Safety

INTRODUCTION

The Safety Element establishes goals, policies, and actions to protect the community from risks of natural and human-induced hazards and to reduce the potential for loss of life and property, and economic and social hardships. In the City of Carpinteria (City), known potential natural hazards include flood, drought, earthquakes, liquefaction, post-fire debris flows, and coastal hazards, as well as limited direct exposure to wildfires. Human-caused hazards in the City include railroad and roadway operations, energy outages, and limited exposure to hazardous materials.

Addressing potential hazards and providing the capabilities to respond to them is critical to maintaining a safe and resilient community. The Safety Element provides the policy framework for community-wide emergency response, efficient evacuation, community protection, and land use and development in higher-risk areas of the City. The Safety Element also anticipates the projected effects of climate change such as increased flooding, mud or debris flows, or drought and water supply shortages as climate change produces more extreme weather, which may exacerbate hazards and require additional City responses. Increased wildfire frequency or severity may also occur, with typically more indirect effects on the city (e.g., post-wildfire debris flows, smoke).

Natural and human-caused hazards do not affect Carpinteria uniformly. Some areas are more vulnerable to certain hazards (e.g., flooding) than other areas. Minimizing risk and improving community resiliency requires both a community-wide review of certain policies or programs and targeted measures in selected areas. The Safety Element evaluates and addresses the known extent of potential hazards in the City to minimize risk within the community.

Issue Areas

The Safety Element addresses the following issue areas:

- **Flood Hazards**, including coastal, fluvial, and urban flooding potential, and dam failure.
- **Fire Hazards,** including wildland and urban fires, peak-load water requirements, evacuation routes, minimum road widths, and clearances around structures.
- **Slope Stability and Soil Hazards,** including mud and debris flow, expansive soils, soil settlement, hydrocompaction, subsidence, and bluff retreat or failure.
- **Seismic Hazards,** including earthquakes, liquefaction, and tsunamis.
- **Hazardous Materials,** including industrial facilities, hazardous materials release, agricultural pesticides, crude oil, and natural gas storage.
- **Energy Shortage and Resiliency,** including the resiliency of the local electric distribution system, renewable energy, and potential service interruptions.

The **Safety Element** is a required Element of the General Plan under California Government Code (Gov. Code) §65032(g). The following legislative requirements are addressed herein:

Coastal Act, Chapter 3

Article 4 – Marine Environment

§30232; §30235

Article 6 – Development

§30250(b), §30253

As well as applicable LCP requirements outlined in the CCC's LCP Update Guide

California Planning Law

Gov. Code §65561 {Open Space}

As well as requirements as outlined in the OPR's 2017 General Plan Guidelines

These hazards are described below as they are currently understood and potentially exacerbated by global climate change. Objectives, policies, and implementation measures designed to reduce or eliminate hazard risks are provided. The figures provided herein represent the likely extent of hazardous impacts and may be used to guide land use and planning; however, the actual severity and extent of such impacts may vary. The Safety Element relates to topics mandated in the City's **Land Use Element** and **Open Space & Conservation Element**, as development must adequately account for public health and safety considerations; and open space provides both buffers from climate-driven hazards such as flooding and increased hazard risks such as wildfire and debris flows. Policies and management strategies specifically related to coastal adaptation and resilience in response to coastal hazards and climate change, including coastal flooding, are further satisfied within the **Coastal Resiliency Element**.

Local Hazard Mitigation Plan

The City of Carpinteria has a Local Hazard Mitigation Plan (LHMP) as an annex to the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). An LHMP assesses risks and vulnerabilities from natural or human-caused disasters and identifies and prioritizes mitigation actions. The LHMP is subject to annual maintenance and implementation and must be updated every five years in compliance with the Disaster Mitigation Act (DMA) of 2000.

Assembly Bill (AB) 2140, passed in 2006, provides the City with the authority to adopt its LHMP as part of the Safety Element of its General Plan. By doing so, the City becomes eligible for additional funding from the California Office of Emergency Services (CalOES) under the California Disaster Assistance Act. The LHMP is, therefore, incorporated as a part of this Safety Element in compliance with AB 2140. Please refer to the LHMP for the current location, extent, probability, and severity of vulnerabilities to hazards that affect the City. The LHMP document is available to view at carpinteriaca.gov/city-hall/community-development/planning/general-plan-coastal-land-use-plan.

FLOOD HAZARDS

Flooding Potential

Flooding can occur during winter storms that produce heavy precipitation, generally between December and March annually. When surface flows exceed the capacity of waterways and stormwater drainage systems, the City is subject to different types of flooding. Fluvial flooding occurs when watershed flows exceed the capacity of a river, creek, or stream. Urban flooding occurs when stormwater flows exceed the capacity of stormwater drains and conveyances. Coastal flooding occurs due to coastal storms and wave runup and may be exacerbated by sea level rise (see also the **Coastal Resiliency Element**). Three major creeks, including Carpinteria Creek, Santa Monica Creek, and Franklin Creek, flow through the Carpinteria Planning Area to the Pacific Ocean and are the potential source of flooding in the City. Lagunitas Creek drains a small watershed in the eastern portions of the City with very limited flooding potential.

Flood flows are conveyed by four creeks in the City such as Franklin Creek (pictured), most of which are channelized to limit the impacts of flood damage and bank erosion on adjacent developed areas.

Definitions

Fluvial flooding is caused by high levels of precipitation that causes a river, creek, or stream to exceed its capacity.

Urban flooding is caused by precipitation that falls on impervious surfaces and overwhelms local stormwater drainage capacity.

Coastal flooding occurs when low-lying land is flooded due to storm surges and other coastal processes (see also the **Coastal Resiliency Element**).

In response to major floods in 1969, Santa Monica and Franklin Creeks were channelized and lined with concrete within the City limits to convey flood flows through the City at higher velocities and protect developed areas, roads, and bridges from flooding, bank erosion, and related hazards. This work was implemented by the Santa Barbara County Flood Control and Water Conservation District (County Flood Control District), the U.S. Army Corps of Engineers, and the U.S. Natural Resources Conservation Service.

Carpinteria Creek is primarily natural within the City with extensive native riparian habitats but supports bank protection in places.

FEMA Flood Hazard Zones in Carpinteria

Zone A, AE: SFHA subject to a 1% annual chance of flooding.

Zone VE: Coastal high hazard areas subject to 1% annual chance of flooding and wave effects of 3 feet or greater.

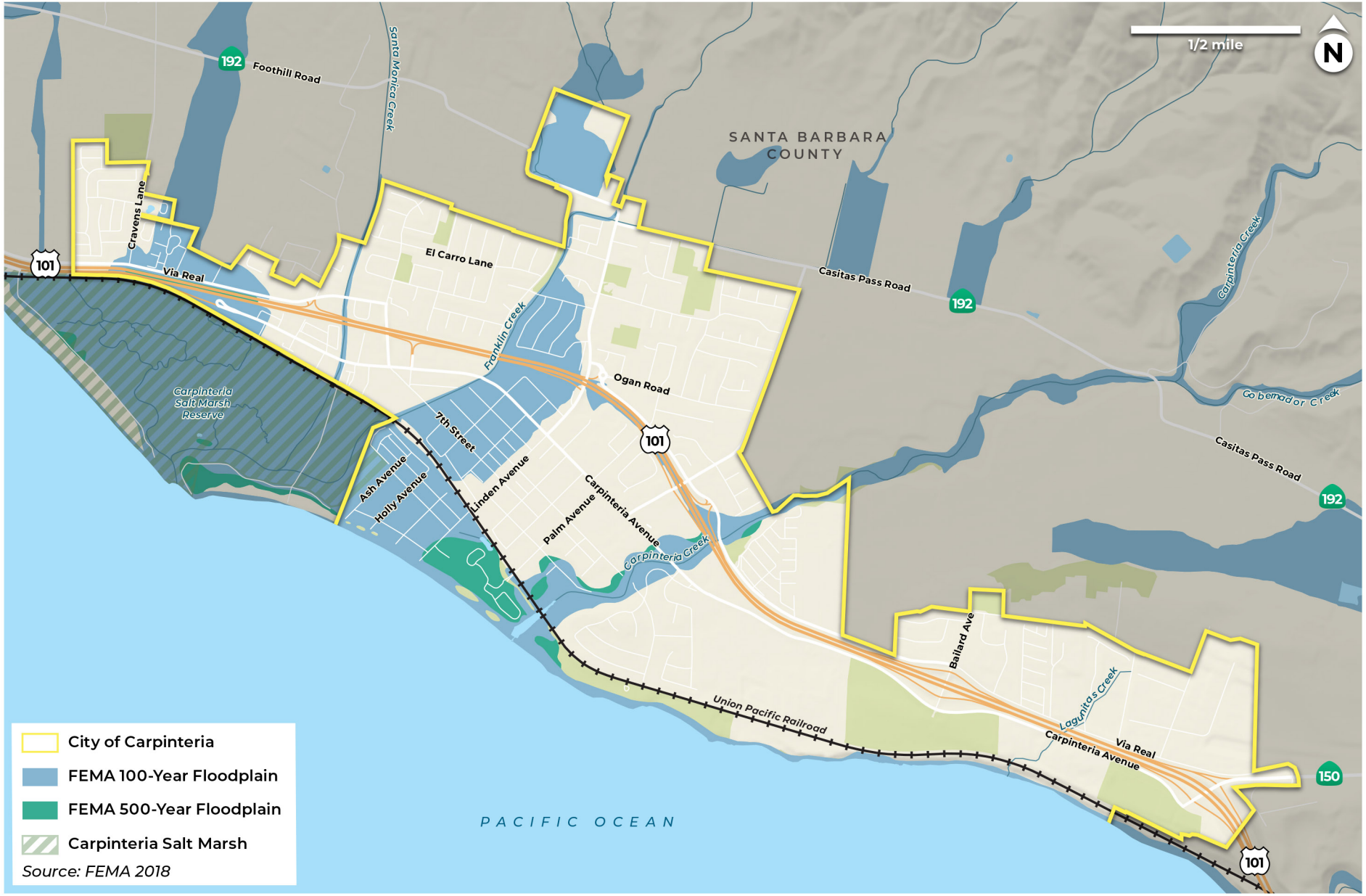
Zone X (shaded): Areas subject to a 0.2% annual chance of flooding.

Zone C, X (unshaded): Minimal flood hazard.

