for contact. The Lake Association owns and operates the Lake facilities, including approximately 124 surface acres of water and 50 acres of land, including Playa del Norte (North Beach) and Marina, Playa del Este (East Beach), parking facilities, and Market on the Lake Dock and dam. Recreational facilities available for Lake Association members include the Lake, two large beaches and picnic areas, clubhouse rental, boat launching facility, and shoreline fishing area.

Dams that could impact Mission Viejo have been identified in bold within this table. **Figure 3-10** identifies the potential inundation areas that could impact the City of Mission Viejo. This figure shows the areas downstream that would be inundated by a breach from a dam's reservoir. The areas that could flood in the case of a dam breach are not necessarily the same areas that a 100-year or 500-year flood could inundate.

Table 3-20 identifies relevant data regarding Mission Viejo from the National Flood Insurance Program (NFIP).

Table 3-20 NFIP Data for Mission Viejo

Total Number of Policies:	**90**
Total Premiums:	$76,594
Insurance in Force:	$30,591,000
Total Number of Closed Paid Losses:	22
$ of Closed Paid Losses:	$303,728
# of Repetitive Loss (RL) Properties	8
# of Severe Repetitive Loss (SRL) Properties	0
CRS Class Rating	7

Source: FEMA, 2022

FIGURE 3-9: FEMA 100 – YEAR AND 500 –YEAR FLOOD ZONES IN MISSION VIEJO

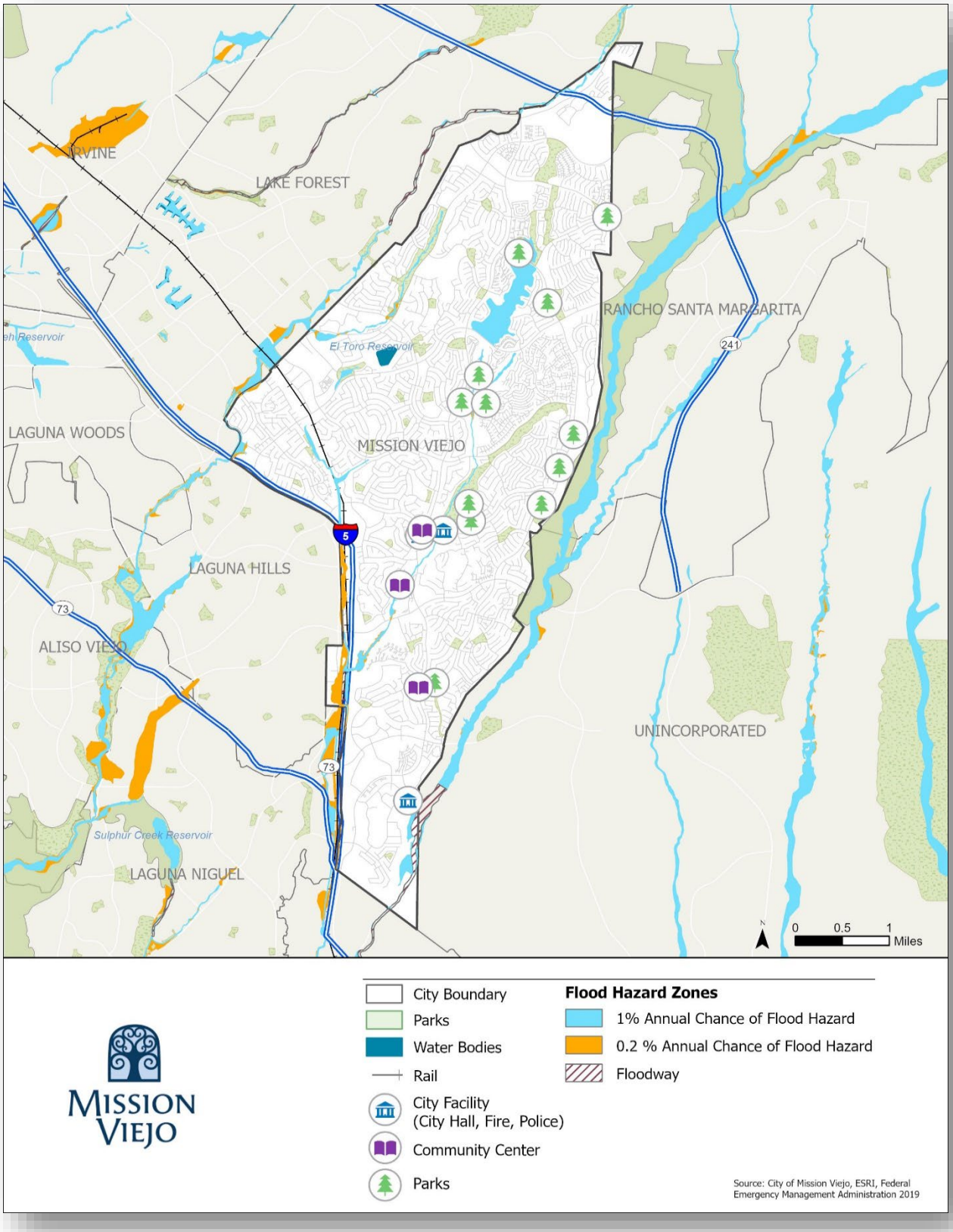
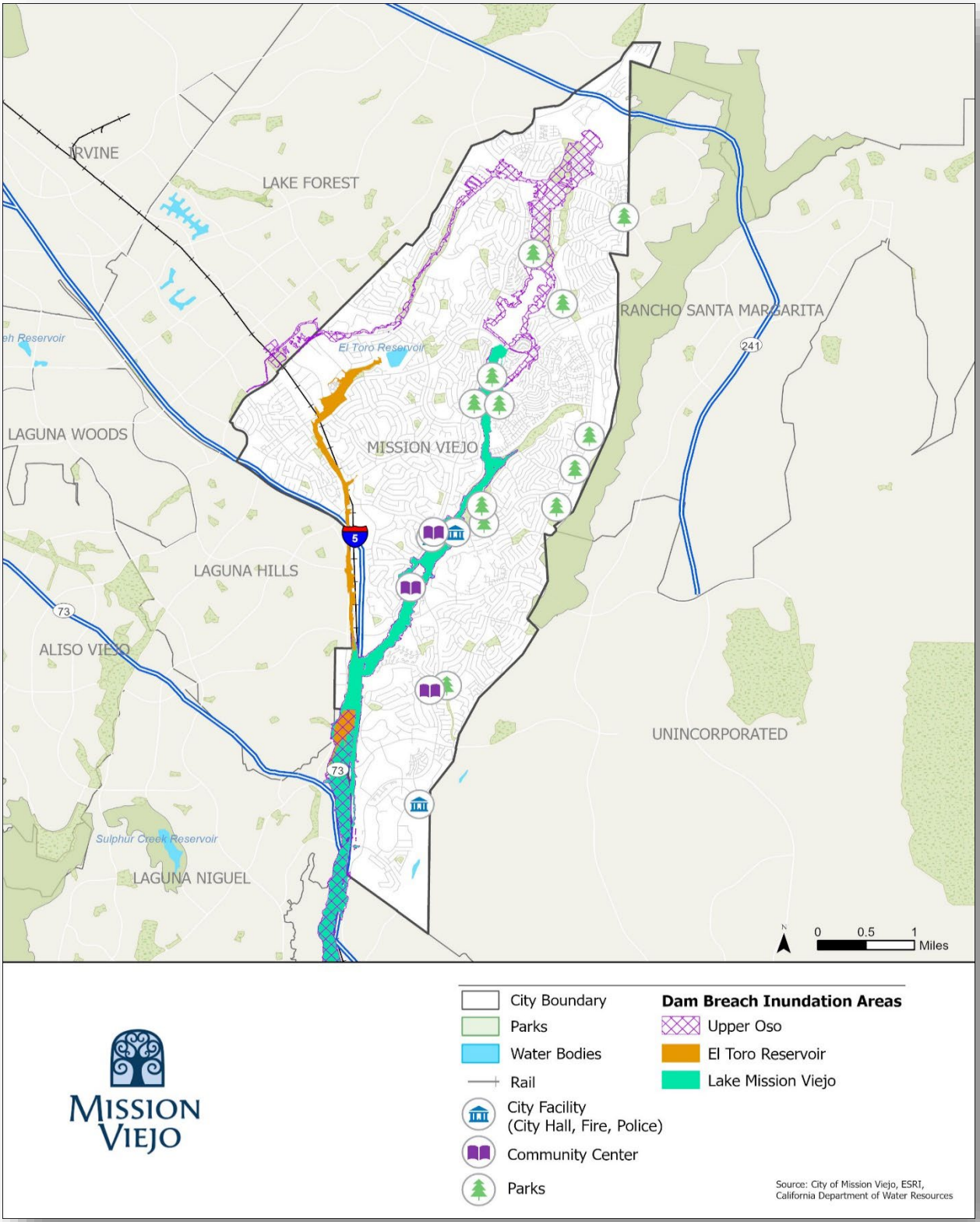


FIGURE 3-10: DAM/RESERVOIR INUNDATION ZONES IN MISSION VIEJO



Past Events

FLOOD

Orange County is no stranger to flooding during massive storm systems and has experienced the destructive effects that occur as a result. Some flooding events have caused damage in the past in the City of Mission Viejo.

Table 3-21 lists examples of significant historic flooding in the region, as well as some of the local flooding events in the City: [23]

TABLE 3-21: SIGNIFICANT LOCAL AND REGIONAL FLOODING EVENTS

Date	Event
December 1861 to January 1862	There were 30 consecutive days of rain across Southern California from Los Angeles to San Diego. Thirty-five inches of rain fell in Los Angeles, causing mass flooding around the region's rivers. Some rivers even changed course, and the mouth of the Los Angeles River shifted from Venice to Long Beach. In Orange County, the Santa Ana River banks in Anaheim created a four-foot-deep water layer extending to the Coyote Hills in Fullerton. Twenty people were reported dead in Orange County.
February to March of 1938	A weakened tropical storm reached Southern California and dropped 11 inches of rain in Los Angeles and 30 inches in some mountain areas. Flood control infrastructure was overwhelmed with the surge of water, and the Los Angeles, San Gabriel, and Santa Ana Rivers flooded their banks. Two hundred and ten people were reported dead or missing, including 45 people in Orange County.
February 1983	Heavy rain fell in Orange County, leading to flooding of several streets. In Mission Viejo, 30 vehicles were damaged, along with a multi-family building.
April 1988	Heavy rains led to flooding across Southern California, including Orange County. In Los Angeles, 26 motorists were injured in a major collision. Uprooted and felled trees brought down power lines that caused outages in the region.
Winter 2005	Several areas along the Oso Creek in the City were eroded and threatened to undermine the Oso Creek Trail. Repeat damage to these areas will likely occur during events exceeding 50-year floods. The City conducted repairs to the area after the event was declared a presidential disaster (DR-1577 and DR 1585)
Winter 2010	The City of Mission Viejo's EOC was activated during the Winter Storms of 2010 in order to monitor Citywide damage from the storm. The City experienced damage to portions of Oso Creek, Jeronimo Creek, and Aliso Creek Bikeway Bridge. FEMA public assistance was received for Citywide debris removal (mostly fallen trees) removal and repairs to the aforementioned channels.
February to March 2014	A very wet storm was the only significant storm of the 2013-14 wet season. Rainfall ranged from 1 inch at the coast to up to 8 inches in the mountains. There was minor street flooding in Mission Viejo.
December 2021 – January 2023	Communities located within canyons of the Bond Fire burn scar have had multiple potential evacuation notices and flash flood warnings as this area of the environment rebuilds and heals itself from the damage caused by the fire. Flood watches remained in effect when large precipitation events were in the forecast.

[23] Weather.gov. (2017)"A History of Significant Weather Events in Southern California." https://www.weather.gov/media/sgx/documents/weatherhistory.pdf

DAM FAILURE

There is no history of dam failure in the city; however, the presence of the dams/reservoirs provides the potential for this hazard. California's dam infrastructure varies in age (some are decades old, while others are more recently constructed), type, and size. In California, there have been several catastrophic dam failure events:

San Francisquito Canyon Dam. One of the earliest dam failures in California history. The dam experienced a structural failure because of insufficient geotechnical engineering analysis, leading to inadequate construction by the then Los Angeles Bureau of Water Works and Supply. At midnight on March 13, 1928, the 205-foot-tall structure failed catastrophically, unleashing a 120-foot-high wave of water traveling 18 miles per hour down the San Francisquito Canyon. By 5:30 AM, the wave had traveled 54 miles from the dam site to the Pacific Ocean, killing at least 438 people, razing towns, and destroying infrastructure. It was reported that victims' bodies were recovered from the ocean as far south as the Mexican border. The disaster is considered one of the worst engineering failures in US history.[24]

Baldwin Hills Dam. December 14, 1963, a structural failure in the dam caused a breach that unleashed 250 million gallons of reservoir water. Diligent work by maintenance crews detected the developing failure in the dam four hours before it was breached. With the cooperation of local law enforcement, they were able to successfully evacuate and save nearly 1,500 people downstream from the reservoir. Five lives were lost, 65 homes were destroyed, and nearly $11 million worth of property damage was incurred.[25]

Oroville Dam. In February 2017, the collapse of concrete in the main spillway caused a 60-foot-deep hole to develop in the lower third of the spillway during normal operations undertaken to lower the reservoir before a moderately large storm. A subsequent storm and the inability to fully use the primary spillway led to the filling of the reservoir and its unlined (natural) emergency spillway for the first time. After two days of usage, erosion of the unlined hillside and head cutting (erosion upstream towards the earthen dam), concerns regarding the stability of the emergency spillway caused an evacuation of nearly 200,000 people downstream. This prompted immediate repairs and a re-evaluation of this dam facility and many others throughout the State of California.[26]

Brea Dam. The Brea Dam failed on February 22, 2005, following an extensive episode of winter rains, causing water to spill over its crest. The Fullerton Golf Course and sections of Bastanchury Road were flooded with water, but no lives were lost. The golf course was damaged, and the floodwaters eroded an adjacent storm channel.[27]

Risk of Future Events

FLOOD

Localized instances of ponding occur at least annually or multiple times a year in cities across Southern California. During periods of drought, precipitation levels may decrease and lower the likelihood of ponding. In most years, though, it is almost certain that Mission Viejo will experience

[24] Association of State Dam Safety Officials. Case Study: St. Francis Dam. https://damfailures.org/case-study/st-francis-dam-california-1928/
[25] The Center for Land Use Interpretation. *Baldwin Hills Dam Failure Site*. http://clui.org/section/baldwin-hills-dam-failure-site
[26] California Office of Emergency Services. 2018. California State Hazard Mitigation Plan. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan
[27] Rancho Santiago Community College District. nd. *Part IV-D – Dam Failure*. https://rsccd.edu/Departments/Risk-Management/Documents/Risk%20Management/IV-D%20Dam%20Failure.pdf

some type of flood event. Larger-scale flood events are rare in Mission Viejo and will continue to be rare due to the City's protection by levee and other regional flood control infrastructure. However, during a particularly severe rainstorm or after a dam failure, Mission Viejo could experience some degree of large-scale flooding with inundation levels greater than one foot in depth. All expectations are that the probability of floods/storms occurring again in the future is likely. As discussed in **Table 3-2**, a probability of "likely" indicates that there is between a one and ten percent chance of floods/storms occurring annually.

Dam Failure

Due to the presence of several dams/reservoirs in and near Mission Viejo, areas of the City could be at risk of inundation in the case of significant dam failure. Dam failure's potential consequences are death or injury, people displaced from their homes, damage to existing public and private buildings, damage to infrastructure, loss of services from utilities, loss of government services, and economic losses. All expectations are that the probability of future dam failures occurring within Mission Viejo is possible. As discussed in **Table 3-2**, a probability of "possible" indicates that there is less than a one percent chance of this occurring annually.

Climate Change Considerations

Flood

Climate change is expected to exacerbate the conditions that lead to urban flooding in Mission Viejo. Climate change will cause more intense local, regional, and global weather patterns, intensifying atmospheric rivers. At this time, it is unknown exactly how climate change will impact ENSO frequency, but its effects are anticipated to become more intense. Winter storm precipitation amounts in Southern California will increase based on atmospheric rivers and ENSO changes. This increases the likelihood of an exceptional rain event could Mission Viejo that could overwhelm the capacity of the region's flood control system to contain and drain all the precipitation.

Due to climate change, droughts are also expected to increase in length and frequency. Soils dried by extensive drought periods are less able to absorb and drain water, likely increasing flood possibility. Overall, climate change is expected to create conditions that will raise the likelihood of flooding in Mission Viejo.

Dam Failure

Climate change could increase the risk of dam failure in the future. More intense rainstorms may increase the likelihood of reservoir infrastructure becoming overwhelmed, including the dams that control floodwaters from inundating Mission Viejo and the rest of Orange County. Indirectly, increased climate change-induced rains may cause more erosion, which could compromise the dam's structural integrity of its foundation.

CHAPTER 4 – THREAT AND VULNERABILITY

THREAT ASSESSMENT PROCESS

The threat assessment process evaluates the harm Mission Viejo may experience from a hazard event. Threat assessment does not consider a hazard's likelihood, so it gives equal consideration to hazards that are more likely (e.g., earthquakes, drought) as well as hazards that are less probable (e.g., urban fire, dam failure). The threat assessment examines three aspects of each hazard: the physical threat to Critical Facilities (CFs) and Facilities of Concern (FOC), the social threat to vulnerable populations, and the threat to other assets.

Critical Facilities and Facilities of Concern

Critical facilities consist of properties and structures that play important roles in government operations and their services to the community. Examples of CFs include local government offices and yards, community centers, public safety buildings like police and fire stations, schools, and any other properties a city has deemed essential for its operations. Critical Facilities may also serve dual roles if a city designates them as public assembly points during an emergency. The City often owns CFs, but many are owned and operated privately, such as utilities and telecommunication infrastructure. Facilities of concern are structures that play an important role in the City but are not critical to its function. These can be city-owned or privately owned facilities such as senior assisted living homes, parks, and storage facilities, to name a few.

The HMPC identified 3 CFs and 16 FOC in Mission Viejo that fall into three categories based on their function or characteristics. **Table 4-1** shows the number of CFs and FOC in each category, the total estimated value of the facilities in each category, and examples of the facilities in each. **Appendix D** has a complete list of the CFs and FOC.

The potential loss value is the total insured value of the CFs that fall within the hazard zone. It is intended to provide an estimate of a replacement cost if the property is completely or severely damaged. The actual repair costs could be smaller or larger than the provided estimate. The data relies on the City's Insured Asset Values; therefore, information for facilities not owned by the City is not shown (e.g., bridges, private buildings). In some instances, replacement cost information was not made available. Where this occurs, "N/A" has been used within the table.

Based on the available data provided by the City, there is a minimum of $138,885,926 worth of City-owned assets. The greatest potential for loss among the city-owned assets comes from the Community Center category. The next category with the greatest loss potential is the Parks category followed closely by the City Facilities category, including City Hall, Fire, and Police Stations. To better understand the magnitude of impacts, this plan identifies representative percentages of potential impact based on the total valuation of City assets. For planning purposes, it is reasonable to assume that impacts would not exceed 50% of the total asset value citywide. The following are parameters to help understand how much a proposed investment/improvement compares to the existing assets within the City:

1% Impact - $1,388,859
5% Impact - $6,944,296
10% Impact - $13,888,592
20% Impact - $27,777,185
50% Impact - $69,442,963

The likelihood that all facilities are completely damaged simultaneously is extremely remote. Most impacts are anticipated to be isolated to specific locations based on the hazard. This estimate does not include the value of the City's underground infrastructure and surface drainage facilities.

TABLE 4-1: CRITICAL FACILITIES AND FACILITIES OF CONCERN

Category	Number of Facilities		Potential Loss*
	Critical	Concern	
City Facilities (City Hall, Fire, Police) **	3	0	$30,311,631
Community Centers	0	4	$41,995,049
Parks	0	12	$31,680,972
Other Facilities (Non-HMP)	-	-	$34,898,274
Total	**3**	**16**	**$138,885,926**

*** Potential loss data are estimates only, as some facilities' replacement values were unavailable. Actual losses may be greater than the estimate presented in this table.**

**** Police and Fire Services are provided by Orange County Sheriff's Department and the Orange County Fire Authority. These facilities are not owned by the City; however, they provide a critical service and support for the City. Therefore, these are considered critical facilities and are counted as potential losses in this analysis.**

Vulnerable Populations

Factors such as age, physical and/or mental condition, socioeconomic status, access to key services, and many other factors affect the ability of people to prepare for and protect themselves and their property from a hazard event. Even though some hazard events may equally impact all parts of Mission Viejo, people may experience the impacts differently. Higher-income households, for instance, are likely more able to afford the cost of retrofitting their homes to resist flooding or move to a location that is less prone to flooding than a lower-income household. As a result, a higher-income household is less likely to experience significant damage during a flood event than a lower-income household, even if the same amount of rain falls on both.

A social threat analysis examines how hazard events are likely to impact different demographic populations in Mission Viejo and where these different demographic populations live in the City. This includes assessing whether the people in an area of an elevated hazard risk are more likely than the average person to be considered a threatened population. The social threat analysis uses the following criteria to assess the threat to vulnerable populations:

Disability status: Persons with disabilities may have reduced mobility and experience difficulties living independently. As a result, they may have little or no ability to prepare for and mitigate hazard conditions without assistance from others.

Income levels: Lower-income households are less likely to have the financial resources to implement mitigation activities on their residences. Another challenge may be finding adequate time to research and access educational resources about hazard mitigation strategies. Furthermore, lower-income households are less likely to have the necessary resources to move to safer areas that are less at risk of being impacted by a hazard. The national poverty limit standard for the U.S. for a four-person family is approximately an income of $26,500 or less. For Orange County, the FY 2020 Low-Income Limit for a four-person family, according to Housing and Urban Development (HUD), is $102,450.

Seniors (individuals at least 65 years of age): Seniors are more likely to have reduced mobility, physical and/or mental disabilities, and lower-income levels, all of which may decrease their ability to prepare for and mitigate a hazard event.

Table 4-2 shows the metrics for Mission Viejo residents who meet at least one of the criteria for threatened, vulnerable populations.

TABLE 4-2: MISSION VIEJO THREATENED POPULATION METRICS

Threatened Population Metrix	Community-Wide Data
Population	93,215
Households	33,972
Median household income	$130,867
Renter Households	23.8%
Percentage of households with at least one person living with a disability	20.6%
Percentage of households living under the poverty limit	4.5%
Percentage of households with one member aged 65+	38.7%

Source: US Census Bureau, American Community Survey, 2022 Projections

The social threat analysis also shows the threat other populations may encounter. For example, people experiencing homelessness or without access to lifelines (vehicles or communication networks) may experience greater hardship in evacuating or recovering from a disaster. Since data for these groups are not readily available, there is no definitive way to determine the number of persons in areas of elevated risk, so this assessment will discuss how these other threatened groups may also be affected on a general level.

Data Limitations and Notes on Vulnerability Tables

Due to data limitations, the data comparing the hazard zone population with the citywide population comes from two separate sources. The citywide data comes from the US Census Bureau's American Community Survey (ACS), and the hazard zone population data comes from ESRI's Business Analyst reports. As a result, there may be minor discrepancies in comparing the two data sets. The data relies on readily available 2022 US Census Survey Projections and 2016-2020 U.S. American Community Survey. **Chapter 2** identifies additional census-related information, which may differ from the data in this Chapter based on the data available for the analysis.

Other Assets

In addition to the City's designated inventory of CFs/FOC and vulnerable populations, hazard events could threaten other important assets to Mission Viejo. These assets may include services, artistic or cultural landmarks, or local economic activities. The threat assessment describes the potential harm to these other assets based on available information.

THREAT PROFILES

Severe Weather (Windstorm, Extreme Heat, and Winter/Coastal Storms)

PHYSICAL THREAT

WINDSTORM

Intense winds likely present the greatest threat to physical structures, particularly from trees or branches that fall on buildings and cause substantial damage. Older structures that have deferred maintenance or have not been retrofitted for high wind conditions may suffer greater damage than newer/updated structures. Utility lines and wooden utility poles face an elevated threat from wind, as do buildings without reinforced roofs.

EXTREME HEAT

Very high temperatures can cause roads to deform and buckle as the concrete expands in the heat, especially weaker spots in the pavement, such as areas that have not been maintained. Power lines and other sections of the electrical grid are less effective in higher temperatures and may suffer damage due to stress during extreme heat events. Buildings with dark materials and pavements will absorb more heat than vegetated surfaces or lighter materials that better reflect the sun's energy. This urban heat island effect is more likely to occur during the summer months when the sun is most intense.

WINTER/COASTAL STORMS

There is no indication that rainfall or severe rain hazards will abate either in Mission Viejo or the greater region of Southern California in the future. While Mission Viejo may experience prolonged periods of dry or wet years, all expectations are that they will continue and increase in severity. Rain could damage structures with poorly constructed roofs and erode the soil around building foundations. Heavy rain could also lead to flooding, damaging unelevated structures in flood zones. Landslides triggered by heavy rains would damage structures below the landslide's starting point.

SOCIAL THREAT

WINDSTORM

Severe wind events can harm people throughout Mission Viejo but have a greater effect on the safety of people experiencing homelessness and people who work outdoors. Lower-income residents, who may not have the financial resources to purchase homes built or retrofitted to withstand powerful winds, could also have difficulty recovering from wind events.

EXTREME HEAT

Certain population groups face higher risks of heat-related illness or death during a heat event. Young children, the elderly, or people with certain medical conditions are physiologically more vulnerable to heat exhaustion and heatstroke. Certain medications may inhibit heat-related illness signs and symptoms, creating an additional threat during heat events. Young children may be more vulnerable since they are less able to adapt to heat than adults, and they are not aware of the signs of dehydration or ways of protecting themselves from heatstroke.

People experiencing homelessness are at a high risk of health complications during heat waves, especially if they are unsheltered. According to the Orange County, "Everyone Counts" 2022 Point in Time Summary, there are approximately 5,718 individuals experiencing homelessness in the county, with 54% unsheltered and 46% sheltered. These individuals are more vulnerable to heatstroke during a heatwave, especially if they cannot reach a cooling center.

A sudden heatwave can cause a shortage of fans, air-conditioning units, or drinking water in stores. Lower-income households or those with limited mobility may not have the time and resources to prepare for the high temperatures. During these events, extreme heat may impact a larger portion of the City's residents that would not be viewed as vulnerable under normal circumstances.

WINTER/COASTAL STORMS

Severe storms pose a threat to any groups in Mission Viejo who cannot access adequate shelter. Homeless people often live in tents or other informal structures that may protect against minor rains but are inadequate against heavy rain events. Heavy rain can lead to flooding, which could inundate or sweep away any informal dwellings. Additionally, vulnerable populations living in older homes with outdated building materials may experience damage during significant rain events. If affected groups have limited incomes or lack the resources to make necessary repairs or maintain the structures, retrofit of these structures may be hindered.

OTHER THREATS

WINDSTORM

The potential for windstorms to create a financial strain on both the public and the City exists in the event of utility infrastructure damages or loss of power. These windstorms can uproot trees and landscaping, further burdening the owners to replace or repair the losses. Trees located in City parks may also be damaged or destroyed. Air quality can also be affected by these wind events, stirring up dust, pollen, debris, etc. Another threat associated with severe wind is wildfire impacts (discussed earlier) and the recent practice of electric utilities conducting Public Safety Power Shutoff activities. These shutoffs may affect electrical services during high wind events in parts of southern California. Several PSPS circuits owned by both SCE and SDG&E are in operation within the vicinity of Mission Viejo, and if activated could potentially affect the flow of power to the city.

EXTREME HEAT

Extreme heat events can lead to increased water and energy demands within the City. This could lead to increased utility charges, strains on the current utility infrastructure, and increased spending by the City to support the community during these heat events.

WINTER/COASTAL STORMS

The potential for winter/coastal storms to create a financial strain on both the public and the City exists in the event of utility infrastructure damage and loss of power. Damage to roadway networks, including bridges, can interrupt effective transportation throughout the city, possibly hindering emergency equipment and first responder response capability. Major storm events can even impact the effectiveness of the evacuation capacity of the roadway network into and out of the City.

CLIMATE CHANGE VULNERABILITY

WINDSTORM

Climate change will likely increase the city's vulnerability to severe weather impacts because of the increase in anticipated storm intensity and frequency, as well as anticipated increases in temperatures.

EXTREME HEAT

Climate change will likely increase the city's vulnerability to extreme heat impacts because of the anticipated temperature increase in intensity, duration, and frequency.

WINTER/COASTAL STORMS

Climate change and increased temperatures will likely increase the city's vulnerability to winter/coastal storms because of the anticipated alteration of rainfall patterns, and the increase in anticipated storm intensity and frequency. Vulnerability to rain inundation events that lead to flooding, erosion and increase the threat of dam failure, landslides, and other potential hazards within the community and surrounding area could also increase.

CHANGES IN POPULATION AND LAND USE DEVELOPMENT

WINDSTORM

Severe windstorms occur periodically (primarily during the Fall months) and generally do not affect populations to the degree that they would need to migrate in and out of the city.

It is unlikely that severe wind will affect land use and development because the development review process will take steps to mitigate or minimize the impacts of severe wind. There is the potential that older structures in parts of the city may be impacted more severely than newer structures within the city. Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU's to existing older structures in the city over the next 5 years, is anticipated to increase Mission Viejo's vulnerability to windstorms.

EXTREME HEAT

It is unlikely that extreme heat will affect land use and development because the development review process will take steps to mitigate or minimize impacts from severe weather and heat events. Mission Viejo Municipal Code Section 8.02.410 has adopted the California Green Building Standards Code which sets standards for environmentally friendly building standards. Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU's to existing older structures in the city over the next 5 years, is anticipated to increase Mission Viejo's vulnerability to winter/coastal storms.

WINTER/COASTAL STORMS

It is unlikely that winter/coastal rainstorms will affect land use and development because the development review process will take steps to mitigate or minimize impacts from severe rainstorms. The City has invested significantly in its stormwater management infrastructure, which should protect much of the city from the effects of severe rainstorms. Based on the current Housing Element data, the anticipated residential growth and potential for the addition of ADU's to existing structures in the city over the next 5 years, is anticipated to increase MIssion Viejo's vulnerability to winter/coastal storms.

