CITY OF MALIBU PLANNING COMMISSION
RESOLUTION NO. 26-12

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MALIBU RECOMMENDING THE CITY COUNCIL DETERMINE THAT THE PROJECT IS EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, INCORPORATE THE LAS VIRGENES MALIBU COUNCIL OF GOVERNMENTS MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN INTO THE SAFETY ELEMENT OF THE CITY OF MALIBU GENERAL PLAN BY REFERENCE, AND ADOPT GENERAL PLAN AMENDMENT NO. 24-002 ADOPTING THE SAFETY ELEMENT UPDATE TO THE CITY OF MALIBU GENERAL PLAN CONSISTENT WITH ALL APPLICABLE STATE SAFETY ELEMENT LAWS

The Planning Commission of the City of Malibu does hereby find, order and resolve as follows:

SECTION 1. Recitals.

A. The State of California requires each city and county to prepare a General Plan, which is a comprehensive, long-term guide for a community's physical development. California Government Code (Government Code) Section 65302 *et seq.* establishes requirements for General Plans, which includes a Safety Element.

B. Section 65302(g) of the Government Code establishes requirements for a Safety Element of a General Plan to provide for the protection of the community from unreasonable risks associated with seismically induced surface rupture, ground shaking, and ground failure; tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, flooding, wildland and urban fires; and climate change. The Safety Element must include maps of known seismic and other geologic hazards, and must address evacuation routes, peak load water supply requirements, and minimum road widths and clearances around structures related to identified fire and geologic hazards.

C. The City of Malibu General Plan Safety and Health Element was last updated in 1995, and since then, several changes to Government Code Section 65302(g) have occurred, requiring the Safety and Health Element to be updated to meet current state requirements, including but not limited to, those related to wildfire, climate adaptation and resiliency, and evacuation routes.

D. The Safety Element Update (the "project") establishes goals, objectives, policies, and implementation actions that address emergency preparedness, seismic and geologic hazards, flood hazards, fire hazards, climate adaptation, shoreline protection, and hazardous materials and wastes in the Safety Element.

E. The state adopted Assembly Bill (AB) 2140 in 2006, which added provisions to the Government Code specifying what is to be included in a Local Hazard Mitigation Plan, requiring consistency between the Local Hazard Mitigation Plan and the Safety Element of a General Plan, and requiring a jurisdiction to adopt the Local Hazard Mitigation Plan into the Safety Element to be fully eligible for disaster relief funding under the California Disaster Assistance Act. Furthermore, AB 2140

can be met by either including the Local Hazard Mitigation Plan language specific to AB 2140 in the Safety Element or incorporating the Local Hazard Mitigation Plan by reference into the Safety Element.

F. The City of Malibu adopted the Las Virgenes Malibu Council of Governments Multi-Jurisdictional Hazard Mitigation Plan on August 26, 2024, which was approved by the Federal Emergency Management Agency (FEMA) Region IX officials on August 13, 2024, in accordance with the requirements of the Disaster Mitigation Act of 2000.

G. At its regularly scheduled meeting on November 24, 2025, the City of Malibu City Council received a presentation on the Safety Element by staff and provided feedback for consideration. Public notice of the meeting was posted at City Hall, on the City's website, and sent to interested parties.

F. On December 9, 2025, the California Board of Forestry and Fire Protection reviewed the Draft Safety Element, consistent with Government Code Section 65302.5(a), and found it to comply with all applicable state requirements.

G. On January 14, 2026, the City of Malibu Public Safety Commission received a presentation by staff on the Safety Element and provided feedback for consideration. Public notice of the meeting was provided to interested parties and posted on the City website.

H. On February 3, 2026, the Draft Safety Element was provided to the California Geological Survey of the Department of Conservation to ensure that all known seismic and other geologic hazards are addressed, in accordance with Government Code Section 65302.5(a).

I. On February 4, 2026, a draft Safety Element Update was made available for public review at City Hall. Public notice of the document's availability was provided to interested parties; regional, state and federal agencies; local libraries and media.

J. On February 5, 2026, a Notice of Planning Commission Public Hearing was published in a newspaper of general circulation within the City of Malibu and mailed to all interested parties, regional, state and federal agencies, local libraries and media.

K. On March 2, 2026, the Planning Commission held a duly noticed public hearing on the Draft Safety Element Update and at that hearing the Planning Commission reviewed and considered the Draft Safety Element Update, staff report, written reports, public testimony, and other information in the record.

SECTION 2. Environmental Review.

Pursuant to the authority and criteria contained in the California Environmental Quality Act (CEQA), the Planning Commission has analyzed the proposed project. The Planning Commission hereby recommends the City Council find that the proposed Safety Element Update is exempt from the California Environmental Quality Act (CEQA). CEQA applies only to projects that have the potential for causing a significant effect on the environment. Pursuant to CEQA Guidelines Section 15061(b)(3),

where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA. Therefore, because the Safety Element Update would involve adoption of a policy document that does not, in and of itself, include any proposed development or land alteration, and would not require rezoning or facilitate development beyond what is currently allowed in the City's General Plan, it can therefore be seen with certainty that there is no possibility that adoption of the Safety Element Update would have a significant effect on the environment. In addition, pursuant to CEQA Guidelines Section 15308, the project is exempt from CEQA, as it consists of an action taken by a regulatory agency, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment.

SECTION 3. General Plan Amendment.

The Safety Element Update is provided in Exhibit A. General Plan Amendment (GPA) No. 24-002 constitutes a complete replacement of the existing text in the General Plan Safety and Health Element with new text and exhibits to be consistent with state law. The original General Plan Safety and Health Element has not been updated since its adoption in 1995 and has policies that are outdated with current state law and city goals and objectives.

SECTION 4. General Plan Amendment Findings.

A. The Safety Element is part of the City's General Plan, which sets forth guidance for physical development in the City. The requirement for each city to adopt a General Plan is contained in Government Code Section 65300 *et seq.*, which also lays out specific requirements for each element. Government Code Section 65302(g) requires a Safety Element to include maps of known seismic and other geologic hazards; address evacuation routes, peak load water supply requirements, and minimum road widths and clearances around structures related to identified fire and geologic hazards; and provide for the protection of the community from unreasonable risks associated with the following:

- Seismically induced surface rupture ground shaking, and ground failure;
- Tsunami, seiche, and dam failure ;
- Slope instability leading to mudslides and landslides;
- Subsidence;
- Liquefaction;
- Flooding;
- Wildland and urban fires; and
- Climate change.

The Safety Element Update meets each of the aforementioned requirements, therefore, is consistent with state law.

B. Government Code Section 65300.5 requires General Plan elements to be consistent, integrated, and compatible with one another. The Safety Element is consistent with the goals,

objectives, policies, and implementation measures of the General Plan and all its elements, specifically in the Conservation Element and Land Use Element, including C Implementation Measure 7 (Work with the fire and sheriff to minimize road closures due to accidents and disasters to facilitate traffic flow on these occasions); C Implementation Measure 37 (Work with appropriate agencies such as Water District 29 and the Los Angeles County Fire Department to increase water storage at strategic locations throughout the City as required to assure a seven-day emergency water supply); LU Goal 1 (Natural and environmental resources of Malibu are protected and enhanced); LU Objective 1.3 (Land uses consistent with flood, geologic and fire safety requirements); LU Policy 1.3.1 (City shall regulate development in floodways); LU Policy 1.3.2 (City shall require proposed development to avoid geologic safety hazards created by development); LU Policy 1.3.3 (City shall require fire protection measures for development); LU Implementation Measure 18 (Implement the FEMA Flood Insurance Rate Map program in flood hazard overlay areas); LU Implementation Measure 19 (Amend the Building Code to regulate development to respond to local conditions that require special consideration, such as impacts of septic systems on ancient and active landslides, unusual drainage problems, fire hazards and similar conditions); LU Implementation Measure 20 (Develop a system of incremental and progressive reviews of known or suspected geologic and liquefaction hazards in connection with development applications so that review is proportionate to the risk of such hazards); LU Implementation Measure 21 (Require study of potential soil creep, settling, mass movement and their attendant hazards as part of geologic review for proposed development in areas where appropriate due to known or suspected hazards); LU Implementation Measure 22 (Require applicants to execute release and assumption of risk from flood, geologic and fire hazards where appropriate); LU Implementation Measure 23 (Implement regulations, such as those of the Los Angeles County Consolidated Fire Protection District, to minimize the risk of loss of life and property as a result of fire); and LU Implementation Measure 24 (In consultation with the appropriate park agency, all development within 200 feet of public park lands, [shall] require a fire vegetation clearance prescription analysis and require appropriate landscaping or vegetation clearance as a condition for development).

The Safety Element addresses development in floodways and geologic safety hazards as well as fire protection measures to be incorporated into development. The Flood Hazards section of the Safety Element requires development to be consistent with the FEMA guidelines for flood plain management (S-3.2.1), encourages residents to participate in the National Flood Insurance Program (NFIP) (S-3.2.4), and requires public outreach on flood hazards and the NFIP (S-3.2.4a). The Seismic and Geologic Hazards section addresses requirements for geologic/geotechnical studies for development projects (S-3.1.2, S-3.1.3, S-3.1.3b). The Fire Hazards section incorporates goals, objectives, policies, and actions to coordinate with the Los Angeles County Fire Department and other relevant agencies regarding minimizing risks from fires (S-3.3.1b through S-3.3.1e, S-3.3.1i, S-3.3.1k, S-3.3.1n, and S-3.3.2). Action S-3.3.13 specifically requires coordination with neighboring jurisdictions to create strategic fire plans for fuel management/modification balancing structure protection with native vegetation and sensitive habitat protection.

SECTION 5. Adoption of General Plan Amendment.

Based on the foregoing findings and evidence contained in the record, the Planning Commission hereby adopts Resolution No. 26-12 recommending that the City Council:

A. Determine the project is exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3);

B. Incorporate the Las Virgenes Malibu Council of Governments Multi-Jurisdictional Hazard Mitigation Plan by reference into the Safety Element Update of the General Plan in accordance with the requirements of AB 2140;

C. Adopt GPA No. 24-002 for the Safety Element Update to the General Plan (attached hereto as Exhibit A);

D. Direct City staff to submit a City Council resolution of adoption of the Safety Element Update to the California Office of Emergency Services to establish conformance with the requirements of AB 2140; and

E. Direct City staff to submit a City Council resolution of adoption of the Safety Element Update to the California Department of Forestry and Fire Protection for the City to be eligible for the California Board of Forestry's Fire Risk Reduction Community List (FRRCL).

PASSED, APPROVED, and ADOPTED this 2nd day of March 2026.

ELIZABETH RIDDICK, Planning Commission Chair

ATTEST:

REBECCA EVANS, Recording Secretary

Exhibit A: Safety Element Update

I CERTIFY THAT THE FOREGOING RESOLUTION NO. 26-12 was passed and adopted by the Planning Commission of the City of Malibu at the Regular meeting held on the 2nd day of March 2026 by the following vote:

AYES:	4	Commissioners: Peak, Leonard, Kamins, Riddick
NOES:	1	Commissioner: Mazza
ABSTAIN:	0	
ABSENT:	0	

Rebecca Evans

REBECCA EVANS, Recording Secretary

A

CITY OF MALIBU GENERAL PLAN

SAFETY ELEMENT

PUBLIC REVIEW DRAFT

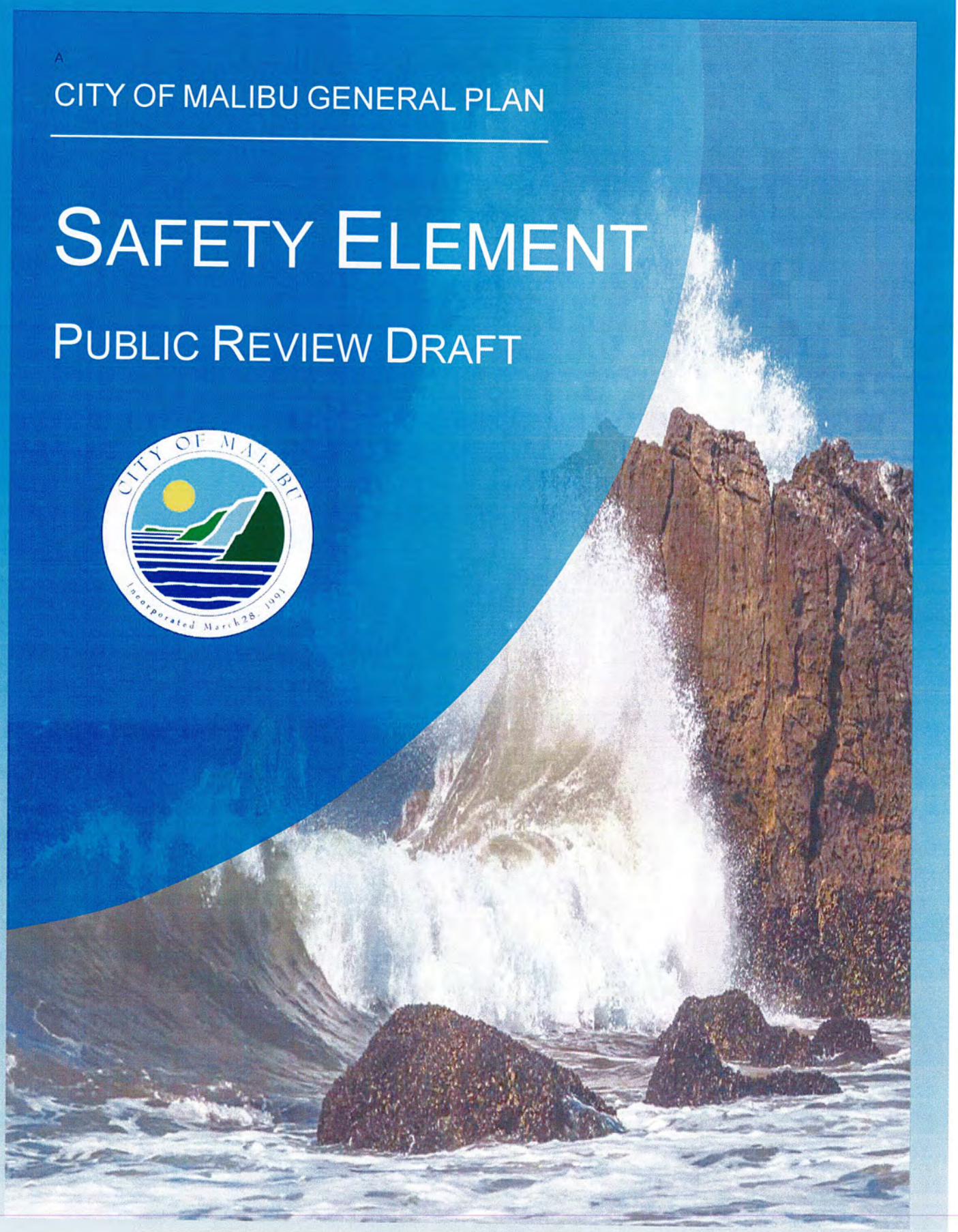


EXHIBIT A

CITY OF MALIBU

SAFETY ELEMENT

ADOPTED BY CITY COUNCIL ON

CITY OF MALIBU

SAFETY ELEMENT

REVISED 2026

CITY COUNCIL

Marianne Riggins, Mayor
Bruce Silverstein, Mayor Pro Tem
Haylynn Conrad, Councilmember
Doug Stewart, Councilmember
Steve Uhring, Councilmember