The Federal Emergency Management Agency (FEMA) publishes flood hazard information in support of the National Flood Insurance Program (NFIP), including National Flood Insurance Rate Maps (FIRMs) that designate Special Flood Hazard Areas (SFHAs). Areas with a 1.0 percent chance of flooding annually (i.e., once every 100 years; Zone AE) on the FEMA FIRM depict the "base flood elevation", which is the elevation that flood water is anticipated to rise during a 100-year storm event. Coastal areas with a 1.0 percent chance of flooding with wave effects of 3 feet or greater (100-year coastal flood zone; Zone VE) indicate a potential for coastal flooding and wave runup. Areas with a 0.2 percent annual chance of flooding (500-year flood zone; Zone X) indicate more severe flooding conditions and include base flood elevation plus additional areas where floodwaters may further inundate low-lying areas.

The City participates in the NFIP and coordinates with FEMA to periodically update the City's FIRMs and ensure that the extent and depth of the flood hazard zone are accurately characterized. The FIRMs depict flood hazard extents and include portions of the Carpinteria Planning Area (Figure S-1). Portions of the Carpinteria Planning Area that are within the 100-year SFHA (Zones A, AE, and VE) include:

- Areas adjacent to Santa Monica, Franklin, and Carpinteria Creeks;
- Intermittent areas north of Foothill Road;
- Low-lying areas adjacent to U.S. Highway 101 (U.S. 101) between Santa Monica and Carpinteria Creeks;
- Low-lying areas along the Pacific Ocean coastline;
- El Estero Marshland, and;
- Areas east of the marshland, west of Linden Avenue, and south of the Union Pacific Railroad (UPRR).



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Carpinteria Flood Hazards

FIGURE S-1

Potential Debris Basin Failure

Debris basins are structures that capture sediment, gravel, boulders, and vegetative debris that wash through creeks during major storms, reducing the risk of flooding and debris and mud flows downstream. Debris basin failure can occur due to prolonged periods of rainfall and flooding that exceed the structure's design requirements. Structural damage can also result from floods, erosion, or earthquakes.

The Santa Monica Debris Basin, located along Santa Monica Creek approximately 0.9 miles north of City limits, is over 100 feet tall and is lined with rock. A concrete spillway is located on the east side of the basin.

Three debris basins lie in the Carpinteria Planning Area north of City limits, including the Franklin, Gobernador, and Santa Monica Debris Basins. The Santa Monica Debris Basin is the largest and was constructed in the 1970s following major floods.

Santa Monica Creek is the largest creek in the City, draining a 2,337-acre watershed capable of producing flows of 4,500 cubic feet per second during a 100-year storm. The Santa Monica Debris Basin has a capacity of approximately 129 acre-feet (208,000 cubic yards). This debris basin captures floodwater and large debris to help limit downstream flooding. The Santa Monica Debris Basin played a key role in community protection during the 2018 Montecito Debris Flows by preventing over 100,000 cubic yards of sediment from overflowing downstream. Gobernador Creek Debris Basin and the Franklin Debris Basin also played an important role, although their watersheds and capacity are considerably smaller. Gobernador Creek Debris Basin has a maximum capacity of 15.5 acre-feet (25,275 cubic yards) and the Franklin Debris Basin has a maximum capacity of 3.7 acre-feet (5,965 cubic yards). County Flood Control District maintains debris basins in Santa Barbara County, which are regularly cleared to minimize blockage and retain capacity (Santa Barbara County Flood Control and Water Conservation District 2017). The County Flood Control District also manages the County's Debris Basin Maintenance and Removal Plan, which details the extent and frequency of annual maintenance activities.

The California Department of Water Resources (DWR) Division of Safety of Dams (DSOD) oversees jurisdictional-sized dam safety and reviews and approves inundation maps for Extremely High, High, and Significant Hazard dams (as required by California Water Code §6161). Jurisdictional-sized dams are over 6 feet in height and impound over 50 acre-feet (8,100 cubic yards) of water. The Santa Monica Debris Basin is over 60 feet high on the upstream and approximately 150 feet

The Gobernador Debris Basin, located on Gobernador Creek approximately 1.6 miles north of City limits, consists of a concrete inlet structure and open passage that may be closed off by a steel gate if necessary.

high on the downstream side, and is the only jurisdictional-sized dam in the Carpinteria Planning Area. This debris basin has a high hazard potential as designated by DWR, which indicates that failure or malfunction during a storm-induced probable maximum flood or debris flow event could result in loss of human life (DWR DSOD 2019; California Code of Regulations [CCR] Title 23, § 335.4). Inundation areas within the City mapped by DWR in the event of debris basin failure include low-lying areas in the western half of the City between Santa Monica and Franklin Creek (between Santa Monica Road and Sterling Ave) bounded by U.S. 101 to the south and extending north past Route 192, areas west of Santa Monica Creek along U.S. 101; Beach Neighborhood areas adjacent to the Carpinteria Salt Marsh; and areas east of Franklin Creek and south of U.S. 101, bordered to the west by Ash Avenue, the east by Linden Avenue, and the south by Sandyland Road, extending north up to 9th Avenue. The City's LHMP provides the current extent and evaluates potential vulnerabilities to debris basin failure.

Climate Change

Projected climate change has the potential to intensify rainfall during storm seasons, which may increase flooding potential. The current average annual rainfall in the City is approximately 17.9 inches, but through the end of this century, annual rainfall is projected to change with more intense rain events but with fewer total days with precipitation (Langridge 2018). This projected increase in extreme precipitation values may exceed the capacity of storm drainage and flood control and increase the potential for short-term urban, fluvial, and coastal flooding (Pierce et al. 2018). Further, projected sea level rise combined with coastal storm surges may exacerbate coastal flooding potential and inundation at low-lying areas near the shoreline and the confluence of the creeks with the Pacific Ocean. This is a particular vulnerability within the Beach Neighborhood. The overall potential for climate change to affect the likelihood of debris basin failure is not fully understood at this point. Despite increased rainfall intensity, the increased risk of debris basin failure could be offset by generally lower reservoir levels if storage water resources become more limited or stretched in the future due to climate change, drought, and/or population growth. See the **Coastal Resiliency Element** for further information on coastal flooding impacts due to projected sea level rise.

FIRE HAZARDS

Wildland and Urban Fires

Definitions

Urban Fire: a fire occurring within City limits; typically residential, commercial, or industrial in nature.

Wildland Fire (Wildfire): a fire occurring in a suburban or rural area that contains flammable vegetation, including areas where there is development in proximity to undeveloped lands.

A wildfire is an unplanned fire that burns in a natural area or wildlands, such as the Los Padres National Forest or undeveloped ranchland, particularly in the Santa Ynez Mountains. Urban fires originate within developed areas and can cause severe damage to structures and essential infrastructure such as telecommunication and electricity lines. Although fires can start from numerous causes, major urban fires are often the result of other hazards, such as storms, droughts, transportation accidents, hazardous material spills, criminal activity (arson), or terrorism. High-fire hazard areas experience annual cycles of elevated wildfire danger. Wildland fires typically originate outside of the City and have the potential to impact the City by causing smoke and ash fall, evacuations, and post-fire flooding or debris flows. High-velocity "sundowner" and "Santa Ana" winds can fan wildfires, increasing overall intensity and the rate at which they spread. However, the City is largely buffered from wildland areas by extensive areas of irrigated agricultural land.

The City is largely developed with residential, commercial, and industrial structures, including many older structures that may lack modern fire suppression systems. Due to its urban setting, the City does not contain wildland vegetation subject to wildfire hazards. The two areas within the City with extensive areas of natural vegetation are the Carpinteria Bluffs, which support a mix of nonnative grasslands, coastal sage scrub, and eucalyptus trees. Existing residential neighborhoods are generally well buffered from wildfire hazards surrounding the City, although existing light industrial uses and future development on the west end of the bluffs would border these vegetated open space areas. In the Carpinteria Planning Area, the City is surrounded by agricultural land that buffers neighborhoods from high fire hazard wildland in the Santa Ynez Mountains.

Fire Station No. 1, located at 911 Walnut Avenue, serves the southern portion of the CSFPD, including the entire City.

The California Department of Forestry and Fire Protection (Cal Fire) and local wildfire agencies define Local Responsibility Areas, State Responsibility Areas, and Federal Responsibility Areas, which determine wildfire response and coordination efforts. The City is within a Local Responsibility Area. Fire protection service in the City is provided by the Carpinteria-Summerland Fire Protection District (CSFPD), which serves approximately 40 square miles along the coastline from the Santa Barbara-Ventura County line to the east and Montecito to the west. CSFPD also manages the Community Wildfire Protection Plan (CWPP), which provides a risk assessment and wildfire prevention measures within the Carpinteria Planning Area. The CSFPD has mutual aid agreements for wildfire response with the Ventura County and Santa Barbara County Fire Departments, as well as the Santa Barbara County Office of Emergency Management (OEM). Santa Barbara County Fire Department generally responds to wildfires outside the Local Responsibility Area. Cal Fire is responsible for wildfire response within the State Responsibility Areas north of the City, and federal agencies such as the Department of the Interior Office of Wildland Fire and the U.S. Department of Agriculture (USDA) Forest Service are responsible for the Federal Responsibility Area (USDA 2019). However, in the event of a major wildfire, the response is typically a collaborative effort between local agencies and Cal Fire (CSFPD 2013). See also the **Public Facilities & Services Element**, as well as the City's LHMP, for additional information on the City's firefighting capabilities.

Urban fires occur within the City and are typically associated with residential, community, and industrial structures.

Wildfire management and response consider several factors to minimize risk and maximize firefighting success. Flame lengths, fire intensity, heat output, rate of spread, residence time, and whether the fire burns on the surface or in the crowns of the vegetation contribute to fire behavior, and characterize its resistance to control and potential to cause ecological and structural impacts. Cal Fire models the potential risk for wildfire on developed and undeveloped lands and maps high fire hazards based on fuel loading, slope, fire, weather, and historic wildfire conditions. Cal Fire designates Fire

Hazard Severity Zones (FHSZ), which define an area's wildfire risk and help identify potential mitigation to reduce risk.