Earthquake Hazards

PHYSICAL THREAT

SEISMIC SHAKING

Many physical assets in the City are estimated to experience the same seismic shaking intensity, ranging from 0.55 to 0.75g and 0.75+ to 1.05g (shaking intensity in relation to earth's gravity). Therefore, all facilities could potentially be damaged during a significant seismic event, which could be extremely costly for the City. If all facilities were damaged at the same time during a seismic shaking event, it can be assumed that the City would incur a percentage of the maximum potential loss of its physical assets. Assuming 20% of the City's assets are impacted, this potential loss could amount to over $27 million. Underground physical assets, like pipelines or utilities, could be damaged if the intensity of the seismic shaking is severe enough. In such a scenario, natural gas and water delivery service to Mission Viejo homes and businesses would not be

available until repairs are completed. **Table 4-3** displays the potential scenario and losses that could incur should shaking reach the described threshold. **Figure 4-1** displays the CFs and FOC located within the city's Seismic shaking potential hazard zones.

TABLE 4-3: CRITICAL FACILITIES & FACILITIES OF CONCERN (SEISMIC SHAKE 0.55 TO 0.65G)

Category	Number of Facilities		Potential Loss*
	Critical	Concern	
City Facilities (City Hall, Fire, Police)	2	0	$3,069,953
Community Center	0	1	$9,021,450
Park	0	11	$29,977,092
Total	**2**	**12**	**$42,068,495**

* Based on the City of Mission Viejo insured replacement values

LIQUEFACTION

Due to the City's location near so many regionally active faults capable of generating large earthquakes, the potential for CFs and FOC to be affected by liquefaction is a concern. Like other cities in Orange County, Mission Viejo is located in a geographical area where the soil makeup is conducive to liquefaction hazards in some areas. **Table 4-4** identifies the CFs and FOC located within these areas, accounting for over $7 million in potential losses affecting 1 CF and 2 FOC. **Figure 4-2** displays the CFs and FOC located in liquefaction susceptible hazard zones within the city.

TABLE 4-4: CRITICAL FACILITIES AND FACILITIES OF CONCERN (LIQUEFACTION)

Category	Number of Facilities		Potential Loss*
	Critical	Concern	
City Facilities (City Hall, Fire, Police)	1	0	$347,128
Community Centers	0	0	N/A
Park	0	2	$7,129,855
Total	**1**	**2**	**$7,476,983**

* Based on the City of Mission Viejo insured replacement values

FIGURE 4-1: CFS AND FOC LOCATED IN POTENTIAL SEISMIC SHAKING HAZARD ZONES

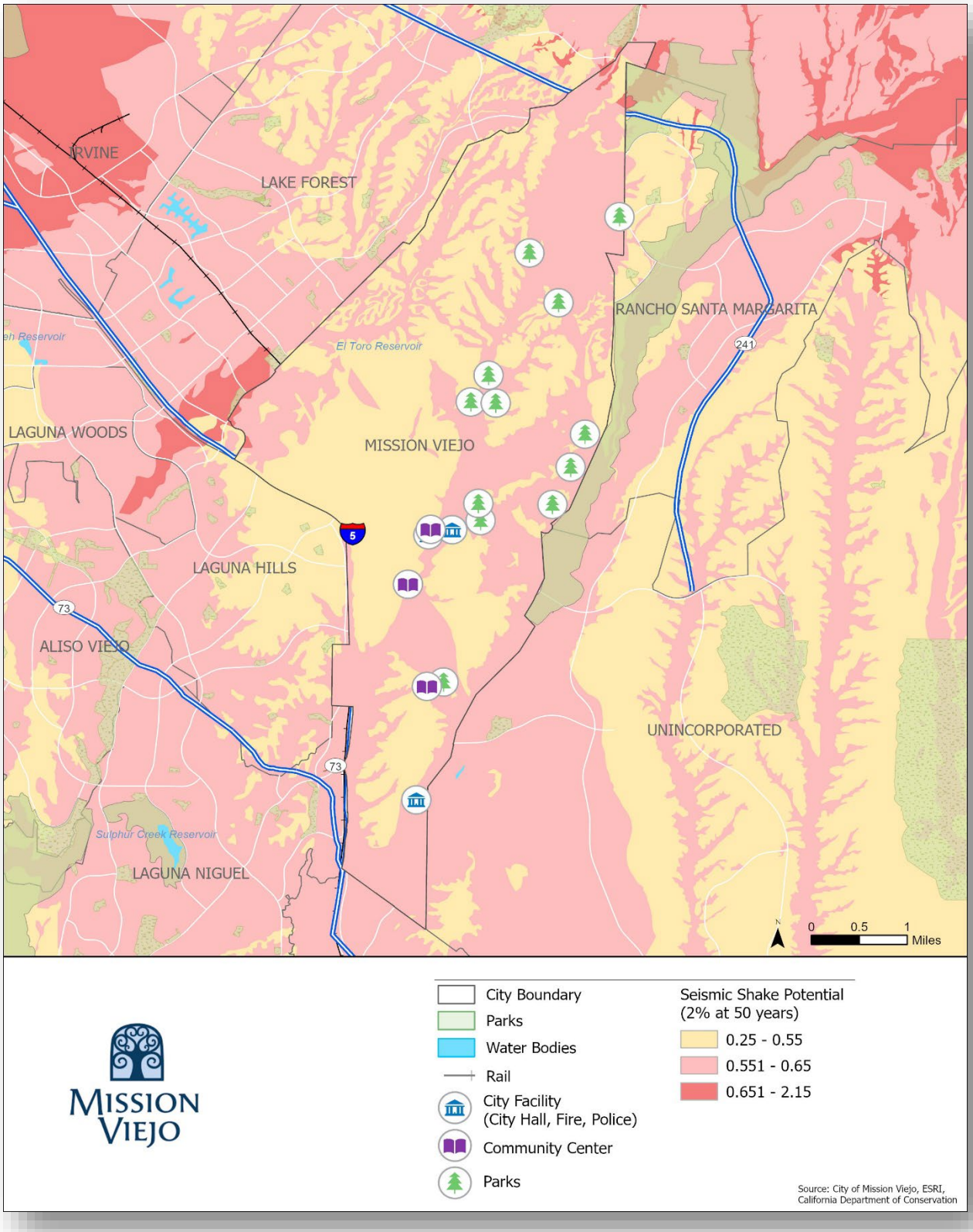
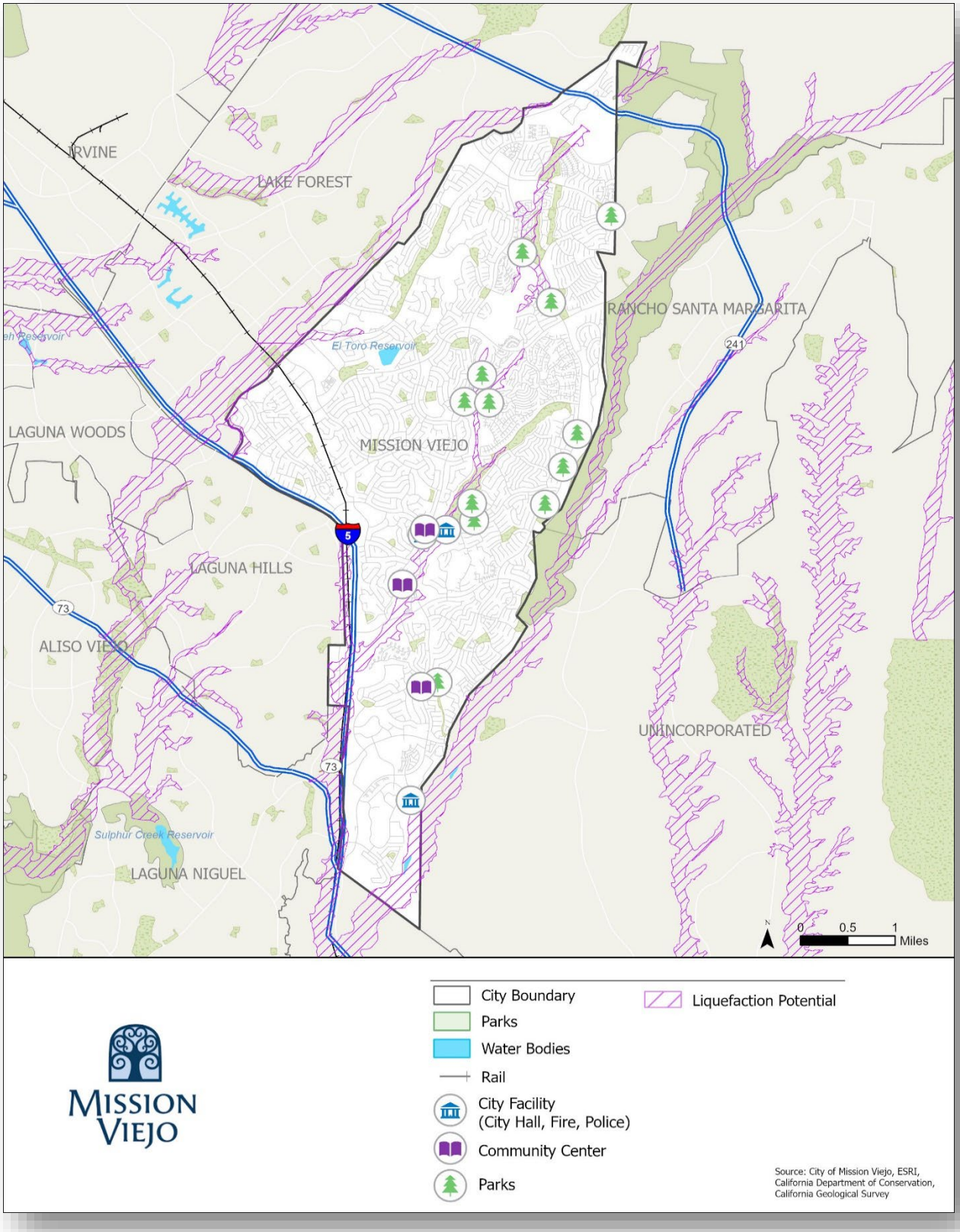


FIGURE 4-2: CFS AND FOC LOCATED IN LIQUEFACTION HAZARD ZONES



Social Threat

The risk of a seismic event is a danger to all Mission Viejo households and businesses; however, some populations are at higher risk than others.

Seismic Shaking

Seniors, pregnant women, and persons with disabilities may be at higher risk in a seismic shaking event as they may have limited mobility, which could delay or prevent safe evacuation. Renters and persons with lower incomes are also more threatened by seismic shaking since they may live in homes that are not properly retrofitted to withstand the stresses of a seismic event. These groups may not have the financial resources to repair their homes or move to new housing if their existing home becomes uninhabitable.

Data compares the populations within the seismic shaking hazard zones to the citywide population. Of the approximately 93,215 residents of Mission Viejo, approximately 52.1% or 48,565 residents live within the 0.55 to 0.65g seismic shake zone, while only 0.3% live within the areas where the seismic shake zone potential is over 0.65g. This equates to approximately 17,801 of the City's 33,972 households being located in a potential seismic shaking hazard zone.

Liquefaction

Just over 3.3% of the City's population is located within a designated zone of liquefaction, and over time, mitigation measures have been incorporated into most construction. Newer buildings constructed are anticipated to contain moderate and high-income tenants with greater amounts of disposable income, allowing them to recover after an incident. However, lower-income residents and residents located in areas of older construction may be more impacted, as they may not have the financial resources needed to make repairs and/or retrofit older buildings. **Table 4-5** compares threatened populations living within the liquefaction hazard zones to the citywide population.

Table 4-5: Liquefaction Hazard Threatened Populations

Threatened Population Metrics	Living within Liquefaction Hazard Zones	City of Mission Viejo
Population	3,089	93,215
Households	1,303	33,972
Median household income	$104,886	$130,867
Renter Occupied Households	46.4%	23.8%
Percentage of households with at least one person living with a disability	11.1%	20.6%
Percentage of households living under the poverty limit	4.4%	4.5%
Percentage of households with one member aged 65+	22.0%	38.7%
Percentage of Mission Viejo Potentially Affected Area.	7.0%	-

Other Threats

Seismic Shaking

The goal of early earthquake warning systems is to afford utility providers additional time that they may use to shut off gas, water, and power transmission to try and control potential leaks following the event. Authorities may also have enough warning to halt the use of bridges or safely shelter or evacuate workers away from hazardous locations. Therefore, the goal is to allow service providers to remain inactive, reducing further impact, until authorities determine it is safe for employees to return and reactivate utilities. The length of this time will vary depending on the event's magnitude. A significant earthquake would necessitate utilities to remain off for a few hours or several days. The City and the region could lose the economic activity that normally occurs. In addition, structures such as downed telephone poles or power transmission towers could block roadways and prevent first responders from reaching victims or evacuees who need assistance.

Liquefaction

Services and mobility may be disrupted during and following a liquefaction event. Due to the liquefying soils, sidewalks, roadways, and pipelines may become fractured and disjointed. Severe liquefaction events may render roads and sidewalks impassable until they are repaired. Broken gas and water pipelines could result in utility outages, with services delayed until the infrastructure is repaired or replaced. Damage to power lines is unlikely since they are not rigid structures and can move if any transmission towers experience slight leaning. Homes and mid-rise office buildings may be unsafe for occupancy if the soil loses substantial strength.

Changes in Population and Land Use Development

Seismic Shaking

Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU’s to existing older structures in the city over the next 5 years, is anticipated to increase Mission Viejo’s vulnerability to earthquake related hazards. While this may also be true concerning land use and development, if a strong earthquake impacts the city, there is the potential that older structures of the city may be impacted more severely than newer structures and developments in the city.

Liquefaction

Liquefaction is being monitored throughout hazard prone areas in the city, the impacts can cause damage to structures located within these zones. However, these zones are generally located in certain areas of the city, meaning that the damage potential is limited to these areas. Despite this potential, liquefaction is unlikely to cause changes in population patterns. However, land use designations and new development may be limited in these areas out of precaution, or subject to policies developed in City documents such as the LHMP, Land Use, Housing, and Safety Elements. The City’s development review process will identify steps to mitigate or prevent future liquefaction events. Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU’s to existing older structures in the city over the next 5 years, is anticipated to increase Mission Viejo’s vulnerability to earthquake related hazards.

Wildfires

Physical Threat

Structures and physical assets in Mission Viejo that are not equipped with fire suppression technology or design features that mitigate fire vulnerability are at risk of fire. Generally, these buildings are older, may not be well maintained, and may not meet current code requirements and regulations. While all structures can be impacted by either wildland or urban fire, older buildings may have increased vulnerability to these hazards.

Wildland Fire

The California Department of Forestry and Fire Protection has mapped Very High Fire Hazard Severity Zones (VHFHSZ) within both the City's Local Responsibility Area (LRA) and the State Responsibility Area (SRA). The LRA is a government-designated area where a local agency, city, or county, NOT the State, is responsible for fire protection. An SRA is the opposite, where the State has responsibility for wildland fire protection. **Figure 4-3** identifies these zones along with the City's CFs and FOC located within the area. All structures within this fire zone are at an elevated risk of wildfire impacts. **Table 4-6** identifies 0 CFs and 0 FOC within the fire hazard severity zones. While the VHFHSZs are highly vulnerable to wildfire, other areas of the City may also be susceptible due to ember cast. Sometimes the ignition of a wildfire may occur as a result of power lines located around overgrown trees, causing a spark and catching the tree on fire.

Table 4-6: Critical Facilities and Facilities of Concern (VHFHSZ)

Category	LRA - VHFHZ		Potential Loss*	SRA - VHFHZ		Potential Loss*
	Critical	Concern		Critical	Concern	
City Facilities (City Hall, Fire, Police)	0	0	$0	0	0	$0
Community Center	0	0	$0	0	0	$0
Parks	0	0	$0	0	0	$0
Total	**0**	**0**	**$0**	**0**	**0**	**$0**

* Replacement Values Unavailable
** Based on the City of Mission Viejo insured replacement values

Social Threat

A fire hazard immediately threatens seniors and persons with disabilities. These groups may have limited mobility or diminished environmental awareness. For example, a senior who lives alone may not know if a fire ignites in their house until a room fills with smoke or a flashover occurs, at which point escape may be more difficult or impossible. Therefore, a fire that starts in or spreads to senior residences in Mission Viejo could be highly threatening to those populations. Persons with disabilities may require special mobility devices or caregiver assistance to evacuate, which may not be readily available when a fire occurs. Other groups with increased threat levels include lower-income persons and renters. These individuals may live in substandard housing with outdated materials known to be flammable. Renters and lower-income persons may also live in housing units with improperly designed or unmaintained electrical or heating systems that could cause a fire. These groups may not have the financial resources to rebuild or relocate to new homes after a wildland or urban fire.

WILDFIRE

Mission Viejo has a sizable portion of its residents located in the LRA, primarily within the City's eastern portion of the community. **Table 4-7** shows that approximately 8.8% of the City's population is located within Mission Viejo's LRA and the identified VHFHSZ. Of these households, the vulnerable populations represent approximately 20.9% of these households having at least one person living there with a disability, 3.2% of these households live under the poverty limit, and 33.5% of these households have one member aged over 65+; however, these households have a higher median income than the City as a whole.

Residents of Mission Viejo live in all of the various levels of fire hazard threat zones. **Table 4-8** dataset tells us that within the Very High and Extremely High fire hazard threat zones, there are approximately 267 residents living there. Of that, approximately 4.8% of these households report having at least one person living there with a disability, and 17.7% of these households have one member aged 65+. However, these households have a higher median income than the City as a whole.

TABLE 4-7: VERY HIGH FIRE HAZARD SEVERITY ZONE THREATENED POPULATIONS

Threatened Population Metrics	LRA - VHFHZ	City of Mission Viejo
Population	8,038	93,215
Households	2,733	33,972
Median household income	$159,685	$130,867
Renter Occupied Households	17.2%	23.8%
Percentage of households with at least one person living with a disability	20.9%	20.6%
Percentage of households living under the poverty limit	3.2%	4.5%
Percentage of households with one member aged 65+	35.5%	38.7%
Percentage of Mission Viejo potentially affected area	8.8%	-

TABLE 4-8: FIRE HAZARD THREAT ZONE THREATENED POPULATIONS

Threatened Population Metrics	Very High/Extremely High Fire Hazard Threat Zone	City of Mission Viejo
Population	267	93,215
Households	78	33,972
Median household income	$165,252	$130,867
Renter Occupied Households	30.8%	23.8%
Percentage of households with at least one person living with a disability	4.8%	20.6%
Percentage of households living under the poverty limit	0.0%	4.5%
Percentage of households with one member aged 65+	17.7%	38.7%
Percentage of Mission Viejo Potentially Affected Area	1.3%	-

Other Threats

Wildfire

Wildfires can consume power lines and force utility operators to shut off electrical and gas transmission activity, leading to utility outages in Mission Viejo homes and businesses. Any streets surrounded by blazes or blocked by burning debris would hinder transportation, prevent evacuees from escaping, and block emergency response crews from reaching the fire. Anyone living at the end of a cul-de-sac faces an elevated threat of being trapped if the fire occurs or spreads to the mouth of the street. Fires that destroy trees or vegetation (especially within parks and open space areas) could limit or prevent the use of these areas affecting recreation for residents. Public Safety Power Shutoffs (PSPS) are an issue for many communities throughout California. Although there are no designated PSPS circuits within Mission Viejo, the potential for large-scale events is an ongoing concern. In the event of a PSPS outage in neighboring cities, the City's resources could be strained as residents of affected areas seek refuge in communities that have power. Outreach to residents and businesses to help them understand and prepare for these events will be an important aspect of the City's overall hazard mitigation strategy.

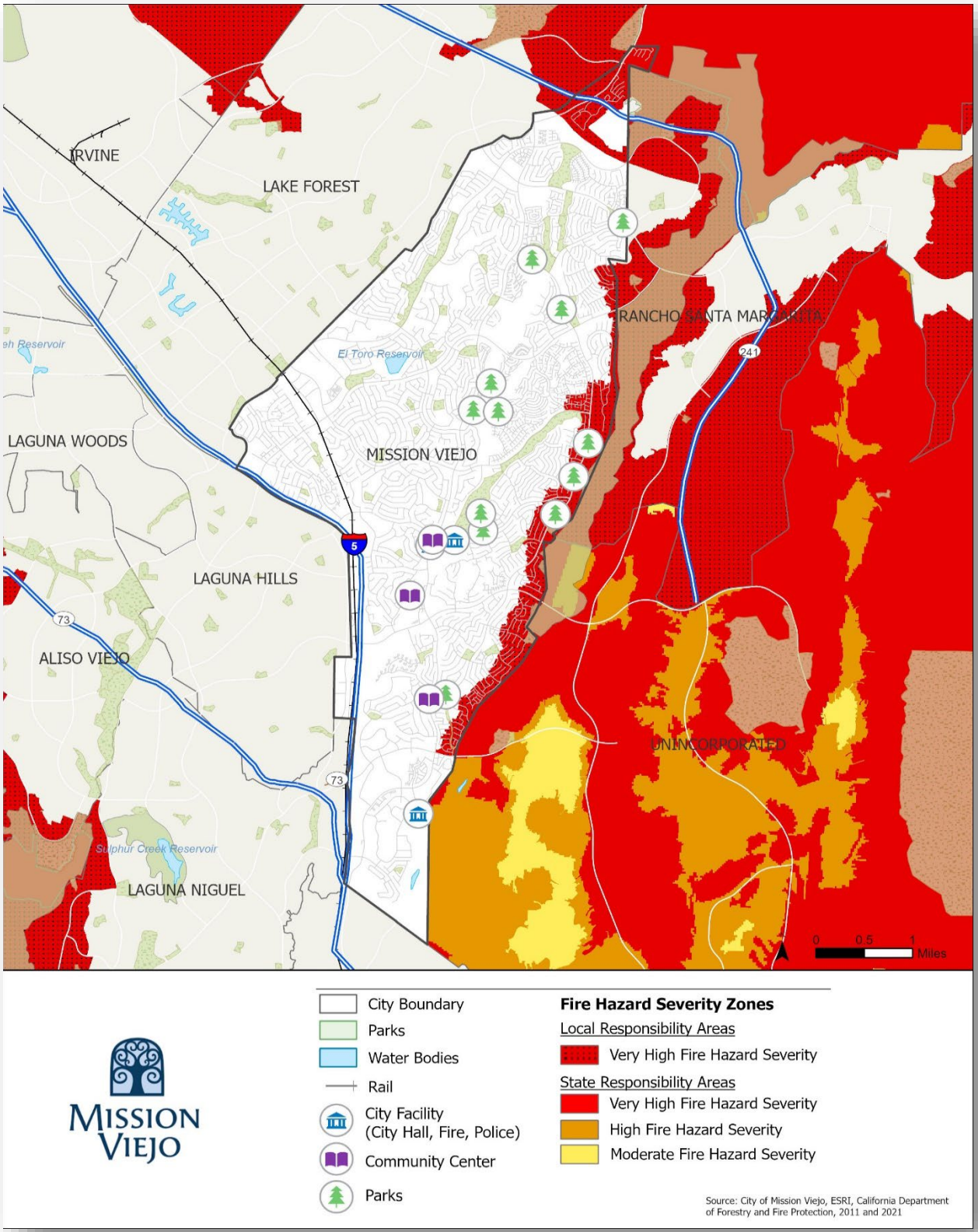
Climate Change Vulnerability

Climate change will likely increase the city's vulnerability to wildfire impacts because of increasing temperatures, which could change the moisture content of plant materials and potentially increase future drought conditions.

Changes in Population Patterns and Land Use Development

If a large wildfire were to occur, it is feasible that changes to population patterns could fluctuate. Future land use designations, re-development, or new development in these areas could be restricted or even prohibited, especially in the WUI and the VHFHSZ's. Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU's to existing older structures in the city over the next 5 years, is also anticipated to increase Mission Viejo's vulnerability to wildfire related hazards.

FIGURE 4-3: CFS AND FOCS LOCATED IN FIRE HAZARD SEVERITY ZONES



Landslide

Physical Threat

Landslides pose a threat to a variety of city and resident-owned facilities. **Table 4-9** identifies the city facility located within the mapped deep-seated landslide hazard zones. Much of the City is located within these landslide susceptible areas, especially in those areas characterized by steep slopes and canyons, which are vulnerable to landslides during long periods of rainfall or seismic events. Deep-seated landslides could cause over $1.7 million in losses based on the 1 FOC located in these zones. **Figure 4-4** displays these areas of the city along with the mapped CFs and FOC that could potentially be damaged by landslide events.

Table 4-9: Critical Facilities and Facilities of Concern (Deep-Seated Landslide – Category 7+)

Category	Number of Facilities		Potential Loss*
	Critical	Concern	
City Facilities (City Hall, Fire, Police)	0	0	$0
Community Center	0	0	$0
Parks	0	1	$1,703,880
Total	**0**	**1**	**$1,703,880**

* Based on the City of Mission Viejo insured replacement values

Social Threat

As shown in **Table 4-10**, the dataset shows that 10,402 residents and 3,644 households are located within the deep-seated landslide hazard zone, which is approximately 11.2% of the city's population. The median household income is higher in these zones, and the percentage of households living under the poverty limit is lower than the city overall. However, households with at least one person living with a disability is slightly lower, while the percentage of households with one member aged 65+ is also slightly lower when compared to the city overall.

Table 4-10: Deep-Seated Landslide (Category 7+) Hazard Zone Threatened Populations

Threatened Population Metrics	Landslide Zones	City of Mission Viejo
Population	10,402	93,215
Households	3,644	33,972
Median household income	$144,488	$130,867
Renter Occupied Households	14.4%	23.8%
Percentage of households with at least one person living with a disability	19.8%	20.6%
Percentage of households living under the poverty limit	3.5%	4.5%
Percentage of households with one member aged 65+	35.1%	38.7%
Percentage of Mission Viejo potentially affected area	13.3%	-

Other Threats

Landslides may block roadways causing long-term disruptions to the roadway network, infrastructure systems, and city capabilities. Underground utility lines in slide-prone areas or above-ground lines built on or above them can be damaged in a landslide, causing service outages. Landslides could affect sensitive ecological areas around the community, causing

localized harm to the region's ecosystem, although widespread disruptions are unlikely. Homes and businesses are typically damaged or destroyed by landslides. In addition to potentially causing significant injuries or fatalities, this can cause economic harm and create a need for long-term emergency sheltering and temporary housing until these buildings can be reconstructed. Utility lines, such as power lines or water pipes, may be broken by a landslide, interrupting important services.

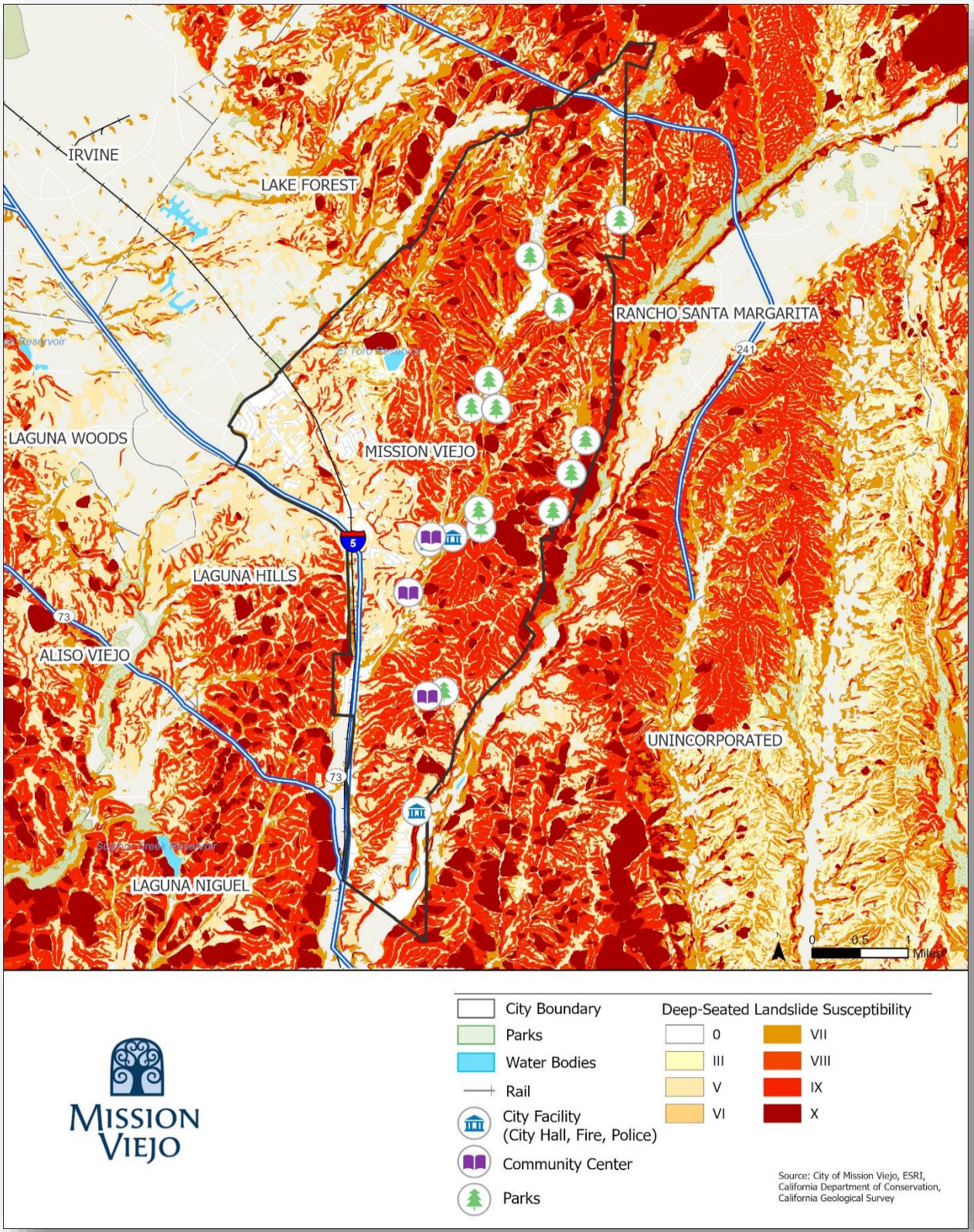
Climate Change Vulnerability

Climate change could indirectly increase the city's vulnerability to landslide impacts. Increased frequency and intensity of future storms may cause more moisture-induced landslides. Warmer temperatures and more frequent drought conditions may lead to more fires, destabilizing soil on slopes, and making future landslide events more likely.