PLANNING COMMISSION

Elizabeth Riddick (Chair)
John Mazza (Vice Chair)
Marni Kamins
Drew Leonard
Skylar Peak

PUBLIC SAFETY COMMISSION

Joshua Spiegel (Chair)
Brian Merrick (Vice Chair)
Alexis Aria
Keegan Gibbs
Chris Frost
Brent Woodworth (Ex Officio Member)

COMMUNITY DEVELOPMENT DEPARTMENT

Yolanda Bundy, Community Development Director

Tyler Eaton, Assistant Community Development Director

PUBLIC SAFETY DEPARTMENT

Susan Duenas, Public Safety Director

LOS ANGELES COUNTY SHERIFF'S DEPARTMENT

Dustin A. Carr, Captain,

LOS ANGELES COUNTY FIRE DEPARTMENT

Anthony Marrone, Fire Chief

CONSULTANTS

Atlas Planning Solutions (Lead)
Capstone City Planning

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I. EXECUTIVE SUMMARY

A. CONDITIONS IN MALIBU AND FOCUS OF THE SAFETY ELEMENT

Malibu is a coastal hillside community located along the Pacific Ocean, northwest of Los Angeles, surrounded by open space, including foothills and canyons. Its physical characteristics include prominent ridgelines, steep hillsides with gullies, rugged canyon bottoms, coastal bluffs, and low-lying coastal areas, creating a variety of hazardous conditions that can impact the community. Much of the City of Malibu remains undeveloped due to constraints posed by the natural environment and the coastline. Malibu faces serious risks that could detrimentally impact overall community safety, including, but not limited to wildfires and urban fires, earthquakes, instability from geologic conditions, and flooding from both stormwater runoff and tidal conditions. The City has experienced these specific events on several different occasions throughout the years, most recently the devastating Palisades Fire, which caused some $25 billion in damages in Malibu and the surrounding area. To compound matters, the impact of a changing climate is likely to intensify many of these risks. Drier, hotter weather will likely increase fire risk and potentially affect water supplies. Wetter and more intense winter storms could inundate parts of Malibu that have never experienced flooding or could exacerbate slope instability, causing landslides within the City's hillsides. This Safety Element focuses on identifying these safety risks and identifying policies, goals, and implementation actions to address and prepare for them. The Safety Element also strives to align with other general plan elements, as required by state law, including (1) Land Use, (2) Open Space and Recreation, (3) Conservation, (4) Circulation and Infrastructure, (5) Noise, and (6) Housing Elements. Malibu and several neighboring jurisdictions also updated the multijurisdictional Las Virgenes-Malibu Council of Governments Hazard Mitigation Plan (MJHMP), which was adopted in 2024, maintaining federal grant funding eligibility to mitigate many of the natural hazards identified in the City.



View of Malibu looking south.

B. PURPOSE OF SAFETY ELEMENT

The Safety Element is one of seven mandatory elements of the General Plan. Its primary purpose is to identify potential risks within the City that could endanger the community's public health, safety, and welfare. Periodic updates of the Safety Element ensure that goals and policies are relevant and responsive to community needs. California Government Code Section 65302(g)(1) identifies the following list of safety risks that, at a minimum, should be examined in each Safety Element:

- **seismically induced surface rupture***
- **ground shaking***
- **ground failure***
- **flooding***
- **tsunami***
- **seiche***
- **dam failure***
- **slope instability leading to mudslides and landslides***
- subsidence
- **liquefaction (areas with shallow groundwater [<50 feet]) ***
- other seismic hazards identified under Chapter 7.8 (commencing with Section 2690) of Division 2 of the Public Resources Code
- other geologic hazards known to the legislative body
- **wildland and urban fires***
- **climate change***

***potential hazards specific to the City of Malibu**

Each Safety Element must also geographically identify each safety risk's location and potential extent using maps, primarily for seismicity, flooding, and fire risks.

C. MOVING FORWARD

The City of Malibu reaffirms its commitment to protecting the community from potential natural hazard risks. The City's location and history with hazards make it likely that Malibu will experience risks from seismic, flooding, and wildfire events in the future. Malibu can also expect that some of these risks will worsen as climate change accelerates. With this in mind, the Safety Element, in conjunction with the MJHMP, is the best avenue for understanding and addressing natural hazard risks within the community.

II. INTRODUCTION

PURPOSE

The City of Malibu takes pride in its responsibility to safeguard the well-being of its community members. Among other things, this includes adequately anticipating potential emergencies caused by natural and human-made hazards and planning response strategies in an emergency. This element provides the necessary context to understand the hazards threatening the community and outlines policies and practices that take tangible steps to ensure the community's continued prosperity.

SCOPE

The Malibu Safety Element addresses the relevant planning hazards mandated by California Government Code Section 65302(g). Under state planning law, this element identifies and discusses the following hazards as they relate to the City:

- Seismic and geologic hazards such as seismic shaking, liquefaction, landslides, and mudslides caused by slope instability
- Fire hazards
- Flood hazards
- Climate adaptation and resiliency strategies
- Shoreline protection

The element also identifies and addresses the following safety issues, as permitted by law:

- Disaster and emergency preparedness, including evacuation
- Hazardous materials and waste

ELEMENT ORGANIZATION

This element is organized to be consistent with the other General Plan Elements. The goals, policies, and implementation actions/programs provide declarative statements setting forth the City's approach to safety-related issues. A definition of these key terms is provided below:

Goal: A general statement of the desired community outcome. It is denoted as Goal S-X in this element.

Objective: Objectives are the focused steps further streamlining the stated goals. These are denoted as Objective S-X.X in the element.

Policy: Policies are actions that a community will undertake to meet the goals. They are denoted as Policy S-X.X.X in this element.

Implementation Action/Programs: A list of recommended programs and future actions necessary to achieve element goals and policies; implementing actions are discussed within each section of this element.

Many of the previous Safety Element's policies have been incorporated into this element either as a new policy or an implementation action. Modifications to the previous text language occurred to ensure new goals, policies, and implementation actions meet City needs and best practice standards.

CONSISTENCY WITH OTHER ELEMENTS

Integrating safety considerations throughout the General Plan creates a consistent framework that prioritizes the community's well-being. The Malibu Safety Element is an essential component of the General Plan and works in tandem with the other elements in the General Plan to guide these efforts.

Land Use Element

The Land Use Element is considered the key element of any general plan because of its broad scope. This element plays a central role in synthesizing all General Plan issues, constraints, and opportunities. It was prepared to ensure consistency with the information, policies, and programs contained in the Circulation and Infrastructure, Housing, Open Space and Recreation, Conservation, Safety, and Noise elements of the General Plan and the Local Coastal Plan. The Land Use Element is particularly responsive to natural hazards. Understanding the natural and human-caused hazards that threaten a community can help reduce the possibility of disaster by avoiding the designation of sensitive land uses in hazard-prone areas.

Open Space and Recreation Element

The purpose of the Open Space and Recreation Element is to improve the overall quality of life for Malibu residents and visitors by managing the natural resources and open space areas. The Open Space and Recreation Element deals with open space and recreation issues, including outdoor recreation facilities and trails. The issues addressed in this element include various aspects of the natural environment that contribute to ecological balance. The Malibu Open Space and Recreation Element is to be used as a guide for the maintenance of existing parkland, the acquisition and development of additional parks and recreational facilities, and the management of vacant open land. The Open Space and Recreation Element works with the Conservation Element to help protect open space and provide ecosystem services to reduce flood risk and preserve habitat.

Conservation Element

The purpose of the Conservation Element is to serve as a guide for the conservation, protection, restoration, management, development, and appropriate and responsible utilization of the City's existing natural resources. Substantial areas of land within the City of Malibu and north of the City within the Malibu Coastal Zone (MCZ) are undeveloped or contain an abundance of natural resources. To protect these resources, the City has established policies that promote intelligent management. These policies address a variety of natural resources issues, including water quality, coastal and slope erosion, maintenance of unique plant communities, habitat protection, viable populations of plants and wildlife, and preservation of visual resources.

Circulation and Infrastructure Element

The Circulation and Infrastructure Element sets forth policies and standards for the rational and cost-efficient provision and extension of public services to support planned development and protect natural resources. It addresses present conditions and concerns and sets measures for improvement. It is structured to accommodate future growth and development patterns. The purposes and goals of the other elements align with those of the Circulation and Infrastructure Element. Together, they serve as a guide for decision-making by public and private investors and for the future expenditure of public funds. Coordination with the Safety Element can influence public health and safety by addressing traffic congestion on roads designated as evacuation routes during emergencies and by redefining truck routes to avoid residential and other heavily populated areas.

Noise Element

The purpose of the Noise Element is to guide comprehensive local programs to control and abate excessive noise and to protect residents from adverse noise impacts. The element provides information on the existing and projected noise environment and includes goals, objectives, policies, and implementation programs to ensure an acceptable noise environment. The element also identifies criteria for decision-makers to evaluate the noise implications of proposed projects.

Housing Element

The Housing Element is more closely associated with land use and incorporates many safety considerations into its goals and objectives. Building practices and codes addressed in the Housing Element contribute to community safety by improving the built environment's resiliency to natural and human-caused hazards. Additionally, the Housing Element can help identify vulnerable populations and inform the Safety Element to ensure that proper protections are in place.

MULTIJURISDICTIONAL LAS VIRGENES-MALIBU COUNCIL OF GOVERNMENTS HAZARD MITIGATION PLAN (LVMCOG HMP) CONSISTENCY

The multijurisdictional Las Virgenes-Malibu Council of Governments Hazard Mitigation Plan (LVMCOG HMP), was adopted by the City in 2024 and serves three primary purposes: 1) it provides a comprehensive analysis of the natural and human-caused hazards that threaten the City, with a focus on mitigation; 2) it keeps the City of Malibu eligible to receive additional federal and state funding to assist with emergency response and recovery, as permitted by the federal Disaster Mitigation Act (DMA) of 2000 and California Government Code § 8685.9 and 65302.6; and 3) it complements the efforts undertaken by the Safety Element. The LVMCOG HMP complies with all requirements set forth under the federal Disaster Mitigation Act of 2000 and received approval from the Federal Emergency Management Agency (FEMA) in 2024. Sections of the Safety Element are supplemented by the LHMP, incorporated by reference in this element, as allowed by California Government Code § 65302.6. To

access, visit the City's website dedicated to emergency plans at: (https://www.malibucity.org/1159/Emergency-Plans).

CONSISTENCY WITH THE LOCAL COASTAL PROGRAM

The Malibu Local Coastal Program (LCP) was certified in 2002 by the California Coastal Commission. Since the entire City is located within the coastal zone, the Local Coastal Program regulates all development activities (except activities considered exempt). Malibu's LCP functions similarly to the City's General Plan and Zoning Code (Title 17 of the Municipal Code), as it too regulates zoning and land use. The main difference between the LCP and the General Plan/Zoning code is the LCP is an extension of State law (i.e., California Coastal Act) implemented at the local level. As a result, the policies and regulations of the LCP supersede any policy or regulation of the City's General Plan or Zoning Code in the event there is a conflict between the documents. Zoning is administered through the LCP Local Implementation Plan (LIP), and land use is administered through the LCP Land Use Plan (LUP).

REGULATORY ENVIRONMENT

California Government Code § 65302(g)(1)

California Government Code § 65302(g)(1) establishes the legislative framework for California's safety elements. This framework consolidates requirements from relevant federal and state agencies, ensuring that all cities comply with numerous statutory mandates. These mandates include:

- Protecting against significant risks related to earthquakes, tsunamis, seiches, dam failure, landslides, subsidence, flooding, and fires as applicable.
- Including maps of known seismic and other geologic hazards.
- Addressing evacuation routes, military installations, peak-load water supply requirements, and minimum road widths and clearances around structures as related to fire and geologic hazards, where applicable.
- Identifying areas subject to flooding and wildfires.
- Avoiding locating critical facilities within areas of high risk.
- Assessing the community's vulnerability to climate change.
- Including adaptation and resilience goals, policies, objectives, and implementation measures.