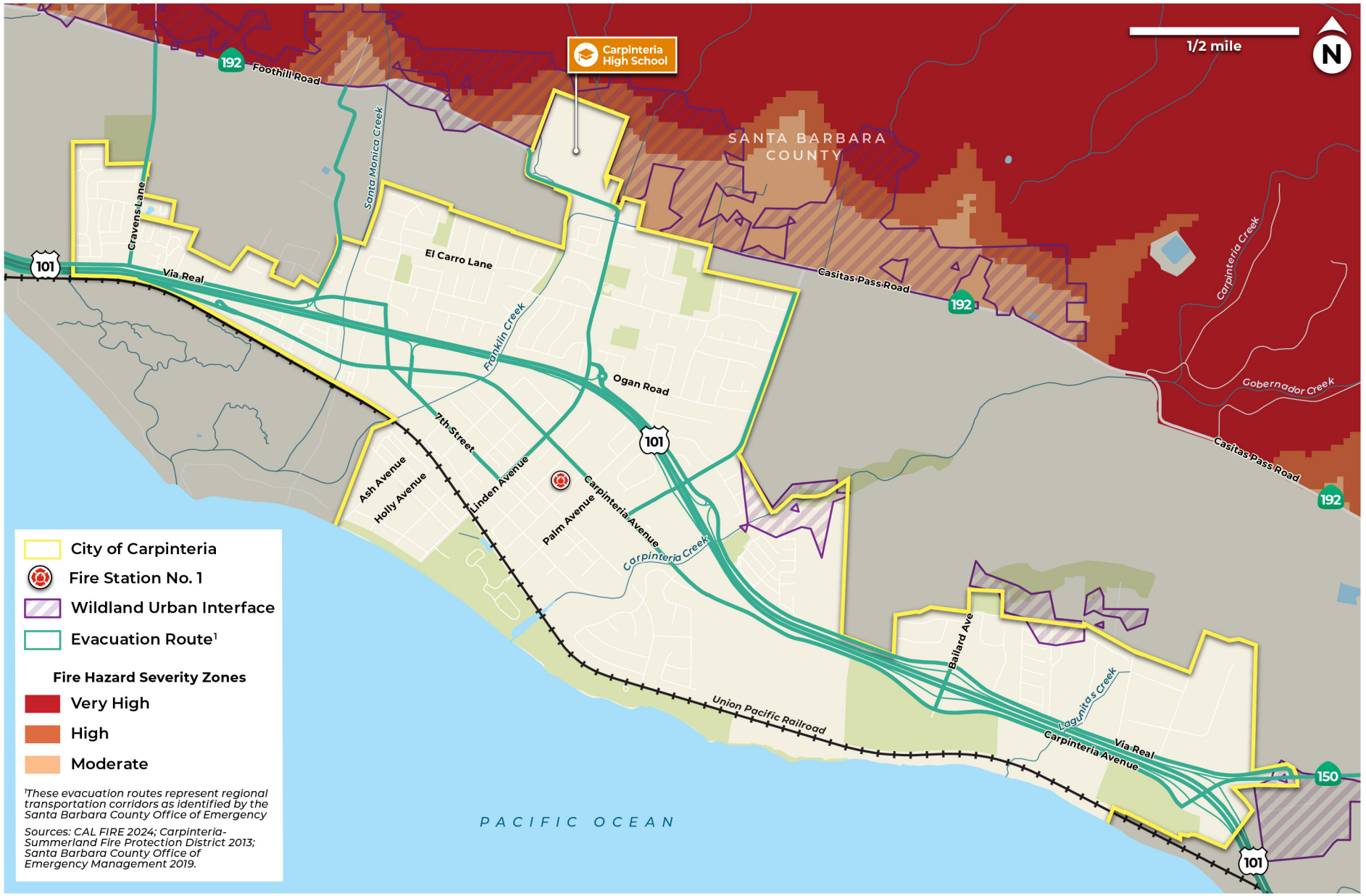
Apart from a small area of moderate FHSZ adjacent to Carpinteria High School in the northern portion and a small area of High FHSZ in the southeastern portion of the City, no areas within City limits lie within an FHSZ. Further, Carpinteria High School and nearby residential neighborhoods are generally buffered from fire-prone native vegetation by irrigated orchards and greenhouses (Figure S-2).

Definition

Defensible Space refers to the area around the perimeter of a structure where wildfire prevention or protection practices are implemented to provide defense from an approaching wildfire or to minimize the spread of a structure fire to wildlands or surrounding areas.

Outside of the City limits, Moderate, High, and Very High FHSZ are located adjacent to and north of the City (Figure S-2) in the Wildland-Urban Interface (WUI). The WUI is broadly defined as the area where improved property development meets fuel (i.e., vegetated wildland areas) (CSFPD 2013). WUI areas are inherently high-risk areas for wildfire impacts on life and property. WUI areas are often the first urban areas affected by evacuation orders and can be challenging for firefighters to reach and defend. Cal Fire has the authority to implement standards for new development in the WUI, such as defensible space requirements. The City contains WUI areas in limited neighborhoods located above Highway 192 (Casitas Pass Road, Foothill Road) within the northern corner of the City, as well as in the southeastern corner of city boundaries, adjacent to U.S. 101, as defined by the CSFPD CWPP and the LHMP (Figure S-2). The City and portions of the Carpinteria Planning Area within the WUI are also identified as "communities at-risk" in the Federal Register and by the State of California due to their proximity to FHSZs. However, as noted above, neighborhoods along the City's northern boundary are buffered from areas of native vegetation by extensive tracts of irrigated agriculture and greenhouses, which help support community resilience to wildfire and the effects of climate change.

Historical wildfire data is recorded by the CSFPD and the Santa Barbara County Fire Department and is documented in the CSFPD CWPP and the City's LHMP. Previous wildfire occurrences help to indicate which areas are susceptible to burning again and can inform management actions to reduce wildfire risk. Historical fire data indicates that vegetated areas that recover from a wildfire can burn again after approximately 20 years. Recently, large wildfires such as the Thomas Fire (2017) have burned near the City. However, there are no historical records of the City experiencing the direct effects of a regional wildfire.



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Carpinteria Fire Hazard Severity Zones and Potential Evacuation Routes

FIGURE S-2

2017 Thomas Fire

Location: Santa Barbara and Ventura Counties

Size: Over 281,000 acres burned

Description: The Thomas Fire originated near Santa Paula in Ventura County in December 2017. The cause was determined to be power lines coming into contact during high winds. The wildfire caused evacuations throughout the Carpinteria Planning Area and burned portions of the WUI in proximity to the City but did not directly affect the City.

Significance: At the time it was actively burning, the Thomas Fire was the largest recorded wildfire in California. Its rapid spread was attributed to weather conditions and a buildup of dry brush, which exemplifies the potentially catastrophic results of prolonged drought in wildfire-prone areas. Direct wildfire effects on the City included extensive ash fall and smoke, which extended for several weeks, as well as the Montecito Debris Flows in January 2018, which directly impacted areas of the City and led to prolonged road closures, including U.S. 101.

Evacuation Routes and Emergency Access

Wildfire evacuation routes in the City generally consist of major transportation corridors leading away from the WUI and may depend on the hazard type and geographic origin or location (Figure S-2). The CSFPD, in conjunction with the County of Santa Barbara Sheriff's Department, is responsible for coordinating evacuation due to wildland or major urban fires. The primary east-west traversing evacuation route and emergency access to and from the City is via U.S. 101. Evacuation zones, road closures, and other emergency information in the case of a wildfire are communicated to the community through the City, CSFPD, or Ready Santa Barbara County.

The CSFPD, in line with state guidance, establishes road design safety requirements within the City. The safety standards such as a road's minimum width (e.g., roads serving two or more residential parcels or dwellings require a minimum width of 24 ft), turning radius, and surface paving requirements support safe ingress and egress for both emergency vehicles and public evacuation safety. For instance, sufficient road accessibility can decrease fire response times in the case of an emergency, and proper road widths can also reduce the likelihood of spreading fire.

Peakload Water Requirements

Peakload water supply is the amount of water available to meet both domestic water and firefighting needs during the season and time of day when demand on the water system is at its peak. These standards ensure that sufficient water flow is available to supply municipal users and fight wildland and urban fires. The minimum fire flow required is determined by the type of building construction, proximity to other structures, firewalls, and fire protection devices, as specified by the latest version of the California Fire Code. The Carpinteria Valley Water District (CVWD) is the water purveyor for the entire Carpinteria Valley, including the City and Planning

Area. Please also refer to the **Public Facilities & Services Element** for further discussion regarding CVWD water supplies.

The CVWD owns the fire hydrants in the City and the hydrants are used as needed by the CSFPD. The CVWD and CSFPD work in conjunction to evaluate the need for water storage on properties where other sources of water are not available for firefighting purposes; however, such properties generally fall outside of the City. As set forth by the CVWD Water Management Plan, agricultural or other regular CVWD customer water flow may be shut off for CVWD customers in the event of a fire. All CVWD customer water may be temporarily shut off in the event of a major urban fire in the Downtown Core of the City (CVWD 2018).

Climate Change

Climate factors that play a role in the origination and spread of wildfires include heat, humidity, fuel (i.e., vegetation), and precipitation patterns. Fire season typically occurs during the fall months when Santa Ana winds blow down hillsides and across dry brush that dries out during the summer. Climate change may increase ambient temperature and reduce rainfall, resulting in the extension of the wildfire season into the spring and fall/winter months. Climate changes that create warmer, drier conditions, increased drought, decreased biodiversity, changes in ecosystems, and a longer fire season are boosting these increases in wildfire risk, as vegetation can become dry and increasingly susceptible to ignition and burning. Across California, extremely wet and dry years may become more severe, which would exacerbate the severity of wildfire conditions in dry years (Langridge 2018). Climate change may also foster more consecutive disasters, including drought followed by wildfires, which can prolong the recovery of natural resources and compound recovery costs.

DROUGHT

A drought occurs when climactic and weather conditions are drier than normal for a long period, making less water available for people, agricultural uses, and ecosystems. California's periodic droughts contribute to water shortages that stress supplies for consumption, industrial uses, firefighting, and other uses. One of the most severe droughts in the City's history extended from 2012-2017, with Lake Cachuma, which supplies 41 percent of CVWD's total water supplies, reaching historic low water levels and associated drawdown of the groundwater basin. On April 7, 2017, the Governor lifted the statewide drought emergency; however, given ongoing low water levels in local reservoirs, the County kept the local drought emergency in place until 2019. Effects of this drought included wetland and stream drying, impacts on agricultural land, and tree mortality across the Carpinteria Valley. Additionally, CVWD's water storage capacity and water quality were impacted at Lake Cachuma by increased sedimentation from the Thomas Fire in 2017. The drought threatened to reoccur in 2020-2022 but was broken by historic rainfall that began in late 2022 and into 2023, which caused Lake Cachuma to fill and spill for the first time in over a decade.