Changes in Population and Land Use Development

Land sliding is being monitored throughout the hazard prone areas in the city, the impacts can cause damage to structures located within these zones. However, these zones are generally located in certain areas of the city, meaning that the damage potential is limited to these areas. Despite this potential, landslides are unlikely to cause changes in population patterns. However, land use designations and new development may be limited in these areas out of precaution, or subject to any policies developed in City documents such as the LHMP, Land Use, Housing, and Safety Elements. The City's development review process will identify steps to mitigate or prevent future landslide events. Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU's to existing older structures in the city over the next 5 years, is also anticipated to increase Mission Viejo's vulnerability to wildfire related hazards.

FIGURE 4-4: CFS AND FOCS LOCATED WITHIN LANDSLIDE SUSCEPTIBLE ZONES



Flood (including Dam Failure)

Physical Threat

Flood

Any physical assets located within these mapped boundaries could be inundated if enough precipitation were to fall, exceeding the storm drain infrastructure design capacity in these areas. Electronic or mechanical equipment on the ground could become waterlogged and nonfunctional. Mission Viejo is extremely fortunate compared to other cities, as they have no CFs or FOC located within any mapped FEMA flood zones.

Dam Failure

Various factors, such as the amount of water released, the distance between the dam failure site, and the topography of the surrounding land, will influence the extent to which physical assets in Mission Viejo are threatened. The Upper Oso Reservoir and Lake Mission Viejo have large storage capacities that could cause widespread inundation in Mission Viejo if the reservoir waters are released due to a dam breach. There is also one other dam/reservoir that could potentially inundate the City in the event of a failure, the El Toro Reservoir. **Table 4-11** identifies the physical assets in Mission Viejo that are threatened by the potential failure of these dams and reservoirs. Combined, 2 CFs and 5 FOC could be affected, totaling over $23 million. **Figure 4-5** shows the location of the identified CFs and FOC within the inundation zones. No CFs or FOC are located within the inundation zone from the El Toro Reservoir; therefore, it is not included in **Table 4-11**.

Table 4-11: Critical Facilities and Facilities of Concern (Dam Failure)

Category	Upper Oso		Potential Loss	Lake Mission Viejo		Potential Loss
	Critical	Concern		Critical	Concern	
City Facilities (City Hall, Fire, Police)	1	0	$347,128	1	0	$347,128
Community Center	0	1	$5,400,210	0	1	$5,400,210
Parks	0	2	$7,129,855	0	1	$4,415,515
Total	**1**	**3**	**$12,877,193**	**1**	**2**	**$10,162,853**

*Neither Diamond Valley East nor Walnut Canyon would affect any CFs or FOC; therefore not included in the table.

Social Threat

Flood

Floodwater in these areas, both the 100-year zone and the 500-year zone, are anticipated to rise to a depth of no more than one foot. Flooding of this type would likely inundate curb cuts and sidewalks to some extent. People who walk or bike as their primary form of transportation may encounter difficulties if they do not have access to an alternative means of transportation. Seniors, persons with disabilities, and low-income persons are also likely to be threatened. **Table 4-12** shows the proportions of Mission Viejo's vulnerable populations that face a greater threat from a flood event in the city. Based on the analysis in **Table 4-12**, the median household incomes in the 100-year and 500-year flood zones are much lower than the citywide average median income.

Additionally, persons experiencing homelessness who are outside during flood conditions may experience property damage or be unable to access shelter. Though floodwaters in Mission Viejo are not expected to exceed a depth of one foot, six inches of floodwater may render any makeshift

structures uninhabitable during a flood event. Possessions such as sleeping bags or electronic devices may be damaged or swept away by the floodwaters.

TABLE 4-12: FLOOD HAZARD THREATENED POPULATIONS

Threatened Population Metrics	Flood Hazards (100 Years)	Flood Hazards (500 Years)	Flood Hazards (100/500-Year Combined)	City of Mission Viejo
Population	409	0	409	93,215
Households	150	0	150	33,972
Median household income	$90,052	$0	$90,052	$130,867
Renter Occupied Households	38.0%	0.0%	38.0%	23.8%
Percentage of households with at least one person living with a disability	20.0%	0.0%	20.0%	20.6%
Percentage of households living under the poverty limit	8.3%	0.0%	8.3%	4.5%
Percentage of households with one member aged 65+	17.2%	0.0%	17.2%	38.7%
Percentage of Mission Viejo potentially affected area	3.1%	1.0%	4.1%	-

DAM FAILURE

Dam failure hazards in the City would impact various downstream properties and the residents that live there. **Table 4-13** identifies these potential dam failure impacts caused by the Upper Oso, El Toro Reservoir, and Lake Mission Viejo facilities. The greatest risk to the City and its population comes from the failure of the Upper Oso, as it would affect almost 4.5% of the population and inundate 7.6% of the acreage in the City of Mission Viejo.

FIGURE 4-5: CFS AND FOCS LOCATED IN DAM INUNDATION ZONES

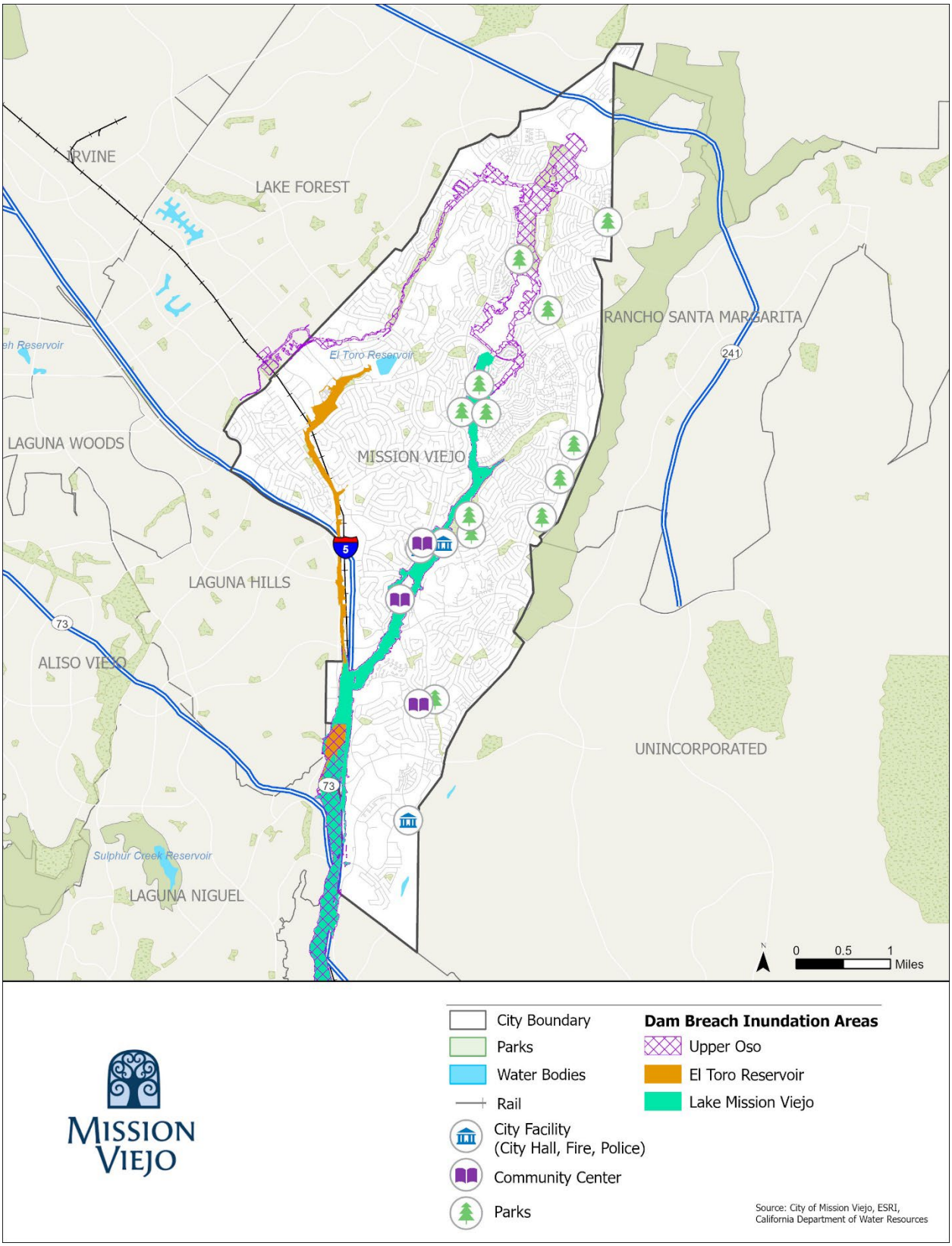


TABLE 4-13: DAM INUNDATION HAZARD THREATENED POPULATIONS

Threatened Population Metric	Upper Oso	El Toro Reservoir	Lake Mission Viejo	City of Mission Viejo
Population	4,067	786	985	93,215
Households	1,517	307	349	33,972
Median household income	$113,169	$111,027	$88,670	$130,867
Renter Occupied Households	32.3%	36.5%	44.4%	23.8%
Percentage of households with at least one person living with a disability	16.0%	25.8%	13.3%	20.6%
Percentage of households living under the poverty limit	2.3%	5.5%	0.0%	4.5%
Percentage of households with one member aged 65+	36.3%	25.4%	37.8%	38.7%
Percentage of Mission Viejo potentially inundated (acres)	7.6%	1.4%	3.5%	38.0%

OTHER THREATS

FLOOD

Flooding may temporarily stop any type of transportation in the City. Debris carried by floodwaters can block roadways, hinder access for vehicles, and potentially affect emergency response services. One foot of rushing water is enough to carry small vehicles. A severe flood may prevent people who own smaller vehicles from driving to work, reducing economic activity. Severe flooding that causes serious damage to homes and businesses may also reduce economic activity until repair work is completed.

DAM FAILURE

Dam failures are often triggered by other events (e.g., seismic shaking, intense rainstorms, etc.). There would most likely be service disruptions in Mission Viejo if this type of event occurred. Floodwaters could quickly inundate the City, disrupting utilities such as water, power, heating, and other services such as communications or transportation infrastructure. Residents may find street lighting and traffic signals are temporarily disabled. Debris may be carried in the rapid inundation of water, blocking roads and impeding traffic flow. Water would likely inundate roadways and other low-lying, flat areas, such as parking lots, open spaces, and schoolyards. In severe scenarios, people's mobility in these areas would likely be restricted or even impossible. Any unprotected or unhoused mechanical or electronic equipment that is not properly elevated would become waterlogged and inoperable until crews can conduct repairs or replacements.

CLIMATE CHANGE VULNERABILITY

Climate change will likely increase the city's vulnerability to flooding impacts because of the anticipated increase to the intensity and frequency of local, regional, and global weather patterns, intensifying atmospheric rivers. This increases the likelihood of an exceptional rain event in Mission Viejo that could overwhelm the capacity of the region's flood control system to contain and drain all the precipitation. Droughts are also expected to increase in length and frequency

due to climate change. Soils dried by extensive drought periods are less able to absorb and drain water, likely increasing flood possibility. Overall, climate change is expected to create conditions that will raise the likelihood of flood related hazards in Mission Viejo.

Changes in Population and Land Use Development

Given the lack of residents residing in FEMA flood zones it is highly unlikely that flooding will affect the City's population patterns and growth. It is also unlikely that flooding will affect land use and development patterns because the development review process ensures flood related impacts are mitigated or minimized. Based on the current Housing Element data, the anticipated residential/population growth and potential for the addition of ADU's to existing older structures in the city over the next 5 years, is also anticipated to increase Mission Viejo's vulnerability to flood related hazards in Mission Viejo.

CHAPTER 5 – HAZARD MITIGATION STRATEGY

STRATEGY DEVELOPMENT PROCESS

Mission Viejo's hazard mitigation strategy is a comprehensive set of actions intended to reduce the impact of hazard events. These hazard mitigation actions will help protect the safety and well-being of residents, visitors, CFs and FOC, other buildings and structures, key services, the local economy, and other important community assets. Some actions will also help with emergency preparedness, allowing for a more effective community response to hazard events. Preparedness actions are not a required component of an LHMP, but they support and complement mitigation activities. The HMPC chose to include them as part of the overall hazard mitigation strategy.

Use of Hazard and Threat Assessment

The HMPC relied partly on this plan's hazard profiles and threat assessments to develop the mitigation strategy's actions. A comprehensive set of mitigation actions was prepared to respond to the relevant hazard situations and protect residents, businesses, and community assets in Mission Viejo. The HMPC ensured that the mitigation actions would help reduce damage from the most frequent types of hazard events, the most significant that may reasonably occur, and those with the greatest potential to harm the community. The HMPC also drafted mitigation actions to help protect the most vulnerable community members and the most vulnerable local assets.

Capabilities Assessment

As part of the effort to draft mitigation actions, the City completed a capabilities assessment, which included reviewing existing policies, personnel, and technical resources to support hazard mitigation activities in Mission Viejo. The hazard mitigation actions build off these resources' existing success and leverage their capabilities to support improved resiliency in the community. The capabilities assessment looked at the following types of resources:

- Personnel resources: City employees and volunteers, and employees and volunteers at other agencies
- Plan resources: Advisory or enforceable plans adopted by the City or other agencies
- Policy resources: Policies adopted and implemented by the City or other agencies
- Technical resources: Data and tools available to the City
- Financial resources: Funding mechanisms available to the City that support mitigation activities

Capabilities Improvement/Expansion

The ability to expand current mitigation capabilities will generally be reliant upon the budgeting allocated for each department/program for that fiscal year. The level at which these programs may or may not be expanded upon, will depend on the amount of funding received. FEMA has released a series of guides over the past few years highlighting some ways jurisdictions can expand mitigation. Some strategies for increasing current mitigation capabilities may include:

1. The City should actively identify, adopt, and enforce the most current development codes and standards available. Strongly encouraging new development to be constructed to higher standards than currently required, increasing resilience within the community.
2. Engaging parts of the community that may not be actively involved in mitigation efforts.

3. Expanding the number and types of organizations involved in mitigation planning and implementation, increasing both efficiency and bandwidth.
4. Fostering new relationships to bring underrepresented populations and partners to the hazards mitigation planning process.
5. During the annual LHMP review, the committee should look for opportunities to fund and expand/enhance the effectiveness of current mitigation actions.

Table 5-1 shows the capabilities assessment for Mission Viejo.

TABLE 5-1: CITY OF MISSION VIEJO CAPABILITIES ASSESSMENT

Resource	Resource Description	Connection to Mitigation (Last Updated)
Planning and Regulatory Capabilities		
Capital Improvement Program FY 2021 - 23	The Capital Improvement Program (CIP) is a projection of the City's capital investments over two years. The CIP is a fiscal and planning tool that allows the City to monitor all capital project costs, funding sources, departmental responsibilities, and timing. Each year, the CIP is reviewed within the context of ongoing city, county, state, and federal planning programs and policies. Capital investments involve major City projects that produce outputs having long and useful life spans.	Integration of this HMP into the CIP can assist in mitigation efforts by identifying new funding sources for future improvements. Expansion and Improvement: Prioritize new projects that support mitigation activities within the City.
City of Mission Viejo General Plan	State law requires every city and county to adopt a comprehensive, long-term General Plan. A General Plan represents the community's view of its future and is often called a blueprint for growth and development. As a result, local decision-makers often use the goals and policies of the General Plan as a basis to formulate land-use decisions. The City's General Plan is considered "comprehensive" since it addresses many land use-related issues. It is also considered "long-term" since it is designed to provide policy guidance for the next 20 years and beyond. Details of the General Plan in its entirety can be found at: City of Mission Viejo General Plan	The General Plan assists in HMP mitigation practices and policies by providing a guide for the city to use for progress. Expansion and Improvement: The LHMP can be aligned with the General Plan to ensure the various documents within the General Plan and the LHMP complement each other and assure continuity of policies and vision.
City of Mission Viejo General Plan – Public Safety Element	The Safety Element identifies potential hazards: • Provides background on the history of hazards and the likelihood of future changes to these hazards. • Provides policies that increase resilience of residents, businesses, workers, and visitors. • Provides policies to reduce the level of property loss due to a potential disaster. • Provides a framework for emergency management. Details of the Safety Element, including a discussion of the process to reduce the loss of life, injury, private property damage, infrastructure damage, economic losses, and social dislocation, can be found at City of Mission Viejo Safety Element	The HMP will be informed by reference to the Safety Element of the General Plan. The City will adopt the approved HMP as part of the General Plan Safety Element to meet the requirements of AB 2140. As the Safety Element is revised, include applicable material from the HMP tor hazard analysis and goals. Add climate change and drought to the Safety Element. Expansion and Improvement: The HMP will be informed by referencing the Safety Element of the General Plan. The City will adopt the approved HMP as part of the General Plan Safety Element to meet the requirements of AB 2140.
City of Mission Viejo General	The Land Use Element functions as a guide to the ultimate pattern of development for the City, both within	The Land Use Element and HMP will be aligned to describe developmental trends, hazards, and

Plan - Land Use Element	its incorporated boundaries and sphere of influence. The Land Use Element: • Designates the distribution, location, and balance of land uses. • Describes the desired build-out of Mission Viejo • Describes building intensity standards for each land use. • Communicates population density. • Ensures compatibility between land uses. The entire Land Use Element may be found at: City Of Mission Viejo Land Use Plan	potential development in hazard areas. Expansion and Improvement: Focus on balancing community needs and ensuring compatibility of uses and development patterns.
Mission Viejo City Municipal Code – Title 9 Land Use/Zoning/ Subdivision Regulations	The purpose of this section of the Municipal Code is to promote public health, safety, and general welfare and preserve and enhance the aesthetic quality of the City by providing regulations to ensure an appropriate mix of land uses in an orderly manner. The full code can be found at the following link: Land/Use/Zoning/Subdivision Regulations	Understanding land use policy and regulatory requirements is essential to developing mitigation strategies and activities. The land use components of the City Code will inform the development of the HMP mitigation actions. Expansion and Improvement: Adherence to local zoning regulations and codes, including municipal codes, regulates growth and controls land use designations. As codes are updated, addressing known hazards results in lowered risk and potentially fewer losses.
Mission Viejo City Municipal Code – Title 8 Building and Construction	The purpose of the Building and Construction Code is to implement the Mission Viejo City General Plan by classifying and regulating the uses of land and structures. It addresses earthquake and fire safety of structures, historic preservation, and compliance with California and Uniform Building Code regulations. As a planned community, the City has one of the nation's strictest and most comprehensive building codes. The building code can be found at the following link: Title 8: Building and Construction	The building code allows for buildings to be constructed properly and in compliance with building requirements and regulations in the City. Building code policies should inform the HMP and the General Plan Land Use Element to provide guidance on developing structures that are compatible with and able to withstand hazards. Expansion and Improvement: Adherence to building codes, including local codes, regulates growth and controls land use patterns. As codes are updated, addressing known hazards results in lowered risk and potentially fewer losses.
City Emergency Operations Plan	Explains how the City will respond to a major emergency or disaster and coordinate between the Emergency Operations Center (EOC) and field-level Incident Commanders; includes the hazards with a description of each; the concept of operations during a major emergency or disaster; the role of the EOC, and the coordination that occurs between the EOC and County's departments and other local, state, and federal governments in times of disaster.	The hazards section of the Emergency Operations Plan (EOP) is informed by the HMP as the two are closely correlated. Expansion and Improvement: The hazards section of the Emergency Operations Plan (EOP) is informed by the HMP as the two are closely correlated.

National Flood Insurance Program	NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. The City will continue to participate in the NFIP program and will make changes accordingly. Data for the NFIP participation is: CID: 060735 Community Name: Mission Viejo, City of County: Orange County	City websites and social media accounts will include information on the value of flood insurance for properties located in flood hazard areas and how to buy the insurance.
Mission Viejo Sustainability Action Plan (SAP)	The SAP aims to reduce greenhouse gas (GHG) emissions by taking action in the community. The SAP is designed to implement the Mission Viejo General Plan. In doing so, the SAP preserves the option for the City to offer streamlining opportunities for future discretionary projects. The plan may be found at the following link: City of Mission Viejo Sustainability Action Plan	The HMP and SAP should be closely correlated. As the SAP is updated, mitigation measures from the new HMP can be incorporated. Expansion and Improvement: The HMP and Sustainability Action Plan should be closely correlated. As the Sustainability Action Plan is updated, mitigation measures from the new HMP can be incorporated.
Code Enforcement	The City's Code Enforcement staff responds to potential violations of the City of Mission Viejo Municipal Code, including property maintenance, recreational vehicle parking and storage, zoning regulations, signs, and home occupations. When a violation is identified, the responsible parties are contacted and requested to abate the violation. If the respondent fails to comply with the City codes, the City conducts administrative hearings giving the respondent every opportunity to voluntarily comply. The City Attorney may prosecute the case if voluntary compliance cannot be achieved. Administrative citations are utilized for some minor infractions, while a criminal and civil complaint process is used for significant violations. The book of code enforcement regulations can be found at the following link: City of Mission Viejo Code Enforcement Regulations	Mitigation activities could include the identification of violations and then implementing the necessary correction to reduce vulnerability and mitigate damage. a23215 Expansion and Improvement: Utilize code compliance to incorporate mitigation into structures and improvements conducted by residents and businesses. Provide continued education opportunities to build staff to maintain state-of-the-art knowledge for new code and regulatory requirements.
Orange County Hazard Mitigation Plan	Mitigation actions for Mission Viejo that require coordination with the county may be integrated into the County of Orange & Orange County Fire Authority Local Hazard Mitigation Plan. Similar mitigation actions in both the counties and Mission Viejo's hazard mitigation plans can lead to a more regionally unified hazard mitigation strategy, improving effectiveness. The OCHMP can be found at the following link: Orange County Hazard Mitigation Plan	Orange County's 2020 Hazard Mitigation Plan identifies and describes the hazard events that may occur in the unincorporated areas of Orange County and provides a suite of mitigation actions to help decrease the potential damage from these hazards. Expansion and Improvement: The LHMP can be aligned with the County HMP to ensure that relevant mitigation activities and policies for the County and the City are implemented.
California State Hazard Mitigation Plan	The California State Hazard Mitigation Plan assesses the types of hazards that may be present in California. It includes descriptions of these hazards, summaries of past hazard events, descriptions of how these hazards may occur in the future, and how these hazards may harm California's people and assets. Like a local hazard mitigation plan, the State Hazard Mitigation Plan is updated every five years.	The City can use the 2018 State Hazard Mitigation Plan as a source of information to refine the hazard profiles and vulnerability assessments in future Mission Viejo LHMPs.

	The 2023 State Hazard Mitigation Plan SHMP Public Review Draft can be found at the following link: 2023 State Hazard Mitigation Plan (SHMP) Public Review Draft	Expansion and Improvement: The LHMP can be aligned with the State HMP to ensure that relevant mitigation activities and policies for both the State and City are put in place.
Administrative and Political Capabilities		
City Council	The City Council represents residents and businesses in Mission Viejo. The City Council is made up of five members elected by Districts. The Council Members select the Mayor and Mayor Pro Tem for an annual term beginning in January each year. The City Council addresses the current and future needs of the City by adopting policies that promote the best interests of the community and the City's relationships with citizens, businesses, community organizations, and other governmental agencies.	Expansion and Improvement: The City Council supports mitigation through strategic planning and goal setting for the city.
City Clerk	The City Clerk is a critical link between the City of Mission Viejo and its citizens. The City Clerk is the local official who administers democratic processes such as elections, all legislative actions, and ensures transparency to the public. The City Clerk is a compliance officer for federal, state, and local statutes, including the Political Reform Act and the Brown Act. The department is committed to quality customer service and innovation.	Mitigation activities implemented by this office may include direction setting with the City Council and City Departments and prioritizing new initiatives that support mitigation activities within the city. The City Clerk is integral to the HMP adoption process. They make sure the adoption resolution meets all administrative requirements. Expansion and Improvement: Prioritize new initiatives that support mitigation activities within the city.
City Manager's Office	The City Manager serves as the administrative head of city government and is responsible for the coordination and direction of all activities in the City within the framework of policies established by the City Council. The City Manager provides leadership for City staff to provide for the effective delivery of municipal services, management of City operations, negotiation of agreements, and the administration of contracts. The City Manager also advises the City Council on policy matters, adopting measures and ordinances, and fiscal matters. The City Manager's Office is also responsible for representing the City's interest throughout the region and beyond by coordinating activities related to the Orange County Council of Governments, the Southern California Association of Governments, the League of California Cities, and numerous other governmental and quasi-governmental agencies.	Mitigation activities implemented by this office may include direction setting with the City Council and City departments and prioritizing new initiatives and ordinances to support mitigation projects and activities within the city. Expansion and Improvement: Prioritize new initiatives and ordinances that support mitigation activities within the city.
City Attorney	Reviews and approves resolutions and ordinances.	Expansion and Improvement: Provide opportunities for the City Attorney to review updates to regulatory information to provide expert review of City resolutions and ordinances that may address hazard mitigation.
Community Development Department	The Community Development Department administers the City's land use policies, including zoning, building, subdivision, and environmental regulations, to ensure the orderly physical growth of the community. Program activities range from advanced and current planning to permit inspection, code enforcement, and economic development. The Department also oversees the	Mitigation actions implemented by this department can assist in disseminating hazard awareness information, provide insight into the unique condition's hazards may impose on the various elements within the community, and create

	Community Development Block Grant (CDBG) and Housing Rehabilitation programs.	programs intended to increase overall life quality in the city. Expansion and Improvement: Ensure the outreach and education of the City's most vulnerable populations are prioritized through the department. Integrate the mitigation actions and strategies into overall programming for capital improvements of recreation and community services. Utilize code compliance to incorporate mitigation into structures and improvements conducted by residents and businesses.
Building Services Division	Building Services is responsible for administrating and enforcing the uniform codes and related federal, state, and city-adopted laws and ordinances. This responsibility includes meeting state mandates to ensure all structures meet or exceed the minimum life safety standards of the aforementioned codes, laws, and ordinances. This division assures these standards by providing organized procedures for reviewing plans and specifications, field-checking construction projects, and investigating substandard structures for abatement.	Expansion and Improvement: Provide opportunities for continued education to Community Development staff to maintain state-of-the-art knowledge of new code and regulatory requirements.
Planning Division	The Planning Division is responsible for implementing the City's Development Code and related goals, policies, and objectives of the City's General Plan. The Planning Division processes land use and development applications, promoting public health, safety, and general welfare to preserve or enhance the high quality of life. The Planning Division is also responsible for long-range planning, housing issues, and administering the Community Development Block Grant program. The Planning Division provides support to the City's Planning and Transportation Commission. Able to apply for grants (Grant Writer).	Expansion and Improvement: Provide opportunities for continued education to Community Development staff to maintain state-of-the-art knowledge of new code and regulatory requirements.
Finance Department	The Finance Department assists other departments in the city in meeting their service objectives and is responsible for maintaining the City's financial health and monitoring and reporting on the City's financial position. The department directs and manages the City's financial activities and manages services provided to other city departments.	Expansion and Improvement: Assist with key mitigation activities associated with cost-tracking hazard events and disasters, identifying grant funding opportunities, grant reporting and administration, and establishing financial risk calculations that can help assist with budgeting of operations, maintenance, and capital improvements.
Public Works Department	The Public Works Department is responsible for the Engineering, Transportation, Integrated Waste Management, Water Quality, and Crossing Guard programs. Public Works reviews development proposals and street improvement plans; manages capital improvement projects and oversees construction work within the public right-of-way; maintains the City's Master Drainage program and flood control systems; oversees water quality programs; manages the design, construction, and operation of the City's transportation network; manages the City's solid waste contract and recycling programs; and implements environmental programs.	Expansion and Improvement: Public Works provide engineers and technicians that manage the City's infrastructure. They possess critical understanding of the risks posed by hazards and potential mitigation activities to address the risks. Their input into developing mitigation strategies and actions is critical.

Public Services	The Public Services department maintains the City's facilities and infrastructure in good working order, and maintains a high-level of care of the City's landscaping resources in parks, medians, and slopes. The department organizes and marshals resources for emergency preparedness, and strives to provide exceptional volunteer opportunities for community groups and organizations.	Expansion and Improvement: Improve the understanding of the role that daily activities play in hazard mitigation.
Floodplain Manager	The duties and responsibilities of the Floodplain Administrator shall include, but not be limited to: • Permit review • Flood hazard reduction • NFIP program administration • Construction inspections	Expansion and Improvement: The Floodplain Administrator supports compliance with NFIP requirements, advocates for appropriate development in flood hazard areas, and provides technical expertise on effective flood mitigation activities. This can support mitigation activities.
Planning and Transportation Commission	This five (5) member Commission, established under Municipal Code Chapter 2.06, is tasked with advising the Mayor, City Council, and City staff on the physical development of the City, including zoning, building, land use, and related matters. The Planning Commission is responsible for reviewing proposed residential and commercial development projects, subdivisions, and land use requests on private property, to determine their compliance with applicable City regulations. The Commission has the authority to approve various development projects that comply with County requirements. In addition, the Commission makes recommendations to the City Council with respect to the City's General Plan, Zoning Code, Specific Plans, and other matters related to development within the County. The Commission may be responsible for implementing mitigation items pertaining to the Commission's scope.	Expansion and Improvement: Provide opportunities for continued education to Planning and Transportation Commission members to maintain state-of-the-art knowledge of new code and regulatory requirements.
Human Resources	The Human Resources Division is a division within the Administrative Services Department. The Human Resources Division provides centralized human resources functions, including recruitment, classification, compensation and benefits administration, training, employee relations, employee recognition, promotion of the City's Core Values, and maintenance of employee records. It also participates in protecting the City's physical and human assets through risk identification, avoidance, training, administration of the City's self-insurance worker's compensation program, and other risk-sharing mechanisms.	The Human Resources Department focuses on employment, benefits and wellness, employee relations, and risk management, which can play a key role in identifying risks and understanding risks to employees within the city. Increase knowledge and information through the collection of better data and tracking. Expansion and Improvement: Increase knowledge and information through better data collection and tracking
Community Relations Department	The Community Relations Department is a critical link between the City of Mission Viejo and its citizens. The department's mission is to ensure residents in both private and business sectors stay informed about City-related programs, services, priorities, issues, and events. The department seeks citizen input regarding projects and initiatives and evaluates public perception and feedback from the community, so the City can address issues in a timely manner.	It can provide timely and effective dissemination of critical hazard information about mitigation, information on programs created by the city, and improve the general public knowledge of hazards. Expansion and Improvement: Ensure the outreach and education of the City's most vulnerable populations are prioritized through the Community Relations Department. Integrate the mitigation actions and strategies into overall programming for capital

		improvements of recreation and community services.
Fire Services	The City contracts with the Orange County Fire Authority, which provides fire prevention/suppression and emergency services to 22 jurisdictions within Orange County, California. Mission Viejo is one of those partner cities.	Expansion and Improvement: Proactively identify opportunities to coordinate and collaborate with neighboring jurisdictions to increase City and region-wide capabilities.
Police Services	The City contracts with the Orange County Sheriff's Department for Police Services. The Sheriff's Department is responsible for the protection of citizens, enforcement of laws, and crime prevention. Law enforcement services include patrol, general, and special crime investigations. Police Services preserve the quality of life throughout the community by enforcing the adopted local codes and ordinances that govern the proper use and maintenance of private properties. Police Services provides support for emergency management activities.	Expansion and Improvement: Provide training to Officers to better enable them to see potential hazards and take action to report them.
Community GIS	Provides complex mapping and data management of City facilities, land use, and potential hazards. Supports visualization of complex data sets using geo-location and data correlation.	Expansion and Improvement: Acquire and conduct training for GIS technicians on the latest versions of ArcGIS. Increase system redundancy and resiliency through improvements to technologies and connectivity.
Mission Viejo RACES-ARES	The Mission Viejo RACES-ARES is guided by the City of Mission Viejo's Department of Emergency Services. Presently, twenty-five active registered volunteer Amateur Radio Operators use their own and/or city-owned equipment to assist with emergency radio communications. As an ARES group, members become "local volunteers" helping out. In a "declared" disaster, the group can 'change hats' and become a Radio Amateur Civil Emergency Service (RACES) group. The OES/FEMA assumes responsibility, and Mission Viejo RACES-ARES members are registered Disaster Service Workers eligible for workmen's compensation.	Expansion and Improvement: Continue to recruit amateur radio operators. Conduct preparedness exercises to provide proficiency in supporting emergency response.
Southern California Association of Governments (SCAG)	Functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. As the designated Metropolitan Planning Organization, the federal government mandates the Association of Governments to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.	Expansion and Improvement: Attend SCAG meetings. Continue to participate in SCAG-sponsored programs. Routinely coordinate with SCAG staff to stay informed of current planning initiatives.
California Governor's Office of Emergency Services	The California Governor's Office of Emergency Services (Cal OES) is the state agency responsible for reducing hazards through mitigation activities, conducting emergency planning, supporting emergency response and recovery activities, and acting as a liaison between local and federal agencies on emergency-related issues. Cal OES guides hazard mitigation planning activities, shares best practices, and distributes funding opportunities.	Expansion and Improvement: The City can work with Cal OES to obtain funding to implement LHMP mitigation strategies and receive future updates.
Federal Emergency Management Agency	The Federal Emergency Management Agency (FEMA) is responsible for hazard mitigation, emergency preparedness, and emergency response and recovery activities. It guides state and local governments on hazard mitigation activities, including best practices and compliance with federal requirements.	Expansion and Improvement: FEMA also provides funding for hazard mitigation actions through grant programs.