California Government Code § 8685.9 and 65302.6

California Government Code § 8685.9 (also known as Assembly Bill 2140, or AB 2140) limits California's share of disaster relief funds paid to local governments to 75 percent of the funds not covered by federal disaster relief efforts. However, if the jurisdiction has adopted a valid hazard mitigation plan consistent with DMA 2000 and has incorporated the Hazard Mitigation Plan into the jurisdiction's General Plan, the State may cover more than 75 percent of the remaining disaster relief costs. 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. The Safety Element may be a standalone chapter or incorporated into another section as the community wishes. California Government Code § 65302.6 allows a community to adopt an LHMP into its Safety Element, provided the LHMP meets applicable state requirements. This enables communities to use the LHMP to meet state Safety Element requirements. As the General Plan is an overarching long-term plan for community growth and development, incorporating the LHMP into it creates a stronger mechanism for implementing the LHMP.

California Government Code § 65302(g)(3) adopted through SB 1241 (2012)

California Government Code § 65302(g)(3) requires the Safety Element to identify and update mapping, information, and goals and policies to address wildfire hazards. As part of this requirement, any jurisdiction that includes State Responsibility Areas or Very High Fire Hazard Severity Zones in the Local Responsibility Areas (LRA), as defined by the California Board of Forestry and Fire Protection (Board), is required to transmit the updated element to the Board for review and approval.

California Government Code § 65302(g)(4) adopted through SB 379 (2015)

California Government Code § 65302(g)(4) requires the Safety Element to address potential impacts of climate change and develop potential strategies to adapt/mitigate these hazards. Analysis of these potential effects should rely on a jurisdiction's Local Hazard Mitigation Plan or an analysis that includes data and analysis from the State of California's Cal-Adapt website. The City prepared a Climate Vulnerability Assessment to comply with SB 379 requirements, which can be accessed here.

California Government Code § 65302(g)(5) adopted through SB 99 (2019)

California Government Code § 65302(g)(5) requires the Safety Element to identify evacuation constraints associated with residential developments, specifically focused on areas served by a single roadway. Refer to the Malibu Safety Element Update SB 99 Evacuation Discussion memo for additional detail.

California Government Code 65302.15(a) adopted through AB 747 (2020) and AB 1409 (2021)

California Government Code 65302.15(a) requires the Safety Element to be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. The bill would authorize a city or county that has adopted an LHMP, emergency operations plan, or other document that fulfills commensurate goals and objectives to use that information in the Safety Element to comply with this requirement by summarizing and incorporating by reference that other plan or document in the Safety Element. The City has completed a Transportation Study for Malibu Safety Element that relies on an existing plan "Transportation Plan for Wildfire and Tsunami Evacuation Study" completed in 2020. This study complies with AB 747/1409 requirements and can be accessed here.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) was created in 1968 to help communities adopt more effective floodplain management programs and regulations. The Federal Emergency Management Agency (FEMA) is responsible for implementing the NFIP and approves the floodplain management plans for participating cities and counties. Malibu participates in the NFIP and uses Title 15, Chapter 15.20 of the Malibu Municipal Code to administer flood management regulations throughout the City.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (California Public Resources Code [PRC], Chapter 7.5, § 2621-2699.6) was intended to reduce the risks associated with surface faults and requires the designated State Geologist to identify and map "Earthquake Fault Zones" around known active faults. Per PRC § 2623(a), cities and counties shall require a geologic report defining and delineating any hazard of surface fault rupture before the approval of a project. If the jurisdiction finds no undue hazard of that kind exists, the geologic report on the hazard may be waived, with the State Geologist's approval. For a list of project types, please refer to PRC § 2621.6. There is one Alquist-Priolo Earthquake Fault Zone in Malibu.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (California Public Resources Code, Chapter 7.8, § 2690-2699.6) created a statewide seismic hazard mapping and technical advisory program in 1990 to help cities and counties more effectively address the effects of geologic and seismic hazards caused by earthquakes. Under PRC § 2697, cities and counties shall require a geotechnical report that defines and delineates any seismic hazard before approving a project located in a seismic hazard zone. If the jurisdiction finds that no undue hazard of this kind exists based on information resulting from studies conducted on sites near the project and of similar soil composition to the project site, the geotechnical report may be waived. After a report has been approved or a waiver granted, subsequent geotechnical reports shall not be required, provided that no new geologic datum or data warranting further investigation is recorded. Each jurisdiction shall submit one copy of each approved geotechnical report, including the mitigation measures to be taken, if any, to the State Geologist within 30 days of its approval of the report. For a list of project types, please refer to PRC § 2693.

Cortese List

Government Code § 65962.5 (typically referred to as the "Cortese List") identifies sites that require additional oversight during the local permitting process as well as compliance with the California Environmental Quality Act (CEQA). The list generally comprises properties and businesses that generate, store, or have been impacted by hazardous materials/wastes. Many properties identified on this list may be undergoing corrective action, cleanup, or abandoned and in need of these activities. The City of Malibu does not have any properties or businesses identified on this list as of October 2025.

III. HAZARDS / TRENDS

A. EMERGENCY PREPAREDNESS

The ability to anticipate, evaluate, and mitigate potential risks posed by natural and human-caused hazards is paramount to a city's longevity. In some cases, hazard events may occur with little to no notice. These types of events can make emergency management activities more difficult. To better prepare for these occurrences, the City considers various hazard events that have different warning times as part of their planning and preparation to ensure better response in the future. Although this element specifically addresses natural and human-caused hazards, emergency preparedness involves many more considerations beyond identifying the hazards themselves. The Emergency Preparedness section consolidates and briefly describes the City of Malibu's hazard prevention and response strategies.

Emergency Operations Plan

The Emergency Operations Plan (EOP), managed by the Public Safety Department, is primarily responsible for informing the City of Malibu's emergency management strategies. These strategies are typically organized under four categories: mitigation, preparedness, response, and recovery.

Mitigation

The EOP, in conjunction with the MJHMP, identifies and assesses the natural and human-caused hazards that threaten the City and recommends proactive policy and procedural actions that reduce the risks associated with these hazards. This preemptive planning is intended to decrease the probability of emergency situations and minimize the effects should one occur. Examples of hazard mitigation and prevention can be found in many city policies, but they are most prominently displayed in the numerous codes regulating construction and development. A key strategy for many fire prone communities is the relocation of overhead powerlines underground.



Example of overhead powerlines

Preparedness

Emergency preparedness focuses on activities that equip a community to respond to a disaster. These activities typically involve preparing plans addressing life safety, emergency response, and evacuation; purchasing and storing emergency supplies; and conducting training and exercises to practice response activities. As part of the City's preparedness initiatives, an Evacuation Analysis has been prepared that identifies potential evacuation routes and Genasys evacuation zones. These potential constraints may affect evacuation activities and inform future improvements to evacuation efforts. As part of this analysis, single ingress/egress locations have been mapped and locations within the City that have impaired access roadways. These locations may require earlier evacuation notifications during an emergency incident.

Response

Emergency response activities typically focus on actions necessary to save lives and prevent further property damage during an emergency/disaster. Many of these activities are conducted in tandem with the Los Angeles County Sheriff's Department and the Los Angeles County Fire Department's standard emergency response procedures. To guide response activities, the City relies on implementing the EOP and working closely with volunteer organizations such as the Community Emergency Response Team (CERT). If City resources become overwhelmed, the City will request support through the Operational Area (which consists of a county and all political subdivisions within that county, including incorporated cities and special districts) and mutual aid agreements currently in place. However, the City recognizes that mutual aid resources are dependent on availability and may be limited during a large regional incident. Therefore, consideration for strengthening self-sufficiency should be a priority.

Recovery

Recovery activities typically occur after an emergency/disaster event. These activities focus on reestablishing services to impacted areas, repairing and/or reconstructing damaged buildings and infrastructure, and assisting residents and businesses with permitting and approvals of building plans. Depending on the scale and type of incident, recovery could occur in specific community locations and/or require specialized expertise to address the issues created. Cleanup of hazardous wastes shall be considered part of the recovery from a major disaster event.

GOAL S-1: A COMMUNITY BETTER PREPARED FOR FUTURE EMERGENCIES.

Objective / Policy / *Action*

S-1.1	**Ensure residents, employees, and visitors understand the risks within the community**
S-1.1.1	Communicate existing and emerging risks to residents, businesses, and visitors from hazardous areas, where practicable.
S-1.1.2	Improve understanding of community risks by residents, businesses, and visitors through signage and educational materials.
Action S-1.1.2a	Develop and maintain a development geo-hazard and coastal vulnerability database to incorporate findings from site specific and area hazard-related studies.
Action S-1.1.2b	Develop and maintain an up-to-date list of appropriate media outlets to relay emergency information, such as early warnings and notification of threats to the community.
Action S-1.1.2c	Educate and encourage both residents and local businesses to carry adequate insurance or maintain adequate resources to meet most emergencies.
Action S-1.1.2d	Establish community health-education and safety-education programs, to include the need to prepare well ahead of time for emergency response and recovery.
Action S-1.1.2e	Create and maintain an all-hazards outreach and education program prioritizing at-risk populations (could include children, older adults, pregnant women, people with disabilities, chronic health conditions, limited English proficiency, or limited financial/transportation access). Priority issues addressed should include: a) Emergency Preparedness and Evacuation; b) Seismic and Geologic Hazards; c) Flood and Dam Failure Hazards; d) Wildfire Hazards; e) Severe Weather f) Human-Caused Hazards; and g) Climate Adaptation As part of outreach and education programs, share updated maps and information with residents and businesses throughout the City.
S-1.2	**Ensure City staff are able to plan, prepare, and respond to emergency situations efficiently and effectively.**
S-1.2.1	Maintain and update as needed a comprehensive Emergency Operations Plan for response to all levels of emergency situations affecting the City.
Action S-1.2.1a	Conduct annual trainings, exercises, and/or simulations to ensure that staff are properly prepared to support emergency management functions during an incident.
Action S-1.2.1b	Conduct emergency-response drills on a regular basis and periodically participate in Operational Area trainings and exercises and include city staff and stakeholders when appropriate.
S-1.2.2	The City shall cooperate with local first responders to achieve efficient and prompt response by local agencies to those emergencies which do not require mutual aid support.
Action S-1.2.2a	Support and encourage sufficient local staffing and equipment levels for first responder agencies and city services to ensure timely and well-coordinated responses to calls for service and most emergency situations.

S-1.2.3	The City shall coordinate efficient utilization of emergency assistance provided by neighboring communities and county agencies under mutual-aid response.
S-1.2.4	The City shall create, maintain, and coordinate with local volunteer agencies to enhance emergency assistance and response.
Action S-1.2.4a	Continue to organize, train, and support the City of Malibu Community Emergency Response Team (CERT), to maintain trained and organized volunteers from the community capable of providing intelligence, communications, medical and logistic support to the professional health and safety organizations in emergency situations.
Action S-1.2.4b	Continue to improve the area-wide, volunteer-manned emergency communication system.
Action S-1.2.4c	Work with the Red Cross, other private agencies, and local, state and federal government agencies on disaster-preparedness education and training.
S-1.2.5	Ensure information about hazards or concerns, critical facilities, and vulnerable populations is periodically updated by the City.
Action 1.2.5a	Map all existing and planned critical facilities in the City and categorize them based on function.
Action 1.2.5b	In coordination of updates to planning documents (Emergency Operations Plan and Hazard Mitigation Plan, etc.), adopt and update as appropriate maps of existing and emerging hazards of concern.
S-1.2.6	The City shall provide effective and efficient law enforcement protection services to ensure effective emergency response.
Action S-1.2.6a	Periodically evaluate Los Angeles County Sheriff's services and service criteria to ensure that the City continues to receive adequate law enforcement services.
S-1.2.7	Ensure communications capabilities meet current and future community needs and incorporate newer more effective technologies.
S-1.3	**Minimize the impact to the emergency evacuation capability of the City.**
S-1.3.1	Ensure new development, redevelopment, and major remodels do not diminish roadway capacity and evacuation capabilities and support future evacuations during emergencies.
S-1.3.2	Require all new developments and redevelopments within Fire Hazard Severity Zones provide a minimum of two points of access by means of public roads that can be used for emergency vehicle response and evacuation purposes, where practicable.
Action S-1.3.2a	Ensure all private roads are designed and maintained to permit unrestricted emergency equipment and personnel access in compliance with the California Fire Code, adopted local ordinances, and California Fire Safe Regulations.
Action S-1.3.2b	Identify the feasibility of constructing additional emergency access improvements for existing developments that do not meet minimum road standards for emergency equipment, such as: a) Additional vehicle pullouts at key hillside locations. b) Limiting or restricting on-street parking at key hillside locations and areas with inadequate road widths. c) Potential for construction of new or improved emergency access routes. d) Roadside clearance improvements.
S-1.3.3	Maintain functionality, make improvements, and expand the capacity, where feasible, of the existing emergency evacuation routes within the City, taking into account current and future natural and human-caused hazards.

Action S-1.3.3a	Conduct public outreach and educational activities associated with emergency evacuation routes and procedures, prioritizing efforts towards vulnerable populations.
Action S-1.3.3b	Prepare evacuation routes and disaster response plans for known hazards within the city.
Action S-1.3.3c	Work with law enforcement agencies to develop techniques to improve local access during times of emergency.
Action S-1.3.3d	Work with the appropriate jurisdictions to ensure that highways, roads, bike paths, foot paths, and trails are free of avoidable hazards.
S-1.3.4	In areas with inadequate access or without at least two evacuation routes, provide adequate mitigation actions to address the deficiencies required by the Fire Code and State law.
S-1.3.5	For residential developments in hazard areas that do not have at least two emergency evacuation routes, identify alternate evacuation options, implement earlier evacuation notifications, and develop protocols for future evacuations that consider the constraints associated with these areas.