The City relies on water supplies provided by Lake Cachuma, the Carpinteria Groundwater Basin, and surface water supplies from the Santa Ynez River watershed. Historically, when water levels in Lake Cachuma decline due to prolonged drought, the CVWD has relied on the Carpinteria Groundwater basin to meet local water demand. During declared water supply shortages, the CVWD uses a six-stage rationing plan that includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the shortage. The criteria for triggering the CVWD's water rationing stages and water usage reduction goals are based on the percentage of shortage conditions. These regulations are enforced with warnings and fines to discourage excessive water use and incentivize water conservation in the City and Carpinteria Planning Area. During drought conditions, the CVWD also offers rebate programs to reduce water demand, such as installing high-efficiency toilets and washing machines and transitioning from grass lawns to drought-tolerant landscaping.

Climate Change

CVWD and the City can be subject to drought conditions and water shortages in any given year. The most significant impacts associated with drought in the City are those related to water-intensive activities such as wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Climate change has the potential to make drought increasingly common along the West Coast, including in the City. When combined with higher temperatures, changes in precipitation patterns will create significant challenges for the City's water supplies, potentially creating drier conditions and longer and more frequent periods of drought. Increasing temporal variability of water availability may stress water supplies and have the potential to increase the severity of future prolonged droughts. Due to these changes in precipitation patterns, although episodic severe storm events may increase in severity, droughts will likely last longer and happen more frequently because of more variability in precipitation extremes. Average base flows in the City's creeks are projected to decline significantly in an early- and late-century (e.g., post-2050) extended drought scenario. This reduction in average base flows will affect two key local water supply sources (i.e., surface water reservoirs and groundwater), impacting urban and agricultural uses and natural resources (Santa Barbara County Planning and Development Department 2021). Changing precipitation distribution and intensity is projected to lead to increased runoff rather than be captured and stored, exacerbating the potential for drought.

SLOPE STABILITY AND SOIL HAZARDS

Landslides

A landslide is a mass of rock, soil, and/or other debris that has been displaced downslope by sliding, flowing, or falling. Landslides generally occur on steep slopes that have been undercut by erosion, have a sharp decline in the bedrock level, or on slopes where the bedding planes of the bedrock are inclined down the slope. There are no active landslide areas within the City. Most of the City is level and has very low or low landslide potential. Moderate to high rain-induced landslide potential is limited to areas outside current or planned urban development, including coastal bluffs in the eastern area of the City, including Tar Pits Park and the Carpinteria and Rincon

Bluffs, and steeper slopes adjacent to the US 101/SR 150 interchange (see Figure S-3). In these limited areas, active coastal erosion and bluff slumping can occur.

Bluff Retreat

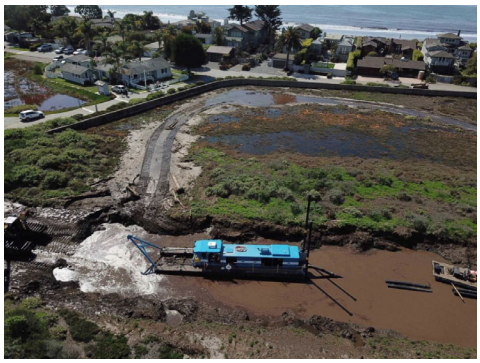
Coastal erosion refers to beach, dune, and bluff erosion that results from winter storms, tidal action, wave action, and over time rising sea levels. Erosion cuts into dunes and bluffs, threatening development along the coast, and can wash away beach sand supplies, resulting in narrower beach conditions and the landward encroachment of ocean mean high-water mark. In Santa Barbara County, coastal erosion is heavily influenced by storm surges when water levels are higher than normal and wave attacks are particularly strong. Erosion potential is related to texture, organic matter content, soil structure, and permeability of soils relative to the weather (i.e., rain, wind, hydrology), the length and steepness of the slope, and the density and type of any vegetative cover. For coastal areas, erosion is also influenced by wave action, drainage, and high winds, which can accelerate bluff erosion and shoreline retreat. In such areas, erosive processes slowly eat away at the beach and foundations of the bluffs, reducing beach widths, eroding dunes, and creating risk for bluff collapse. Bluff collapses threaten bluff-top property and create a safety risk to people visiting the lower beaches.

The Carpinteria and Rincon Bluffs in the southeastern portion of the City rise to about 80 feet in height above mean sea level. The exposed bluffs are composed of the Monterey (Modelo) Formation, which is a thinly bedded, hard, siliceous shale, which is susceptible to erosion, resulting in slumping and landslides. The shoreline in Carpinteria and along Sandyland has experienced dramatic changes since the late 1800s. For conservative planning purposes, the bluffs along the City coastline are estimated to be retreating at an average of 6 inches per year, although actual retreat varies from location to location and from year to year. Of particular concern along this reach are several uncontrolled drainages where older drain culverts have failed, sending water down the bluff face and creating erosional canyons. One mitigating factor reducing bluff retreat along this reach is the well-developed coastal bluff scrub habitat that helps stabilize the bluffs. Additionally, in response to coastal hazards, private property owners and local governments have erected rock revetments and seawalls to protect public and private improvements from coastal hazard damage. The UPRR has also installed both concrete seawalls and rock revetments to protect the railroad tracks along the South Coast from Carpinteria to Gaviota, which lie seaward of all urban development on this reach of shoreline. Refer to the **Coastal Resiliency Element** for further discussion regarding bluff and shoreline retreat.

Definition

The **bluff edge** is defined by the line of intersection between the steeply sloping bluff face and the flat or more gently sloping bluff top (CCR, Title 14, §13577 (h) (2)). Development setbacks are typically measured from the bluff edge.

Mud and Debris Flows



Debris flows following the 2017 Thomas Fire caused habitat loss and food web changes in the Carpinteria Salt Marsh, prompting emergency dredging of drainage canals by the County Flood Control District.

Mudflows are flows or rivers of liquid mud down a hillside on the surface of normally dry land. A debris flow is a soil flow where the majority of the materials are coarse-grained (fine sand to boulder-sized) and non-cohesive. A debris flow is far more powerful and dangerous than a mudslide or mudflow, as it can move stronger, faster, and farther. Mud and debris flows typically occur after periods of heavy precipitation, when water-soaked soil and rock are destabilized and water, soil, and mud are driven downhill by gravity. The most destructive debris flows occur during high-intensity rainfall and mobilize sediments and debris on barren post-wirefire soils. Post-fire mud and debris flow hazards can occur in the years immediately after wildfires, as well as over longer periods until vegetative cover regrows. Post-fire debris flows are particularly hazardous because they can occur with little warning, can exert intense force on objects in their paths, and can strip vegetation, block drainage, damage infrastructure such as bridges and buildings, and endanger human life.

Areas susceptible to mudflow and debris flow hazards are present throughout the City. For example, lowland areas of the City are prone to impacts from mudflows and debris flows as sediment, water, and debris slide down slopes towards these lowland areas. Vegetated upland areas within the Carpinteria Planning Area are prone to wildfires, which strip the land of vegetation that holds soil in place, and therefore, are susceptible to increased runoff, mudflows, and debris flows. Topographically steep areas of the City are also susceptible to mudflows and debris flows.

Following the 2017 Thomas Fire, high-intensity rainfall in recent burn areas caused catastrophic mudflows in the Carpinteria Valley and Montecito. The Montecito Debris Flows (2018) caused severe destruction in Montecito that resulted in the loss of life and property. In the City, the high-intensity rainfall event washed large woody debris, sediment, and other materials into creeks that traverse the City from burn areas in the Carpinteria foothills. Although it remained largely within its banks, Carpinteria Creek in particular carried large amounts of debris through several neighborhoods to the beach, piling logs and debris against bridges and covering the beach. Because the upstream debris basins intercepted large amounts of debris, no infrastructure in the City was heavily impacted by the debris flows; however, the flows damaged portions of the Carpinteria Salt Marsh, causing pollution and habitat loss in the wetland. The event prompted emergency dredging in the Carpinteria Salt Marsh by the County to remove debris and excess sediments.

High-magnitude sediment transport events can add significant volumes of sand to City beaches, both directly at Carpinteria Creek and indirectly through County Flood Control sediment disposal activity from dredging in the Carpinteria Salt Marsh and desilting of foothill debris basins. For example, after heavy precipitation in January 2023, more than 40,000 cubic yards of sediment were deposited on City beaches by County Flood Control. While such sediment disposal can cause short-term turbidity and declines in water quality, where the material is primarily sand and free of toxins it also functions as beach nourishment to enhance shoreline resilience to coastal erosion and flooding. Nourishment can greatly add to beach width and help maintain the width and sandy conditions of City and state beaches for several years after the deposition.

Expansive Soils and Subsidence

Soils that expand, settle, or become compacted can become unstable, particularly for building foundations and infrastructure such as pipelines and roadways. Expansive soils with high shrink-swell potential or those with relatively loose, fine-grained soils of low strength can be unsuitable for construction without engineered foundation design or sometimes over-excavation and export. Areas that may contain soils that are susceptible to compaction are present in the City and primarily overlap with outcrops of claystone, siltstone, and shale; however, these areas are limited to the western portion of the City and the El Estero salt marsh to the south (City of Carpinteria 2003). Additionally, soil instability has not been noted as an issue within the Carpinteria Planning Area, and there is no history of acute, specific events associated with these hazards (County of Santa Barbara 2015).