Technical Capabilities		
Cal-Adapt	Cal-Adapt is an online tool that provides detailed projections for future climate-related conditions in California, including factors such as temperature, precipitation, and sea-level rise. These projections can help inform future hazard events and explain how hazard conditions are expected to change.	Expansion and Improvement: The City can use Cal-Adapt to monitor anticipated changes in future climate conditions and adjust mitigation actions accordingly.
Online Services (Mission Viejo Website, Social Media Accounts)	Over the past several years, the City of Mission Viejo has provided 24/7 access to a wide range of online services. The website includes featured City services from Mission Viejo. Provides alert and warning information. Provides weather information and other public safety. Contains information on home and individual preparedness. The City Website and Social Media Accounts can be found at the following link: City of Mission Viejo	Expansion and Improvement: This service allows the public to ask questions and access information to know what's going on within the city and better prepare for a hazard. Link to FEMA, State, and County websites and social media accounts. Provide comprehensive personal/family preparedness information on these media.
California Department of Transportation	The California Department of Transportation (Caltrans) has jurisdiction over designated highways, including State routes SR-91, SR-55, SR-57, SR-22, and interstate I-5.	Expansion and Improvement: Mitigation measures related to ensuring the resiliency of state-designated routes will be implemented through coordination with Caltrans.
Fiscal Capabilities/Financial Resources		
General Fund	Program operations and specific projects. Consists of property tax, sales tax, transient occupancy tax, and franchise tax that can be used for general purposes.	Expansion and Improvement: Hazard mitigation projects may be considered during the annual budgeting process for funding from the general fund.
Community Development Block Grants (CDBG)	The CDBG program provides funding for eligible senior activities such as in-home care, art classes, counseling, and home-delivered meals. HUD also provides Disaster Recovery Assistance in the form of flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to the availability of supplemental appropriations.	Expansion and Improvement: Where applicable, CDBG grants should be used to fund mitigation projects that enhance the resiliency of low-income and underserved communities.
Hazard Mitigation Grant Program (HMPG)	Provides support for pre-and post-disaster mitigation plans and projects	Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.
California Proposition One Bond Programs	Authorizes $7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection.	Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.
Building Resilient Infrastructure and Communities (BRIC)	Provides support for pre-disaster mitigation plans and projects.	Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.
Flood Mitigation Assistance grant program (FMA)	Mitigates structures and infrastructure that have been repetitively flooded.	Expansion and Improvement: Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.
Special Use Funds	Program operations and specific projects. Consists of property tax, sales tax, transient occupancy tax, and franchise tax that can be used for general purposes.	Expansion and Improvement: Hazard mitigation projects may be considered during the annual

		budgeting process for funding from the general fund.
Education and Outreach Capabilities		
FEMA	Provides free preparedness materials from FEMA's online ordering platform. Contains a link to the FEMA readiness app	FEMA's website can be found at the following link: FEMA
Orange County Emergency Management Division Webpage	Responsible for the comprehensive development and implementation of the four phases of emergency management.	The Orange County Emergency Management Division website can be found at the following link: Orange County EMDW
Mission Viejo Emergency Readiness Website	The Police Services website has educational material on making an emergency plan, stocking supplies staying informed and getting involved.	The Mission Viejo emergency Readiness website can be found at the following link: Mission Viejo Emergency Readiness
Cal OES Family Readiness Guide	The Guide provides a comprehensive toolkit for making a family emergency plan.	The Cal OES Family Readiness Guide can be found at the following link: Cal OES Family Readiness Guide
Community Emergency Preparedness Academy (CEPA)	CEPA is a collaborative effort between the City of Mission Viejo Emergency Services Division, Orange County Fire Authority, Sheriff's Department, Care Ambulance, and other emergency response agencies. The Mission Viejo Academy is uniquely organized through the Neighborhood Watch Program and designed to prepare neighbors to work together before, during, and after disasters to lessen injuries and help with recovery. CEPA is a FEMA approved program which teaches the CERT curriculum.	Expansion and Improvement: Include material in the CEPA curriculum that provides updates to progress in the mitigation action plan and contains links to the appropriate website page. The CEPA website can be accessed at the following link: Mission Viejo CEPA
AlertOC	The County Orange utilizes AlertOC, a emergency public mass notification system, which gives the City and Police Services the ability to launch emergency messages to the community.	Expansion and Improvement: Continue to conduct outreach to expand the database and increase the percentage of residents that are subscribers. A link to the AlertOC membership can be found at the following link: AlertOC

Hazard Mitigation Strategies and Actions

Hazard Mitigation Goals

The goals identified in **Chapter 1** help develop policies to protect community members, ecosystems, and other important assets from hazard events. These goals were developed to ensure consistency with the City's General Plan Safety Element, which plays an important role in risk reduction within Mission Viejo. These goals informed the development of mitigation actions and act as checkpoints to help City staff determine implementation progress.

Evaluation of Potential Hazard Mitigation Actions

The HMPC prepared a set of potential mitigation actions based on the hazard profiles, threat assessment, capabilities assessment, community survey results, discussions among HMPC

members, and existing best practices. Next, the HMPC evaluated these potential actions using the following criteria:

FEMA requires local governments to evaluate potential mitigation actions' monetary and non-monetary costs and benefits. While local governments are not required to assign specific dollar values to each action, they should identify the general size of costs and benefits. The HMPC may elect to include measures with a high cost or low benefits, but such measures should benefit the community and appropriately use local resources.

Also, FEMA directs local governments to consider the following questions as part of the financial analysis:

- What is the frequency and severity of the hazard type to be addressed by the action, and how vulnerable is the community to this hazard?
- What impacts of the hazard will the action reduce or avoid?
- What benefits will the action provide to the community?

The HMPC also reviewed and revised the potential hazard mitigation actions using the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria (**Table 5-2**). The HMPC did not formally assess every potential mitigation action under all STAPLE/E criteria but used the criteria to guide and inform the discussion. The HMPC also discussed how the criteria might evaluate grant applications the City may submit to receive funding for LHMP implementation.

Changes to Previous Mitigation Actions

The proposed 2024 LHMP mitigation actions for Mission Viejo are located in **Table 5-3**. These actions are based on the mitigation actions from the 2013 LHMP. The HMPC modified many of these previous actions to reflect the changes in City priorities and previous implementation. All mitigation actions located in **Table 5-3** are consistent with the actions from the 2013 LHMP, except for those listed below, which have been removed because they were either completed or are no longer applicable:

- Conduct a study and implement actions to protect sewer lines and reduce the amount of silt moving down the channel. *(Action Completed)*
- Protect water facilities in vulnerable areas from damage due to wildfires. *(Action incorporated into other actions)*
- Implement recommendations contained in the Wildland Preparedness Plan mentioned in WF-2. *(Action Completed)*
- Repair the slope above Olive Hills Park. *(Action Completed)*
- Replace culvert at 10th hole at Mission Viejo Hills Golf Course carrying storm water. *(Action Completed)*
- Control rodents and mosquitoes. *(Action implemented by an outside agency)*

The mitigation actions and strategies in **Table 5-3** incorporate the changes in priorities identified by the City and reflect the implementation needs that reduce future risks and vulnerabilities.

Prioritization

As part of the mitigation actions development and review, the HMPC also prioritized the actions. The prioritization efforts looked at the risks and threats of each hazard, financial costs and benefits, technical feasibility, and community values. HMPC members were asked to identify their priority actions through a voting exercise. Items are prioritized based on the number of votes the

HMPC members receive. These quantitative scores were then converted to low, medium, and high-priority qualitative categories.

TABLE 5-2: STAPLE/E CRITERIA

Issues	Criteria
Social	Is the action socially acceptable to Mission Viejo community members? Would the action mistreat some individuals? Is there a reasonable chance of the action causing a social disruption?
Technical	Is the action likely to reduce the risk of the hazard occurring, or will it reduce the hazard's effects? Will the action create new hazards or make existing hazards worse? Is the action the most useful approach for Mission Viejo to take, given the City and community members' goals?
Administrative	Does the City have the administrative capabilities to implement the action? Are there existing City staff who can lead and coordinate the measure's implementation, or can the City reasonably hire new staff for this role? Does the City have enough staff, funding, technical support, and other resources to implement the action? Are there administrative barriers to implementing the action?
Political	Is the action politically acceptable to City officials and other relevant jurisdictions and political entities? Do community members support the action?
Legal	Does the City have the legal authority to implement and enforce the action? Are there potential legal barriers or consequences that could hinder or prevent the implementation of the action? Is there a reasonable chance that the implementation of the action would expose the City to legal liabilities? Could the action reasonably face other legal challenges?
Economic	What are the monetary costs of the action, and do the costs exceed the monetary benefits? What are the start-up and maintenance costs of the action, including administrative costs? Has the funding for action implementation been secured, or is a potential funding source available? How will funding the action affect the City's financial capabilities? Could the implementation of the action reasonably burden the Mission Viejo economy or tax base? Could there reasonably be other budgetary and revenue impacts to the City?
Environmental	What are the potential environmental impacts of the action? Will the action require environmental regulatory approvals? Will the action comply with all applicable federal, state, regional, and local environmental regulations? Will the action reasonably affect any endangered, threatened, or otherwise sensitive species of concern?

COST ESTIMATES

The HMPC identified relative cost estimates to meet the hazard mitigation planning process's cost estimation requirements based on their understanding of the mitigation action intent and their experience developing identical or similar programs/implementing projects. Three cost categories based on the City's typical cost criteria were used for budgeting purposes:

- Low cost ($): $100,000 or less
- Medium cost ($$): $100,001 to $999,999
- High cost ($$$): Greater than $1,000,000

Based on the criteria and evaluation processes used during Plan development, the HMPC prepared a prioritized list of mitigation actions to improve Mission Viejo's resilience to hazard events. In addition to mitigation action and strategies, several" Preparedness Activities" were identified and denoted with the letter "P." **Table 5-3** has some actions identified and highlighted in gray. These are relevant mitigation actions from the previous plan and remain within the current

version of the LHMP, as the status of these actions is currently incomplete. **Table 5-3** lists the mitigation actions, prioritization of each action, and other details related to implementation, including potential FEMA funding sources such as:

Building Resilient Infrastructure and Communities (BRIC): A competitive FEMA grant program to support states, local communities, tribes, and territories.

Flood Mitigation Assistance Program (FMA): A competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.

Hazard Mitigation Grant Program (HMGP): Provides funding to state, local, tribal, and territorial governments so they can rebuild in a way that reduces or mitigates future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.

Other Grants: Other grants may include State of California grants associated with climate change, water infrastructure, homeland security, transportation, or other funding sources that periodically become available. The list below provides some common sources:

1. Climate Adaptation Planning Sustainable Transportation Planning Grant Program - Department of Transportation
2. Sustainable Communities Competitive – Department of Transportation
3. CAL FIRE Wildfire Prevention Grants Program – Department of Forestry and Fire Protection
4. Integrated Climate Adaptation and Resiliency Program's Climate Adaptation Planning Grant – Office of Planning and Research
5. Small Community Drought Relief Program – Department of Water Resources
6. Addressing Climate Impacts – Department of Fish and Wildlife
7. Cleanup Loans and Environmental Assistance to Neighborhoods (CLEAN) Program – Department of Toxic Substances Control
8. Clean Water State Revolving Fund (CWSRF) Program Construction – State Water Resources Control Board
9. Drinking Water State Revolving Fund (DWSRF) Construction – State Water Resources Control Board
10. Water Recycling Funding Program (WRFP) Construction Grant – State Water Resources Control Board
11. Equitable Community Revitalization Grants (ECRG) – Department of Toxic Substances Control
12. Water Recycling Funding Program (WRFP) Planning Grant – State Water Resources Control Board
13. Infrastructure State Revolving Fund (ISRF) Program - Infrastructure and Economic Development Bank

TIMELINES

In addition, the timeframes identified in **Table 5-3** may indicate a particular year to initiate the implementation of the action or, in some instances, use the terms “Ongoing” or “Annually.” For actions that use these terms, it is intended to identify that the action may add to existing capabilities and not have a particular start or end date or occur periodically. This is typically used for actions that include new policies, tasks, or standard operating procedures intended to mitigate future risks.

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN

Action #	Mitigation Action Item	Potential Funding Source	Responsible Department	Relative Cost	Time Frame	Priority
Emergency Preparedness Activities						
PA-1 (Wildfire Short-Term Action Item #1)	Enhance emergency services to increase the efficiency of wildfire response and recovery activities through regional capabilities assessments.	General Fund, Homeland Security Grants	Orange County Fire Authority & Emergency Services	$$	2025	Medium
PA-2 (Wildfire Short-Term Action Item #2)	Educate agency personnel on federal cost-share and grant programs, Fire Protection Agreements, and other related federal programs so the full array of assistance available to local agencies is understood.	General Fund, Homeland Security Grants	Orange County Fire Authority, Emergency Services	$	2025	Low
PA-3 (Wildfire Short-Term Action Item #3)	Inventory alternative firefighting water sources and encourage the development of additional sources.	General Fund, Homeland Security Grants	Orange County Fire Authority, Emergency Services	$	2025	Medium
PA-4	Conduct regular emergency preparedness drills and training exercises for City Staff, including all hazards training at CSTI.	General Fund, Homeland Security Grants	Emergency Services	$	N/A	High
PA-5	Continue agreements with local school districts, OCSSA, and Red Cross, to ensure that school facilities can act as evacuation sites during major emergencies.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-6	Expand participation in the Mission Viejo Community Emergency Prep Academy (CEPA) program.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-7	Ensure that community evacuation plans include provisions for community members who do not have access to private vehicles or are otherwise unable to drive.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-8	Continue to ensure effective emergency notifications through multiple media formats, in languages appropriate for the community, about pending, imminent, or ongoing emergency events. Ensure that information is accessible to persons with access and functional needs.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-9	Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Community Centers, and any other locations designated in the future.	General Fund, Homeland Security Grants	OES	$$$	N/A	High
PA-10	Ensure the Mission Viejo Emergency Operations Plan identifies critical facilities' backup power and communications locations.	General Fund, Homeland Security Grants	OES	$	N/A	Low

PA-11	Continuously update response procedures for first responder departments to properly address new hazard events as they emerge.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-12	Conduct active shooter drills for City staff, residents, and businesses.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-13	Increase the number of City staff who have CalOES Safety Assessment Program (SAP) credentials.	General Fund, Homeland Security Grants	OES, Building Department	$	N/A	High
Multiple Hazards						
1.1 (Multi-Hazard Short-Term Action Item #1)	Integrate the goals and action items from the City of Mission Viejo Natural Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Engineering Division	$	2027	Low
1.2 (Multi-Hazard Short-Term Action Item #2)	Identify and pursue funding opportunities to develop and implement City mitigation activities.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Works	$	Annually	Medium
1.3 (Multi-Hazard Short-Term Action Item #3)	Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases the risk of natural hazards.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Public Works Department	$	Annually	Low
1.4 (Multi-Hazard Short-Term Action Item #4)	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in the City of Mission Viejo.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Public Works Department	$	2028	Low
1.5 (Multi-Hazard Short-Term Action Item #5)	Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Public Works Department	$	2027	Low
1.6 (Multi-Hazard Short-Term Action Item #6)	Participate in the Orange County HAZUS Project at the next available opportunity.	General Fund, BRIC/ HMGP Grants, Other Grants	Hazard Mitigation Committee	$	2029	Low
1.7 (Multi-Hazard Long-Term Action Item #1)	Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs and enhancing public education.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services, Public Works, and Community Development Department	$	Annually	Low
1.8	Develop, enhance, and implement education programs to mitigate natural hazards and reduce the risk to citizens,	General Fund, BRIC/ HMGP	Emergency Services Manager, City	$	Annually	Medium

(Multi-Hazard Long-Term Action Item #2)	public agencies, private property owners, businesses, and schools.	Grants, Other Grants	Public Relations Consultant and City GIS			
1.9 (Multi-Hazard Long-Term Action Item #3)	Use technical knowledge of natural ecosystems and events to link natural resource management and land use organizations to mitigation activities and technical assistance.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development and Public Works Departments	$	Annually	Low
1.10 (Windstorms/ Severe Weather Long Term Action Item #3)	City to purchase and/or test backup power facilities for use during a power failure. Create equipment/testing log to ensure backup power equipment is in working service.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Preparedness Division	$$$	Annually	Medium
1.11	Install energy-efficient equipment upgrades in City facilities to increase the longevity of the fuel supply for backup generators. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$	2028	Medium
1.12	Conduct routine updates to Facility Conditions Assessments for City-owned infrastructure and other utilities and coordinate with other agencies to ensure inspections of other important infrastructure. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$$	Annually	Low
1.13	Incentivize public and private utility operators to harden their lines passing through the City from potential breaches. Encourage adoption of supervisor control and data acquisition (SCADA) to allow instantaneous shutdown o line breaches. Use mitigation grants to incentivize entities to partner with the City to complete these projects. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Services, Public Works	$	Annually	Low
1.14	Install and harden emergency backup power at critical facilities deemed necessary. Prioritize installations for facilities that serve as key cooling/warming centers and evacuation centers. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$$	2027	High
1.15	Conduct a feasibility assessment of solar and battery backup system installation at key critical facilities within the City. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$	2029	Low
1.16	Work closely with community groups to increase awareness of hazard events and resiliency opportunities among socially vulnerable community members, including those experiencing homelessness. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Emergency Services, Community Services	$	Annually	Medium

1.17	Avoid building new City-owned key facilities in mapped hazard areas. If no feasible sites outside mapped areas exist, ensure that such facilities are hardened against hazards beyond any minimum building requirements/ mitigation standards. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Planning, Building	$	Annually	Low
1.18	Closely monitor changes in the boundaries of mapped hazard areas resulting from land use changes or climate change and adopt new mitigation actions or revise existing ones to ensure continued resiliency. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department	$	Annually	Medium
1.19	Integrate policy direction and other information from this Plan into other City documents, including the General Plan, Emergency Operations Plan, and Capital Improvements Program. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Emergency Services, Community Development Department	$	Annually	Low
1.20	Integrate climate change mitigation and adaptation information and analysis into future LHMP updates and other City Plans, where practicable. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department	$	Annually	Low
1.21	Update the City's Master Plans periodically (in conjunction with the LHMP and CIP) to incorporate new data/ mapping and/or address emerging issues. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	Annually	Low
Earthquake Hazards						
2.1 Earthquake Short-Term Action item #1	Encourage seismic strength evaluations of non-City critical facilities in the City of Mission Viejo to identify vulnerabilities for mitigation of schools and critical facilities such as hospitals to meet current seismic standards.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Hazard Mitigation Committee	$	Annually	Low
2.2 Earthquake Short-Term Action Item #2 (From 2007 Plan)	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Hazard Mitigation Committee	$	Annually	Low
2.3	Develop an educational campaign, incentivize, and promote medium-scale seismic retrofits, such as window films to minimize shattering, anchors for rooftop-mounted equipment, bracing for masonry chimneys, and other preventative measures to reduce damage to private buildings with simple earthquake mitigation activities they can take (i.e., water heater straps, furniture anchoring, gas shut off tools, other	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Emergency Services	$	2029	Low

	emergency supplies) to reduce strain on City resources during an event.					
2.4	Conduct a seismic analysis of all City-owned key facilities and retrofit vulnerable facilities.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Public Services	$$	2028	Low
2.5	To the extent feasible, construct all new and significantly retrofitted City-owned facilities to remain operational in the event of a major earthquake.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Community Development Department	$$$	Annually	Low
2.6	Retrofit key critical facilities with seismically rated window film treatments that ensure glass windows do not shatter during a strong seismic event.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Public Services	$$	2029	Low
2.7	Improve local understanding of the threat of a major earthquake by conducting a citywide scenario modeling potential loss of life and injuries, destroyed and damaged structures, and interruptions to key services.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Emergency Services	$	2027	Medium
Flood (Including Dam Inundation)						
3.1 Flood Long-Term Action Item #2	Encourage the development of acquisition and management strategies to preserve open space for flood mitigation, fish habitat, and water quality in the floodplain.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Mission Viejo Public Works and Orange County Public Works Flood Division	$$	Annually	Low
3.2 Flood Long-Term Action Item #3	Identify surface water drainage obstructions for all parts of unincorporated within the City of Mission Viejo.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Mission Viejo Public Works and Orange County Public Works Flood Division	$$	Annually	Low
3.3 Flood Long-Term Action Item #4	Establish a framework to compile and coordinate surface water management plans and data throughout the City.	General Fund, BRIC/ HMGP Grants, Flood Mitigation	Mission Viejo Public Works and Orange County Public Works Flood Division	$	2029	Low

		Assistance Grants, Other Grants				
3.4	Investigate using permeable paving and landscaped swales for new construction and replacement of City-owned hardscaped areas.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$	2029	Low
3.5	Analyze if new critical facilities can be built a minimum of 1 foot higher than the anticipated 500-year flood elevation height to determine where it is feasible.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$	2029	Low
3.6	Identify potential flood improvements that reduce inundation from both storm flows and potential dam inundation effects.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$	2028	Low
3.7	Retrofit roadway medians to capture stormwater during rain events. Prioritize improvements along major arterials/ roadways throughout the City.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$$$	2029	Low
3.8	Conduct frequent cleanings of storm drain intakes, especially before and during the rainy season.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$	Quarterly	Medium
3.9	Track areas where ponding frequently occurs during heavy rainfall and install new drains or upgrade existing ones to reduce ponding of water.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$$	Annually	Low
3.10	Monitor intersections that frequently flood during rain events and identify improvements to alleviate these conditions.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$	Annually	Low

3.11	Coordinate with dam owners/operators, state, and federal agencies to collectively identify threats to the City and the region and identify ways to retrofit/strengthen the dams under their control.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Services, Public Works	$	Annually	Medium
3.12	Implement an early warning system/protocol (Wireless Emergency Alert & AlertOC) that notifies downstream communities in the event of a potential dam failure incident.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Services	$	2027	Low
3.13	Identify all structures located in FEMA flood zones and determine the need to map, analyze, and modify FEMA flood maps. If flood map revisions are possible, work with property owners to determine the desire to perform this activity on their behalf.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$	2027	Medium
Extreme Weather (Windstorms, Extreme Heat, Winter/Coastal Storms)						
4.1 Windstorms/ Severe Weather Long-Term Action Item #1	Public Awareness Campaign: To provide public education materials to City of Mission Viejo residents, businesses, and all School District staff, parents, and age-appropriate students with mitigation materials pertaining to the protection of life and property before, during, and after an extreme weather event.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Planning Department, Public Works Department, and Emergency Preparedness Division	$	Annually	Low
4.2	Conduct outreach to residents and businesses prior to the severe winds (Santa Ana Wind events) on proper tree maintenance and identification of potentially hazardous trees that may require removal. (Hazards Addressed: Windstorms)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Services, Public Services	$	Annually	Medium
4.3	Increase the use and construction of shade structures within new developments, City facilities, parks, and trails to reduce urban heat island impacts. (Hazards Addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Community Development Department	$$	Annually	Medium
4.4	Evaluate the long-term capacity of designated cooling centers and shelters in the City to provide sufficient relief from extreme heat. Assess the need to expand services as the frequency, length, and severity of future heat waves potentially change due to climate change. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Services, Community Services	$	Annually	Low

4.5	Upgrade HVAC within City facilities to more efficient systems that may include split systems or decentralized systems that allow for heating and cooling the spaces needed, not entire buildings. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Public Services	$$	2029	Medium
4.6	Implement a tree-planting program to diversify tree age and increase shaded areas in the City to reduce the effects of the urban heat island effect. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Public Services	$$	2029	Low
4.7	During the design review process, promote passive cooling design (brise soleil, long roof overhangs, locating windows away from southern facades, etc.) in new developments. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Community Development Department	$	Annually	Low
4.8	Promote early notifications to residents before a severe weather event, focusing on effective communication methods with vulnerable populations to better ensure they have adequate time to prepare. (Hazards addressed: Severe Weather)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Services	$	Annually	Low
Landslide						
5.1 (Landslide Short-Term Action Item #1)	Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$	2026	Low
5.2 (Landslide Short-Term Action Item #2)	Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts of development.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Works	$	2027	Low
5.3 (Landslide Short-Term Action Item #3)	Participate in Property Acquisition programs (i.e., FEMA, State and/or local programs) for areas that may be subject to repeat damage in a landslide area.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$$	Annually	Low
5.4 Landslide Long-Term Action Item #2	Limit activities in identified potential and historical landslide areas through regulation and public outreach.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Works	$	Annually	Low
5.5	Install and maintain slope stabilization measures on publicly owned hillsides above roads, buildings, and other facilities.	General Fund, BRIC/ HMGP	Public Works, Public Services	$$$	2029	Low

		Grants, Other Grants				
5.6	Conduct a community-wide moisture-induced landslide and mudslide risk analysis, including the potential for building destruction/damage, deaths, and injuries. Consider the anticipated changes to precipitation patterns, wildfires, and other factors that may influence mudslide events.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$	2028	Low
5.7	Address hillside development constraints in areas of steep slopes to reduce excessive road maintenance or potential landslide effects during winter storms and work with private property owners to install and maintain drainage systems and stabilizing vegetation on and above steep slopes.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$	2027	Low
5.8	Retrofit City facilities to reduce the potential for landslide events within or adjacent to critical infrastructure.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works, Public Services	$$$	2029	Low
5.9	Require geotechnical studies in areas of significant landslide threat and identify strategies for existing development downstream of these hazard areas.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department	$	Annually	Low
5.10	Pursue funding to research, map, and ultimately create a Geological Hazard Abatement District that addresses the entire city and landslide hazards.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	Annually	Low
5.11	Establish/encourage the planting and maintaining slope stabilizing, non-flammable vegetation in all landslide hazard-prone areas of the city.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works, Public Services	$	Annually	Medium
Wildfire						
6.1 (Wildfire Long-Term Action Item #1)	Encourage developing and disseminating maps relating to the fire hazard to help educate and assist builders and homeowners in engaging in wildfire mitigation activities and help guide emergency services during response.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority	$	Annually	Medium
6.2 (Wildfire Long-Term Action Item #2)	Enhance outreach and education programs to mitigate wildfire hazards and reduce or prevent the exposure of citizens, public agencies, private property owners, and businesses to natural hazards.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority	$	Annually	Low

6.3 (Wildfire Long-Term Action Item #3)	Increase communication, coordination, and collaboration between wildland/urban interface property owners, local and county planners, fire prevention crews, and officials to address risks, existing mitigation measures, and federal assistance programs.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority, Engineering and Building, Planning and Information Technology Departments	$	Annually	Low
6.4 (Wildfire Long-Term Action Item #4)	Encourage implementation of wildfire mitigation activities in a manner consistent with the goals of promoting sustainable ecological management and community stability.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority	$	Annually	Low
6.5	Conduct regular fuel modification projects to reduce fire hazard risks, such as clearing out dead vegetation in parks, open spaces, right-of-way embankments, and areas adjacent to the wildland-urban interface.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority, Public Services	$$	Annually	High
*** Relative Cost Categories**						
$	Less than $100,000					
$$	$100,001 to $999,999					
$$$	Greater than $1,000,000					

NATIONAL FLOOD INSURANCE PROGRAM

Mission Viejo participates in the National Flood Insurance Program (NFIP), created by Congress in 1968, to provide flood insurance at subsidized rates to homeowners who live in flood-prone areas. Mission Viejo has participated in NFIP since September of 1974.[28]

Although participation is not a dedicated hazard mitigation action, Mission Viejo will continue to participate in the NFIP and comply with the program's requirements through continued enforcement of the City's Floodplain Management Regulations.[29] This regulation applies to all areas identified as flood-prone within the City. This chapter of the Municipal Code identifies the purpose of the regulation, methods of reducing flood losses, the basis for establishing flood hazard areas, development permit requirements, duties and responsibilities of the City's Floodplain Manager, development standards that apply in flood-prone areas, and required documentation and analysis for construction within these areas. As part of the City's efforts to comply with NFIP, Mission Viejo will make updates and revisions to the Floodplain Management regulations to minimize the threat of harm from flood events. These updates and revisions may be promoted by changes in local demographics, land use shifts, flood regime changes such as frequency and intensity of flood events, and other factors that may warrant municipal action. The City will also continue incorporating any changes to mapped flood plains' locations and designations into future planning documents, including future updates to this Plan.