GOAL S-2: A COMMUNITY THAT CAN QUICKLY RECOVER AFTER A HAZARD EVENT

Objective / Policy / *Action*

S-2.1	**Establish a coordinated post-disaster/ hazard event recovery framework.**
S-2.1.1	Develop and maintain a post disaster/ hazard event recovery framework that guides short- and long-term recovery across housing, infrastructure, public health, and environmental restoration.
Action S-2.1.1a	Adopt a local post disaster/hazard event (i.e. wildfire) Recovery Plan as an appendix to the Emergency Operations Plan (EOP), consistent with the Local Hazard Mitigation Plan (LHMP).
Action S-2.1.1b	Designate a Recovery Coordinator or assign a local recovery team responsible for interagency coordination and communication during hazard event (i.e. wildfire) recovery.
S-2.2	**Promote resilient and safe rebuilding in post hazard event (i.e. wildfire) areas.**
S-2.2.1	Support rebuilding efforts that meet or exceed current wildfire resilience standards and reduce future hazard exposure.
Action S-2.2.1a	Develop a "Resilient Rebuilding Checklist" with requirements for fire-resistant materials, compliance with Wildland Urban Interface (WUI) standards, and enhanced defensible space regulations.
Action S-2.2.1b	Establish a streamlined permit process for rebuilding hazard (i.e. wildfire) damaged structures that meet enhanced resilience criteria.
Action S-2.2.1c	Discourage rebuilding in the most hazardous areas identified in the Community Wildfire Protection Plan (CWPP) or Hazard Mitigation Plan unless risk reduction measures are in place.
S-2.3	**Provide access to temporary and permanent housing after hazard/disaster events (i.e. wildfires).**
S-2.3.1	Facilitate rapid deployment of interim housing and the long-term replacement of lost housing, with a focus on vulnerable populations.
Action S-2.3.1a	Pre-identify sites suitable for temporary housing in coordination with the Housing Element and disaster recovery agencies.

Action S-2.3.1b	Encourage use of Accessory Dwelling Units (ADUs) and SB 9 lot-splits as flexible housing recovery tools.
Action S-2.3.1c	Work with nonprofit and regional partners to provide wraparound services, rental assistance, and housing counseling for displaced residents.
S-2.4	**Restore and protect public health and the environment during recovery.**
S-2.4.1	Ensure that post disaster/hazard event (i.e. wildfire) recovery addresses air and water quality, soil stability, debris, and hazardous waste management.
Action S-2.4.1a	Coordinate with CalRecycle, CalEPA, and County Public Health to manage debris and hazardous materials after disaster/hazard event (i.e. wildfires).
Action S-2.4.1b	Implement erosion control, slope stabilization, and/ or replanting of native vegetation as deemed appropriate by the Fire Chief and Public Works Director in burned areas within 6-12 months of a wildfire.
Action S-2.4.1c	Monitor and report post disaster/hazard event (i.e. wildfire) environmental impacts, including air quality and surface water contamination, and incorporate findings into future planning efforts.
S-2.5	**Prioritize equity and community engagement during the recovery process.**
S-2.5.1	Ensure post disaster/hazard event (i.e. wildfire) recovery services are inclusive and accessible, especially for low-income households, renters, seniors, and persons with disabilities.
Action S-2.5.1a	Develop a post disaster/hazard event (i.e. wildfire) recovery assistance program offering case management, translation services, and rebuilding resources for underrepresented communities.
Action S-2.5.1b	Host community recovery meetings with language translation services responsive to the population and distribute recovery information in accessible formats within 30 days of a disaster/hazard event (i.e. wildfire) disaster declaration.
S-2.6	**Leverage funding and partnerships to support recovery.**
S-2.6.1	Actively pursue local, state, federal, and private funding to support post disaster/hazard event (i.e. wildfire) recovery and resilience infrastructure.
Action S-2.6.1a	Maintain eligibility for FEMA and California Governor's Office of Emergency Services (Cal OES) funding by keeping the Safety Element, Hazard Mitigation Plan, and Emergency Operations Plan updated and aligned.
Action S-2.6.1b	Develop pre-approved applications and templates for commonly used post-disaster grant programs to accelerate access to recovery funding.

B. SEISMIC AND GEOLOGIC HAZARDS

Seismic and geologic hazards are traditionally addressed together because they both involve the movement of the Earth's surface. Although some geologic events (landslides, subsidence, erosion, etc.) can and do occur independently, the primary catalyst for their occurrence is often a seismic event, commonly called an earthquake. This section identifies four common seismic and geologic hazards that threaten Malibu and establishes policies and procedures to protect the community in the event of a geologic event. A key consideration for seismic and geologic hazards is the potential for cascading effects resulting from an event. When an earthquake occurs, seismic shaking can rupture natural gas and water/sewer pipelines, leading to additional impacts such as flooding, erosion, or fires. The goals, policies, and actions throughout this element are designed to work together to reduce both the individual and collective risk of these hazards.

Seismic Hazards

Southern California is prone to earthquakes, and their frequent occurrence is widely accepted as a fact of life. Malibu is prone to seismic hazards due to its location in a seismically active region. These hazards can be divided into three categories, each with unique characteristics and implications for planning.

Surface Rupture

The Earth's crust is composed of large tectonic plates that are in constant motion, moving toward, away from, or past one another. This constant movement means that where two plates grind past each other, friction can cause them to become "stuck". As the plates continue to push, immense energy builds up at the point of friction. Eventually, this stress overcomes the friction, causing the plates to suddenly shift and release the stored energy as an earthquake. This abrupt release can sometimes cause the ground itself to break and displace, a phenomenon known as surface fault rupture. Structures built over a surface rupture are especially vulnerable to damage from ground displacement, which can sever pipelines and destroy roads and bridges. To address this risk, California identifies areas with known surface rupture hazards as Alquist-Priolo Special Study Zones. Malibu includes one zone for the Malibu Coast Fault, requiring special studies for development activities proposed within this defined area. Moreover, many earthquakes may only cause seismic shaking and do not produce a surface rupture event.

Seismic Shaking

Seismic shaking is the recognizable movement caused by the energy released from an earthquake. The same mechanism that creates a surface rupture is also responsible for seismic shaking and can produce an equally devastating effect. Buildings and other structures may be destroyed because of violent shaking. Infrastructure such as roads, pipelines, and power lines is also susceptible to damage and poses additional safety concerns. Unlike surface rupture, the consequences of seismic shaking are not restricted to the area immediately surrounding the fault. Energy resonating through the ground can travel hundreds of miles and cause damage in many locations simultaneously. The closer to the earthquake's source (epicenter), the stronger the shaking will be. Seismic shaking is of particular concern to the City of Malibu due to its proximity to active faults capable of generating significant earthquakes. Numerous faults surround and traverse the Malibu area, including the Malibu Coast Fault, the Santa Monica Fault, the Las Flores Reverse Fault, and the Anacapa Fault. These faults are not well-defined because they are generally not visible on the surface. According to the MJHMP, there is a 93% probability of a magnitude 6.7 or greater event occurring within the Los Angeles Region in the next 30 years. There is a 30-40% chance that the Las Virgenes-Malibu Region will experience a magnitude 6.5 or greater event within the next 25 years. **Figure S-1** depicts the Seismic Shaking anticipated from a strong earthquake in the City. The darker colors on the map indicate stronger shaking is expected in those areas.

Liquefaction

Liquefaction is a phenomenon that occurs when intense earthquake vibrations cause saturated soil to lose stability and behave more like a liquid than a solid. This poses significant problems for buildings and other structures in areas where liquefaction can occur, as the ground may give way under the weight of the structure and its foundation. In addition, underground structures are vulnerable to liquefaction. Few areas of significant liquefaction susceptibility exist in the City of Malibu. These areas are located along beaches and in the floodplains of major streams, such as Malibu Creek. The soils in these areas are sandy or loose sediment washed down the canyons by floods and creeks, and such material is prone to liquefaction. Areas of liquefaction potential in the City occur along stream beds and in some canyon areas. Malibu's coastline, particularly areas near Malibu Creek and the Malibu Coastal Fault Zone, has been identified as having liquefaction potential during earthquakes. **Figure S-2** depicts the areas of the City susceptible to liquefaction.

Figure S-1 Anticipated Seismic Shaking in Malibu

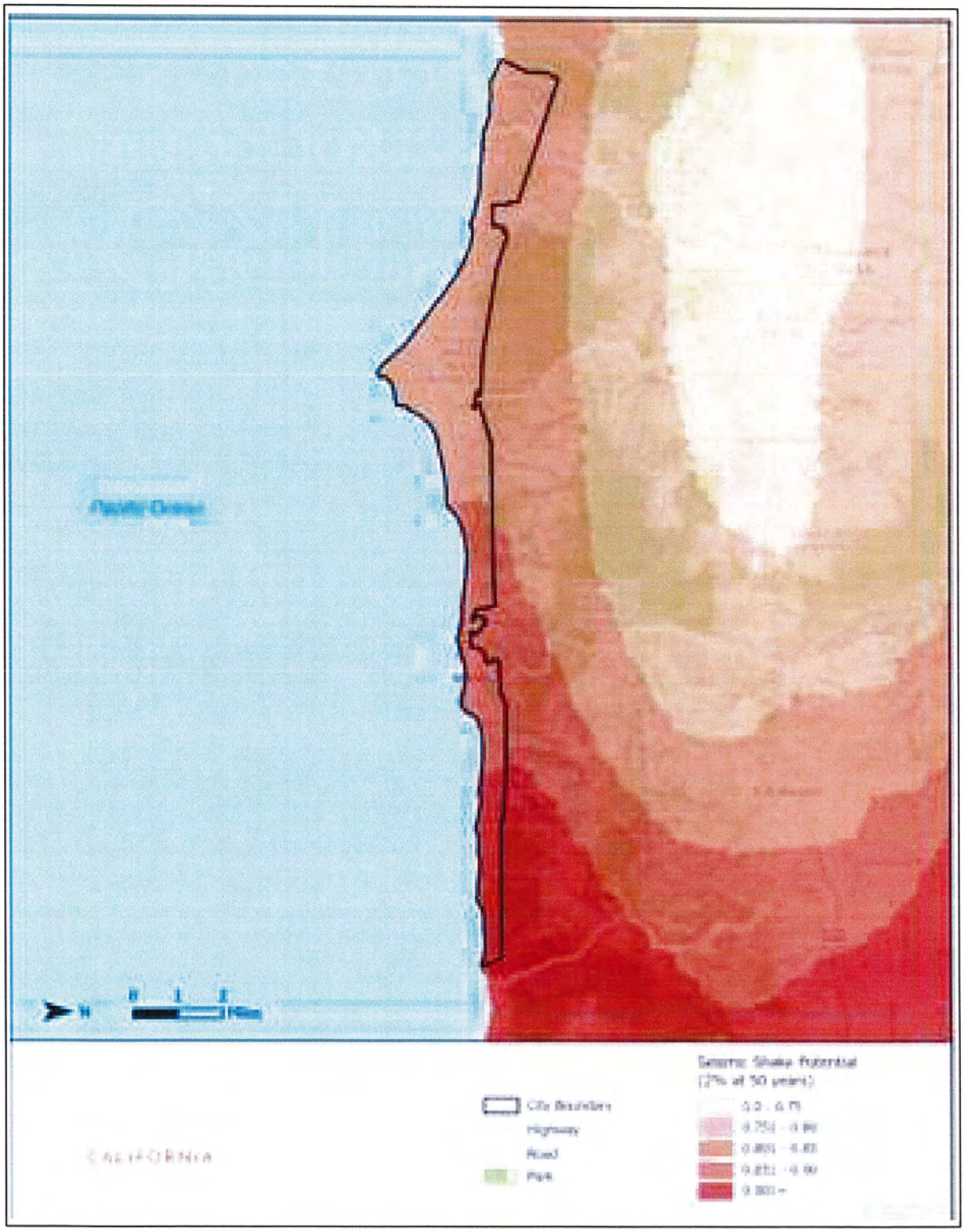


Figure S-2 Liquefaction Susceptibility Locations in Malibu



Geologic Hazards

Although seismic events, such as earthquakes, often trigger geologic hazards, this is not always the case. Therefore, understanding and preparing for these hazards as standalone events is equally important.

Landslides and Mudflows

A landslide is the movement of earth materials down slopes and areas of steep topography. Although earthquakes often trigger them, landslides can occur when a sloped surface can no longer support the material contained within or above it. This instability can be caused by the sheer weight of the loose material or exacerbated by other events, such as heavy rain. When rain causes a slope to fail, the movement of earth materials is typically called a mudslide. The many canyons that drain the Santa Monica Mountains and cross through Malibu to empty into the ocean provide avenues for future debris/mud flow events during wet winters and intense rainstorms. Debris flow events have been experienced in Topanga Canyon, Las Flores Canyon, and other areas, and will occur again in the future. Malibu's landscape is prone to wildfires. The heat from fires makes the soil hydrophobic (water-repellent), while the loss of vegetation and root systems leaves slopes unstable and unable to absorb rainfall. This dramatically increases the risk of destructive debris flows and mudslides in subsequent rain events. Both landslides and mudslides move with great force and pose a significant danger to buildings and other structures. In some circumstances, these events may cause bodily harm if bystanders cannot move out of its path in time. Anticipating the risk of landslides in the areas identified by **Figure S-3** will be essential for protecting the community members who reside there. The parts of Malibu most at risk of landslides are the bottom of canyons and canyon slopes.



Dirt and boulders covering Malibu Canyon Road.



A Los Angeles Fire Department SUV is swept into the ocean by a mudslide along Big Rock Road in Malibu.

The generally recognized landslide areas in Malibu include (listed from east to west):

- Las Tunas Beach Slides
- Eagle Pass-Las Flores Slide
- Calle Del Barco
- Carbon Canyon Slide
- Puerco Beach Slides
- Latigo Shore Slide
- Malibu Cove Colony Slides
- LaChusa Highlands Slide
- Big Rock Mesa
- Rambla Pacifico
- Carbon Mesa Slides
- Amarillo Beach Slides
- RV Park Slide
- Latigo Canyon Slide
- Lower Encinal Canyon Slides

Figure S-3 Earthquake Induced Landslide Zone in Malibu



GOAL S-3: A COMMUNITY BETTER PREPARED TO ADDRESS THE RISKS FROM NATURAL HAZARDS.