Definition

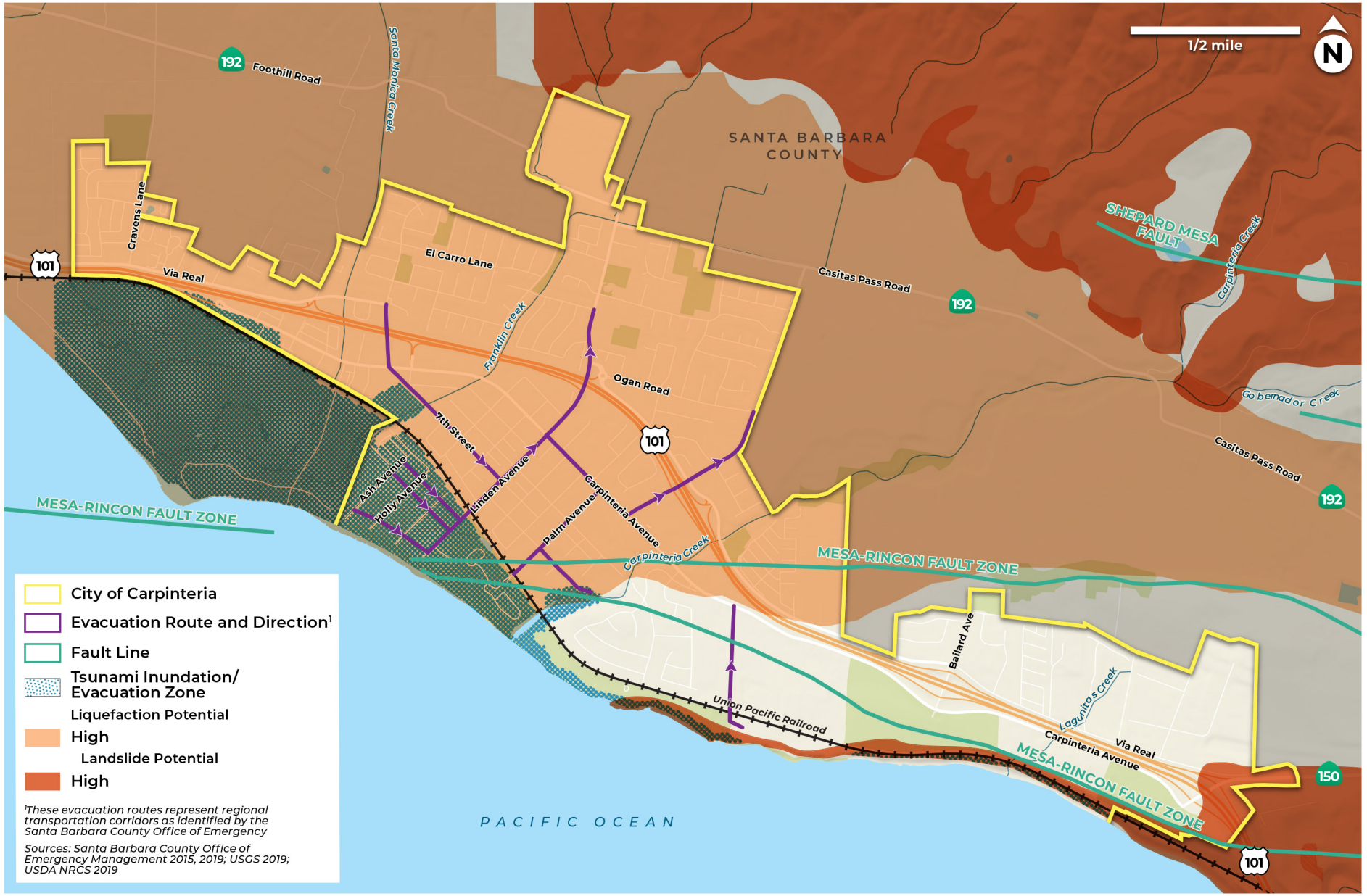
Shrink-Swell Potential is the extent to which certain clay materials will expand when wet and retract when dry.

Susceptibility to Compaction results in compression of pores within the soil that would otherwise transport water and air.

Land subsidence occurs when large amounts of groundwater have been withdrawn from certain types of rocks, such as fine-grained sediments. Land subsidence is most often caused by human activities, mainly from the removal of water from subsurface groundwater aquifers or oil from terrestrial oil fields. The potential for subsidence in the City is considered minimal, as no recognized subsidence has occurred within the planning area due to either groundwater or oil extraction (DWR 2019).

Climate Change

Climate change-induced sea level rise is projected to substantially accelerate bluff retreat rates and impact bluff stability, with some projections finding that bluff retreat rates could increase from 6 inches to one foot per year to as much as 3 feet per year by 2100 under worst-case sea level rise scenarios. See also the **Coastal Resiliency Element** for more information about projected sea level changes in the City. Further, climate change will affect weather patterns, potentially resulting in more extreme rainfall and storm events, which could exacerbate erosion and soil instability. In addition, increased frequency and severity of coastal storms in the City could result in episodic and irreversible bluff erosion if worst-case projections of sea level rise occur.



wsp

Carpinteria Seismic and Soil Stability Hazards

FIGURE S-3

SEISMIC HAZARDS

Earthquakes

An earthquake is ground shaking caused by a sudden release of energy in the Earth's crust that creates seismic waves, most commonly from fault movement or rupture. Ground shaking can cause widespread direct damage to buildings and infrastructure, as well as indirect damage from fires and other hazards. Earthquake intensities range from imperceptible to intense and destructive. The intensity of ground shaking resulting from an earthquake depends on the magnitude of the earthquake, the distance from the epicenter, and the type of earth through which the seismic waves travel. Generally, seismic waves attenuate with distance from the epicenter of the earthquake. In some earthquakes, fault rupture occurs when movement on a fault breaks through to the surface. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep, which is the slow rupture of the earth's crust.

The Mesa-Rincon Fault Zone traverses the City from east to west through neighborhoods along Palm Avenue and Concha Loma neighborhood, as well as the Carpinteria Bluffs, and contains two known branches within the City (see Figure S-3). According to the California Department of Conservation (DOC) classifications of activity level for faults, none of the faults in the Carpinteria Planning Area are considered "active." Thus, the local fault rupture potential is low. Nevertheless, like many California communities, the City is considered seismically active and may be affected by earthquakes generated from regional active faults, including the Carpinteria Fault, the Rincon Creek Fault, the Holloway Fault, the Red Mountain Fault, the Arroyo Parida Fault, and the Shepard Mesa Fault, as well as the Big Pine, Graveyard-Turkey Trap, Mesa, More Ranch, Pacifico, Santa Cruz Island, Santa Rosa Island, Santa Ynez, and the San Andreas Fault zone located northeast of Santa Barbara County.

The Alquist-Priolo Earthquake Fault Zoning Act requires the state to identify zones around "active" faults (those that have experienced movement within the last 11,000 years) in which special studies are required before development. The act prohibits development on the surface trace of active faults to reduce the potential hazards of fault rupture. There are no Alquist-Priolo Earthquake Fault Zones within the Carpinteria Planning Area.

Definition

"Active" vs "Inactive" Fault: A fault is considered "active" if it has experienced movement within the last 11,000 years, and "inactive" if the fault was only active more than 11,000 years ago.

Liquefaction

Liquefaction occurs when ground shaking causes the mechanical properties of some fine-grained, saturated soils to liquefy and act as a fluid. It is the result of a sudden loss of soil strength due to a rapid increase in soil pore water pressures caused by ground shaking. When shallow groundwater and loose soils are present at a site, liquefaction can cause a loss of foundation support, as well as surface subsidence and cracking. Sediments that are saturated and/or contain

significant percentages of fine-grained sediments (i.e., silt and clay) typically have liquefaction potential.

There is no historical evidence of liquefaction in the Carpinteria Planning Area (County of Santa Barbara 2015). However, the low coastal plain and valley bottoms are underlain by alluvium with a high groundwater table, which would present a high potential for liquefaction in the event of high-intensity ground shaking. Areas that are more susceptible to liquefaction include the low coastal areas with high groundwater and poorly consolidated sandy soils in the Toro Canyon-Carpinteria areas south of U.S. 101; most of the central and northern areas of the City are mapped as having a high liquefaction potential (see Figure S-3).

Tsunamis

A tsunami is a series of large ocean waves generated by either large earthquakes that deform the ocean floor, or other displacement of large amounts of water such as a subsea landslide. Unlike wind-driven waves, which only travel through the topmost layer of the ocean, tsunamis move through the entire water column, from the ocean floor to the ocean surface. A tsunami only becomes hazardous when it approaches land and enters shallow water near coastal shorelines where the height increases and currents intensify (NOAA 2018). Large tsunamis that can inundate stretches of the coastline threaten urban development. To generate a tsunami, earthquakes must occur underneath or near the ocean, be of a large magnitude, and create a vertical movement of the sea floor (California Office of Emergency Services [Cal OES] 2019). Low-lying coastal areas are more susceptible to tsunami inundation, but tsunami waves can extend farther inland than typical tidal or storm surge events.

Tsunami hazard zone signs indicate the extent of potential tsunami inundation in the City, shown above at Linden Avenue and 5th Street.

Based on historical events and modeling conducted by the University of Southern California (USC) Tsunami Research Center, a large tsunami event in Carpinteria is unlikely. The potential limits of tsunami inundation modeled for Carpinteria include low-lying areas south of the UPRR tracks, surrounding the Carpinteria Salt Marsh, and along Franklin Creek south of 7th Street. In the event of a strong coastal earthquake, evacuations to higher ground would be orchestrated via tsunami evacuation routes designated in the City (see Figure S-3).

HAZARDOUS MATERIALS

The City has current and former uses involving hazardous materials, resulting in the potential for past and/or ongoing site contamination and the need for remediation. Existing and historical land uses have varying degrees of hazard risk. Hazardous materials may be found in the materials of

older buildings, such as asbestos or lead-based paints (LBPs), or may have been used routinely for the operation of certain land uses, such as automotive repair shops, commercial agricultural fields, medical offices, dry cleaners, and photo processing centers. Potentially hazardous materials found in urban and agricultural areas include cleaning and metal solvents, pesticides/herbicides, paints, and oils and lubricants. Land uses that are sensitive to the release of hazards or hazardous materials include residential, educational, assisted living, and daycare uses in the City.

Industrial and Municipal Facilities

Two CVWD water treatment plants are located at 4810 Foothill Road on the Carpinteria High School property and at El Carro Lane and Namouna Street on the El Carro Park property. Further, the Carpinteria Sanitary District's Wastewater Treatment Plant is located at 5300 6th Street immediately west of Carpinteria Creek. These facilities may store and/or use flammable hazardous materials/waste, highly toxic and corrosive materials/waste, as well as acutely hazardous materials/waste. The Wastewater Treatment Plant uses several processes to treat effluent that generates or uses hazardous materials, including disinfectants such as liquid bleach that ensure residual bacteria is killed before discharge.