The City of Mission Viejo contains Special Flood Hazard Areas (SFHA) and participates in the National Flood Insurance Program (NFIP), which currently includes 90 policies in force, amounting to roughly $76,594 in premiums paid annually. Total insurance coverage for these policies amounts to $30,591,000. Mission Viejo has no repetitive loss properties that FEMA identified; however, they have had a total of 22 closed Paid Losses cases totaling some $303,728 in damages paid out. Mission Viejo has 3 repetitive loss buildings and 8 repetitive losses totaling $237,163.26 in payments over the course of NFIP membership. Mission Viejo is currently at a CRS (Community Rating System) rating of 7,[30] which entitles property owners to a 15% discount should their property be located within an SFHA and 5% if it is not. The City's most current FIRM (Flood Insurance Rate Map) was adopted on September 2, 2016.

[28] Community Status Book Report – California: Communities Participating in the National Flood Program. https://www.fema.gov/cis/CA.pdf
[29] Mission Viejo Municipal Code. Title 9 Land Use/Zoning/Subdivision Regulations, Chapter 9.100 – Floodplain Management. https://library.municode.com/ca/mission_viejo/codes/code_of_ordinances?nodeId=MUCO_TIT9LAUSZOSURE_CH9.100FLMA
[30] FEMA, Sr. Hazard Mitigation Planner, Xing Liu, 2/1/2022

CHAPTER 6 – PLAN MAINTENANCE

For this LHMP to remain effective and useful to the community of Mission Viejo, it must remain up to date. An updated version of the LHMP will continue to guide Mission Viejo's hazard mitigation activities and help keep the City eligible for state and federal hazard mitigation funding. The HMPC has structured this LHMP so individual sections can easily be updated as new information becomes available and new needs arise, helping to keep this Plan current.

This chapter discusses updating this Plan to comply with applicable state and federal requirements. This chapter also describes how the City can incorporate the mitigation actions described in Chapter 5 into existing programs and planning mechanisms and how public participation will remain an important part of Plan monitoring and future update activities.

COORDINATING BODY

The HMPC will remain responsible for maintaining and updating the Plan, including evaluating the Plan's effectiveness as needed. Members of the HMPC will also coordinate the Plan's implementation through their respective positions. **Table 1-1** contains a list of current members. In future years, staff and representatives (either current HMPC members or other individuals) from the following departments, districts, and agencies should be included in maintenance and update activities:

- Emergency Services
- Building
- Planning
- Public Services
- Engineering
- Community Services
- Orange County Fire Authority
- Orange County Sheriff's Department

The staff member currently serving as the HMPC leader (responsible for coordinating future updates) is the Emergency Manager. They will serve as the project manager or designate this role to another staff member during the update process. The HMPC leader or their designee will coordinate the maintenance of this Plan, lead the formal Plan review and evaluation activities, direct the Plan update, and assign tasks to other members of the HMPC to complete these activities. Such tasks may include collecting data, developing new mitigation actions, updating mitigation actions, presenting to City staff and community groups, and revising the Plan sections.

PLAN IMPLEMENTATION

The Plan's effectiveness depends on the successful implementation of the mitigation actions. Implementation includes integrating mitigation actions into existing City plans, policies, programs, and other implementation mechanisms. The mitigation actions in this Plan are intended to reduce the damage from hazard events, help the City secure funding, and provide a framework for hazard mitigation activities. HMPC members prioritized the hazard mitigation actions in **Table 5-4** in **Chapter 5**. These priorities will guide the implementation of these actions through new or existing City mechanisms as resources are available. The LHMP project manager is responsible for overseeing this Plan's implementation, promotion, and maintenance, facilitating meetings, and coordinating activities related to Plan implementation and maintenance.

The key City Plans that should incorporate content from this LHMP include the following:

Mission Viejo General Plan Safety Element – This element should incorporate relevant mapping and analysis in the Safety Element to ensure this plan's goals and policies are reinforced throughout future developments and projects proposed within the city.

Mission Viejo Emergency Operations Plan – The EOP focuses on effective preparedness and response to hazard events within the city. Incorporating relevant content from this plan into the EOP ensures consistency regarding the hazards addressed in both plans.

Mission Viejo Capital Improvements Program – The CIP identifies key infrastructure investments throughout the city, including hazard mitigation elements. Incorporating this plan into the CIP may enhance infrastructure investment through additional funding and/or modification of improvements to include hazard mitigation elements.

This integration of the LHMP into the Mission Viejo General Plan also allows the City to comply with AB 2140 requirements, as identified in **Chapter 1** of this plan. Integration of the updated LHMP into the Safety Element should occur after the adoption of the FEMA approved LHMP by the City Council. This includes incorporating any new mapping or new hazard information from the updated plan. The updated plans will be incorporated by reference.

Plan Maintenance Process

The City's plan maintenance process will rely on the Mission Viejo Mitigation Implementation Handbook, located in **Appendix E**. The handbook is intended to function as a stand-alone document that gives concise and accessible guidance to City and Fire Department staff to implement and maintain the Plan. A key component is the specific mechanisms that the City can use to integrate this plan into the other City planning mechanisms.

Plan Monitoring and Evaluation

When members of the HMPC are not updating the Plan, they should meet at least once a year to go over mitigation action implementation and evaluate the Plan's effectiveness. These meetings should include:

- Discussion of the timing of mitigation action implementation
- Mitigation action implementation evaluation and determination of success
- Mitigation action prioritization revisions, if deemed necessary
- Mitigation action integration into other mechanisms, as needed

The first of these meetings will be held in the 2024-2025 fiscal calendar year. To the extent possible, HMPC meetings should be scheduled at an appropriate time in the City's annual budgeting process, which will help ensure that funding and staffing needs for mitigation actions are considered.

When the HMPC meets to evaluate the Plan, members should consider these questions:

- What hazard events, if any, have occurred in Mission Viejo in the past year? What were the impacts of these events on the community? Were the impacts mitigated, and if so, how?
- What mitigation actions have been successfully implemented? Have any mitigation actions been implemented but not successfully, and if so, why?

- What mitigation actions, if any, have been scheduled for implementation but have not yet been implemented?
- What is the schedule for implementing future mitigation actions? Is this schedule reasonable? Does the schedule need to be adjusted for future implementation, and are such adjustments appropriate and feasible?
- Have any new concerns arisen, including hazard events in other communities or regions not covered by existing mitigation actions?
- Are new data available to inform the Plan's updates, including data relevant to the hazard profiles and threat assessments?
- Are there any new planning programs, funding sources, or other mechanisms to support hazard mitigation activities in Mission Viejo?

Plan Updates

The information in this Plan, including the hazard profiles, threat assessments, and mitigation actions, is based on the best available information, practices, technology, and methods available to the City and HMPC when this Plan was prepared. As factors change, including technologies, community demographics and characteristics, best practices, and hazard conditions, it is necessary to update the Plan to remain relevant. Additionally, Title 44, Section 201.6(d)(3) of the Code of Federal Regulations requires that LHMPs be reviewed, revised, and resubmitted for approval every five years to remain eligible for federal benefits.

Update Method and Schedule

The update process will begin no later than four years after this Plan is adopted, allowing a year for the update process before the Plan expires. However, it is recommended that you begin the update process three years after plan adoption if the funding source for the plan will be a mitigation grant. Depending on the circumstances, the LHMP project manager or their designee may also choose to begin the update process sooner. Some reasons for accelerating the update process may include:

- A presidential disaster declaration for Mission Viejo or an area that includes part or the entire City
- A hazard event that results in one or more fatalities in Mission Viejo

The update process will add new and updated methods, demographic data, community information, hazard data and events, considerations for threat assessments, mitigation actions, and other necessary information, keeping the Plan relevant and current. The HMPC will determine the best process for updating the Plan, which should include the following steps:

Update Adoption

The Mission Viejo City Council is responsible for adopting this Plan and all future updates. As previously mentioned, adoption should occur every five years. The City will begin the update process at least one year before expiration to ensure the plan remains active. If the City has a grant application that relies on the LHMP, an update to the plan should occur no later than 18 months before expiration. Adoption should take place after FEMA notifies the City that the Plan is Approved Pending Adoption. Once the City Council adopts the Plan following FEMA's approval, the adopted plan should be transmitted to FEMA.

Continued Public Involvement

The City will keep the public informed about the HMPC's actions to review and update the LHMP. The HMPC will develop a revised community engagement strategy that reflects the City's updated needs and capabilities. The updated strategy should include a tentative schedule and plan for public meetings, recommendations for using the City's website and social media accounts, and content for public outreach documentation. The HMPC will also distribute information annually through the most appropriate method to ensure the most significant information dissemination to residents and businesses. These updates are anticipated to occur after the City's annual HMPC meeting.

Point of Contact

The Hazard Mitigation Plan leader for Mission Viejo is the primary point of contact for this Plan and future updates. At the time of production, the LHMP project coordinator is Paul Catsimanes, City of Mission Viejo Emergency Manager, available at PCatsimanes@cityofmissionviejo.org| 949-246-7014.

APPENDIX A – HMPC MEETING MATERIALS

2023 Mission Viejo Hazard Mitigation Planning Committee Force Attendees

Name	Title	Department	HMTF Meeting 1	HMTF Meeting 2	HMTF Meeting 3
Paul Catsimanes	Emergency Services Manager	Emergency Services	X	X	X
Paul Melby	Building Official	Building		X	X
Tim Martin	Senior Planner	Planning		X	X
Nick Lagura	Associate Planner	Planning	X	X	X
Corey Gonyea	Public Services Operations Manager	Public Services	X	X	
Jerry Hill	Director of Public Services	Public Services	X	X	X
Rich Schlesinger	City Engineer	Engineering	X	X	X
Drew Fine	Community Services Manager	Community Services	X	X	X
Cheyne Maule	Division Chief	Orange County Fire Authority		X	X
Chris McDonald	Chief of Police Services	Orange County Sheriff Department	X		X
Tobin Anderson	Sergeant	Orange County Sheriff Department	X	X	X
Aaron Pfannenstiel	LHMP Project Manager	Atlas Planning Solutions	X	X	X
Crystal Stueve	LHMP Planner	Atlas Planning Solutions	X		X
Robert Jackson	LHMP Planner	Atlas Planning Solutions	X	X	

City of Mission Viejo

LOCAL HAZARD MITIGATION PLAN UPDATE
HMPC MEETING #1 AGENDA

I. **Team Introductions**

II. **Local Hazard Mitigation Plan Overview**

III. **Project Goals and Expectations**

IV. **Hazard Mitigation Planning Team Roster**

V. **2023 City of Mission Viejo LHMP**

VI. **Data Needs (Critical Facilities List, vulnerable populations, recent/past hazards, GIS)**

VII. **Community Engagement and Outreach Strategy**

VIII. **Hazard Identification/Prioritization**

IX. **Next Steps and To-Do List**

Hazard Mitigation Planning Update Process	**October 2022 – September 2023**
Community Outreach	Ongoing
Administrative Draft LHMP	February/March 2023
Public Review Draft LHMP Document	Spring/Summer 2023
Cal OES/FEMA Review Draft Document	Summer/Fall 2023

Criteria	*1*	*2*	*3*	*4*
Probability: *Estimated Likelihood that the hazard will occur in the future.*	**Unlikely**	**Occasionally**	**Likely**	**Highly Likely**
Location: *The size of the affected area from a typical future occurrence.*	**Negligible**	**Limited**	**Significant**	**Extensive**
Maximum Probable Extent: *The estimated damage to facilities from a typical failure.*	**Weak –** little to no damage	**Moderate –** some damage, loss of service for days	**Severe –** devastating damage, loss of service for months	**Extreme –** catastrophic damage, uninhabitable conditions
Secondary Impacts: *The effects to the community beyond physical damage*	**Negligible –** no loss of function, downtime, and/or evacuations	**Limited –** minimal loss of function, downtime, and/or evacuations	**Moderate –** some loss of function, downtime, and/or evacuations	**High –** major loss of function, downtime, and/or evacuations

City of Mission Viejo

LOCAL HAZARD MITIGATION PLAN UPDATE
HMPC MEETING #2 AGENDA

I. **Introductions (5 minutes)**

II. **Review of Project Goals (5 minutes)**

III. **Review of Hazard Prioritization (5 minutes)**

IV. **Review of Critical Facilities (5 minutes)**

V. **Review of Hazard Profiles/Mapping Discussion/Threat Assessment (75 minutes)**

VI. **Introduction to Mitigation Strategies (5 minutes)**

VII. **Next Steps (5 minutes)**

Hazard Mitigation Planning Process	**August 2022 – June 2023**
HMPC Meeting #3 – Mitigation Action Review/Prioritization	Ferbruary 2023
Community Outreach	Ongoing
Administrative Draft LHMP	March 2023
Public Review Draft LHMP Document	May 2023
Cal OES/FEMA Review Draft Document	Summer 2023

City of Mission Viejo

LOCAL HAZARD MITIGATION PLAN UPDATE
HMPC MEETING #3 AGENDA

I. Introductions

II. Review of Project Goals

III. Overview of Mitigation Strategies

Plans and Regulations	• Ordinances, Regulations
Structural Projects	• Utility Undergrounding, Structural Retrofits
Natural Systems Protection	• Stream restoration, erosion control
Education Programs	• Outreach materials, websites, presentations
Preparedness and Response Actions	• Mutual aid agreements, equipment purchases, notification protocols

IV. Discussion of STAPLE/E Criteria

V. Discussion of Relative Cost Estimates

VI. Review and Discussion of Draft Mitigation Strategies

VII. Next Steps

STAPLE/E Criteria	
Issue	**Criteria**
Social	• Is the action socially acceptable to Mission Viejo community members? • Would the action treat some individuals unfairly? • Is there a reasonable chance of the action causing a social disruption?
Technical	• Is the action likely to reduce the risk of the hazard occurring, or will it reduce the effects of the hazard? • Will the action create new hazards or make existing hazards worse? • Is the action the most useful approach for Mission Viejo to take, given the City's goals and community members?
Administrative	• Does the City have the administrative capabilities to implement the action? • Are there existing City staff who can lead and coordinate the measure's implementation, or can the City reasonably hire new staff for this role? • Does the City have enough staff, funding, technical support, and other resources to carry out implementation? • Are there administrative barriers to implementing the action?
Political	• Is the action politically acceptable to City officials and other relevant jurisdictions and political entities? • Do community members support the action?
Legal	• Does the City have the legal authority to implement and enforce the action? • Are there potential legal barriers or consequences that could hinder or prevent the implementation of the action? • Is there a reasonable chance that implementation of the action would expose the City to legal liabilities? • Could the action reasonably face other legal challenges?
Economic	• What are the monetary costs of the action, and do the costs exceed the economic benefits? • What are the start-up and maintenance costs of the action, including administrative costs? • Has the funding for action implementation been secured, or is a potential funding source available? • How will funding the action affect the City's financial capabilities? • Could the implementation of the action reasonably burden the Mission Viejo economy or tax base? • Could there reasonably be other budgetary and revenue impacts to the City?
Environmental	• What are the potential environmental impacts of the action? • Will the action require environmental regulatory approvals? • Will the action comply with all applicable federal, state, regional, and local environmental regulations? • Will the action reasonably affect any endangered, threatened, or otherwise sensitive species of concern?

Relative Cost Categories	
$	Less than $50,000
$$	$50,001 to $999,999
$$$	Greater than $1,000,000

APPENDIX B – OUTREACH ENGAGEMENT MATERIALS

City of Mission Viejo 2023 LHMP Update Project Website

https://cityofmissionviejo.org/departments/police-services/local-hazard-mitigation-plan

MISSION VIEJO
Make Living Your Mission

Home | News | Events | Services & Guides | Document Center | Departments | Government

HOME > LOCAL HAZARD MITIGATION PLAN

Text + -

- Police Services
  - About
  - Services
  - Crime Statistics
  - **Local Hazard Mitigation Plan**
  - Emergency Preparedness
  - Programs & Education
  - Crime Prevention
  - Events, News & More
  - Volunteer Opportunities

Local Hazard Mitigation Plan

The City of Mission Viejo is preparing an update to its Local Hazard Mitigation Plan (LHMP). This plan will help create a safer community for residents, businesses, and visitors. The LHMP allows public safety officials and city staff, elected officials, and members of the public to understand the threats from natural and human-caused hazards in our community. The plan will also recommend specific actions to proactively decrease these threats before disasters occur.

Why have an LHMP?

An LHMP will let Mission Viejo better plan for future emergencies. Usually, after a disaster occurs, communities take steps to recover from the emergency and rebuild. An LHMP is a way for the City to better prepare in advance for these disasters, so when they do occur, less damage occurs, and recovery is easier. Our community can use LHMP strategies to reduce instances of property damage, injury, and loss of life from disasters. Besides protecting public health and safety, this approach can save money. Studies estimate that every dollar spent on mitigation saves an average of four dollars on response and recovery costs. An LHMP can also help strengthen the mission of public safety officers, such as police and fire department staff, providing them with clear roles and responsibilities to build a safer community.

Besides helping to protect Mission Viejo, our LHMP will make the City eligible for grants from the Federal Emergency Management Agency (FEMA) that can further improve community safety and preparedness. Having an adopted LHMP can also make Mission Viejo eligible to receive more financial assistance from the State when disasters do occur.

TAKE THE CITY'S LOCAL HAZARD MITIGATION SURVEY

What is in our LHMP?

The City of Mission Viejo LHMP includes four main sections:

- A summary of the natural and human-caused hazards that pose a risk to our community. This will include descriptions of past disaster events and the chances of these disasters occurring in the future.
- An assessment of the threat to Mission Viejo, which will describe how our community is vulnerable to future disasters. The plan will examine the threat to important buildings and infrastructure, such as police and fire stations, hospitals, roads, and utility lines. It will also examine the threat to community members, particularly vulnerable populations.
- A hazard mitigation strategy, which will lay out specific policy recommendations for Mission Viejo to carry out over the next five years. These recommendations will help reduce the threat that our community faces from hazard events.
- A section on maintaining the plan, which will help ensure that our LHMP is kept up-to-date. This will make it easier for us to continue proactively protecting ourselves and keep the City eligible for additional funding.

DOWNLOAD MISSION VIEJO LOCAL MITIGATION PLAN UPDATE PRESENTATION - April 13, 2023

What hazards will our LHMP help protect against?

The City's current plan addresses the following natural and human-caused hazards:

- Coastal Storms
- Dam Failure
- Flood
- Geologic Hazards
- Landslide
- Severe Winter Storm (Flood Section)
- Seismic Hazards (Seismic Shaking, Liquefaction, Earthquake-Induced Landslide)
- Windstorms
- Wildfire
- Climate Change (Will be addressed in all Hazards)

Our LHMP will also look at how climate change may affect these hazards and may include other hazards that pose a threat to our community.

How is our LHMP being prepared?

The City has assembled a Hazard Mitigation Planning Committee (HMPC), which includes representatives from City Departments and is supported by key stakeholders, and technical consultants. Together, these participants form the project team responsible for guiding the overall development of our LHMP.

When will our LHMP be done?

The project team plans to release a first draft of the Mission Viejo LHMP for public review in Spring 2023. After members of the public provide comments and feedback, the City will revise the plan and send it to the California Office of Emergency Services and FEMA for review and approval. Once approved by these agencies, the Mission Viejo City Council will adopt the final LHMP. We hope to have the plan ready for adoption in Summer 2023, but it may be later depending on how long state and federal review takes.

How can I get involved?

You can get involved in preparing our LHMP in different ways.

- The City has released an online survey to members of the public, asking for information about past experiences with natural hazards and how our LHMP can be the most useful. Take the survey and encourage your friends and family to do the same.
- The City will release a draft of the completed LHMP for public review. Please review and provide comments on this document, either at in-person meetings or in writing.
- Encourage members of the Mission Viejo City Council to adopt the plan and begin implementing it.
- Reach out to the project team at LHMP@cityofmissionviejo.org for more ways to stay involved.

What can I do now to be better prepared for disasters?

- Know the hazards that may affect you at home, work, or school. You can find out more at http://myhazards.caloes.ca.gov/.
- Assemble an emergency kit for your home. In a disaster, you may have to rely on supplies in your emergency kit for at least three days. Be sure to include supplies for pets and anyone with special needs in your home. Learn more at https://www.ready.gov/kit.
- Have a disaster plan for your household, including how people should contact each other if a disaster occurs and where you should meet.
- Learn about your neighbors and how to help them. In a disaster, emergency responders may not be able to reach your neighborhood for a while. Know if your neighbors have any special needs, and check on them as soon as possible.
- Ensure your homeowner's or renter's insurance covers you from disasters such as earthquakes and floods. Good insurance coverage will help you recover more easily if these disasters occur.
- Volunteer with an emergency response or community service organization that does work on disaster

The City of Mission Viejo Hazard Mitigation Plan Survey

Dear Community Member,

The City of Mission Viejo is preparing an update to the Local Hazard Mitigation Plan or LHMP. Like all other communities, Mission Viejo could potentially face widespread devastation in the event of a natural disaster. While no community can completely protect itself against all potentially hazardous situations, this plan will help identify those situations, assess our current provisions, and outline a strategy to lessen the vulnerability and severity of future disasters.

Your responses will help shape the plan. We appreciate your feedback.

* Indicates required question

Email*

Cannot pre-fill email

Hazard Awareness

1. Please indicate whether you live or work in the City of Mission Viejo.

*

I live in the City of Mission Viejo.
I work in the City of Mission Viejo.
I live and work in the City of Mission Viejo.
Neither applies to me, but I am interested in the City's resiliency.

2. What is the ZIP code of your home?

*

Your answer

3. Have you been impacted by a natural hazard event in your current residence? *

Yes
No

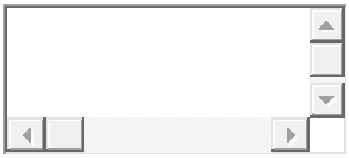
4. If you answered yes to the previous question, please select the type of natural hazard event you have been impacted by (select all that apply).

Column 1

Severe Weather (High winds, Extreme Heat)
Earthquake
Wildfire
Landslide
Flooding (Including Dam Inundation)
Winter/Coastal Storms
Other
Severe Weather (High winds, Extreme Heat)
Earthquake
Wildfire
Landslide
Flooding (Including Dam Inundation)
Winter/Coastal Storms
Other

If you selected "Other" above, please list any additional hazards that have previously impacted your neighborhood or home.

Your answer



5. The following natural hazards could potentially impact the city. Please mark the THREE (3) hazards that are of most concern to your neighborhood or home.

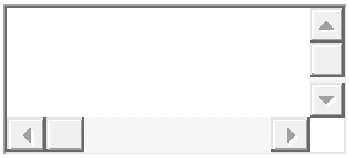
Column 1

Severe Weather (High Winds, Extreme Heat)
Earthquake
Wildfire
Landslide
Flooding (Including Dam Inundation)
Winter/Coastal Storms
Other
Severe Weather (High Winds, Extreme Heat)
Earthquake
Wildfire

Landslide
Flooding (Including Dam Inundation)
Winter/Coastal Storms
Other

If you selected "Other" above, please list any additional hazards that have previously impacted your neighborhood or home.

Your answer



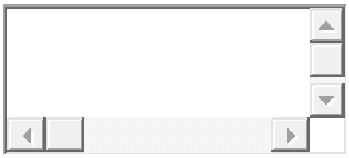
6. The planning team uses various data sources to identify hazards in your community; however, some sources do not provide data at a general citywide level. Are there any small-scale issues, such as ponding at a specific intersection during rain, that you would like the planning team to consider?

*

I am not aware of local hazards
I am aware of local hazards

If you indicated "I am aware of local hazards" above, please provide as much detail as possible, including the location and type of hazard.

Your answer



7. How concerned are you that climate change may create new hazardous situations in Mission Viejo or worsen existing natural hazards?

*

Very concerned.
Somewhat concerned.
Somewhat unconcerned.
Not at all concerned.
Unsure

8. When do you think climate change will pose a threat to your health, property, livelihood, or overall well-being?

*

It already is.
Within the next five years.
In five to twenty years.

Not for at least another twenty years.
Never, or not in my lifetime.

9. If you have taken any action to protect yourself against natural hazards, how confident are you that these actions will be sufficient to protect against more severe hazards that may occur in the future?

*

Very confident.
Somewhat confident.
Somewhat unconfident.
Not at all confident.
Unsure.

10. If you are a homeowner, do you have adequate homeowners' insurance to cover the hazards that could impact your home?

*

Yes, my insurance coverage should be adequate.
No, I don't believe my insurance coverage would be adequate for a major disaster.
Unsure.
I do not have an insurance policy.
Not applicable; I rent my current residence.

11. If you rent your residence, do you have renters' insurance?

*

Yes
No
Not applicable; I own my residence

12. Do you have flood insurance for your home?

*

Yes, I own my home and have flood insurance.
Yes, I rent my home and have flood insurance.
No, but I am interested in reviewing flood insurance options (http://www.floodsmart.gov/floodsmart/).

13. Have you done anything to your home to make it less vulnerable to hazards such as earthquakes, floods, and fires?

*

Yes
No
Not applicable; I rent my residence.

If not, do you plan to?

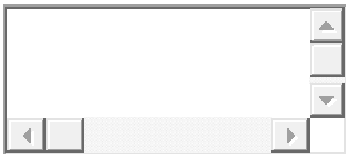
Your answer

14. If a severe hazard event occurred today, such that all services were cut off from your home (power, gas, water, sewer) and you were unable to leave or access a store for 72 hours, which of these items do you have readily available?

Column 1
Potable water (3 gallons per person)
Cooking and eating utensils
Can opener
Canned / nonperishable foods (ready-to-eat)
Gas grill/camping stove
Extra medications and contact lenses (if applicable)
First aid kit/supplies
Portable AM/FM radio (solar powered, hand crank, or batteries) i. Handheld "walkie-talkie" radios (with batteries)
Important family photos/documentation in a water- and fireproof container
Extra clothes and shoes
l. Blanket(s) / sleeping bag(s)
Cash
Flashlight (with batteries)
Gasoline
Telephone (with batteries)
Pet supplies
Secondary source of heat
Potable water (3 gallons per person)
Cooking and eating utensils
Can opener
Canned / nonperishable foods (ready-to-eat)
Gas grill/camping stove
Extra medications and contact lenses (if applicable)
First aid kit/supplies
Portable AM/FM radio (solar powered, hand crank, or batteries) i. Handheld "walkie-talkie" radios (with batteries)
Important family photos/documentation in a water- and fireproof container
Extra clothes and shoes
l. Blanket(s) / sleeping bag(s)
Cash
Flashlight (with batteries)
Gasoline
Telephone (with batteries)
Pet supplies
Secondary source of heat

What else do you have in your emergency kit?

Your answer



For more information on emergency kits, visit:
https://www.ready.gov/kit

15. Are you familiar with the special needs of your neighbors in the event of a disaster situation (special needs may include limited mobility, severe medical conditions, and memory impairments)?

*

Yes
No

16. Have you attended the free Community Emergency Preparedness Academy (CEPA)?

*

Yes
No, but I would like to learn more about CEPA.
No, I am not interested in attending CEPA.

For more information about CEPA, please visit:
https://cityofmissionviejo.org/departments/police-services/emergency-preparedness/cepa

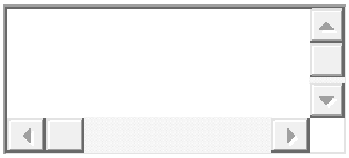
17. How can the City help you become better prepared for a disaster? (Choose all that apply)

*

Provide effective emergency notifications and communication.
Provide training and education to residents and business owners on reducing future damage.
Provide community outreach regarding emergency preparedness.
Create awareness of special needs and vulnerable populations.
Other (please specify)

If you selected "Other" above, please specify.

Your answer



If you do NOT work in the City of Mission Viejo, please skip to question 21.

18. What is the ZIP code of your workplace?

Your answer

19. Does your employer have a plan for disaster recovery in place?

Yes

No
I don't know

20. Does your employer have a workforce communications plan to implement following a disaster so that they can contact you?

Yes
No

Recommendations and Future Participation

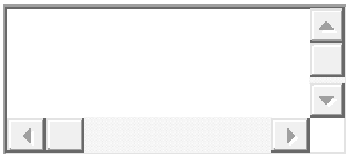
21. Would you like to be contacted when the Draft 2023 Mission Viejo Hazard Mitigation Plan is available for review?

*

Yes, please notify me using my contact information in the next question.
No

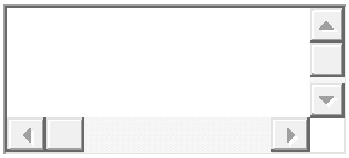
22. If you would like to be notified of future opportunities to participate in hazard mitigation and resiliency planning, please provide your name and e-mail address. Please provide your mailing address if you do not have an e-mail address.

Your answer



23. Please provide us with any additional comments/suggestions/questions regarding your risk of future hazard events.

Your answer



Thank you for taking the time to complete this survey. If you have any questions or know of other people/organizations that should be involved, please contact Paul Catsimanes at LHMP@cityofmissionviejo.org

Mission Viejo Local Hazard Mitigation Plan Update

C.E.P.A. Member Presentation

April 13, 2023

Lake Mission Viejo. (2022, March 20). In Wikipedia. https://en.wikipedia.org/wiki/Lake_Mission_Viejo

Meeting Outcomes

- Provide and Overview of Mission Viejo's LHMP Update Process
- Share Mission Viejos's Hazards of Concern
- Share Mission Viejo's Potential Mitigation Strategies
- Enlist Feedback from CEPA Members

Who is this Plan For?

Emergency Management Staff	City Departments	Stakeholders	Residents, CEPA Members, and Businesses
• Pursue Grants • Reduce future hazard risks	• Increase funding for project and programs	• Opportunities to partner with the City • Opportunities to leverage federal grants for community benefit	• Reduce future hazard risks • Improved quality of life

What is Hazard Mitigation?

Sustained actions taken to reduce or eliminate long-term risk to life and property from hazards

Actions that make the community less vulnerable to natural hazards before disasters strike

Communities reduce their vulnerability through the development of a Local Hazard Mitigation Plan (LHMP)

WHY PREPARE AN LHMP?

Reduces injury, loss of life, property damage, and loss of services from natural disasters.