Objective / Policy / *Action*

S-3.1	**Ensure seismic and geologic hazards are addressed to effectively protect structures and lives.**
S-3.1.1	The City shall minimize the risks from landslides and debris flows.
Action S-3.1.1a	Work with the residents of neighborhoods affected by landslides and debris flows to develop appropriate risk abatement programs.
S-3.1.2	Require new development/ redevelopment, and major remodels to provide for analyses of site safety related to potential hazards of fault rupture, seismic shaking, liquefaction, subsidence, soil erosion, seepage, and rockfalls.
S-3.1.3	Reduce the risk of impacts from geologic and seismic hazards by applying proper development engineering, building construction, and retrofitting requirements on new developments and major redevelopments.
Action S-3.1.3a	Apply all restrictions and investigation requirements mandated by the State under the Alquist-Priolo Special Studies Zones Act for faults classified as "active" to development on properties crossed by or adjacent to the Malibu Coast Fault.
Action S-3.1.3b	Require that soils, geologic and structural evaluation reports with appropriate mitigation measures be prepared by registered soils engineers, engineering geologists, and/or structural engineers and that all recommended mitigation measures be implemented.
Action S-3.1.3c	To protect slope stability, restrict grading or development related vegetation clearance where the slope exceeds 2:1, except as required for fire safety, driveways and utilities and where there is no reasonable alternative.
Action S-3.1.3d	Ensure water efficient landscaping plans in areas of landslide susceptibility minimize deep percolation and enhance slope stability.
Action S-3.1.3e	Encourage research to study the effects of excessive ground water on surface erosion, earth movement, and groundwater "daylighting." Seek funding opportunities and resources to support this project including but not limited to: the Environmental Protection Agency (EPA) Water Research Grants Program, The U.S. Geological Survey (USGS) Water Resources Research Act Program, or the U.S Department of Agriculture (USDA) Conservation Innovation Grants.
S-3.1.4	Require that all City-owned and private critical facilities (hospitals/urgent care clinics, police and fire stations) be earthquake resistant designed for the effects of a maximum credible earthquake.

C. FLOOD HAZARDS



Floodwaters surge at the Pacific Coast Highway and Las Flores Canyon Road in Malibu

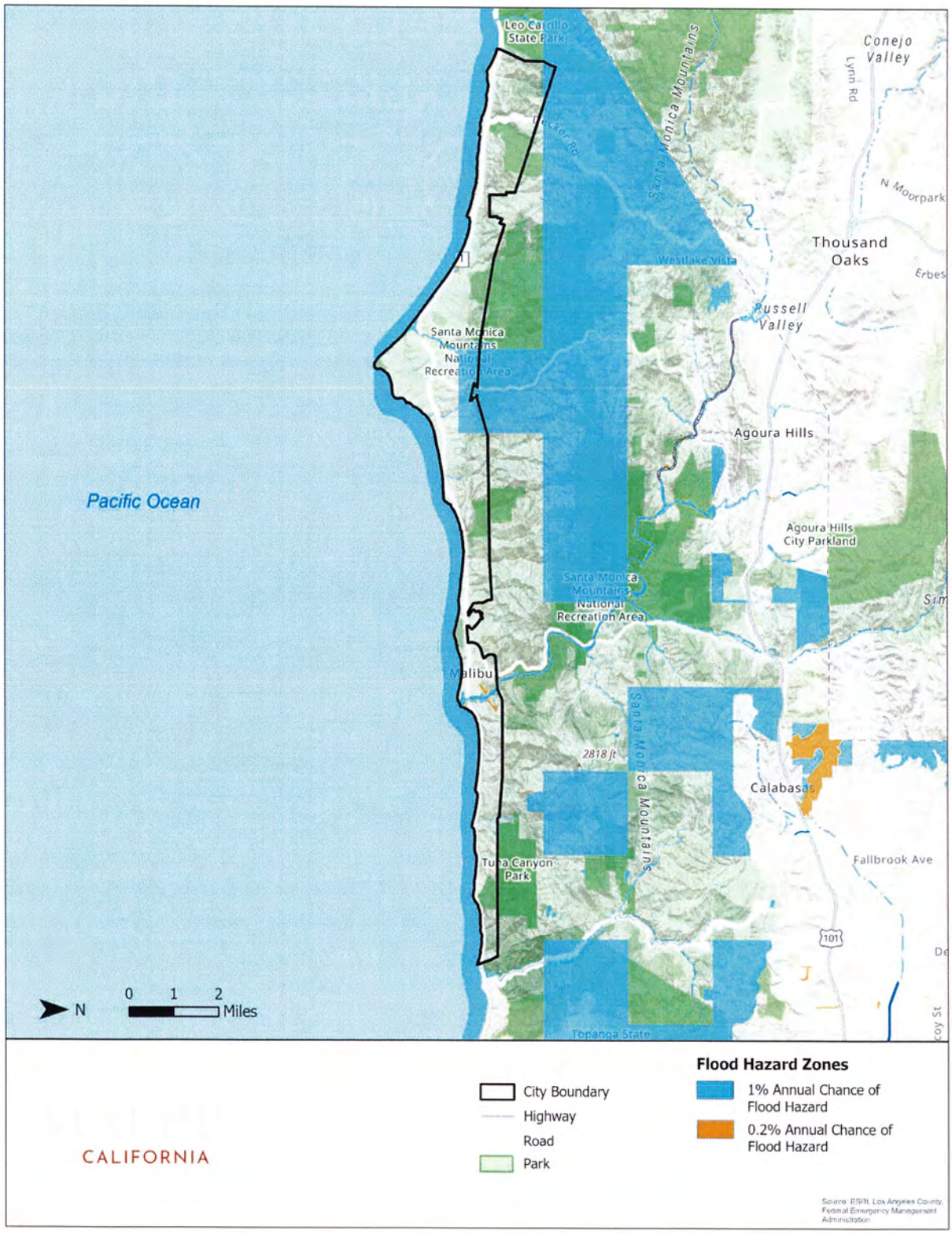
The accumulation of water on the ground surface leads to flooding, which can occur after heavy rainfall or from failures in water delivery infrastructure. The effects of flooding may be intensified by climate change-driven droughts, as parched ground becomes less permeable. Flooding presents significant hazards to both individuals and property. Risks range from drowning in deep standing water to extensive property damage caused by even shallow water. Fast-moving water is particularly perilous, capable of sweeping away people and causing severe structural damage. In Malibu, where flooding is a persistent threat, current flood control and drainage systems are inadequate to consistently meet community needs. Malibu's combination of steep clay slopes and numerous canyons, such as Las Flores Canyon and Malibu Canyon, make it especially vulnerable to rapidly moving water and debris. The Pacific Coast Highway (PCH), which runs through several canyons, is frequently closed due to these hazards. Coastal areas of Malibu are increasingly vulnerable to flooding from rising sea levels, high tides, and storm surges. This threatens low-lying areas and critical infrastructure like the PCH and beachfront properties, especially during major storms. Malibu's flood infrastructure is only moderately effective and faces significant vulnerabilities from post-wildfire debris flows and sea-level rise. While the city works with Los Angeles County to manage stormwater runoff, recent intense weather has frequently overwhelmed the system, causing flash floods and mudslides. To help address these issues, the City is actively engaged in several ongoing initiatives with Los Angeles County Public Works and the Flood Control District to improve the effectiveness of flood control, such as the Enhanced Watershed Management Program, stormwater capture and retention, and continued sediment dredging and maintenance of flood-prone areas. **Figure S-4** illustrates the FEMA flood zones within Malibu. While flooding by itself is a significant hazard, often flooding can coincide with other hazards like landslides and mudslides, which are often exacerbated by wildfires.

GOAL S-3: A COMMUNITY BETTER PREPARED TO ADDRESS THE RISKS FROM NATURAL HAZARDS.

Objective / Policy / *Action*

S-3.2	**A community where impacts of flooding are minimized.**
S-3.2.1	Require development to be consistent with minimum Federal Emergency Management Agency (FEMA) guidelines for flood plain management.
S-3.2.2	Collaborate with local/regional agencies to ensure that risks of flooding caused by upstream development are minimized.
S-3.2.3	Coordinate with the dam owners/operators and responsible jurisdictions to ensure that all dams in the Malibu watershed areas have regular safety inspections.
S-3.2.4	Encourage area residents to participate in the National Flood Insurance Program (NFIP).
Action S-3.2.4a	Create and hold public educational workshops providing information on flood hazards in the City and participation in the National Flood Insurance Program.

Figure S-4 Flood Zones in Malibu



D. FIRE HAZARDS

Wildfires

The most common type of natural hazard in California is wildfire, which can burn large areas of undeveloped or natural land in a short amount of time. They often begin as smaller fires caused by lightning strikes, downed power lines, or unattended campfires, but may rapidly expand in size if conditions are dry and/or windy. Southern California experiences Santa Ana Wind events annually, usually before the winter rainy season. Santa Anas are hot, dry desert winds, usually of relatively high velocity. These events typically occur when humidity is low and temperatures are high. The combination of these two conditions can create extreme fire danger during late summer through early winter. These winds can quickly exacerbate wildfires, intensifying their burning and spreading, potentially increasing the range of embers and feeding oxygen to the flames. Powerful Santa Ana winds made the recent 2025 Palisades fire significantly worse by rapidly increasing its speed and spread. The winds, which gusted up to 80 mph or more, fueled the fire, causing it to explode in size, destroy thousands of structures, and force widespread evacuations



Steep hillside areas of Malibu with natural vegetation

The recent trend toward more extended drought periods increases the likelihood of wildfires. Typically, wildfires pose minimal threat to people and buildings in urban areas, but increasing human encroachment into natural areas raises the threat of damage/destruction. This encroachment occurs in areas called the wildland-urban interface (WUI), which are within the High and Very High Fire Hazard Severity Zones, as defined by the California Department of Forestry and Fire Protection (CAL FIRE). Significant wildfires have occurred in Malibu and the Santa Monica Mountains in the past and posed a significant threat to people and property. Natural, undeveloped hillsides border the community, and the developed areas are very narrow. Much of the community is very close to these hillsides. All of the City is located within a mapped Very High Fire Hazard Severity Zone (VHFHSZ), which is the highest wildfire risk classification designated by CAL FIRE. **Figure S-5** depicts the VHFHSZs mapped throughout Malibu, which covers nearly 100% of the City. **Figure S-6** also identifies areas where historic fires have occurred within the City as well as areas identified within the WUI. In addition, the Los Angeles County Fire Department conducts strategic planning regularly to ensure fire response capabilities and personnel can adequately address current service needs throughout the City and identify potential issues to be addressed. The latest version of the Los Angeles County Fire Department 2017-2021 Strategic Plan is available here.

Urban Fires

The possibility of an urban fire confronts every city. Many urban fires begin as isolated incidents caused by a faulty electrical appliance, an absentminded cooking mishap, or an industrial malfunction, but can spread to other buildings if conditions permit. Many factors contribute to the severity and extent of urban fires, but modern building codes and practices have helped reduce their impact. Despite these improvements, it is essential to acknowledge the risks associated with fires in urban areas. No matter its size, any fire can cause severe harm to people and damage buildings and other structures. The larger concern for Malibu is the ability for a structure fire to ignite surrounding brush and/or structures, which could increase the size of the incident as well as the necessary response.



Structure fire that occurred in Malibu

Water Supply

Water service in Malibu is provided by the Los Angeles County Waterworks Districts (LACWD) specifically District 29. According to LACWD's District 29 Urban Water Management Plan, adequate water supplies are available to meet customer demands within the City, as the District receives its water from West Basin Municipal Water District, which imports its primary source from the Metropolitan District of Southern California. This is especially important for ensuring adequate supplies are available for fire suppression needs within the City. While adequate water supplies are available, parts of the City continue to experience challenges with water pressure and flow, particularly during major infrastructure work and emergencies such as wildfires. These issues have been reported to cause service disruptions throughout the City. As standard practice, new developments and major remodels are required to conduct water pressure/flow testing and to mitigate issues if they are inadequate. The 2025 Palisades Fire highlighted some key challenges associated with water infrastructure used for wildfire fighting purposes. Most water systems are designed to support structure fire response, however when a large wildfire, such as during the Palisades Fire, overwhelms a communities' infrastructure, reductions in water pressure and pumping capacity can occur.