The Carpinteria Wastewater Treatment Plant's aeration and settling tanks allow for removal of solids from liquid waste such that wastewater can then be treated and discharged to the ocean.

Hazardous Materials Release

Definition

Hazardous materials are defined by Cal OES as any material that, because of its quantity, concentration, or physical and chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released.

Hazardous materials release is of the greatest concern at facilities handling acutely hazardous materials or during the transport of hazardous materials. U.S. 101 and the UPRR are the major long-distance transportation corridors through the City. In the event of a major accident involving large trucks, hazardous materials release could occur through the spill of diesel fuels or other materials such as oil, gasoline, or hazardous materials being transported. Collisions, derailments, or other emergencies involving freight rail cars along the UPRR may also result in the release of hazardous materials such as oil, hazardous chemicals, or jet fuel being transported northward through the City to Vandenberg Space Force Base. Train accidents are generally localized and the incidents result in limited impacts at the community level. However, if there are volatile or flammable substances on the train and the train is in a highly populated area, death, injuries, and damage to homes, infrastructure, and the environment, including wildfires, can occur. Additionally, a hazardous materials incident on the rails or roadway has the potential to shut down both rail and highway transportation routes,

such as U.S.101, where the two are within proximity to one another. No major train accidents have occurred in the City or within Santa Barbara County. However, in the last thirty years, numerous train accidents have occurred throughout the southern California region, and several train derailments involving toxic materials occurring across the country in 2023 have drawn national attention.

Agricultural production activities, including both conventional and organic agriculture, occur in a limited capacity within the City and more widely in unincorporated areas surrounding the City. Agricultural activities involve the use of regulated hazardous materials, particularly commercial pesticides. Consequently, pesticides, fertilizers, and associated contaminants may be present in near-surface soils in residual concentrations at these locations. Many irrigated lands are currently required to operate under the Irrigated Lands Regulatory Program to regulate the runoff of pesticides, fertilizers, and sediments from irrigated lands through Waste Discharge Requirements issued by the State Water Resources Control Board.

The City also contains four known hazardous materials sites designated "small quantity generators" of hazardous waste such as dry cleaners and gas stations, where hazardous materials are used and transported within the City.

Oil and Natural Gas Industrial Uses

Oil and natural gas production, processing, and pipeline transportation have historically occurred onshore and continue to exist offshore of the City. Oil and gas industrial uses are regulated by both the County and the federal government. The City has a wide array of oil and gas infrastructure, much of it in the form of legacy inactive wells and associated infrastructure (see Figure S-4). The former Carpinteria Oil and Gas Plant contains oil storage, processing, and cleaning facilities used to support offshore oil production, as well as natural gas dehydration and metering stations (Figure S-4). The major oil and natural gas pipelines that traverse the City are the Rincon crude oil pipeline and the Sempra Gas Company natural gas pipeline.

Significant failure of pipelines, including pipe breaks and explosions, can result in loss of life, injury, property damage, and environmental impacts. There have been no significant historical events relating to pipeline ruptures in Carpinteria.

Oil spills have the potential to affect the offshore and onshore portions of the City. The Santa Barbara Channel contains active federal and state oil leases with oil platforms, such as platforms Hogan, Houchin, and Henry located nearest to Carpinteria in state waters. The Channel also supports wide shipping lanes used by a variety of large transport vessels and oil tankers. Oil spills of varying sizes could potentially occur from any of these operations. Many state and federal agencies are involved in preventing and responding to oil spills. Platforms in federal waters are regulated by the U.S. Department of the Interior's Minerals Management Service. Facilities and mineral resources located in state waters less than 3 nautical miles from shore are regulated by the California State Lands Commission, California Coastal Commission, and California Geologic Energy Management Division, under the jurisdiction of the California Department of Conservation (Cal OES 2018). California enacted the Oil Spill Prevention and Response Act in 1990, which

established the Office of Oil Spill Prevention and Response, which is authorized to direct spill response, cleanup, and natural resource damage assessment activities. Additional oil spill response services are provided by the Marine Spill Response Corporation (MSRC), which works in conjunction with the U.S. Coast Guard. While some offshore platforms will continue production. as of 2023, operators of several offshore platforms and onshore facilities within the City have commenced the long-term process of winding down production, decommissioning, removing existing facilities, and remediating contamination. This process is expected to be ongoing through 2030 or beyond.

Agricultural Pesticides

Agricultural production, including both conventional and organic agriculture, occurs within the Carpinteria Planning Area, often immediately bordering existing residential neighborhoods and other municipal uses within the City, including Carpinteria High School. Agricultural activities can involve the use of regulated hazardous materials. Commercial pesticides, including rodenticides, insecticides, herbicides, and fungicides, are sometimes applied to support the commercial cultivation of some crops. Consequently, pesticide drift may be of concern and such pesticides may be present in near-surface soils in residual concentrations at these locations. Pesticide use is regulated by the County Agricultural Commissioner's Office, with permits required for pesticide application. Pesticide use is carefully regulated under state law and consistent with guidelines issued by the California Department of Pesticide Regulation (DPR). Such regulations govern the type of pesticide applied, the location, timing, and rules of application. Special consideration is given to applications near schools. Further, irrigated lands are required by the California State Water Resources Control Board to operate under the Irrigated Lands Regulatory Program to control the runoff of pesticides.

Pesticides are often applied to conventional agricultural cultivation in the Planning Area. The California Department of Food and Agriculture identifies and regulates facilities that handle and apply such pesticides.

Carpinteria Industrial Infrastructure and Hazardous Materials

FIGURE S-4

ENERGY SUPPLY, OUTAGES, AND RESILIENCY

Electricity is conveyed to the City by Southern California Edison via overhead transmission lines, which could be damaged during a natural disaster.

The City receives electricity from Southern California Edison (SCE). The City is located near the end of the SCE regional power distribution grid. With most electric generation coming from one southeasterly direction, Carpinteria is heavily dependent on a key transmission line extending north from the intersection of Linden Road and Foothill Road to an east-west regional connection line within the Santa Ynez Mountains. Due to this configuration, Carpinteria's power supply is less resilient to natural disasters. Power outages affect critical facilities such as health care, emergency response, and communication facilities, including public radio and television transmitters, cell phone towers, emergency communication antennae, and a wide range of other public and private communication infrastructure systems. The Ellwood Natural Gas power plant is a backup capable of serving almost the entirety of southern Santa Barbara County but failed during the Thomas Fire and Montecito Debris Flows of 2018-2019. These events led to power outages for over 20,000 residents in the region and Carpinteria was left with decreased power supply for nearly a month. Refer to the **Public Services & Facilities Element** for further discussion regarding current and projected energy use in the City.

In any given year, the City can be subject to energy shortages and outages. Climate change is likely to increase power-related hazard levels in the region. With increased changes in weather and climate, energy demands will shift too. The increased prevalence of extreme heat can drive energy demand and increase the need for intentional, unscheduled Public Safety Power Shutoffs (PSPSs). Further, the resiliency of power systems can be threatened during a wildfire. As wildfire occurrences associated with climate change increase, so does the risk of utility failure.

Public Safety Power Shutoffs

To prevent wildfires and other natural disasters due to utility infrastructure failure, SCE implemented the PSPS protocol. The PSPS allows SCE to shut off some key sections of the power grid in the foothills north of Carpinteria during high-risk scenarios such as high-wind events, particularly during wildfire season, which could result in utility-induced power outages. SCE assesses potential wildfire risk when forecasts indicate elevated weather conditions. In the case of a PSPS, SCE alerts the affected customer areas and may provide community resource centers for customers to access generators and charge personal mobile devices.

Increasing Resiliency to Energy Shortage

Solar panels provide electricity to the City's Community Garden center, exemplifying renewable energy potential in the City.

To address state and local emissions reduction goals, and following the 2017-2018 Thomas Fire and Montecito Debris Flows, the City partnered with the County of Santa Barbara and the City of Goleta to create the Strategic Energy Plan (SEP) to improve the resiliency of the local electric distribution system. The SEP aims to increase resiliency by promoting local renewable energy, energy efficiency, and energy storage projects to reduce overall dependency on the electric distribution system and increase electricity reliability during power outages. The promotion of renewable energy development also creates local jobs and helps decouple economic development and greenhouse gas emissions. Solar energy provides the greatest potential for renewable energy in the City, most of which is provided by rooftops and parking lots. Due to Carpinteria's constrained geography and urban/suburban quality, alternative renewable energy sources such as wind, hydroelectric, and geothermal hold minimal potential for local development.

Additionally, the City is enrolled in the Central Coast Community Energy (CCCE) Program. CCCE maintains the Uninterruptible Power Supply Fund to accelerate the adoption of reliable backup power for eligible public and private entities operating critical facilities. The program helps customers maintain critical operations during prolonged power outages, such as those caused by PSPS events or other natural disasters (CCCE 2022).

SCE is also aware of the restrictions on its systems and is making planned systematic changes to address the shortcomings. SCE offers several programs to customers experiencing outages, such as hotel discounts, rebates for portable power devices, and portable backup batteries for customers who rely on medical equipment (SCE 2021). SCE also offers power outage alerts via phone and email to alert customers of outages.

EMERGENCY PREPAREDNESS AND COORDINATION

Effective emergency preparedness helps to avoid or minimize the loss of life and property as a result of natural and other disasters, to reduce the social cultural, environmental, and economic costs of disasters, and to assist the rapid recovery from disasters. The City is responsible for emergency preparedness and response, in cooperation with FEMA, the County of Santa Barbara, Cal OES, and local agencies including the CSFPD. Components of emergency preparedness and response include the identification of evacuation routes and secondary emergency accesses, as

well as the provision of information to the community regarding appropriate individual actions in the event of various types of emergencies.

The City has local programs to address local hazard preparedness, including Don't Panic! Prepare!, Community Emergency Response Team (CERT) Program training, the City's Emergency Operations Plan, and the LHMP. The City's Emergency Operations Plan addresses the City's planned response to extraordinary emergencies associated with natural disasters, technological incidents, and national security emergencies.

The City provides Community Emergency Response Team (CERT) Program training that educates the community about disaster preparedness and response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations.