AB 2140 Compliance

Eligibility for FEMA Grants:
Building Resilient Infrastructure and Communities (BRIC)*
Flood Mitigation Assistance (FMA)
Hazard Mitigation Grant Program (HMGP)
* Replaces the Pre-Disaster Mitigation (PDM) Grant Program

Fitting the pieces together

Review of Hazard Prioritization Table

Plan Organization

- Earthquake/Geologic Hazards (Seismic Shaking, Liquefaction)
- Severe Weather (Windstorm, Extreme Heat, Winter/Coastal Storms)
- Wildfire
- Landslide (Earth Movement)
- Flooding (Including Dam Inundation)

HAZARD RANKING WORKSHEET - City of Mission Viejo 2023 LHMP					
Hazard Type	Probability	Impact			Hazard Planning Consideration
		Location	Primary Impact	Secondary Impacts	
Severe Weather (Windstorm)	Highly Likely	Extensive	Severe	Limited	High
Earthquake	Likely	Extensive	Severe	High	High
Winter/ Coastal Storms	Highly Likely	Significant	Moderate	Limited	Medium
Wildfire	Highly Likely	Limited	Severe	Moderate	Medium
Severe Weather (Extreme Heat)	Highly Likely	Extensive	Weak	Negligible	Medium
Landslide (Earth Movement)	Highly Likely	Negligible	Severe	Limited	Medium
Flooding (Includes Dam Inundation)	Occasional	Limited	Moderate	Limited	Medium

* Climate Change considerations discussed as appropriate within this hazard.

Severe Weather

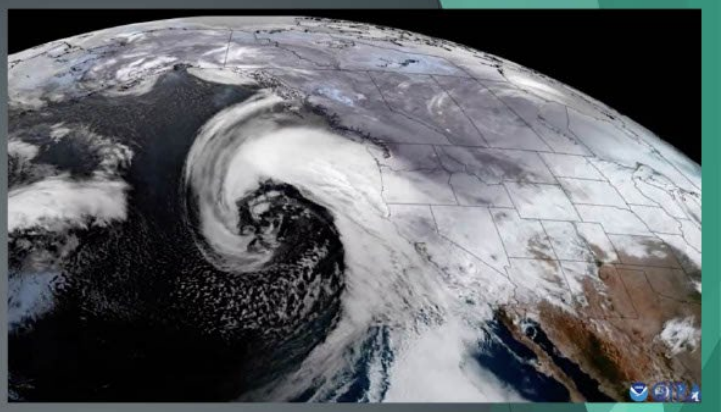
Winter/Coastal Storms

Winter/Coastal Storm - Coastal storms happen when different meteorological conditions converge. Coastal storms are organized systems that have unique characteristics, but each type can turn deadly due to their hazardous consequences — sustained destructive winds, heavy rainfall, storm surge, coastal flooding, and erosion.

Winter/Coastal Storm events will continue in the future and are expected to change as a result of climate change.

Recent Events

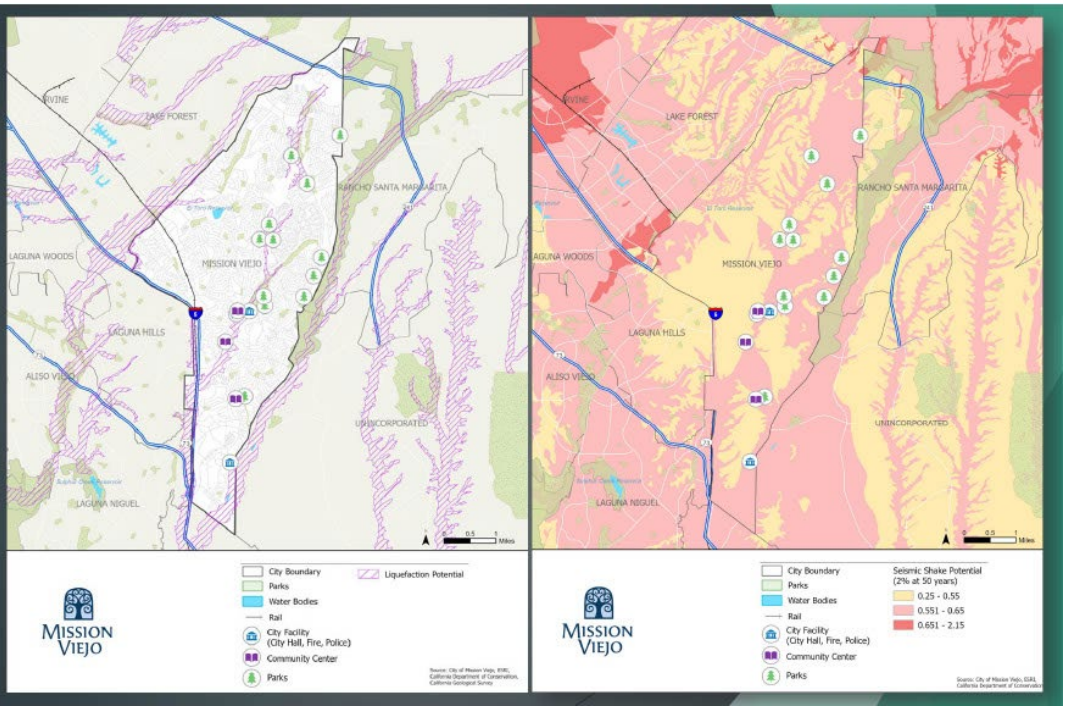
- December 2021, major storm brought intense rainfall, flash flooding, and high winds to the city, and Orange County.
- December 2022, massive winter storms impact southern California causing flash flooding and damage throughout Orange County.
- January 2023, another winter storm in a series of major storms impacts all of southern California and Orange County.



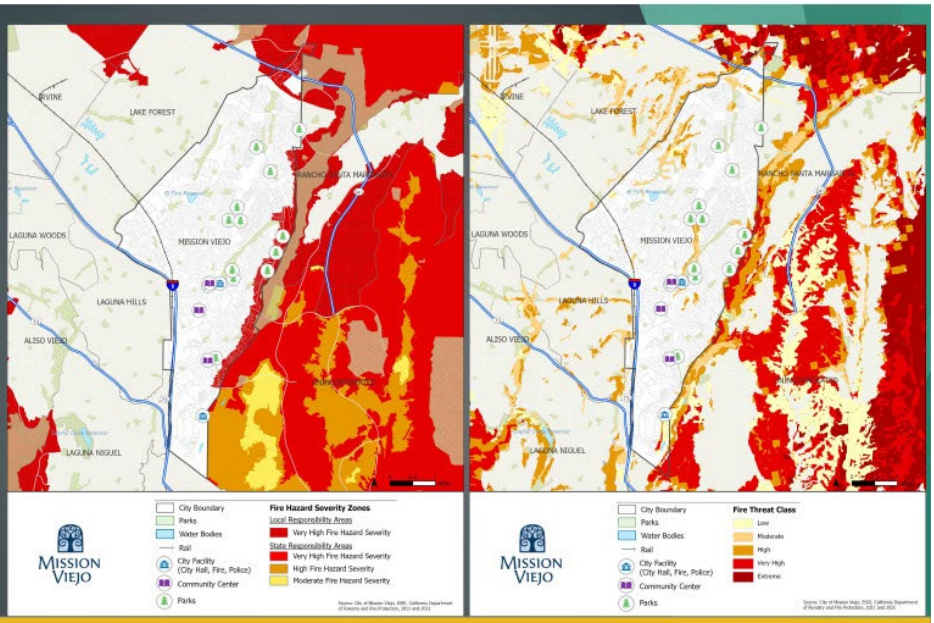
Winter/Coastal Storms are a city-wide hazard and does not necessarily affect one area of the city more than another.

Vulnerable populations, however, may experience greater hardship in mitigating the effects of winter storms.

Seismic Hazards



Wildfire



Fire Threat Zones, Very High Fire Hazard Severity Zones within the City

- Local Responsibility Area (LRA) –City of Mission Viejo (OCFA)
- State Responsibility Area (SRA) – OCFA

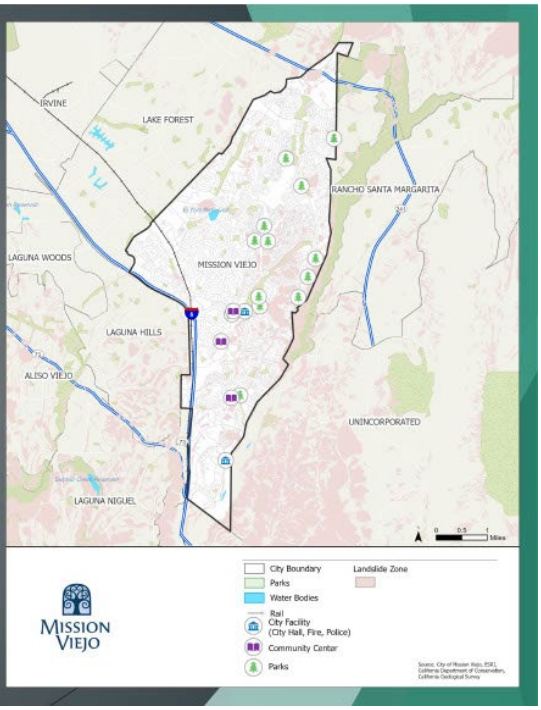
Landslide/Earth Movement Hazards

Masses of earth whose center of gravity has moved outward and downward. Can destroy homes, businesses, and more importantly can injure and kill people caught in the shifting earth. Areas of concern are generally found in locations with steep slopes within the City.

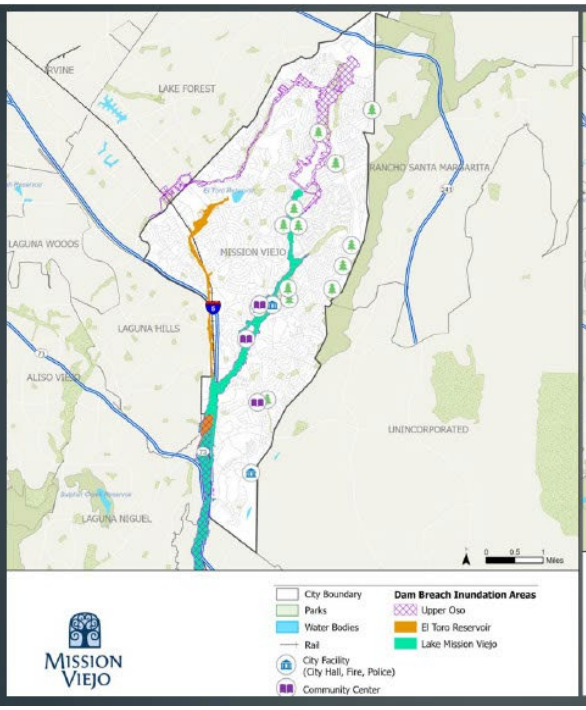
Recent Events

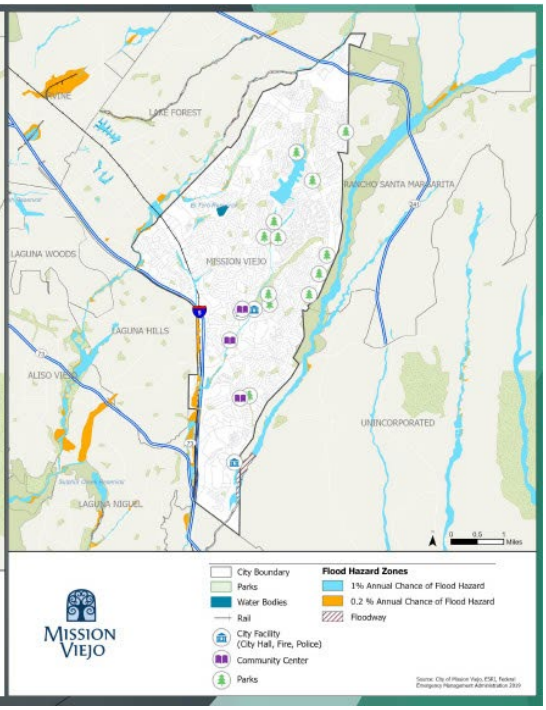
1998/99 - slope failure along the Mojave Slope/Open Space area in the City. No structures were damaged.

2005 - large residential landslide between Ferrocarril and Encorvado Lane. Landslide consisted of an approximate 300 foot wide by 70-foot-high slope failure that occurred during winter storms.



Flooding and Dam Inundation





Potential Types of Mitigation Actions

Plans and Regulations	Structural Projects	Natural Systems Protection	Education Programs	Preparedness and Response Actions
• Ordinances • Regulations • Guidelines	• Infrastructure improvements • Utility relocation • Structural Retrofits	• Stream restoration • Erosion control	• Outreach materials • Websites • Presentations • Trainings	• Mutual aid agreements • Equipment purchases • Notification protocols

High Priority Mitigation Actions in the 2023 Update

Emergency Preparedness Activities

- Conduct regular emergency preparedness drills and training exercises for City Staff, including all hazards training at CSTI.
- Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Community Centers, and any other locations designated in the future.
- Increase number of City staff who have CalOES Safety Assessment Program (SAP) credentials.

High Priority Mitigation Actions in the 2023 Update

Multiple Hazards

- Install and harden emergency backup power at critical facilities deemed necessary. Prioritize installations for facilities that serve as key cooling/warming centers, and evacuation centers.

  (Hazards addressed: All)

Wildfire

- Conduct regular fuel modification projects to reduce fire hazard risks, such as clearing out dead vegetation in parks, open spaces, right-of-way embankments, and areas adjacent to the wildland-urban interface.

How Can You Get Involved?

Check Out the LHMP Webpage

Comment on the Draft Plan

- Expected to be released in Spring/Summer 2023

Online Survey

https://cityofmissionviejo.org/departments/city-manager/local-hazard-mitigation-plan

C.E.P.A. Member Feedback

- Questions about the LHMP Planning Process
- Questions about the Hazards of Concern?
- Thoughts on Potential Mitigation Strategies
- Other Suggestions or Comments

Questions?

Paul Catsimanes

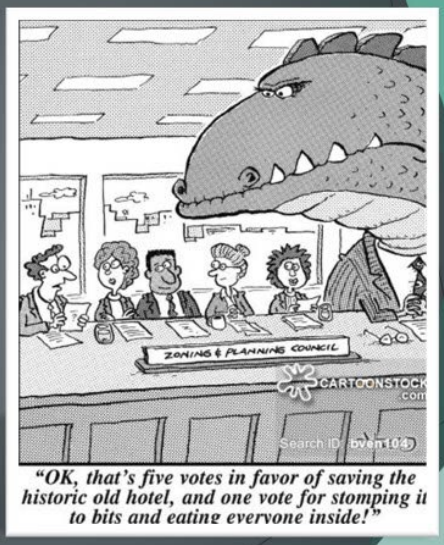
Pcatsimanes@cityofmissionviejo.org

949-246-7014

Aaron Pfannenstiel, AICP

aaron@atlasplanning.org

951-444-9379



"OK, that's five votes in favor of saving the historic old hotel, and one vote for stomping it to bits and eating everyone inside!"

The City of Mission Viejo Hazard Mitigation Plan Survey

44 responses

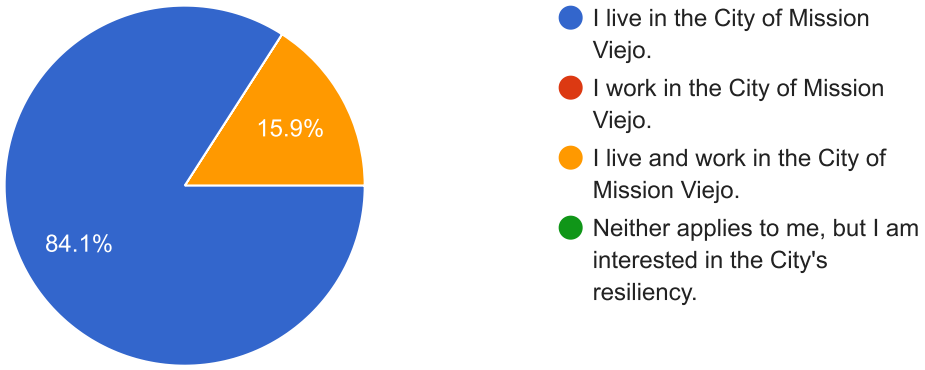
Publish analytics

Hazard Awareness

Copy

1. Please indicate whether you live or work in the City of Mission Viejo.

44 responses



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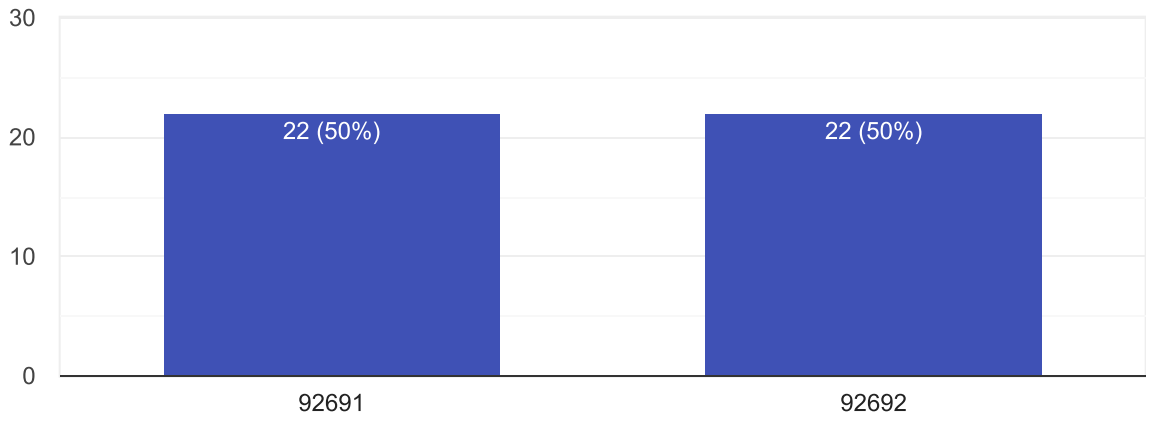
2. What is the ZIP code of your home?

44 responses



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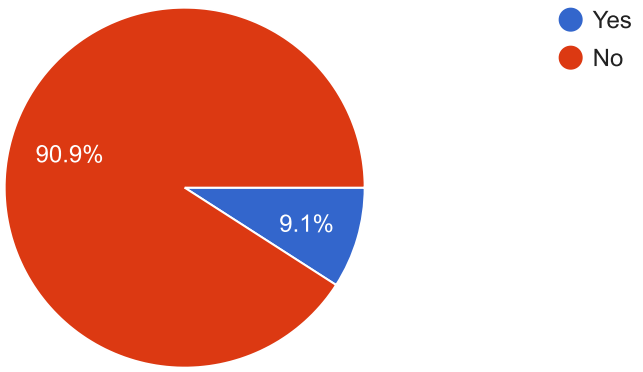
3. Have you been impacted by a natural hazard event in your current residence?

44 responses



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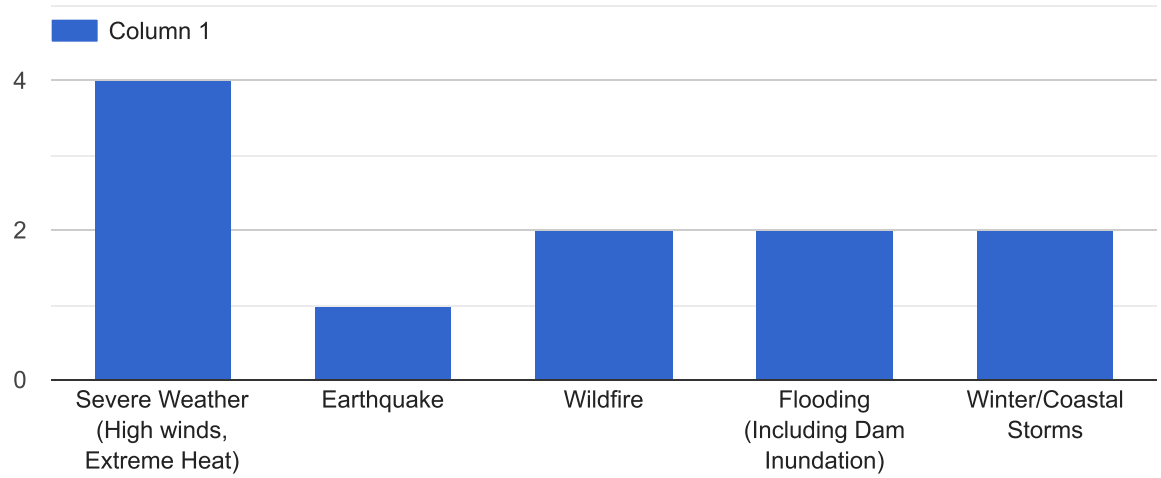
4. If you answered yes to the previous question, please select the type of natural hazard event you have been impacted by (select all that apply).



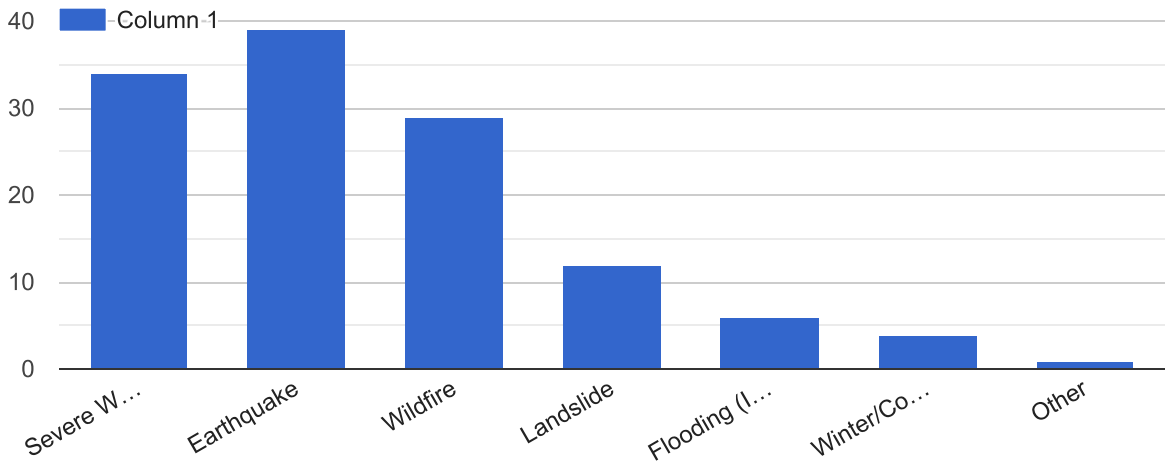
If you selected "Other" above, please list any additional hazards that have previously impacted your neighborhood or home.

1 response

Power outage

5. The following natural hazards could potentially impact the city. Please mark the THREE (3) hazards that are of most concern to your neighborhood or home.

Copy



If you selected "Other" above, please list any additional hazards that have previously impacted your neighborhood or home.

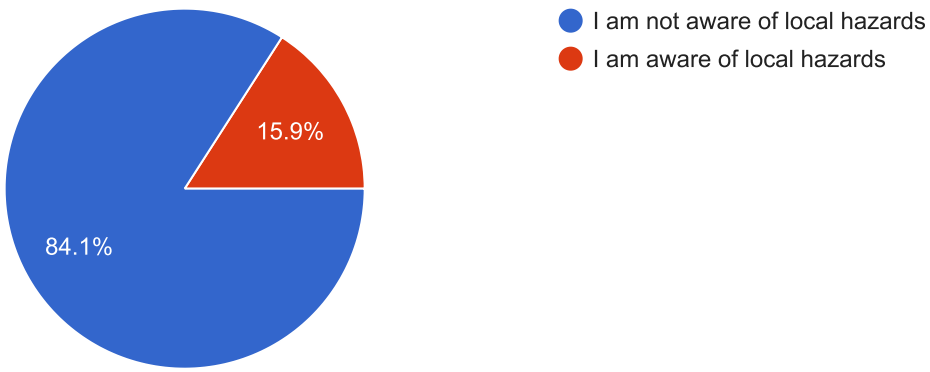
1 response

San Onofre Nuclear Power Plant (Not Operating) stores nuclear rods, some new many used that are in dry storage in containers with a short shelf life. They have the potential to release radio active material in the event of a fire, earthquake or container failure and prevailing winds could affect millions of people.

Copy

6. The planning team uses various data sources to identify hazards in your community; however, some sources do not provide data at a general citywide level. Are there any small-scale issues, such as ponding at a specific intersection during rain, that you would like the planning team to consider?

44 responses



If you indicated "I am aware of local hazards" above, please provide as much detail as possible, including the location and type of hazard.

6 responses

Flooding at Alicia and Jeronimo

Flooded sidewalks in/around Aliso Villas 2.

Aliso Villas 2 severe flooding in common area and HOA doesn't have a solve or never fully resolved issues, this causes landscaping to become demolished and HOA never fixes it back. Common area looks terrible between via Roble 26274, 26266, 26264.

El Toro Reservoir

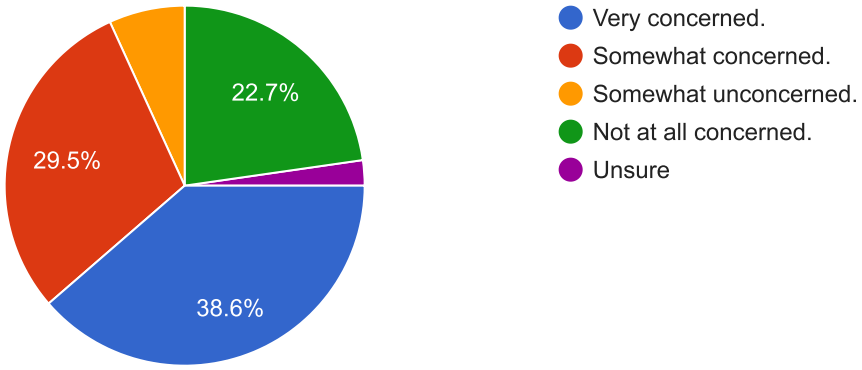
Power outages and traffic signals out

I am a concerned resident of Ridgemont HOA in the City of Mission Viejo. Over the years, the acacia trees on the slope that belongs to Highland Park (Commercial buildings) have grown tall and woody, presenting a serious fire hazard. These trees are not regularly maintained and pose a significant risk to our community. I kindly request that you inspect the Highland Park slope and, if necessary, issue a formal notice to ensure that Highland Park manages their landscape on the slope in a manner that is safe for our community.

Copy

7. How concerned are you that climate change may create new hazardous situations in Mission Viejo or worsen existing natural hazards?

44 responses



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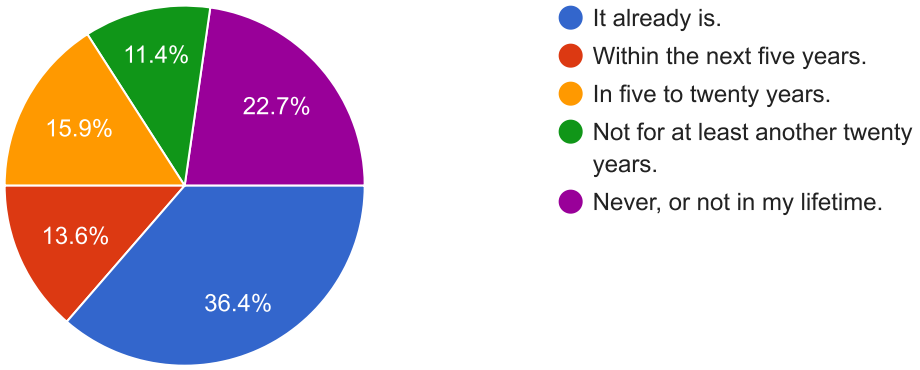
8. When do you think climate change will pose a threat to your health, property, livelihood, or overall well-being?

44 responses



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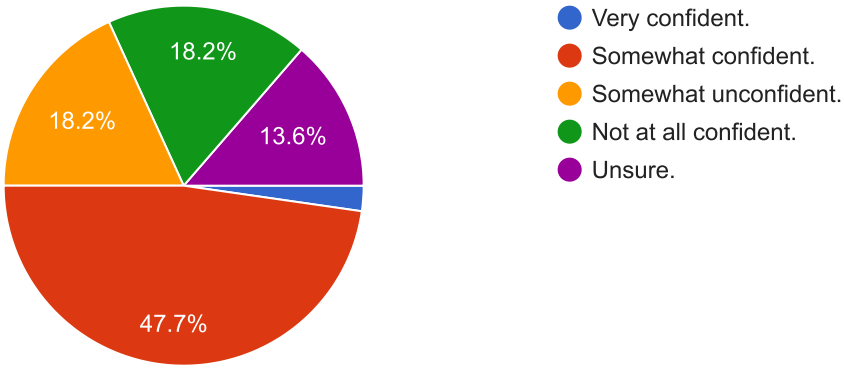
9. If you have taken any action to protect yourself against natural hazards, how confident are you that these actions will be sufficient to protect against more severe hazards that may occur in the future?

44 responses



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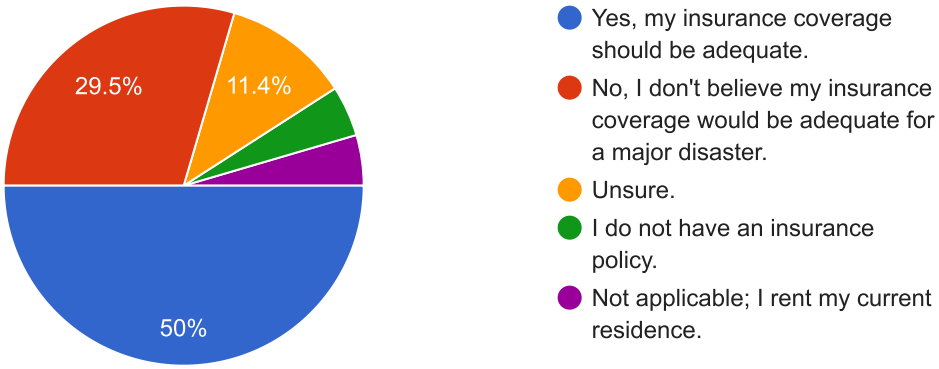
10. If you are a homeowner, do you have adequate homeowners' insurance to cover the hazards that could impact your home?