Figure S-5 Very High Fire Hazard Severity Zones in Malibu

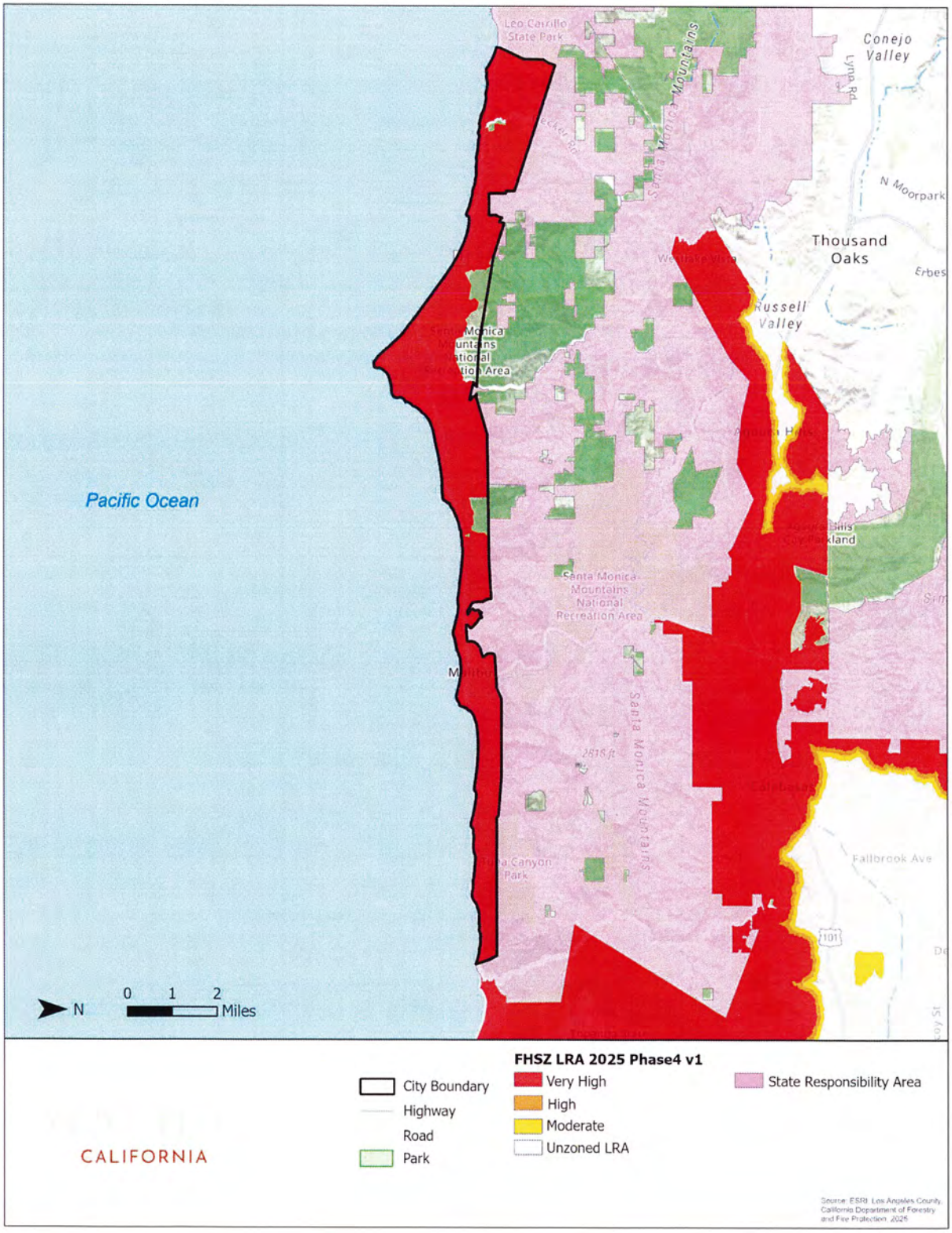
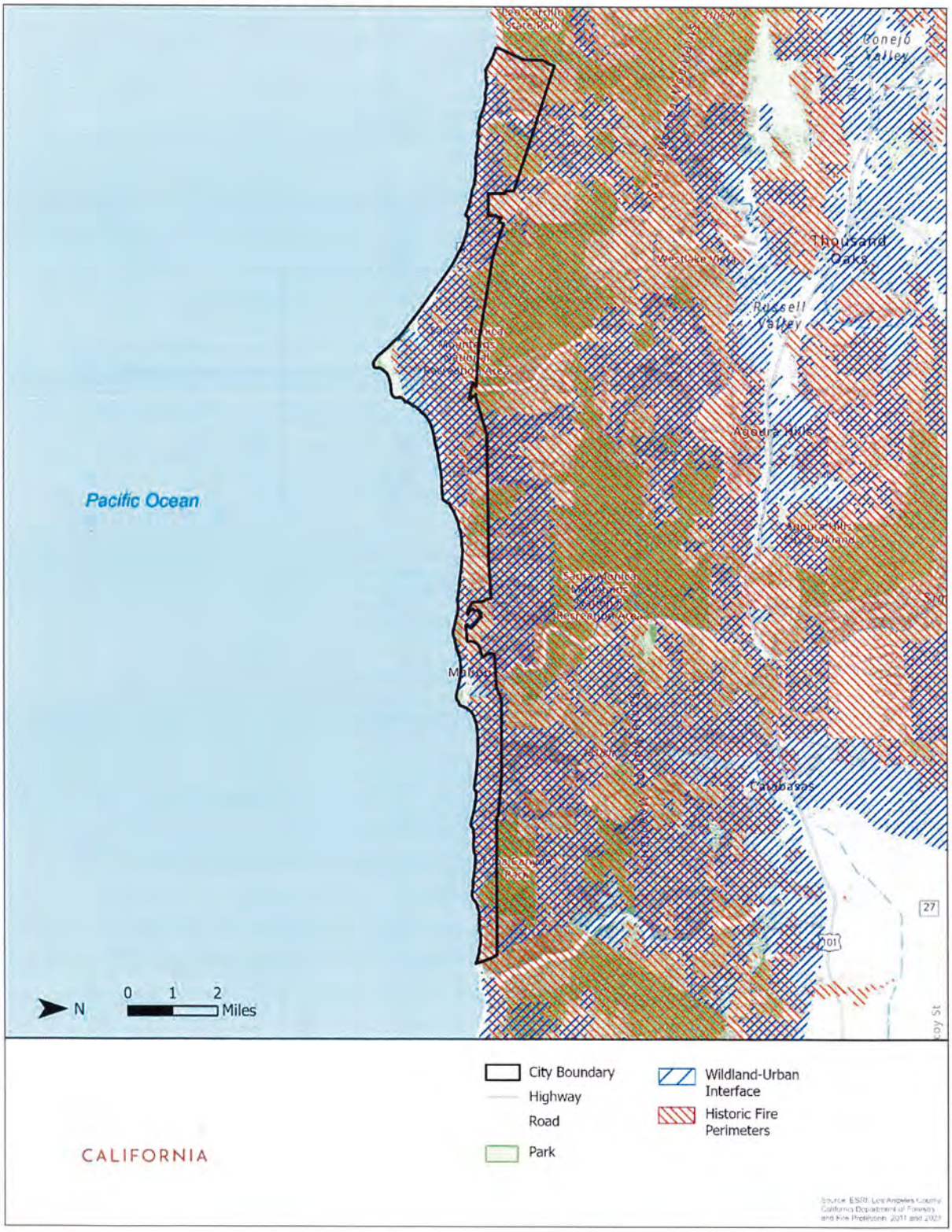


Figure S-6 Historic Fire Perimeters and WUI Areas in Malibu



GOAL S-3: A COMMUNITY BETTER PREPARED TO ADDRESS THE RISKS FROM NATURAL HAZARDS.

Objective / Policy / *Action*

S-3.3	**A community adapted to wildfire risks and hazards .**
S-3.3.1	The City shall minimize the risk of loss to life and property from wildfire by reducing wildfire vulnerability where possible.
Action S-3.3.1a	Continue to monitor and update the Malibu Community Wildfire Protection Plan, including the identification of fire hazards, assessing acceptable levels of cost and risk, and determining appropriate fire protection programs.
Action S-3.3.1b	Work with other agencies including but not limited to Los Angeles County Fire Department, Ventura County Fire Department, and California Department of Forestry and Fire Protection (CAL FIRE), to ensure effective and efficient fire suppression, prevention and rescue services.
Action S-3.3.1c	Coordinate with Los Angeles County Fire Department and CAL FIRE to establish programs and guidelines for fire-safe landscaping including buffers comprised of fire adapted/ resistant vegetation between residential areas and open space areas and encourage use of fire-safe landscaping principles which emphasize plant species with low fuel volumes.
Action S-3.3.1d	Work with the Los Angeles County Fire Department to adopt a program for controlled burning of combustible vegetation, based on the recommendations of the responsible forestry and fire-protection official.
Action S-3.3.1e	Work with the Los Angeles County Fire Department to enforce code requirements for flammable brush clearance, and reduction of flammable vegetation, including both native plants and ornamental landscaping.
Action S-3.3.1f	Work with appropriate agencies to ensure sufficient stored water and consider non-monetary incentives for on-site or area-wide shared storage water suitable to meet effective firefighting standards and requirements .
Action S-3.3.1g	Work with Los Angeles County Fire Department to establish standards for fire-fighting equipment access suitable for Malibu.
Action S-3.3.1h	Develop and update as necessary an Evacuation Plan for the City which identifies streets available to serve as wildfire escape routes, potential hazard incidents, and criteria regarding capacity, safety, and viability.
Action S-3.3.1i	Coordinate with Los Angeles County Fire Department and CAL FIRE to develop guidelines and standards for all new construction and remodel structures to utilize fire-resistant building materials and designs, and, if feasible, to be sited to minimize fire hazards.
Action S-3.3.1j	Provide South Coast Air Quality Management District regional wind patterns maps to homeowners, architects and contractors to help them plan development siting and design that minimizes fire hazards.
Action S-3.3.1k	Provide on-site fire safety home inspections (using Fire Safety Liaisons), when requested by resident or property owner, and advise homeowners on the most current programs/policies within the City and County, to help minimize fire hazards while maintaining slope stability and appropriate vegetation.
Action S-3.3.1l	Develop, encourage, and support volunteer neighborhood watch and arson prevention programs.

Action S-3.3.1m	Develop a permanent, ongoing homeowner watershed area management plan to reduce fire hazards while maintaining appropriate vegetation that will stabilize the watershed and control the flow of water from it. Application of such plan in Resource Protection Areas shall be subject to review and approval for compliance with resource protection requirements.
Action S-3.3.1n	Work with water service providers and Los Angeles County Fire Department, to identify neighborhoods with inadequate flow from fire hydrants, and to upgrade deteriorated and undersized water-distribution systems.
Action S-3.3.1o	Work with jurisdictions within the city and surrounding region to ensure that all public water storage facilities have an emergency power supply for their pumps, or gravity-driven water distribution systems.
Action S-3.3.1p	Require smoke detectors, carbon monoxide alarms, and fire sprinkler systems in all new residential developments.
Action S-3.3.1fq	Reassess fire hazards after wildfire events to adjust short- and long-term fire prevention and suppression needs.
S-3.3.2	Work with the Los Angeles County Fire Department to ensure that communities address the following wildfire risk within Fire Hazard Severity Zones: a) Identify building and site design methods or other methods to minimize damage in fire prone areas on undeveloped land and when rebuilding after a fire. b) Require ongoing brush management to minimize the risk of structural damage or loss due to wildfires. c) Provide and maintain water supply systems to for adequate structural fire suppression. d) Provide adequate fire protection.
Action S-3.3.2a	Assess site constraints when considering land use designations near wildlands to avoid or minimize wildfire hazards as part of land use update or amendment.
Action S-3.3.2b	Establish ongoing maintenance and funding for vegetation management and brush clearance along City-maintained roads, open space areas, and fire breaks.
Action S-3.3.2c	Implement brush management along City maintained roads in Fire Hazard Severity Zones adjacent to open space and canyon areas.
Action S-3.3.2d	Maintain up-to-date maps depicting Fire Hazard Severity Zones and historical wildfire data and ensure that information is readily accessible to the public.
Action S-3.3.2e	Maintain access (ingress and egress) for fire apparatus vehicles along public streets in Fire Hazard Severity Zones for emergency equipment and evacuation.
S-3.3.3	All proposed development shall incorporate fire safe design and adhere to the latest fire safe regulations adopted by the State and City.
S-3.3.4	Require development to be located, designed, and constructed to provide adequate fire defensibility and minimize the risk of structural loss and life safety.
S-3.3.5	Require development located near ridgelines, top of slopes, saddles, or topography prone to wildfire hazards to be located and designed to account for the increased risk.
Action S-3.3.5a	Require new developments and major redevelopments to be designed to minimize pockets, peninsulas, or islands of flammable vegetation to reduce fire susceptibility.
S-3.3.6	Require new developments and major redevelopments to conform to contemporary fire safe standards related to road standards and vegetative hazards.
Action S-3.3.6a	Develop, implement, and maintain a public outreach program educating the community about contemporary fire safe standards, and wildland fire preparedness.

S-3.3.7	Require all new development and redevelopment after a fire to meet current Fire Code requirements. Incorporate fire safe design into all new development within the City, which should include but not be limited to: a) Require that development is located, designed and constructed to provide adequate defensibility and minimize the risk of structural and human loss from wildland fires. b) Require development on hillsides and canyons to be designed to reduce the increased risk of fires from topography features (i.e., steep slopes, bluffs, and ridge slopes). c) Administer state vegetation management requirements for new and existing developments. d) Design and maintain public and private streets for adequate fire apparatus vehicle access (ingress and egress). e) Install and maintain visible street signs, and necessary water supply for structural fire suppression. f) Require that development provide and maintain adequate fire breaks where feasible or identify other methods to slow the movement of a wildfire in very high Fire Hazard Severity Zones. g) Ensure long-term maintenance of vegetation management activities is accounted for in budgeting and planning throughout the City. h) Fire prone areas shall require construction standards to reduce structural susceptibility and increase protection. In addition, require onsite detection and suppression, including automatic sprinkler systems. i) Encourage owners of non-sprinklered properties to retrofit their buildings and include internal fire sprinklers. j) As appropriate, require site and design new development to avoid the need to extend fuel modification zones into sensitive habitat, where feasible. k) Adopt, amend or maintain the Fire Hazard Severity Zone Map and applicable Wildland Urban Interface Code Standards through periodic updates and ensure alignment with City documents such as but not limited to; the Community Wildfire Protection Plan, General Plan Safety Element, and the Local Hazard Mitigation Plan. l) Incorporate all of the previous requirements into any new or updated Fire Protection Plans (see Policy S-3.3.11) to maintain consistency.
S-3.3.8	Require development to provide additional access roads when necessary to provide for safe access of emergency equipment and civilian evacuation concurrently.
S-3.3.9	Require all new, remodeled, or rebuilt structures to meet current ignition resistance construction codes and establish and enforce reasonable and prudent standards that support retrofitting of existing structures in High Fire Hazard Severity Zones.
S-3.3.10	Require all new essential public facilities to adhere to the latest construction requirements and best management practices within fire prone areas to minimize risk to these facilities.
S-3.3.11	All new development and major redevelopment shall provide a Fire Protection Plan which meets the minimum standards as required by the State of California, County of Los Angeles, and the Los Angeles County Fire Department.
S-3.3.12	Require brush clearance around structures consistent with the City of Malibu and Los Angeles County Fire Department Fire Code and California Fire Safe Regulations.