OEM is responsible for emergency planning and coordination among the Santa Barbara Operational entities, which includes the City and Planning Area. OEM also coordinates with the emergency services offices of Ventura and San Luis Obispo Counties and maintains the Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). As an annex to the MJHMP, the City's LHMP identifies resources and capabilities and proposes mitigation actions or projects to reduce future impacts.

The California Emergency Management Agency (Cal EMA) is the primary emergency response and coordination agency for California. Cal EMA is responsible for the coordination of state agency response to major disasters and support of local government. During major emergencies, Cal EMA will coordinate region-wide and mutual aid responses to emergencies, provide equipment and support to local agencies, and provide search and rescue support. Cal EMA also facilitates federal disaster assistance, primarily from FEMA, which helps local governments assess damages and acquire funding through state grants and loan applications.

FEMA's primary responsibility is to coordinate the response to disasters occurring in the U.S. that overwhelm the resources of local and state authorities. FEMA provides a wide variety of services, including disaster response preparation, disaster survivor assistance, and disaster response and recovery operations.

Goal

Minimize potential safety risks and reduce the loss of life, property and economic and social hardships resulting from natural and human induced hazards.

OBJECTIVES AND POLICIES

General

Objective S-1: Ensure that new development and major redevelopment located in areas of potential hazards are analyzed, sited, designed, and operated to assure stability and structural integrity.

Policies:

GP

S-1a. The current Local Hazard Mitigation Plan as adopted by City Council is incorporated as part of this Safety Element and can be accessed via this link: carpinteriaca.gov/city-hall/community-development/planning/ general-plan-coastal-land-use-plan.

Commented [TL1]: New policy added to explicitly incorporate the City's adopted Local Hazard Mitigation Plan as part of the Safety Element.

S-1b. New development and major redevelopment shall be sited, designed, constructed, and operated (including adherence to recommendations contained in any site-specific geologic evaluation required) to ensure that the development avoids or minimizes risks to life and property, assures stability and structural integrity, and neither creates nor contributes significantly to erosion, geologic instability, or destruction of the site or surrounding area over its expected life, factoring in the effects of climate change and sea level rise.

S-1c. Site-specific hazard evaluations and/or geotechnical investigations prepared by a qualified licensed professional shall be required for new development or major redevelopment proposed within areas of potential hazards, including, but not limited to, the following areas:

a. Special flood hazard areas (SFHA);
b. Carpinteria Bluffs and other areas that are subject to bluff erosion and slope stability hazards;
c. Areas within 100 feet of a fault line or trace;
d. Areas identified as having high seismically induced liquefaction potential;
e. Areas identified as having high potential for expansive soils or settlement;
f. Areas identified on maps prepared by other resource agencies that depict areas of known hazards; and,
g. Areas with site-specific hazards other than those identified in items a) through f) above, but that have the potential to exacerbate or be impacted by natural or human-caused hazards.

Implementation Action:

1. *A hazard evaluation that meets the criteria below shall be required in accordance with Policy S-1c. The Community Development Director shall also determine if a hazard evaluation is required for new development or major redevelopment in other locations not specified in Policy S-1c, the scope of analysis, and the adequacy of any submitted reports. Site-specific geologic hazard evaluations shall include:*
    a. *An evaluation of the potential for hazards to be onsite and an evaluation of any potential adverse impacts the project may have during construction or operation on the extent and severity of hazards on the site or neighboring sites;*
    b. *Foundation and construction recommendations;*
    c. *Ground acceleration as a result of a maximum credible earthquake and required setbacks from faults;*
    d. *Liquefaction potential;*
    e. *Identification of any alternatives to avoid or minimize hazards;*
    f. *In areas of potential slope or bluff failure, a quantitative evaluation of potential slope failure to demonstrate how all structures will at a minimum meet a factor of safety of 1.5 under static conditions and 1.1 under pseudostatic conditions; and*
    g. *A statement verifying whether the proposed development will minimize risks to life and property, assure stability and structural integrity; and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area over the expected life of the development.*

    This policy shall be integrated into the City's Zoning Ordinance.

    Timing: Ongoing.

Flooding

Objective S-2: Minimize risks associated with fluvial and coastal flooding.

Policies:

S-2a. New development or major redevelopment shall meet the following requirements over the expected life of the development based on the current fluvial and coastal flooding data and factoring in the effects of climate change and sea level rise; see also, the **Coastal Resiliency Element**:

a) Avoid flood hazard areas where feasible and minimize risks to life and property;

b) Where avoidance of flood hazards cannot be feasibly achieved, minimize flood risk by increasing elevation of the site and structures, restricting basements or habitable floor area below grade, restricting grading, restricting fencing or yard enclosures that cause water to pool, and/or utilizing flood-proof materials consistent with local building requirements; and

c) Neither create nor contribute significantly to downstream flooding, erosion, geologic instability, or destruction of the site or surrounding area.

S-2b. New development or major redevelopment of critical facilities (i.e., health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communication facilities) shall not be sited within an SFHA.

S-2c. New development or major redevelopment shall be located outside of setbacks from flood control channels to allow access to maintain and enable proper operation of the channels.

GP **S-2d.** New development or major redevelopment proposed in an SFHA shall be reviewed by the Santa Barbara County Public Works Department Water Resources Division before the issuance of land use, grading, and/or building permits.

Commented [TL2]: Policy changed to a GP policy per Coastal Commission recommendation.

S-2e. The City shall coordinate with the Santa Barbara County Public Works Department Water Resources Division to regularly maintain flood control structures, including, but not limited to, drainage channels, culverts, stormwater outlets, and debris basins.

S-2f. The City should continue to work with local, state, and federal agencies to update, monitor, and maintain the most current flood hazard and floodplain information, including the U.S. Army Corps of Engineers, FEMA, DWR, and Santa Barbara County Public Works Department Water Resources Division.

Implementation Actions:

GP 2. *The City shall continue to coordinate with FEMA to update the FIRMs in the City for special flood hazard areas and notify property owners within special flood hazard areas regarding flood hazards and opportunities to purchase flood insurance.*

Timing: Ongoing.

GP 3. *The City shall update the Flood Hazard Overlay District consistent with those areas identified as hazardous on adopted FEMA FIRMs and shall be regulated per the policy and provisions of the LCP.*

Timing: Ongoing.

4. *The City should develop improved modeling of 100-year and 500-year storm fluvial hazards in combination with coastal confluence hazards, particularly for Santa Monica and Franklin Creeks where they interact with tidal factors within the Carpinteria Salt Marsh.*

Timing: Within 3 years of adoption of the CLUP/General Plan.

5. *Permit applications submitted to the City shall include adequate information to determine compliance with the objectives and policies herein including the City's floodplain management regulations.*

   Timing: Ongoing.

Wildland and Urban Fires

Objective S-3: Minimize risks associated with structural and wildland fires.

Policies:

S-3a. The City shall evaluate wildfire risk to determine appropriate land uses and intensities when considering potential new development or major redevelopment in the wildland-urban interface.

S-3b. The City shall ensure that new development or major redevelopment is supported by adequate fire protection infrastructure, including safe access for emergency response vehicles, visible street signs, and water supplies for structural fire suppression.

S-3c. All new development or major redevelopment shall be subject to review by the Carpinteria-Summerland Fire Protection District (CSFPD) to ensure compliance with applicable fire protection standards, including:

a. The CSFPD Ordinances;
b. Santa Barbara County Fire Department Ordinances;
c. The City Commercial and Residential Automatic Fire Sprinkler Standards;
d. The County of Santa Barbara Private Road and Driveway Standard, Section 8 of the Santa Barbara Municipal Code; and
e. The most up-to-date California Building Standards Code and California Fire Code, with appropriate local amendments.

Any vegetation removal that is required for fire protection of new development or redevelopment shall be considered as part of any Coastal Development Permit application review to ensure that adverse impacts to coastal resources are avoided or minimized consistent with the policies of the LCP.

S-3d. The City shall work with the Carpinteria-Summerland Fire Protection District (CSFPD) to adhere to, and enforce, all fire codes for proposed development or redevelopment, or when code violation or code enforcement issues arise.

S-3e. Critical facilities (i.e., health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communication facilities) shall be located, when feasible, outside of high-fire risk areas. Construction methods or other methods to minimize the risk of wildfire damage shall be incorporated.

S-3f. The City shall coordinate with water purveyors to maintain an adequate water supply for fire suppression, including capacity for peak-load water requirements.

S-3g. New development and major redevelopment shall be sited to ensure that vegetation management to reduce fire risks, including clearing, landscaping, irrigating, and thinning, is the minimum necessary to meet CSFPD requirements, and is designed to minimize erosion and impacts on habitat values.

Implementation Actions:

6. *The City should perform a comprehensive evaluation of all Wildfire Hazard Reduction Programs and updates.*

   Timing: Within 2 years of adoption of the CLUP/General Plan.

Drought

Objective S-4: Proactively plan for the impacts of climate change on hydrologic cycles, including increased rainfall variability and drought frequency and severity.

Policies:

GP **S-4a.** The City shall ensure continued compliance and coordination with federal, state, and local jurisdiction standards and programs to evolve with climate change science, including energy and water conservation and other drought management strategies.

GP **S-4b.** The City shall collaborate with the Carpinteria Valley Water District and Carpinteria Sanitary District to pursue opportunities for enhanced water reclamation systems. Such systems may be incorporated as design requirements for development permit applications.

GP **S-4c.** The City shall collaborate with the Carpinteria Valley Water District County Water Agency, and other water resource agencies to promote and enact water conservation programs and improve local water source resiliency.

Implementation Actions:

GP 7. *The City should develop a Drought Resiliency Plan to minimize impacts on the community and coastal resources during drought periods. The Drought Resiliency Plan should address drought's toll on the local community, water sources, coastal resources, food and water security concerns, crop yields, and other economic considerations.*

   Timing: Within 5 years of adoption of the CLUP/General Plan.

GP 8. *The City should continue participating in the County Drought Task Force to assess multi-jurisdictional vulnerabilities and monitor drought conditions and water supply.*

   Timing: Ongoing.

Slope/Soil Stability and Mud/Debris Flows

Objective S-5: Minimize risks associated with slope stability hazards, including mud and debris flows.

Policies:

S-5a. The City and County shall continue to collaborate to ensure that adequate catchments and other flood control improvements occur to capture mud and debris flows consistent with applicable resource protection policies of the LCP. Within the City, areas prone to mud and debris flows shall be identified to ensure that adequate buffers are provided and only limited development (e.g., safety-related uses) occurs in such hazardous areas.