44 responses



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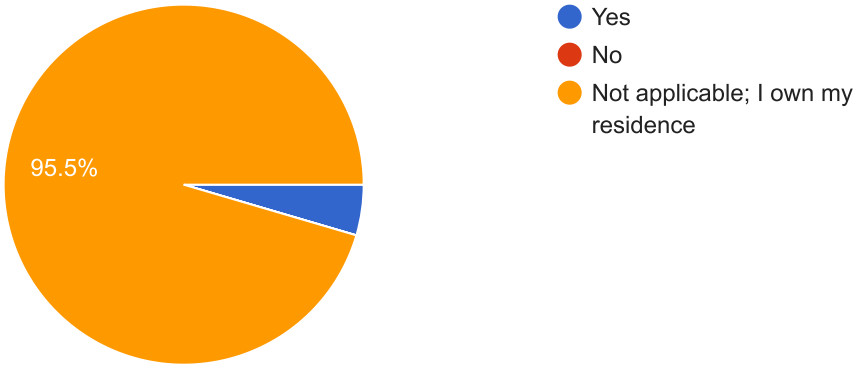
1. If you rent your residence, do you have renters' insurance?

44 responses



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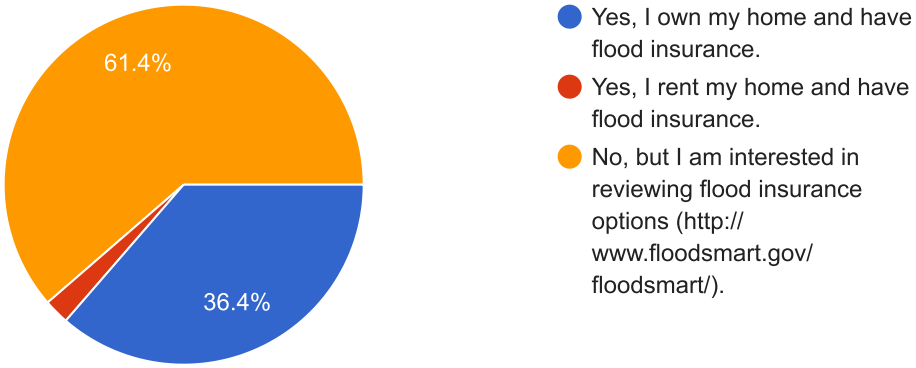
12. Do you have flood insurance for your home?

44 responses



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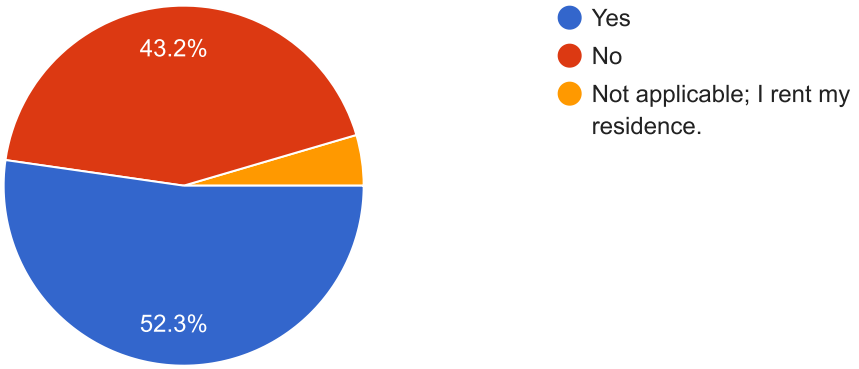
13. Have you done anything to your home to make it less vulnerable to hazards such as earthquakes, floods, and fires?

44 responses



If not, do you plan to?

11 responses

I don’t know what I would do to improve it

I don't know what else to do

Yes

No, not sure what I could do in case of wind, fire and earthquake

Unsure what steps to take.

Unsure

Unsure of what to do

limited by condo association

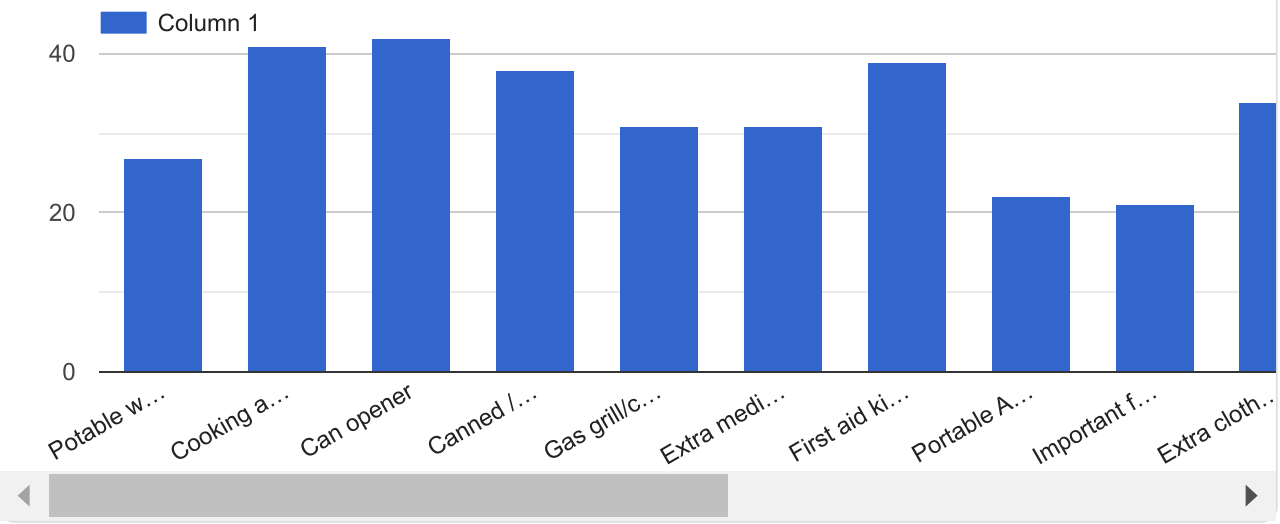
No

The roof was replaced with a lightweight cement tile roof to resist embers. And I carry earthquake insurance !!

I’d like to but don’t know what to do.

14. If a severe hazard event occurred today, such that all services were cut off from your home (power, gas, water, sewer) and you were unable to leave or access a store for 72 hours, which of these items do you have readily available?

Copy



What else do you have in your emergency kit?

14 responses

Emergency food supply

Meeting area

N95

Water filter straws, lanterns, solar phone chargers, bear spray

Generator

Emergency phone numbers

Activities to do to keep occupied that don't require batteries; sewing, puzzles, plain paper and pencils/pens.

plastic bags for toilet waste

Candles, fire pit, pool water, garden food

My neighbors phone numbers so that I can contact them and organize my neighborhood.

Solar lights. Extra batteries. Cell phone chargers.

Solar powered radio

Personal protection.

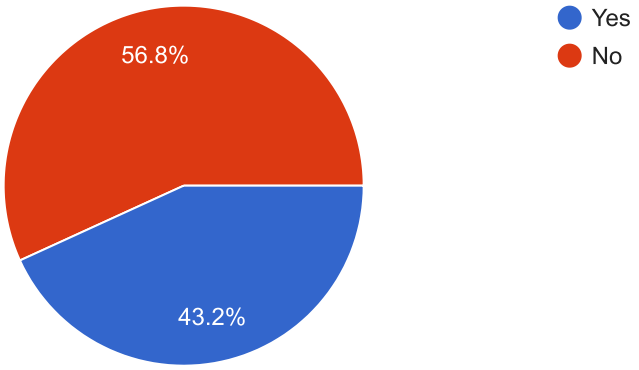
First aid kits

For more information on emergency kits, visit:

Copy

15. Are you familiar with the special needs of your neighbors in the event of a disaster situation (special needs may include limited mobility, severe medical conditions, and memory impairments)?

44 responses



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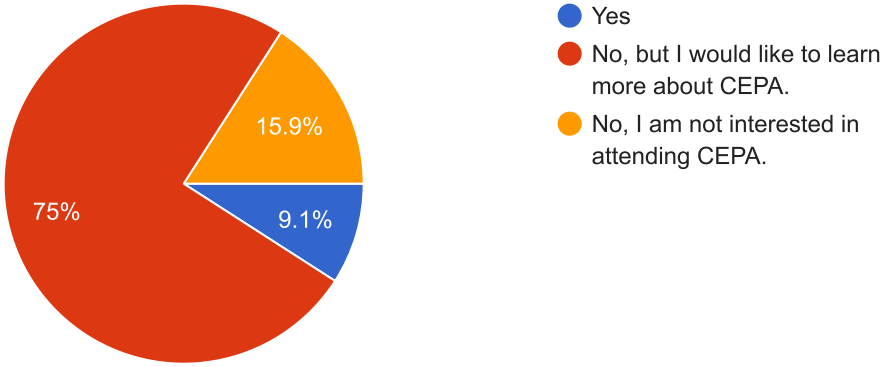
16. Have you attended the free Community Emergency Preparedness Academy (CEPA)?

44 responses



For more information about CEPA, please visit:

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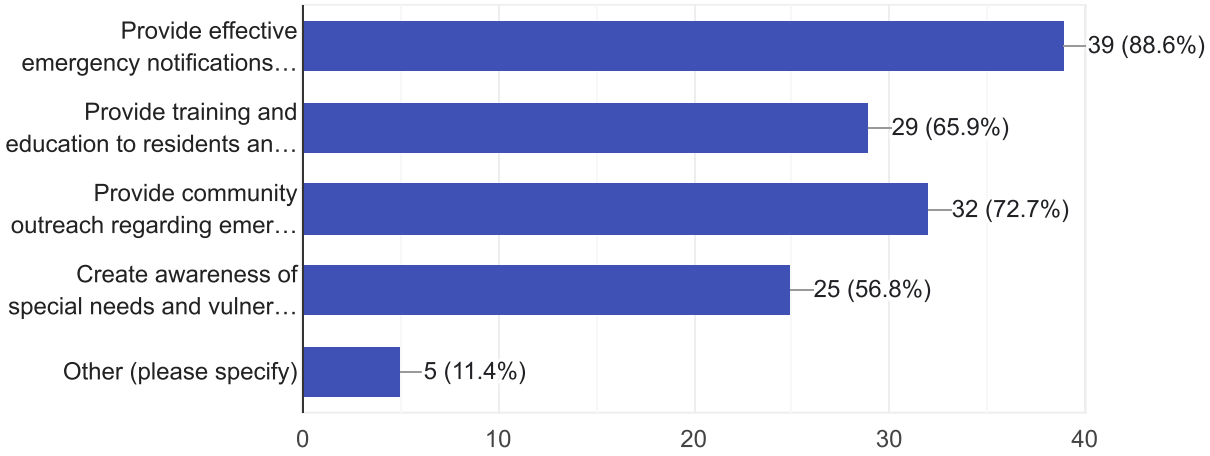
17. How can the City help you become better prepared for a disaster? (Choose all that apply)

44 responses



If you selected "Other" above, please specify.

5 responses

Parent of full assist special needs child on ventilator, with equipment; extra care to learn about adults&children with disabilities during emergency drills

Updated Emergency kit suggestions

Special courses for preparedness if you have livestock (maybe boarded in a nearby community) as well as pet preparation.

Offer CPR training

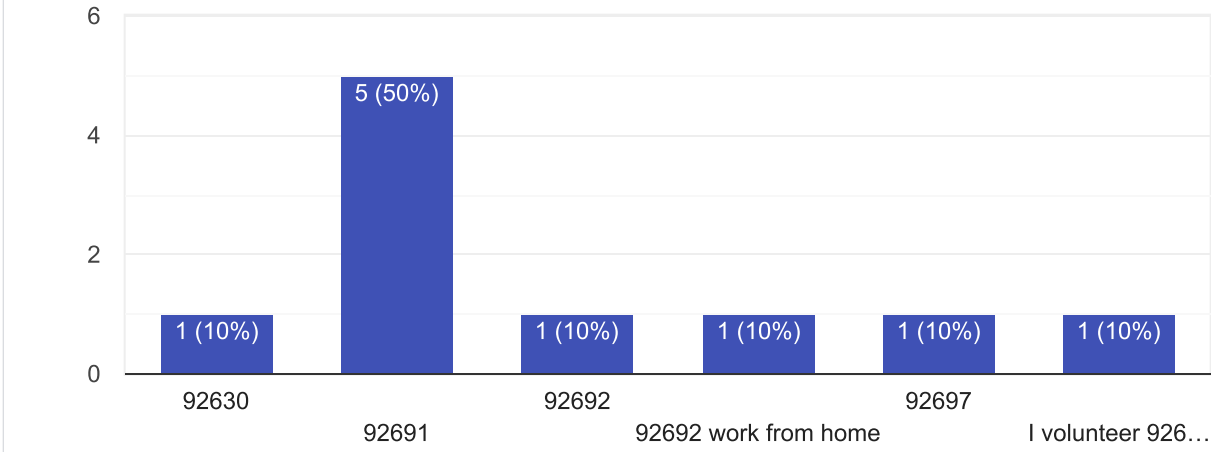
Maintain a current Safety Element and Hazard Mitigation Plan, to better support citizens in the event of a disaster.

If you do NOT work in the City of Mission Viejo, please skip to question 21.

Copy

18. What is the ZIP code of your workplace?

10 responses



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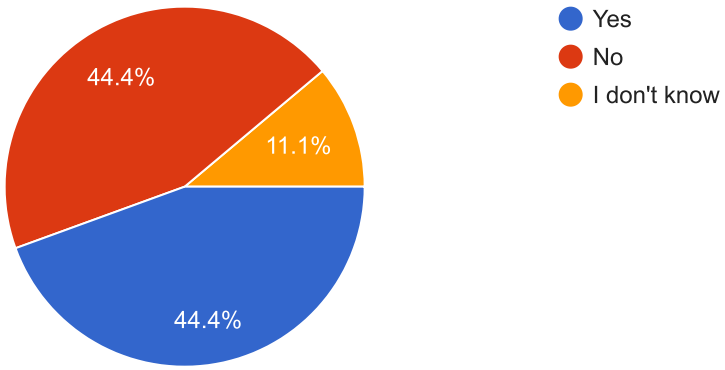
19. Does your employer have a plan for disaster recovery in place?

9 responses



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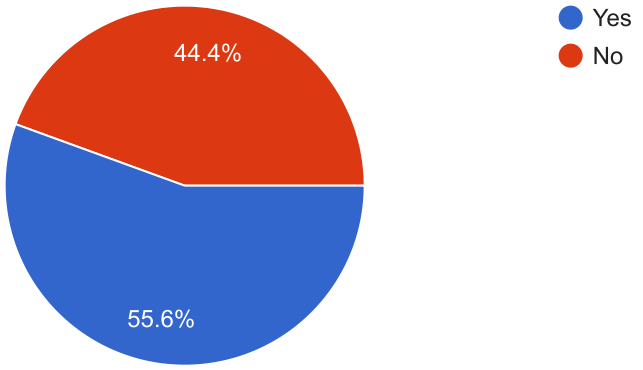
20. Does your employer have a workforce communications plan to implement following a disaster so that they can contact you?

9 responses



Recommendations and Future Participation

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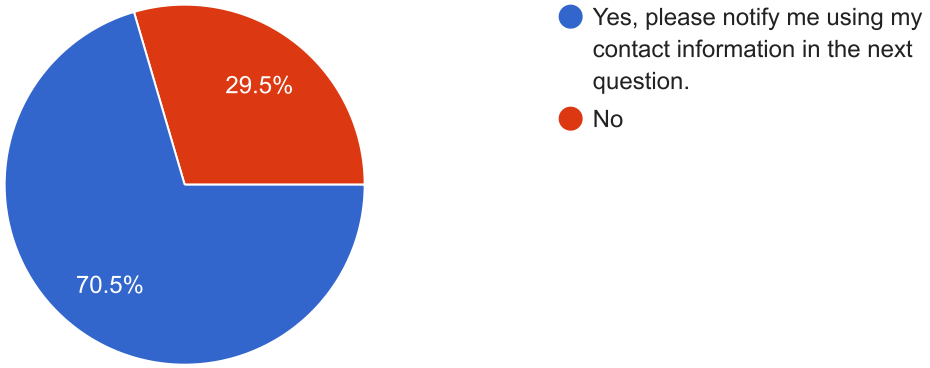
21. Would you like to be contacted when the Draft 2023 Mission Viejo Hazard Mitigation Plan is available for review?

44 responses



Appendix C - Resolution of Adoption
(to be inserted after City Council approval)

Appendix D- List of Key Facilities

CITY OF MISSION VIEJO CRITICAL FACILITIES AND FACILITIES OF CONCERN

Asset Name	Critical Facility / Facility of Concern	Asset Type Category	Asset Type	Address
City Hall/Civic Center	X	City Facilities	City Facility (City Hall, Fire, Police)	200 Civic Center
Corporate Yard/Public Services	X	City Facilities	City Facility (City Hall, Fire, Police)	27204 La Paz Road
Animal Shelter	X	City Facilities	City Facility (City Hall, Fire, Police)	28095 Hillcrest
Library	X	City Facilities	Community Center	100 Civic Center
Montanoso Recreation Center	X	City Facilities	Community Center	25800 Montanoso Dr
Norman P. Murray Community & Senior Center	X	City Facilities	Community Center	24932 Veterans Way
Sierra Recreation Center	X	City Facilities	Community Center	26887 Recodo Lane
Felipe Recreation Center	X	City Facilities	Parks	27161 Nogal
Marguerite Aquatic Center	X	City Facilities	Parks	27474 Casta del Sol Unit 2
Marguerite Tennis Center	X	City Facilities	Parks	27475 Casta del Sol Unit 1
Beebe Park	X	City Facilities	Parks	24190 Olympiad Rd
Thomas R. Potocki Center	X	City Facilities	Parks	27301 La Paz Rd
Florence Joyner Olympiad Park	X	City Facilities	Parks	22760 Olympiad Rd
Marty Russo Youth Athletic Park	X	City Facilities	Parks	22056 Olympiad Rd
James Gilleran Park	X	City Facilities	Parks	24960 Felipe Rd
Melinda Park	X	City Facilities	Parks	28951 Melinda Rd
Oso Viejo Community Park	X	City Facilities	Parks	24932 Veterans Way
Casta Del Sol Golf Course	X	City Facilities	Parks	27601 Casta Del Sol
Curtis Park	X	Community Facilities	Parks	24460 Olympiad Rd

Not all critical facility locations are listed here. Only those locations that have been made accessible to public records have been listed to maintain facility site integrity and security.

Appendix E – Hazard Mitigation Implementation Handbook

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Local Hazard Mitigation Plan Implementation Handbook

February 2024

What Is This Handbook?

The Local Hazard Mitigation Plan (LHMP) for the City of Mission Viejo features an evaluation of the City's hazards as well as a variety of corresponding mitigation actions. These actions are intended to preserve public safety, maintain critical municipal government operations and services when hazard events emerge, and empower community members to take on hazard mitigation at an individual level. This Implementation Handbook (Handbook) is intended for use by City staff and decision-makers after the LHMP is adopted. It will:

- Give clear instructions following the adoption of the LHMP.
- Simplify future updates to the LHMP.
- Assist the City in preparing grant funding applications related to hazard mitigation.
- Guide annual plan review actions.

How do I Use This Handbook?

This Handbook can help City staff and decision-makers in several different situations. If and when the events listed below occur, consult the respective sections of this Handbook for advice on how best to proceed:

- A disaster proclamation has been issued by the Mission Viejo City Council
- A disaster proclamation has been issued by the State of California
- A disaster declaration has been signed by the Federal Government
- I want to apply for mitigation grant funding
- Mission Viejo is undergoing its budgeting process
- Mission Viejo is holding its annual meeting of the Hazard Mitigation Planning Committee
- Mission Viejo is updating the following policy and regulatory documents:
    - The Local Hazard Mitigation Plan
    - The Safety Element of the General Plan
    - The Housing Element of the General Plan
    - The Zoning Code

Who Maintains This Handbook?

The Hazard Mitigation Planning Committee (HMPC) leader is responsible for maintaining this Handbook. At the time of writing, the current HMPC leader is Paul Catsimanes from the Mission Viejo Emergency Services Department. The HMPC may delegate this responsibility to someone else should they choose.

What to do when a disaster has been proclaimed or declared

Disasters may be proclaimed or declared by the Mission Viejo City Council, the State of California, or the federal government. Responsibilities may differ depending on who proclaims or declares the disaster. If multiple organizations proclaim or declare a disaster, consult all applicable lists.

The Mission Viejo City Council

If the Mission Viejo City Council (or the Director of Emergency Services, if the City Council is not in session) proclaims a Local Emergency, take the following steps:

- ☐ Update **Attachment** 1 with information about the disaster. Include information about cumulative damage, including any damage outside of Mission Viejo.
- ☐ Discuss opportunities for local assistance with the representatives from the California Office of Emergency Services (Cal OES).
- ☐ If the disaster damages local infrastructure or City-owned facilities, repair or rebuild the structure to be more resilient, following applicable hazard mitigation actions. A list of actions, organized by hazards, is included in **Attachment 4**.
- ☐ **Chapter 6** of the Mission Viejo LHMP states that the City should consider updating the LHMP if a disaster causes a loss of life in the community, even if there is no state disaster proclamation or federal disaster declaration that includes part or all of the city. If there is a loss of life in Mission Viejo, consider updating the LHMP. Consult the section on updating the LHMP in this Handbook for details.

The State of California

If the State of California proclaims a disaster for Mission Viejo, or an area that includes part or all of Mission Viejo, take the following steps:

- ☐ Update **Attachment 1** with information about the disaster. Include information about cumulative damage, including any damage outside of Mission Viejo.
- ☐ Collaborate with representatives from Cal OES to assess the damage from the event.
- ☐ Discuss opportunities for local assistance with representatives from Cal OES.
- ☐ If the disaster damages local infrastructure or City-owned facilities, repair or rebuild the structure to be more resilient, following applicable hazard mitigation actions. A list of actions, organized by hazards, is included in **Attachment 4.**
- ☐ If the disaster may escalate into a federal disaster declaration, begin any necessary coordination with representatives from the Federal Emergency Management Agency (FEMA).
- ☐ **Chapter 6** of the Mission Viejo LHMP states that the City should consider updating the LHMP if a disaster leads to a state disaster proclamation or federal disaster declaration that includes part or all of Mission Viejo, even if there is no loss of life. Consider updating the LHMP. Consult the section on updating the LHMP in this Handbook for details.

The Federal Government

If the federal government declares a disaster for Mission Viejo, or any area that includes part or all of Mission Viejo, take the following steps:

- ☐ Update **Attachment 1** with information about the disaster. Include information about cumulative damage, including any damage outside of Mission Viejo.
- ☐ Collaborate with Cal OES and FEMA representatives to assess the damage.
- ☐ Determine if Mission Viejo will be eligible for public assistance funds related to the federal disaster declaration. These funds can be used to reimburse the City for response and recovery activities. If the City is eligible, work with FEMA and Cal OES representatives to enact the necessary requirements and receive funding.
- ☐ If the disaster damages local infrastructure or City-owned facilities, repair or rebuild the structure to be more resilient, following applicable hazard mitigation actions. A list of actions, organized by hazards, is included in **Attachment 4**.
- ☐ The Hazard Mitigation Grant Program (HMGP) is a FEMA program that helps fund hazard mitigation activities after a disaster event. Mission Viejo may be eligible for funding because of the federal disaster declaration, although not all activities may meet the program's requirements. If Mission Viejo is eligible, work with FEMA to apply for this funding.
- ☐ **Chapter 6** of the Mission Viejo LHMP states that the City should consider updating the LHMP if a disaster leads to a state disaster proclamation or federal disaster declaration that includes part or all of Mission Viejo, even if there is no loss of life. Consider updating the LHMP. Consult the section on updating the LHMP in this Handbook for details.

I Want to Apply for Mitigation Grant Funding

There are three potential grant funding programs that FEMA administers for hazard mitigation activities. Two of these programs, the Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA) funding sources, are available to communities with an LHMP that complies with FEMA guidelines and has been adopted within the past five years.
The third funding program is the Hazard Mitigation Grant Program (HMGP), which is available for communities that are part of a federal disaster declaration. This section discusses the BRIC and FMA programs and how to apply for them. The HMGP is discussed under the "Federal Government" subsection of the above "What to Do When a Disaster Has Been Proclaimed or Declared" section.

Building Resilient Infrastructure and Communities (BRIC)

Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a FEMA pre-disaster hazard mitigation program that replaced the Pre-Disaster Mitigation (PDM) program.

The BRIC program's guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

Development projects must be identified in a hazard mitigation plan that meets FEMA guidelines and has been adopted within the past five years. When applying to this program, review the list of hazard mitigation actions in **Attachment 4** to see which projects may be eligible. Planning efforts for communities that lack a valid hazard mitigation plan may be eligible for funding if the

effort would create a valid hazard mitigation plan. All BRIC grant applications are processed through the State. To learn more, consult with Cal OES representatives or visit the FEMA webpage for the program. At the time of writing, this webpage is available at https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities.

TAKE THE FOLLOWING STEPS TO APPLY FOR BRIC FUNDING:

- ☐ Confirm that the program is currently accepting funding applications. Check with representatives from Cal OES or consult the Cal OES webpage on the BRIC program. At the time of writing, this webpage is available at https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities.
- ☐ Identify the actions from the hazard mitigation strategy (see Attachment 4) that call on the City to pursue funding or list grants as a potential funding source. Confirm that the actions are consistent with the requirements of the BRIC grant.
- ☐ Coordinate with Cal OES representatives to compile and submit materials for the grant application.

Flood Mitigation Assistance

The FMA grant program is a competitive, national program that awards funding for physical development projects and planning efforts that mitigate against long-term damage from flooding. The funding is only available to communities participating in the National Flood Insurance Program (NFIP), which Mission Viejo currently does. Communities must also have a valid hazard mitigation plan that meets FEMA guidelines to be eligible, and all projects must be consistent with the list of actions in the hazard mitigation strategy. When applying to this program, review the list of hazard mitigation actions in **Attachment 4** to see which projects may be eligible. As with the BRIC program, applications for the FMA program must be processed through the State. To view more information, consult with Cal OES representatives or visit the FEMA webpage on the program. At the time of writing, this webpage is available at https://www.fema.gov/grants/mitigation/floods.

TAKE THE FOLLOWING STEPS TO APPLY FOR FMA FUNDING:

- ☐ Confirm that the program is currently accepting funding applications. Check with representatives from Cal OES or consult the Cal OES webpage on the FMA program. At the time of writing, this webpage is available at https://www.fema.gov/grants/mitigation/floods.
- ☐ Identify the actions from the hazard mitigation strategy (**see Attachment 4**) that call on the City to pursue funding or list grants as a potential funding source. Confirm that the actions are consistent with the requirements of the FMA grant.
- ☐ Coordinate with Cal OES representatives to compile and submit materials for the grant application.

Mission Viejo is going through the budgeting process

Mission Viejo's budget process is an ideal opportunity to secure funding for hazard mitigation actions and to ensure that hazard mitigation efforts are incorporated into the City's fiscal priorities. Mission Viejo currently operates on an annual budget cycle that runs from July 1st to June 30th.

During this process, City staff should take the following steps to incorporate hazard mitigation into Mission Viejo's annual budget:

- ☐ Include hazard mitigation activities into Mission Viejo's list of Capital Improvement Projects (CIP). Review the list of hazard mitigation actions in Attachment 4 and identify the projects that can be included in the CIP or can support efforts within the CIP.
- ☐ Review the risk and threat assessments in the LHMP (Chapter 3 and Chapter 4) to ensure that all items in the CIP list are planned, designed, and constructed to minimize the threat from hazard events.
- ☐ Identify opportunities to identify stand-alone hazard mitigation actions through the annual budget process. Include appropriate items from Attachment 4 in the budget as stand-alone line items, particularly items that the Hazard Mitigation Planning Committee (Planning Committee) considered a high priority.
- ☐ Set aside staff to conduct hazard mitigation activities, including time to participate in Planning Committee meetings and research, prepare, and submit BRIC and FMA grant opportunities (consult the "I Want to Apply for Mitigation Grant Funding" section above).
- ☐ Ensure hazard mitigation activities are reflected in each department's priorities and earmarked time for specific goals.

Mission Viejo is Conducting its Annual meeting of the Hazard Mitigation Planning Committee

The hazard mitigation planning process brings together representatives from multiple City departments as well as other relevant stakeholders. It provides a forum to discuss the hazards in Mission Viejo and how to mitigate them effectively. As mentioned in **Chapter 6** of the LHMP, the Planning Committee should meet at least once each year, beginning a year after the LHMP is adopted. During these meetings, the Planning Committee should discuss implementation progress and integration of hazard mitigation actions in other City documents. At these meetings, the Planning Committee can review the status of the hazard mitigation actions and discuss whether completed or in-progress actions are working as expected. These meetings also allow the Planning Committee to strategically plan for the upcoming year.

It may help for the Planning Committee to meet early in the year, in advance of annual budget activities. **Attachment 3** contains an example of a Planning Committee Meeting Agenda.

The annual meeting should include representatives from City departments and other organizations that originally prepared the LHMP. Representatives from other relevant organizations should also be invited. During the preparation of the current LHMP, the following individuals were part of the Planning Committee:

Mission Viejo Hazard Mitigation Planning Committee		
Name	**Title**	**Department**
Paul Catsimanes	Emergency Services Manager	Emergency Services
Paul Melby	Building Official	Building
Tim Martin	Senior Planner	Planning
Corey Gonyea	Public Services Operations Manager	Public Services
Jerry Hill	Director of Public Services	Public Services
Rich Schlesinger	City Engineer	Engineering
Drew Fine	Community Services Manager	Community Services
Cheyne Maule	Division Chief	Orange County Fire Authority
Chris McDonald	Chief of Police Services	Orange County Sheriff's Department
Tobin Anderson	Sergeant	Orange County Sheriff's Department
Aaron Pfannenstiel	LHMP Project Manager	Atlas Planning Solutions
Crystal Stueve	LHMP Planner	Atlas Planning Solutions
Robert Jackson	LHMP Planner	Atlas Planning Solutions

In advance of Planning Committee meetings, consider using **Attachment 1** to maintain an accurate list of recent disaster events that have occurred in and around Mission Viejo since the LHMP was adopted. At the Planning Committee meeting, review the Plan Maintenance Table **(Attachment 2**) to identify any gaps in the LHMP or any other component of the plan that needs updating. This also allows Planning Committee members the opportunity to review the actions in the hazard mitigation strategy **(Attachment 4)** and ensure that they are implemented as intended.

Mission Viejo is updating its policy and regulatory documents

If Mission Viejo is updating the LHMP, the Safety Element or Housing Element of the General Plan, or the Zoning Code, consult the following applicable section.