Action S-3.3.12a	Provide information for and encourage the removal of dead, dying, and diseased trees on developed properties.
S-3.3.13	New development near or within environmentally sensitive habitat areas and habitat buffers shall be sized, sited, and designed to minimize the impacts of fuel modification and brush clearance activities to the extent feasible
Action S-3.3.13a	Coordinate with neighboring jurisdictions to develop strategic fire plans focusing on fuel management/ modification within established defensible spaces, balancing structure protection with native vegetation, and sensitive habitat preservation.
S-3.3.14	Advocate and support regional coordination among fire and protection service providers to improve fire protection and maximize service levels in a fair, efficient, and cost-effective manner.
Action S-3.3.14a	Coordinate with local, state, and federal fire protection agencies with respect to fire suppression, rescue, mitigation, training, and education.
Action S-3.3.14b	Coordinate with local, state, and federal agencies to update emergency, evacuation, and hazard mitigation plans, as necessary.
Action S-3.3.14c	Coordinate with local, state, and federal agencies to develop emergency services training and education goals, policies, and standards
Action S-3.3.14d	Coordinate with local, state, and federal agencies to ensure adequate training is provided to first responders and emergency services personnel
Action S-3.3.14e	Coordinate with fire services providers to improve fire protection services for multi-story construction.
S-3.3.15	Require and maintain adequate setbacks, easements, and accesses to development, to ensure that emergency services can function.
S-3.3.16	Require all planned development and major redevelopment has adequate fire and emergency services.
Action S-3.3.16a	Analyze new development impacts on emergency services funding and develop new funding sources, if needed
Action S-3.3.16b	Coordinate with the Los Angeles County Fire Department to ensure adequate emergency services staffing, facilities, and equipment is available to serve existing and future development.
Action S-3.3.16c	Coordinate with Los Angeles County Fire Department to develop and periodically update an Emergency Services Master Plan that details staffing, facilities, and equipment needs. Updates should periodically assess future emergency services needs for the City.
S-3.3.17	Require adequate water supplies and infrastructure are available for current and future development.
S-3.3.18	Ensure that adequate water storage and capacity are available to meet daily demand and fire flow requirements.
S-3.3.19	Coordinate with appropriate providers/agencies to ensure adequate infrastructure and conditions for new development related to: a. Water supply and fire flow. b. Location of anticipated water supply. c. Maintenance and long-term integrity of water supplies. d. Evacuation and emergency vehicle access. e. Fuel modification and defensible space. f. Vegetation clearance maintenance on public and private roads. g. Visible home and street addressing and signage.

E. CLIMATE ADAPTATION

Although climate change is not a hazard, variations in environmental conditions can impact some of the natural hazards affecting Malibu. Projections of future conditions include increased temperatures, increased extreme heat days, changes in precipitation, more prolonged droughts, and changes in the size and frequency of wildfire incidents. **Table S-1** identifies the current/historical conditions and end of the century projected conditions within Malibu projected from climate change.

Increasing temperatures associated with climate change can act as a hazard multiplier. By the end of the century, annual mean temperatures are projected to increase between two and ten degrees, impacting City residents and businesses. These increases are also anticipated to increase the number of extreme heat days, from 3 days per year to between 8 and 37 days. These potential temperature increases may impact residents living in poorly insulated structures or structures that do not meet current code requirements.

TABLE S-1 – POTENTIAL CLIMATE CHANGE EFFECTS FOR MALIBU

CATEGORY	Historic (1961-1990) /Current	Future/End of the Century (2070-2099)
ANNUAL MEAN TEMPERATURE	71.3° F	73.9 – 81.4 °F
EXTREME HEAT DAYS (90.1° F)	3 days per year	8 to 37 days per year
ANNUAL MEAN PRECIPITATION	17.0 inches	13.2 to 26.0 inches
ANNUAL AVERAGE AREA BURNED	379.6 acres	490.3 – 531.8 acres

SOURCE: HTTPS://CAL-ADAPT.ORG/

Climate change projections suggest that while temperatures will increase in the coming decades, annual mean precipitation could decrease. However, future rainfall events are expected to be more intense, potentially increasing the risk of flooding. These shifts in precipitation patterns may also lead to changes in local vegetation, impacting drainages and changing wildfire management needs.

Increased rainfall could intensify flooding in the community and extend into areas that have not experienced such events before. In addition, more intense precipitation can destabilize local hillsides and drainages, potentially resulting in an increase of landslides, mudslides, and erosion along stream courses, which would threaten adjacent properties and structures.

With future temperature increases and unpredictable precipitation events compared to those experienced today, wildfire impacts are projected to increase by the end of the century. This projection is based on the overall reduction in small and moderate precipitation events in place of large or extreme events, suggesting that vegetation could also experience fluctuating growth patterns. A reduction in vegetation (during dry years) could reduce future wildfire vulnerability, while an increase in vegetation (during wet years) could increase wildfire vulnerability. The City currently experiences an average of 379.6 acres burned annually, projected to increase to 490.3–531.8 acres by the end of the century. Based on these projections the City could experience a 40% increase in acreage burned during a wildfire.

While climate change is projected to exacerbate many of the hazards already affecting the City, many of these hazards may interact with each other. Increased temperatures coupled with less precipitation (a prolonged drought) can reduce water supplies and vegetation growth. Under these drier conditions lower vegetation growth may reduce fire risk, however during a prolonged drought, the existing vegetation will be drier than normal and

could become diseased due to the added stress. Under these conditions, the remaining vegetation would be extremely vulnerable to wildfire conditions.

GOAL S-3: A COMMUNITY BETTER PREPARED TO ADDRESS THE RISKS FROM NATURAL HAZARDS.

Objective / Policy / *Action*

S-3.4	**A community where hazards from weather related events are minimized.**
S-3.4.1	Require buildings and developments exposed to high wind conditions to incorporate design elements and features that minimize or reduce damage to people, structures, and the community.
S-3.4.2	Ensure city operations and the community are informed about heat risk during extreme heat events.
Action S-3.4.2a	Maintain a heat vulnerability index and use it in prioritizing capital projects and neighborhood investments.
Action S-3.4.2b	Operate and maintain cooling centers in underserved neighborhoods during heat emergencies and publicize their locations widely
Action S-3.4.2c	Conduct public outreach to inform residents of heat risks each summer and collaborate with local health agencies to support vulnerable populations.
S-3.4.3	Ensure new multi-family development, non-residential, and single-family residential subdivision developments shall plant street trees at appropriate intervals to increase shade and canopy cover.
S-3.4.4	Promote the use of increased shading, light colored-paving, and pervious surfaces.
S-3.4.5	Require heat mitigation plans as part of project review for all new developments, showing shading, ventilation, and surface treatment strategies
Action S-3.4.5a	Implementation of heat mitigation measures shall prioritize nature based solutions to improve tree cover, cooling resources, and infrastructure capacity to address extreme heat impacts.
S-3.4.6	Coordinate with utility providers to reduce blackouts and public safety power shutoff events.
Action S-3.4.6a	Provide timely communication regarding power constraints and public safety power shutoff events to residents and businesses.
Action S-3.4.6b	Explore and encourage alternative power sources and power infrastructure including micro-grids and battery backup systems.
S-3.5	**A community prepared for future climate related impacts.**
S-3.5.1	Support regional and subregional efforts to adapt current water supply practices in anticipation of reduced water availability due to the effects of climate change.
S-3.5.2	Collaborate with local, regional, state, and/or federal jurisdictions and agencies on climate resiliency and adaptation strategies in the City.
Action S-3.5.2a	Develop a climate resiliency plan that integrates and builds upon the strategies identified in the General Plan, Energy Action Plan, and Coastal Vulnerability Assessment.
S-3.5.3	Monitor climate change-related effects with local, regional, state, and/or federal partners to provide information about the effectiveness of existing infrastructure and programs within the City.

Action S-3.5.3a	Establish a collaborative framework with partners at various levels of government and local community to share goals, collect localized data, and regularly evaluate the effectiveness of resilience and adaptation efforts. Potential partners could include but not be limited to: • Local Community-Based Organizations (CBOs), • Research and Academic Institutions, • Local Cities and Counties, • Regional Planning Organizations Like Southern California Association Of Governments (SCAG), • Governor's Office Of Land Use And Climate Innovation (LCI), • California Department Of Public Health, • National Oceanic And Atmospheric Administration (NOAA), And • Environmental Protection Agency (EPA).
S-3.5.4	Coordinate with regional, state, and federal agencies to monitor the indicators and impacts of climate change as they relate to the City.
Action S-3.5.4a	Monitor and periodically update the following City plans and mapping as required to include the most up to date climate adaptation resiliency strategies and information within the City: a) Las Virgenes-Malibu Council of Governments MJHMP - to incorporate new information related to climate change, as necessary. b) The City of Malibu Energy Action Plan - focuses on climate mitigation and generally addresses climate adaptation. c) The City of Malibu Vulnerability Assessment - integrates climate adaptation and hazard mitigation information and analysis.

F. SHORELINE PROTECTION

Coastal Erosion

Coastal erosion is the gradual or sudden wearing away of coastal bluffs and beaches by wind, rain, high surf, tides, and other events. If buildings and facilities on a beach or bluff have poor drainage, it can exacerbate erosion. Bluff erosion weakens the edges of the coastal terraces and causes parks or yards built on top of the bluffs to shrink over time. Erosion also weakens or hollows out areas beneath structures, leading to partial or complete collapse if the erosion progresses far enough. If the risk of collapse is high enough, the structure may be closed to prevent a potential disaster. Beach erosion narrows beaches, reducing recreational use or limiting coastal access. A narrower beach is also less able to act as a buffer from wave action and coastal flooding, so beach erosion can increase the risk to beachfront properties or increase the rate of bluff erosion when the beach is at the cliff's base. The entire shoreline of Malibu—both beach and bluffs—is subject to coastal erosion. Depending on the orientation of the shoreline and composition of the coastal geology, erosion occurs at different rates in different locations along the coast. Erosion is often worse during the rainy season when severe storms can cause substantial erosion.



Eroded embankment on PCH near Coastline Drive in Malibu.

Sea-Level Rise

Sea-level rise is the increase in the ocean's height and is driven by changes in the Earth's climate. Global temperatures are increasing and causing land ice (i.e., glaciers) to melt. Meltwater runs into the oceans, raising sea levels. Warmer temperatures also cause the water in the oceans to expand (as many other materials do when heated), further raising sea levels. Although it occurs globally, various factors and changes in ocean composition cause sea-level rise at different rates in different locations. Sea-level rise can happen naturally at the end of an ice age, although current sea-level rise is very likely (at least a 90 percent chance) due to human-caused climate change. Sea-level rise is not a direct threat, but it exacerbates various coastal flooding hazards, such as storms, high surf, or exceptionally high tides. Sea-level rise makes beaches narrower and less effective as buffers between the ocean and waterfront development. As a result, when coastal flooding occurs, floodwaters can advance farther inland. Higher ocean levels can also increase the rate of erosion of beaches and bluffs. In the long term, ocean levels may rise high enough to permanently or semi-permanently flood low-lying coastal areas. All beaches in Malibu are at risk of sea-level rise. Areas particularly vulnerable to sea-level rise include low-lying coastal communities, such as the Malibu Lagoon area, as well as specific beaches, such as Zuma Beach, Malibu Surfrider, and Topanga Beach. Critical infrastructure, such as PCH and wastewater treatment facilities, is also at risk, as are beachfront properties, including those on Carbon Beach.

The City prepared a Coastal Vulnerability Assessment (Coastal VA) in 2023 to plan for measures to reduce future vulnerabilities of the City's built and natural coastal resources to projected sea-level rise. The assessment analyzed coastal hazards including tidal inundation, shoreline and bluff erosion, and extreme coastal storm flooding associated with sea-level rise through the end of the century.

SEA-LEVEL RISE VULNERABILITY SUMMARIES

According to the Coastal VA, Malibu's vulnerabilities to coastal flooding and erosion are projected to increase with projected sea-level rise. Many of the City's assets are currently exposed to flooding and erosion hazards in the coastal zone, which are projected to experience greater impacts if no actions are taken. In addition, many assets are not currently subject to coastal hazards but may become exposed under projected future conditions. The following summarizes key sea level rise vulnerabilities of concern for Malibu:

Critical Facilities and Infrastructure

Critical infrastructure in Malibu includes Lifeguard Towers and the Station at Zuma Beach, which may need modification/relocation to avoid erosion and flooding impacts with sea-level rise. Several stretches of PCH are vulnerable to hazards by the end of this century, including bluff erosion or coastal storm flooding and wave run-up (along Zuma Beach, Dan Blocker County Beach, Puerco Beach and Carbon Beach). Several fire hydrants may be exposed to coastal flooding and erosion with sea-level rise. Other important infrastructure includes a sewer pump station that may be exposed to coastal erosion with sea-level rise. In addition, beachfront parcels may also experience issues with onsite septic systems due to rising groundwater levels from sea-level rise. Failure of septic systems may result in discharge of untreated wastewater, poor local water quality and adverse impacts to human health and the environment.

Development

Vulnerable development in Malibu includes beachfront and blufftop homes and businesses, much of which are currently armored and/or elevated. With sea level rise, development on the beaches or lower bluffs may be subjected to coastal erosion and flooding more frequently, leading to property damage and degradation of existing coastal armoring structures. Some oceanfront property and buildings may become impacted by tidal inundation depending on floor elevation and configuration of utilities beneath structures. Shore and bluff erosion may impact upland property and structures. By end of the century, much of the commercial area west of Malibu Creek and lagoon is vulnerable to coastal storm flooding and regular inundation by spring tides.