S-5b. The City shall coordinate with the local, state, and federal agencies on Burned Area Emergency Response (BAER) efforts and stabilize recently burned soils, where consistent with applicable resource protection policies of the LCP, to prevent further damage to life, property, or natural resources.

S-5c. The City shall implement long-term rehabilitation efforts, pursuant to a valid Coastal Development Permit, on burned areas that present slope stability hazards and areas unlikely to recover naturally from wildfire damage.

S-5d. New development and major redevelopment shall avoid areas subject to slope failure to the extent feasible, factoring in the effects of sea level rise. Where avoidance is not feasible, minimize development and incorporate design and construction techniques that lessen slope failure risk, including the use of deep-rooted, drought-tolerant vegetation, control of site drainage, and erosion control measures.

Implementation Actions:

~~9. *The City should coordinate with Santa Barbara County, CSFPD, CAL FIRE, and local jurisdictions to develop a BAER Program addressing slope stability hazards presented by recently burned soils to prevent further damage to life, property, or natural resources.*~~

~~*Timing: Within 3 years of adoption of the CLUP/General Plan.*~~

10. *The City should coordinate with the County of Santa Barbara, the U.S. Army Corps of Engineers (USACE), FEMA, Cal OES, and others as needed to update and expand mapped potential debris flow hazard areas.*

Timing: Ongoing.

Commented [TL3]: Implementation Action removed at recommendation from Coastal Commission staff due to redundancy with Policy S-5b.

Objective S-6: Minimize risks associated with bluff erosion by siting and designing development to avoid risks.[1]

Policies:

S-6a. For new development or major redevelopment in areas potentially subject to bluff erosion according to the Coastal Hazard Map (Figure CR-1), on any site seaward of the railroad tracks, and in other areas where there is evidence of bluff instability as a result of coastal processes, the City shall require a site-specific coastal hazard geologic report that demonstrates the safety and stability of the proposed development over its anticipated lifespan. The report shall, at a minimum, include and/or analyze the following items:

- A quantitative evaluation of potential slope failure;
- The predicted position of the bluff after bluff retreat, taking into account both historical bluff retreat conditions and accelerated future retreat without reliance on shoreline protective devices;
- A minimum bluff edge setback amount that would ensure the proposed development will not be endangered by erosion or slope instability over the development's anticipated lifespan.

S-6b. Building improvements and other development involving any irrigated landscape areas shall be set back sufficiently to protect new development or major redevelopment and all associated improvements from bluff erosion over the life of the development, and to not exacerbate the rate of bluff erosion, factoring in the effects of sea level rise.

S-6c. In the area identified as Carpinteria Bluffs subject to potential bluff erosion in Figure CR-1, existing railroad improvements and cut slopes shall not be expanded or altered. Maintenance or protection proposed for existing slopes shall be reviewed through the Coastal Development Permit process. Slope and coastal bluff stabilization techniques (e.g. seawalls and similar structures) shall be prohibited unless necessary to protect existing structure(s) in danger of erosion, and when no less environmentally damaging alternative is feasible.

S-6d. Existing drainage systems on bluff sites, including drainage pipes that hang partially or fully down a coastal bluff and any drainage outlet on the coastal bluff, shall be phased out and removed to the maximum extent feasible.

S-6e. New development or major redevelopment on bluff sites shall have site drainage systems that carry runoff landward and prevent surface runoff from flowing towards bluff areas. Site drainage systems should integrate onsite retention/detention, low-impact development techniques, and offsite conveyance systems that direct stormwater and surface runoff away from the bluffs, as feasible for the site.

Commented [TL4]: Language of this policy revised per recommendations from Coastal Commission staff and to be informed by the site-specific coastal hazard geologic report

[1] See also the **Coastal Resiliency Element** for further policies and implementation measures addressing coastal erosion impacts.

Objective S-7: Minimize risks associated with expansive soils and subsidence.

Policies:

GP **S-7a.** If areas of ground subsidence due to groundwater, oil, or gas withdrawal are identified in the future, these areas shall not be developed until the City's Water Resource Management Program is reviewed and/or updated cooperatively by the City and the water district to determine appropriate measures for the protection of the groundwater basin, existing water service to the community, and property.

S-7b. All proposed development shall comply with local City building ordinances and geotechnical recommendations identified within any reports created under Policy S-1b related to construction in areas identified as having a high potential for expansive soils.

Commented [TL5]: Policy changed to a GP policy per Coastal Commission recommendation.

Seismic Hazards

Objective S-8: Minimize risks associated with seismic hazards, including earthquakes, liquefaction, and tsunamis.

Policy:

GP **S-8a.** The City shall continue participation in regional coordination efforts to develop and implement tsunami emergency response plans and evacuation programs.

GP **S-8b.** Structures used for human habitation shall be set back a minimum of 50 feet from an active fault. This setback may be increased when geologic conditions warrant. For linear utility infrastructure (e.g., water, sewer, gas pipelines) that must cross an active fault, appropriate safety measures shall be provided. Examples of appropriate safety measures include providing shut-off valves on both sides of the fault, motion-sensitive shut-off valves, and appropriate structural engineering to accommodate anticipated levels of ground movement or surface warping.

Commented [TL6]: New policy added at the recommendation of Coastal Commission staff.

Implementation Actions:

GP 11. *The City shall review and periodically update local and regional tsunami inundation maps for Carpinteria and adjacent coastal communities as they are developed to identify susceptible areas and plan evacuation routes.*

Timing: Ongoing.

GP 12. *An emergency tsunami notification and evacuation program should be initiated. The program should consider education for owners and renters within potential tsunami and flood hazard zones, and should include the possible effects of an earthquake with an epicenter located in the Santa Barbara Channel.*

Timing: Within 5 years of adoption of the CLUP/General Plan.

GP 13. *The City should include tsunami evacuation route information as part of an overall evacuation route sign program implemented in the City. Signs should be clearly posted.*

Timing: Within 5 years of adoption of the CLUP/General Plan.

Hazardous Materials

Objective S-9: Minimize risks associated with hazardous materials, including those located at industrial facilities, at facilities handling acutely hazardous materials, and along transportation corridors.

Policies:

GP **S-9a.** All development shall comply with the County of Santa Barbara and the State Regional Water Quality Control Board requirements, as well as the requirements of the LCP, to ensure that the use, storage, transportation, and disposal of hazardous materials do not result in any hazardous materials upset, discharge, or runoff.

GP **S-9b.** The City shall ensure land use compatibility with development adjacent or near industrial facilities, facilities that handle acutely hazardous materials or pesticides, and railroad and utility rights-of-way.

GP **S-9c.** The City shall encourage new development, major redevelopment, and existing development to implement pest management strategies that reduce the use of pesticides.

Commented [TL7]: New policy added per Coastal Commission staff recommendation and relating back to policies of the Open Space & Conservation Element.

S-9d. The City shall require protective measures against the release of hazardous materials, including oil, natural gas, and petroleum products, and shall support effective containment and cleanup facilities and procedures for accidental spills that occur.

Commented [TL8]: Policy changed to a LUP policy per Coastal Commission staff recommendation.

GP **S-9e.** The City should continue to coordinate with Southern California Gas Company (SCG) and the California Public Utilities Commission to review gas and utility pipeline safety documents and to conduct public outreach related to gas pipeline safety.

GP **S-9f.** Development of sensitive uses, including residences, schools, daycares, special needs facilities, or senior living centers, shall not be located adjacent to facilities with a high potential for hazardous materials leaks, spills, or other catastrophic events.

GP **S-9g.** Before the development of any site with previous and/or current storage of hazardous materials or activities involving the use of hazardous materials, the City shall require the developer to demonstrate compliance with the California Department of Toxic Substances Control (DTSC) and local regulations addressing the management of hazardous materials. Compliance may require site investigations, testing to determine the existence and extent of soil and/or groundwater contamination, preparation of a DTSC-approved Remedial Action Plan (RAP), and agency confirmation of RAP compliance.

S-9h. The City shall ensure that contamination on the former oil and gas plant property on the Bluffs is completely remediated before approving new development.

Commented [TL9]: Policy changed to a LUP policy per Coastal Commission staff recommendation.

S-9i. The City shall work with the County of Santa Barbara to ensure that new development and major redevelopment adjacent to active agricultural operations within the Carpinteria Planning Area is adequately protected from hazardous agricultural pesticides. The City, through the California Department of Food and Agriculture and the County Office of the Agricultural Commissioner, shall consider agricultural operations of concern as those handling acutely hazardous pesticides.

Commented [TL10]: Policy changed to a LUP policy per Coastal Commission staff recommendation.

GP **S-9j.** No structures shall be constructed overlying active or abandoned oil wells unless the oil well(s) have been properly abandoned or re-abandoned per the California Geologic Energy Management Division (CalGEM) procedures, and under the CalGEM's supervision.

Implementation Measures:

GP *14. The City shall maintain lists of facilities in the planning area that involve the use, storage, and/or transportation of hazardous materials, consistent with the LHMP.*

Timing: Concurrent with the adoption of the LHMP update.

Emergency Operations and Capabilities

Objective S-10: Enhance hazard mitigation coordination and communication to enhance disaster resiliency.

Policies:

GP **S-10a.** The City shall work cooperatively with federal, state, county, and other local jurisdictions to provide a high level of preparedness and emergency response and update emergency response plans as needed.

GP **S-10b.** The City shall implement a hazard notification system that includes communication with all communities, including disadvantaged and vulnerable populations.

GP **S-10c.** The City shall continue partnerships between the state, local, and tribal governments to identify, prioritize, and implement hazard mitigation actions.

GP **S-10d.** The City shall continue to conduct community disaster education and awareness programs, such as the "Don't Panic! Prepare!" and CERT Program, related to general disaster preparedness and implementation of the Local Hazard Mitigation Plan.

GP **S-10e.** The City shall inform the public to increase awareness of hazards, potential impacts, response to hazards, and opportunities for mitigation actions.

Implementation Actions:

GP *15. The City shall monitor and publicize the effectiveness of mitigation actions prescribed in the LHMP implemented Citywide.*

Timing: Ongoing

GP *16. The City should create a disaster response supplies warehouse or reserve storage space for emergency supplies at City Hall.*

Timing: Within 1 year of adoption of the CLUP/General Plan.