Local Hazard Mitigation Plan

All LHMPs should be updated every five years. This helps keep the plan up to date and ensures that it reflects the most recent guidance, requirements, science, and best practices. An updated LHMP also helps keep Mission Viejo eligible for hazard mitigation grants that require a valid, recent LHMP (see "I Want to Apply for Mitigation Grant Funding"), along with an increased amount of post-disaster recovery funds.

The update process for the LHMP takes approximately one year. To ensure that a new LHMP comes into effect before the previous one expires, the update process should begin no later than four years after the plan is adopted. Updates may occur sooner at the City's discretion. Potential reasons for updating the LHMP sooner may include a state disaster proclamation or federal disaster declaration that covers part or all of Mission Viejo, or if a disaster leads to a loss of life in Mission Viejo (see the "What to Do When a Disaster Has Been Proclaimed or Declared" section), as discussed in **Chapter 6** of the LHMP.

Take the following steps to update the LHMP:

Assemble the Hazard Mitigation planning committee

- ☐ Convene a Planning Committee meeting no later than four years after the LHMP is adopted. Invite the regular Planning Committee members, along with representatives from other organizations that may have a role to play in the update process.
- ☐ Review the current status of mitigation actions, including if there are any that are not being implemented as planned or are not working as expected. Determine if there have been any changes in hazard events, regulations, best practices, or other items that should be incorporated into an updated LHMP.
- ☐ Decide if there is a need for a technical consultant to assist with the LHMP update and conduct consultant selection activities if needed. If a consultant is desired, the selection process should begin a few months before the update begins.
- ☐ Create and implement a community engagement strategy based on the strategy prepared for the existing LHMP. Describe in-person and online engagement strategies and materials, including ideas for meetings and workshops, draft community surveys, content for websites and press releases, and other materials that may be useful.

Update the Risk and Threat Assessments

- ☐ Review and update the risk assessment to reflect the most recent conditions in Mission Viejo. Consider recent hazard events, new science associated with hazards and climate change, new development and land use patterns, and other recent changes in local conditions.

- ☐ Evaluate the status of all key facilities. Update this list if new facilities have been constructed or if existing facilities have been decommissioned. Re-assess the threat to key facilities.
- ☐ Review the demographics of community residents and update the threat assessment for vulnerable populations and other community members.
- ☐ Assess any changes to the threat to all other community assets, including key services, other facilities, and economic drivers.

UPDATE THE MITIGATION ACTIONS

- ☐ Update the existing hazard mitigation actions to reflect actions in progress. Remove actions that have been completed or revise them to increase their effectiveness. Revise actions that have been abandoned or delayed to make them more feasible or remove them from the list of mitigation actions if they are no longer appropriate for Mission Viejo.
- ☐ Develop mitigation actions to improve the status of hazard mitigation activities in Mission Viejo by addressing any issues not covered by the existing LHMP.
- ☐ The ability to expand current mitigation capabilities will generally be reliant upon the budgeting allocated for each department/program for that fiscal year. The level at which these programs may or may not be expanded upon, will be dependent upon the amount of funding received. FEMA has released a series of guides over the past few years which highlight some of the ways in which jurisdictions can expand mitigation. Some strategies for increasing current mitigation capabilities may include:
  - City should actively identify, adopt, and enforce the most current set of development codes and standards available. Strongly encouraging new development to be constructed to higher standards than currently required, increasing resilience within the community.
  - Engaging parts of the community that may not be actively involved in mitigation efforts.
  - Expanding the number and types of organizations involved in mitigation planning and implementation, increasing both efficiency and bandwidth.
  - Fostering new relationships to bring underrepresented populations and partners to the hazard mitigation planning process.
  - During the annual LHMP review, the HMPC should look for opportunities to fund and expand/enhance the effectiveness of current mitigation actions.
  - During annual budgeting processes, the City should identify new funding sources (bonds, grants, assessment districts, etc.) that can be used to support existing capabilities enhancements.
- ☐ Ensure that the feedback from the community engagement activities is reflected in the new and updated mitigation actions.

REVIEW AND ADOPT THE UPDATED PLAN

- ☐ Review the other chapters and appendices of the LHMP to reflect any changes made through the update process.
- ☐ Release the updated plan to the Planning Committee members and revise the plan to reflect any comments by Planning Committee members.

- ☐ Distribute the updated Plan to any appropriate external agencies not included in the Planning Committee and revise the plan as appropriate in response to any comments.
- ☐ Release the updated plan publicly for review and make revisions to the plan to reflect public comments.
- ☐ Submit the plan to Cal OES and FEMA for approval and make any necessary revisions.
- ☐ Submit the plan to the Mission Viejo City Council for adoption.

The Safety Element of the General Plan

The Safety Element is a required component of Mission Viejo's General Plan. It can be updated as a stand-alone activity or as part of a more comprehensive process to update multiple sections or all of the General Plan. The Safety Element does not need to be updated on any set schedule, but updates should be frequent enough for the element to remain current and applicable to the community.

Local communities can incorporate their LHMP into their Safety Element as allowed under Section 65302.6 of the California Government Code, as long as the LHMP meets minimum federal guidelines. This allows communities to be eligible for an increased share of post-disaster relief funding from the State if a hazard situation occurs, as per Section 8685.9 of the California Government Code.

Take the following steps to incorporate the LHMP into the Safety Element:

INCORPORATE NEW REQUIREMENTS INTO THE SAFETY ELEMENT, AND ENSURE THAT THE LHMP IS CONSISTENT WITH THE SAFETY ELEMENT

- ☐ Review the requirements for Safety Elements in Section 65302(g) of the California Government Code and for LHMPs in Section 65302.6. Ensure that both documents meet all state requirements.
- ☐ Ensure that the information in both plans does not contradict each other and that any inconsistencies are corrected to use the most accurate and appropriate information. This information should include a community description, a risk assessment, and a threat assessment.
- ☐ Ensure that the policies in the Safety Element support the LHMP and provide a planning framework for specific hazard mitigation actions.

The Housing Element of the General Plan

The Housing Element is a required component of Mission Viejo's General Plan. Section 65583 of the California Government Code requires a Housing Element to analyze and plan for new residential growth in a community, including residential growth for households with an annual income below the area median. Like an LHMP, state regulations require the Housing Elements to be updated regularly to remain current and valid.

The Housing Element is not required to contain any information or policies related to hazards, although it may include policies that address retrofitting homes to improve resiliency. However, state law links the regular schedule of Housing Element updates to mandatory revisions to other General Plan elements. For example, Section 65302(g)(2) of the California Government Code

requires that communities that update their Housing Element on or after January 1, 2009, also update their Safety Element to include specific information and policies related to flood protection. As the LHMP is incorporated into the Safety Element, updates to the Housing Element may indirectly trigger updates to the LHMP.

To update the LHMP concurrent with updates to the Housing Element, take the following steps:

ENSURE THAT THE LHMP MEETS ANY NEW REQUIREMENTS FOR THE SAFETY ELEMENT THAT MAY BE TRIGGERED BY A HOUSING ELEMENT UPDATE

- ☐ Section 65302(g) of the California Government Code lists several requirements for the Safety Element of the General Plan. Some of these requirements are triggered by updates to the Housing Element. Check to see if there are any new requirements of this nature. Note that the requirement is linked to the new Housing Element's adoption date, not the date the update process begins.
- ☐ Because the LHMP is incorporated into the Safety Element, any amendments or revisions to the Safety Element triggered by the Housing Element update may be made directly in the LHMP. Requirements triggered by the Housing Element are unlikely to require a full rewrite of the LHMP, but the process should fully involve the Planning Committee and include appropriate community engagement.
- ☐ Adopt the updated LHMP and incorporate it into the Safety Element. If necessary, amend the Safety Element to ensure the two documents are consistent (review the "Incorporate New Requirements Into the Safety Element, and Ensure that the LHMP is Consistent with the Safety Element" subsection above).

The Mission Viejo Municipal Code

Mission Viejo's Municipal Code contains a set of standards that guide land uses and development in the community. These standards include where different types of buildings and land use activities may be located, how these structures must be built, and how they must be operated or maintained. The Municipal Code may include requirements that structures (particularly new structures or those undergoing substantial renovations) incorporate hazard-resistant features, be located outside the most hazard-prone areas, or take other steps to reduce hazard vulnerability.

All communities in California are required to adopt the minimum state Building Standard Code (BSC), which includes some hazard mitigation requirements for new or significantly renovated structures. The BSC is generally updated every three years, with supplemental code updates halfway into each update cycle. Title 8, "Buildings and Construction," of Mission Viejo's Municipal Code contains building regulations and incorporates the BSC. Other sections of the Code adopt additional standards as desired by the City that adapts the BSC to Mission Viejo's local context.

As a participant in the National Flood Insurance Program (NFIP), Mission Viejo is required to incorporate Floodplain Management Requirements in its Zoning Code, which is located in Title 9, Chapter 9.100 – Floodplain Management. These regulations establish standards for developing and operating facilities within mapped flood-prone areas. Other sections of the Mission Viejo Municipal Code may include additional standards related to hazard mitigation activities.

With the exception of the Floodplain Management Regulations and the minimum standards in the BSC, Mission Viejo is not required to incorporate hazard-related requirements in the Municipal Code. However, the Municipal Code is an effective tool for implementing hazard mitigation

measures related to the siting, construction, and operation of new buildings and other structures. Substantial updates to the Municipal Code, including the Buildings and Construction and Zoning Code sections, should be done in a way that is consistent with the LHMP.

Include Hazard-Related Requirements in Applicable Sections of the Mission Viejo Code of Ordinances

- ☐ If the BSC is being updated, evaluate the hazard-related requirements of all sections in the new BSC. Identify any areas where it may be feasible to add or revise standards to help reduce the threat from hazard events. Ensure that these standards are consistent with the LHMP. Consider whether standards should be applied to all structures, to specific types of structures, or to structures in a limited area (such as a flood plain).
- ☐ If the Zoning Code is being updated, ensure that all requirements do not expose community members or community assets to an excessive risk of harm. Where feasible, use the requirements to strengthen community resiliency to hazard events. Ensure that these standards are consistent with the LHMP. Consider possible standards such as overlay zones that strengthen zoning requirements in hazard-prone areas, landscaping and grading requirements that buffer development from hazards, siting, and design standards that make structures more resilient, and other strategies as appropriate.

Attachment 1: Disaster Information Table

Use this table to fill out the information about any disaster events that have occurred in Mission Viejo or nearby and have affected the community. Include the date and location of the disaster event, the damages associated with the event, and any information about disaster proclamations or declarations resulting from the event.

Date	Location	Damages *	Declaration Details †

* Includes number and type of injuries, number of deaths, and cost of physical damage
† If the disaster was proclaimed or declared by the local, state, and/or federal government

Attachment 2: Plan Maintenance Table

Use this table when reviewing the LHMP as part of the Planning Committee's annual activities. For each section of the LHMP, note if any changes should be made to make the plan more effective for the community. This includes noting if anything in the LHMP is incorrect or if any important information is missing. Make revisions consistent with these notes as part of the next update to the LHMP.

Section	Is Anything Incorrect?	Is Anything Missing?	Should Any Other Changes Be Made?
Multiple sections or throughout			
Chapter 1: Introduction			
Chapter 2: Community Profile			
Chapter 3: Risk Assessment			
Chapter 4: Threat Assessment			
Chapter 5: Mitigation Strategy			
Chapter 6: Plan Maintenance			
Appendices			

Attachment 3: Sample Agenda and Topics for the Hazard Mitigation Planning Committee

This attachment includes a sample agenda and discussion topics for the annual meeting of the Planning Committee. Meetings do not have to follow this order or structure, but the items included in this attachment should be addressed as part of the annual meeting. During the update process for the LHMP, it is likely that the Planning Committee will meet more frequently. The meetings of the Planning Committee during the update process will involve different discussion topics.

ITEM 1: RECENT HAZARD EVENTS

1.1. What hazard events have occurred this past year in Mission Viejo or nearby in a way that affected the community?
- Identify events that caused loss of life or significant injury to Mission Viejo community members, significant property damage in Mission Viejo, or widespread disruption to Mission Viejo.
- More minor events should also be identified if there is a need for a community response to mitigate against future such events.

1.2. What are the basic facts and details behind any such hazard events?
- Consider the size and location of the affected area, any measurements of severity, any injuries and deaths, the cost of any damage, the number of people displaced or otherwise impacted, and other relevant summary information.
- Ensure that these facts and details are clearly recorded for future plan updates, including using the Disaster Information Table (**Attachment 1**).

ITEMS 2: MITIGATION ACTION ACTIVITIES

2.1. What mitigation actions have been fully implemented? Are they working as expected, or do they need to be revised?

2.2. What mitigation actions have started to be implemented since the Planning Committee last met? Is the implementation of these actions proceeding as expected, or are there any barriers or delays? If there are barriers or delays, how can they be removed?

2.3. What mitigation actions are scheduled to begin implementation in the next year? Are there any factors that could delay implementation or weaken the effectiveness of the actions? How can these factors be addressed?

2.4. What resources are needed to support planned, in-process, or ongoing mitigation actions? Does the City have access to these resources? If not, how can the City obtain access to these resources?

ITEM 3: INFORMATION SHARING

3.1. Is the City communicating with all appropriate local jurisdictions, including neighboring communities, Orange County, and special districts? This should include information on district-specific hazard situations, mitigation actions, and other relevant information.

3.2. Is the City communicating with the appropriate state and federal agencies? Is the City receiving information about new regulations, best practices, and data related to hazard mitigation activities?

3.3. Are there opportunities for the City to improve coordination with local, state, and federal jurisdictions and agencies?

ITEM 4: BUDGETARY PLANNING

4.1. What are the financial needs for Mission Viejo to support the implementation of planned and in-process mitigation actions, including ongoing items? Is there sufficient funding for all measures in the LHMP that are planned for the next year, including in-process and ongoing items? If sufficient funding is unavailable, how can the City obtain these funds?

4.2. If it is not feasible for the City to support all planned, in-process, or ongoing mitigation actions, which ones should be prioritized?

4.3. Are there hazard-related activities not included in the LHMP that should be budgeted for? Can the City obtain the necessary funding for these activities?

ITEM 5: STRATEGIC PLANNING

5.1. Which grants are available for hazard mitigation activities, and which activities are best positioned to secure funding?

5.2. How should the agencies and other organizations represented on the Planning Committee coordinate to maximize the chances of receiving funding?

5.3. Are there any scheduled or anticipated updates to other City documents that could relate to hazard mitigation activities? How can the Planning Committee share information with staff and any technical consultants responsible for these updates and ensure that the updates will enhance community resiliency?

5.4. What capital projects are scheduled or anticipated? Are these capital projects being designed and built to be resistant to hazard events? Are there opportunities for these projects to support hazard mitigation activities?

5.5. How can Planning Committee members coordinate efforts with those responsible for capital projects to take advantage of economies of scale that will make implementing hazard mitigation activities easier?

5.6. Has it been four years since the adoption of the LHMP? If so, lay out a timeline for plan update activities, including additional meetings of the Planning Committee. Identify if a technical consultant is needed and begin the contracting process.

5.7. Are there any other opportunities for Planning Committee members and the organizations they represent to coordinate efforts?

ITEMS 6: NEW BUSINESS

6.1. Are there any other items related to the Planning Committee's mission?

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN

Action #	Mitigation Action Item	Potential Funding Source	Responsible Department	Relative Cost	Time Frame	Priority
Emergency Preparedness Activities						
PA-1 (Wildfire Short-Term Action Item #1)	Enhance emergency services to increase the efficiency of wildfire response and recovery activities through regional capabilities assessments.	General Fund, Homeland Security Grants	Orange County Fire Authority & Emergency Services	$$	2025	Medium
PA-2 (Wildfire Short-Term Action Item #2)	Educate agency personnel on federal cost-share and grant programs, Fire Protection Agreements, and other related federal programs so the full array of assistance available to local agencies is understood.	General Fund, Homeland Security Grants	Orange County Fire Authority, Emergency Services	$	2025	Low
PA-3 (Wildfire Short-Term Action Item #3)	Inventory alternative firefighting water sources and encourage the development of additional sources.	General Fund, Homeland Security Grants	Orange County Fire Authority, Emergency Services	$	2025	Medium
PA-4	Conduct regular emergency preparedness drills and training exercises for City Staff, including all hazards training at CSTI.	General Fund, Homeland Security Grants	Emergency Services	$	N/A	High
PA-5	Continue agreements with local school districts, OCSSA, and Red Cross, to ensure that school facilities can act as evacuation sites during major emergencies.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-6	Expand participation in the Mission Viejo Community Emergency Prep Academy (CEPA) program.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-7	Ensure that community evacuation plans include provisions for community members who do not have access to private vehicles or are otherwise unable to drive.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-8	Continue to ensure effective emergency notifications through multiple media formats, in languages appropriate for the community, about pending, imminent, or ongoing emergency events. Ensure that information is accessible to persons with access and functional needs.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-9	Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as City Hall, Community Centers, and any other locations designated in the future.	General Fund, Homeland Security Grants	OES	$$$	N/A	High
PA-10	Ensure the Mission Viejo Emergency Operations Plan identifies critical facilities' backup power and communications locations.	General Fund, Homeland Security Grants	OES	$	N/A	Low

PA-11	Continuously update response procedures for first responder departments to properly address new hazard events as they emerge.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-12	Conduct active shooter drills for City staff, residents, and businesses.	General Fund, Homeland Security Grants	OES	$	N/A	Low
PA-13	Increase the number of City staff who have CalOES Safety Assessment Program (SAP) credentials.	General Fund, Homeland Security Grants	OES, Building Department	$	N/A	High
Multiple Hazards						
1.1 (Multi-Hazard Short-Term Action Item #1)	Integrate the goals and action items from the City of Mission Viejo Natural Hazard Mitigation Plan into existing regulatory documents and programs, where appropriate.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Engineering Division	$	2027	Low
1.2 (Multi-Hazard Short-Term Action Item #2)	Identify and pursue funding opportunities to develop and implement City mitigation activities.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Works	$	Annually	Medium
1.3 (Multi-Hazard Short-Term Action Item #3)	Identify, improve, and sustain collaborative programs focusing on the real estate and insurance industries, public and private sector organizations, and individuals to avoid activity that increases the risk of natural hazards.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Public Works Department	$	Annually	Low
1.4 (Multi-Hazard Short-Term Action Item #4)	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in the City of Mission Viejo.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Public Works Department	$	2028	Low
1.5 (Multi-Hazard Short-Term Action Item #5)	Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department and Public Works Department	$	2027	Low
1.6 (Multi-Hazard Short-Term Action Item #6)	Participate in the Orange County HAZUS Project at the next available opportunity.	General Fund, BRIC/ HMGP Grants, Other Grants	Hazard Mitigation Committee	$	2029	Low
1.7 (Multi-Hazard Long-Term Action Item #1)	Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs and enhancing public education.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services, Public Works, and Community Development Department	$	Annually	Low
1.8	Develop, enhance, and implement education programs to mitigate natural hazards and reduce the risk to citizens,	General Fund, BRIC/ HMGP	Emergency Services Manager, City	$	Annually	Medium

(Multi-Hazard Long-Term Action Item #2)	public agencies, private property owners, businesses, and schools.	Grants, Other Grants	Public Relations Consultant and City GIS			
1.9 (Multi-Hazard Long-Term Action Item #3)	Use technical knowledge of natural ecosystems and events to link natural resource management and land use organizations to mitigation activities and technical assistance.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development and Public Works Departments	$	Annually	Low
1.10 (Windstorms/ Severe Weather Long Term Action Item #3)	City to purchase and/or test backup power facilities for use during a power failure. Create equipment/testing log to ensure backup power equipment is in working service.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Preparedness Division	$$$	Annually	Medium
1.11	Install energy-efficient equipment upgrades in City facilities to increase the longevity of the fuel supply for backup generators. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$	2028	Medium
1.12	Conduct routine updates to Facility Conditions Assessments for City-owned infrastructure and other utilities and coordinate with other agencies to ensure inspections of other important infrastructure. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$$	Annually	Low
1.13	Incentivize public and private utility operators to harden their lines passing through the City from potential breaches. Encourage adoption of supervisor control and data acquisition (SCADA) to allow instantaneous shutdown o line breaches. Use mitigation grants to incentivize entities to partner with the City to complete these projects. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Services, Public Works	$	Annually	Low
1.14	Install and harden emergency backup power at critical facilities deemed necessary. Prioritize installations for facilities that serve as key cooling/warming centers and evacuation centers. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$$	2027	High
1.15	Conduct a feasibility assessment of solar and battery backup system installation at key critical facilities within the City. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Services	$$	2029	Low
1.16	Work closely with community groups to increase awareness of hazard events and resiliency opportunities among socially vulnerable community members, including those experiencing homelessness. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Emergency Services, Community Services	$	Annually	Medium

1.17	Avoid building new City-owned key facilities in mapped hazard areas. If no feasible sites outside mapped areas exist, ensure that such facilities are hardened against hazards beyond any minimum building requirements/ mitigation standards. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Planning, Building	$	Annually	Low
1.18	Closely monitor changes in the boundaries of mapped hazard areas resulting from land use changes or climate change and adopt new mitigation actions or revise existing ones to ensure continued resiliency. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department	$	Annually	Medium
1.19	Integrate policy direction and other information from this Plan into other City documents, including the General Plan, Emergency Operations Plan, and Capital Improvements Program. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Emergency Services, Community Development Department	$	Annually	Low
1.20	Integrate climate change mitigation and adaptation information and analysis into future LHMP updates and other City Plans, where practicable. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department	$	Annually	Low
1.21	Update the City's Master Plans periodically (in conjunction with the LHMP and CIP) to incorporate new data/ mapping and/or address emerging issues. (Hazards addressed: All)	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	Annually	Low
Earthquake Hazards						
2.1 Earthquake Short-Term Action item #1	Encourage seismic strength evaluations of non-City critical facilities in the City of Mission Viejo to identify vulnerabilities for mitigation of schools and critical facilities such as hospitals to meet current seismic standards.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Hazard Mitigation Committee	$	Annually	Low
2.2 Earthquake Short-Term Action Item #2 (From 2007 Plan)	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Hazard Mitigation Committee	$	Annually	Low
2.3	Develop an educational campaign, incentivize, and promote medium-scale seismic retrofits, such as window films to minimize shattering, anchors for rooftop-mounted equipment, bracing for masonry chimneys, and other preventative measures to reduce damage to private buildings with simple earthquake mitigation activities they can take (i.e., water heater straps, furniture anchoring, gas shut off tools, other	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Emergency Services	$	2029	Low

	emergency supplies) to reduce strain on City resources during an event.					
2.4	Conduct a seismic analysis of all City-owned key facilities and retrofit vulnerable facilities.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Public Services	$$	2028	Low
2.5	To the extent feasible, construct all new and significantly retrofitted City-owned facilities to remain operational in the event of a major earthquake.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Community Development Department	$$$	Annually	Low
2.6	Retrofit key critical facilities with seismically rated window film treatments that ensure glass windows do not shatter during a strong seismic event.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Public Services	$$	2029	Low
2.7	Improve local understanding of the threat of a major earthquake by conducting a citywide scenario modeling potential loss of life and injuries, destroyed and damaged structures, and interruptions to key services.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Emergency Services	$	2027	Medium
Flood (Including Dam Inundation)						
3.1 Flood Long-Term Action Item #2	Encourage the development of acquisition and management strategies to preserve open space for flood mitigation, fish habitat, and water quality in the floodplain.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Mission Viejo Public Works and Orange County Public Works Flood Division	$$	Annually	Low
3.2 Flood Long-Term Action Item #3	Identify surface water drainage obstructions for all parts of unincorporated within the City of Mission Viejo.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Mission Viejo Public Works and Orange County Public Works Flood Division	$$	Annually	Low
3.3 Flood Long-Term Action Item #4	Establish a framework to compile and coordinate surface water management plans and data throughout the City.	General Fund, BRIC/ HMGP Grants, Flood Mitigation	Mission Viejo Public Works and Orange County Public Works Flood Division	$	2029	Low

		Assistance Grants, Other Grants				
3.4	Investigate using permeable paving and landscaped swales for new construction and replacement of City-owned hardscaped areas.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$	2029	Low
3.5	Analyze if new critical facilities can be built a minimum of 1 foot higher than the anticipated 500-year flood elevation height to determine where it is feasible.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$	2029	Low
3.6	Identify potential flood improvements that reduce inundation from both storm flows and potential dam inundation effects.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$	2028	Low
3.7	Retrofit roadway medians to capture stormwater during rain events. Prioritize improvements along major arterials/ roadways throughout the City.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$$$	2029	Low
3.8	Conduct frequent cleanings of storm drain intakes, especially before and during the rainy season.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$	Quarterly	Medium
3.9	Track areas where ponding frequently occurs during heavy rainfall and install new drains or upgrade existing ones to reduce ponding of water.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$$	Annually	Low
3.10	Monitor intersections that frequently flood during rain events and identify improvements to alleviate these conditions.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works, Public Services	$$	Annually	Low

3.11	Coordinate with dam owners/operators, state, and federal agencies to collectively identify threats to the City and the region and identify ways to retrofit/strengthen the dams under their control.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Services, Public Works	$	Annually	Medium
3.12	Implement an early warning system/protocol (Wireless Emergency Alert & AlertOC) that notifies downstream communities in the event of a potential dam failure incident.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Services	$	2027	Low
3.13	Identify all structures located in FEMA flood zones and determine the need to map, analyze, and modify FEMA flood maps. If flood map revisions are possible, work with property owners to determine the desire to perform this activity on their behalf.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$	2027	Medium
Extreme Weather (Windstorms, Extreme Heat, Winter/Coastal Storms)						
4.1 Windstorms/ Severe Weather Long-Term Action Item #1	Public Awareness Campaign: To provide public education materials to City of Mission Viejo residents, businesses, and all School District staff, parents, and age-appropriate students with mitigation materials pertaining to the protection of life and property before, during, and after an extreme weather event.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Planning Department, Public Works Department, and Emergency Preparedness Division	$	Annually	Low
4.2	Conduct outreach to residents and businesses prior to the severe winds (Santa Ana Wind events) on proper tree maintenance and identification of potentially hazardous trees that may require removal. (Hazards Addressed: Windstorms)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Services, Public Services	$	Annually	Medium
4.3	Increase the use and construction of shade structures within new developments, City facilities, parks, and trails to reduce urban heat island impacts. (Hazards Addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Community Development Department	$$	Annually	Medium
4.4	Evaluate the long-term capacity of designated cooling centers and shelters in the City to provide sufficient relief from extreme heat. Assess the need to expand services as the frequency, length, and severity of future heat waves potentially change due to climate change. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Services, Community Services	$	Annually	Low

4.5	Upgrade HVAC within City facilities to more efficient systems that may include split systems or decentralized systems that allow for heating and cooling the spaces needed, not entire buildings. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Public Services	$$	2029	Medium
4.6	Implement a tree-planting program to diversify tree age and increase shaded areas in the City to reduce the effects of the urban heat island effect. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Public Services	$$	2029	Low
4.7	During the design review process, promote passive cooling design (brise soleil, long roof overhangs, locating windows away from southern facades, etc.) in new developments. (Hazards addressed: Extreme Heat)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Community Development Department	$	Annually	Low
4.8	Promote early notifications to residents before a severe weather event, focusing on effective communication methods with vulnerable populations to better ensure they have adequate time to prepare. (Hazards addressed: Severe Weather)	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Services	$	Annually	Low
Landslide						
5.1 (Landslide Short-Term Action Item #1)	Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$	2026	Low
5.2 (Landslide Short-Term Action Item #2)	Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts of development.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Works	$	2027	Low
5.3 (Landslide Short-Term Action Item #3)	Participate in Property Acquisition programs (i.e., FEMA, State and/or local programs) for areas that may be subject to repeat damage in a landslide area.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$$	Annually	Low
5.4 Landslide Long-Term Action Item #2	Limit activities in identified potential and historical landslide areas through regulation and public outreach.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department, Public Works	$	Annually	Low
5.5	Install and maintain slope stabilization measures on publicly owned hillsides above roads, buildings, and other facilities.	General Fund, BRIC/ HMGP	Public Works, Public Services	$$$	2029	Low

		Grants, Other Grants				
5.6	Conduct a community-wide moisture-induced landslide and mudslide risk analysis, including the potential for building destruction/damage, deaths, and injuries. Consider the anticipated changes to precipitation patterns, wildfires, and other factors that may influence mudslide events.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$	2028	Low
5.7	Address hillside development constraints in areas of steep slopes to reduce excessive road maintenance or potential landslide effects during winter storms and work with private property owners to install and maintain drainage systems and stabilizing vegetation on and above steep slopes.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$	2027	Low
5.8	Retrofit City facilities to reduce the potential for landslide events within or adjacent to critical infrastructure.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works, Public Services	$$$	2029	Low
5.9	Require geotechnical studies in areas of significant landslide threat and identify strategies for existing development downstream of these hazard areas.	General Fund, BRIC/ HMGP Grants, Other Grants	Community Development Department	$	Annually	Low
5.10	Pursue funding to research, map, and ultimately create a Geological Hazard Abatement District that addresses the entire city and landslide hazards.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	Annually	Low
5.11	Establish/encourage the planting and maintaining slope stabilizing, non-flammable vegetation in all landslide hazard-prone areas of the city.	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works, Public Services	$	Annually	Medium
Wildfire						
6.1 (Wildfire Long-Term Action Item #1)	Encourage developing and disseminating maps relating to the fire hazard to help educate and assist builders and homeowners in engaging in wildfire mitigation activities and help guide emergency services during response.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority	$	Annually	Medium
6.2 (Wildfire Long-Term Action Item #2)	Enhance outreach and education programs to mitigate wildfire hazards and reduce or prevent the exposure of citizens, public agencies, private property owners, and businesses to natural hazards.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority	$	Annually	Low

6.3 (Wildfire Long-Term Action Item #3)	Increase communication, coordination, and collaboration between wildland/urban interface property owners, local and county planners, fire prevention crews, and officials to address risks, existing mitigation measures, and federal assistance programs.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority, Engineering and Building, Planning and Information Technology Departments	$	Annually	Low
6.4 (Wildfire Long-Term Action Item #4)	Encourage implementation of wildfire mitigation activities in a manner consistent with the goals of promoting sustainable ecological management and community stability.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority	$	Annually	Low
6.5	Conduct regular fuel modification projects to reduce fire hazard risks, such as clearing out dead vegetation in parks, open spaces, right-of-way embankments, and areas adjacent to the wildland-urban interface.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Orange County Fire Authority, Public Services	$$	Annually	High
*** Relative Cost Categories**						
$	Less than $100,000					
$$	$100,001 to $999,999					
$$$	Greater than $1,000,000					