Access roads to beachfront development may become exposed to erosion with sea-level rise, while Malibu Colony Road may also be subject to tidal inundation and coastal storm flooding.

Beaches

Many of the narrow beaches along the Malibu coast may disappear with sea-level rise, impacting shore ecology and recreation. Beaches in Malibu mostly exist as narrow stretches along beachfront homes, coastal bluffs and PCH, with wider beaches at Zuma/Westward Beach, Point Dume State Beach, and Malibu Surfrider Beach. Today, approximately one quarter of beaches in Malibu may disappear annually from seasonal fluctuations alone and nearly two thirds may disappear annually by middle of this century. In addition, beaches may cease to recover along coastal armoring and other hardened shorelines without action. The disappearance of beaches in Malibu would adversely impact ecological functions along the coastline as well as recreation opportunities for Malibu residents and visitors.

With projected sea-level rise, Malibu's current vulnerabilities to coastal flooding and erosion are projected to increase. There are many assets currently exposed to flooding and erosion hazards in the coastal zone that will experience greater impacts without action. There are also many assets that are not currently subject to coastal hazards but may become exposed under projected future conditions. **Table S-2** (Table 4-22 from the Coastal VA) summarizes the grades for each asset category's exposure, sensitivity, adaptive capacity, and overall vulnerability to sea-level rise. For additional information refer to the Draft Coastal Hazard Vulnerability Assessment.

Table S-2 Coastal VA Results for Malibu

Asset Category	Asset	Hazard Exposure	Asset Sensitivity	Adaptive Capacity	Vulnerability
Communication	Communication Towers	Med	Med	Low	Med-High
Critical Facilities	Fire Stations	Med	High	Low	High
	Fire Hydrants	Med	High	Low	High
	Emergency Shelter	Med	High	Low	High
	Legal Facilities	Med	Med	Low	Med-High
	Lifeguard Towers	Med-High	Low	High	Med
	Lifeguard Stations and Headquarters	Med	High	Med	Med-High
Development	Coastal Armoring Structures	High	Med	Low	Med-High
	Commercial Buildings	Med	Med	Low	Med-High
	Government Buildings	Med	Med	Low	Med-High
	Industrial Buildings	Med	Med	Low	Med-High
	Recreational Buildings	Med-High	Med	Low	Med-High
	Single Family Homes	Med-High	Med	Med	Med-High
	Multi-Family Buildings	High	Med	Low	Med-High
	Mobile Homes	Med-High	Med	High	Med
	Parking Lots	Med	Med	Med	Med
	Other Buildings	Med-High	Med	Med	Med-High
	Malibu Parcels	Med-High	Med	Med	Med-High
Ecology	Wetlands	High	Med	Med	Med-High
	Beaches	Med-High	High	Low	High
	Environmentally Sensitive Habitat Areas (ESHA)	Med-High	Med	Med	Med-High
Energy	Electrical Meters	Med-Low	Med	Med	Med
Recreation	Parks and Open Space	Med-High	Low	High	Med
	Hiking Trails	Med-High	Med	High	Med
	Coastal Access Points	Med-High	Med	Med	Med-High
	Paradise Cove and Malibu Piers	Med	Med	Med	Med
Transportation	Bridges	Med	Low	Low	Med
	Local Roads	Med	Med	Med	Med
	Pacific Coast Highway	Med	High	Low	Med
	Fueling Stations	Med-Low	High	Low	Med-High
Water	Sewer Mains	n/a*	High	Med	n/a*
	Sewer Pipes	Med-Low	High	Med	Med
	Sewer Treatment	n/a**	High	Low	n/a*
	Sewer Pump Stations	n/a*	High	Low	n/a*
	Storm Drain Lines	Med	Med	Med	Med
	Storm Drain Blocks	Med	Med	Med	Med

**n/a – vulnerability grading not applicable; assets are not exposed to hazards by late century*

*** septic systems are not evaluated in this study but have the potential for high vulnerability*

Tsunami

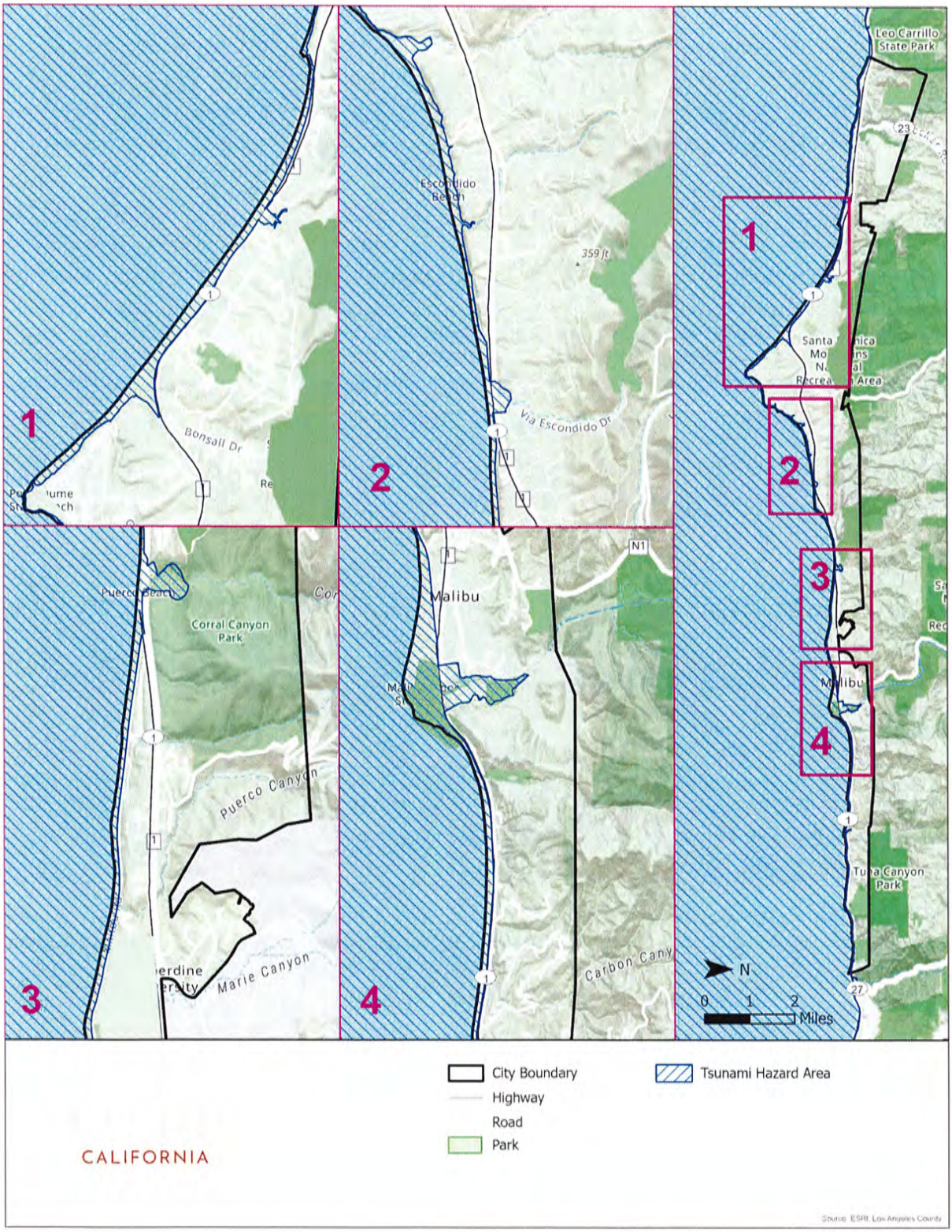
A tsunami is a type of sea wave typically generated by an underwater or coastal geologic event. Earthquakes are the most common cause of tsunamis, but they may also be triggered by landslides, volcanic eruptions, and —in rare instances—meteor strikes. A large and sudden change in atmospheric pressure can also trigger a rare tsunami-type called a meteotsunami. Tsunamis can inundate low-lying coastal areas, causing widespread flooding, and the force of the water can cause significant damage. A typical tsunami event involves multiple waves of varying heights, and the initial wave is not always the tallest. Part of the danger of tsunamis is that they can cause damage far away from the event that triggers them. Although tsunamis weaken as they travel and typically do the most significant damage near the displacement event, large ones can retain enough energy to be destructive hundreds or thousands of miles away. While Malibu is not considered high-risk for tsunamis (due to coastal orientation and geographic location) compared to other coastal areas in California, its low-lying areas and beaches are vulnerable to inundation during a tsunami event. This includes areas surrounding the Malibu Lagoon and much of the coast near Pacific Coast Highway. **Figure S-7** depicts key locations of concern for tsunami inundation based on the latest tsunami hazard mapping prepared by the State of California.

GOAL S-3: A COMMUNITY BETTER PREPARED TO ADDRESS THE RISKS FROM NATURAL HAZARDS.

Objective / Policy / *Action*

S-3.6	**A community resilient to changing coastal conditions.**
S-3.6.1	Require development to provide for safety from coastal storm flooding, coastal erosion, surfacing septic effluent, sea level rise, and tsunami.
Action S-3.6.1a	Require coastal development, except supporting structure, to be above the wave uprush level for storms within the past 100 years, above the 100-year flood plain, and consistent with the latest state and federal guidance and regulations regarding sea level rise.
Action S-3.6.1b	Complete coastal morphology studies and establish shoreline construction standards.
Action S-3.6.1c	Study the effects of seawalls, groins and revetments on beach erosion, consistent with the latest state and federal guidance and regulations regarding sea level rise.
Action S-3.6.1d	Require that proposed coastal development exposed to ocean waters, including but not limited to potentially heavy tidal or wave action, be sited landward of state-owned tidelands and be further sited so as not to cause a potential nuisance, hazard to navigation, public safety problem, or interference with the public's right in the navigable waters.
Action S-3.6.1e	Continue to require a coastal engineering report for all proposed revetments, seawalls, cliff retaining walls and other such construction proposed to protect existing structures to ensure that the structure is constructed utilizing the least environmentally damaging method.
S-3.6.2	Ensure the latest state and federal guidance and regulations regarding sea level rise impacts are considered during planning and development.
Action S-3.6.2a	Implement the recommended actions identified in the Coastal Vulnerability Assessment to address sea-level rise impacts.
S-3.6.3	Participate in a tsunami warning system.

Figure S-7 Tsunami Inundation Hazard Areas in Malibu



G. HAZARDOUS MATERIALS AND WASTES

Natural hazards are not the only threat to a community's safety. Human-caused hazards associated with hazardous materials and waste, are often found throughout a community and can pose significant risks. Generally, hazardous materials are identified as being toxic, flammable, explosive, corrosive, infectious, radioactive, or a combination of these characteristics. Hazardous waste is categorized similarly but is identified separately from materials because they no longer serve a meaningful use.

In the Community

Although common household chemicals pose little threat to the community at large, hazardous materials and waste used by business and industry present a greater risk. Mechanical dealerships, repair shops, gasoline, diesel fuel stations, and dry cleaners are examples of businesses that regularly use and store chemicals or other hazardous materials. Pipelines and tanks within the City also transport and store chemicals that could pose a risk if failure occurs. These releases are anticipated to be isolated to properties where storage occurs. Releases also tend to involve the transportation of raw materials and their byproducts either by pipeline or truck. Regulation of the use, storage, and transportation of hazardous materials and wastes rests on state and federal agencies; however, cities play a significant role in minimizing the risks and impacts of exposure through careful planning and preparation. The City's only truck route is PCH, which has restrictions on the size of vehicles (four or more axles) between Topanga Canyon Blvd (State Route 27) and Decker Road. In addition, California's Department of Transportation and the Los Angeles County Department of Public Works impose limits on trucks on the main roads in and around the City.

In the Home

Exposure to hazardous materials is not uncommon, as many household cleaning products contain chemicals that can harm both humans and the environment. Through proper use, however, the health risks associated with these hazardous materials can largely be avoided. The proper storage of household cleaning products and other common hazardous materials, such as those used in automotive and home repair, is also an important component of responsible management. Following the manufacturer's instructions on the packaging and keeping products out of the reach of children are two simple steps that can help reduce the risk of exposure.

Post Emergency/Disaster Concern

Following a major wildfire or flood, hazardous materials can pose significant risks to public health, safety, and the environment due to the release of toxic substances from damaged structures, vehicles, industrial sites, and household products. Contaminants such as heavy metals, asbestos, hydrocarbons, and volatile organic compounds can infiltrate soil, air, and water systems, creating long-term cleanup and exposure challenges. Effective recovery efforts require coordinated hazardous materials management, debris removal, and water quality protection consistent with state and federal regulations to safeguard community health and environmental quality.

GOAL S-4: A COMMUNITY BETTER PROTECTED AGAINST HUMAN-CAUSED HAZARDS (HAZARDOUS MATERIALS RELEASE).

Objective / Policy / *Action*

S.4.1	**Minimize the impact from hazardous materials and accidental release in the City.**
S-4.1.1	Ensure hazardous materials release programs are up to date and effectively implemented by the City.
Action S-4.1.1a	Work with trash haulers and Los Angeles County Fire Department to provide for the proper collection and disposal of hazardous wastes.
Action S-4.1.1b	Work with Los Angeles County Fire Department to ensure compliance with the Hazardous Materials Disclosure Law.
S-4.1.2	Continue to maintain and hold the bi-monthly Malibu Roundups, a household hazardous waste (HHW) and electronic waste (E-Waste) disposal program, which enables residents to bring material to a centralized collection facility (City Hall) for proper disposal.
Action S-4.2.1a	Develop an informative campaign promoting Malibu Roundups and hold educational workshops/events teaching residents and businesses of the City about the safe handling, storage, use, disposal, and alternatives to use of hazardous materials.
Action S-4.2.1b	Coordinate with federal, state and county resources on potential hazardous materials sites to support identification, analysis, and cleanup if needed.