Moraga-Orinda Fire District vehicle

11

SAFETY AND RESILIENCE ELEMENT

The Safety and Resilience Element focuses on protecting people and property from natural and human-caused hazards. These hazards include earthquakes, landslides, wildfires, and flooding, as well as health risks associated with hazardous materials and noise. The Element is particularly concerned with hazards that may worsen in the future due to climate change, including extreme heat, increasing wildfire frequency, severe storms, and drought. The Safety and Resilience Element also addresses emergency preparedness, providing a foundation for future analysis and programs related to evacuation in the event of a wildfire or other disaster.

The overarching goal of this Element is to minimize the economic and social impacts of environmental hazards. This can be achieved by considering local hazards in all land use and development decisions and by implementing policies and programs designed to reduce future losses. Effective land use planning, site design, architecture, and construction practices can significantly lower hazard levels and aid in disaster recovery.

California has required the inclusion of a Safety Element in general plans since the 1960s. The requirements for this Element have evolved over time to address climate change adaptation and social equity and to align with the Local Hazard Mitigation Plan (LHMP), which is a federally mandated document. Since 2000, cities and towns have needed an LHMP to qualify for federal disaster funds. In 2006, California passed AB 2140, encouraging local governments to incorporate the LHMP into their Safety Element. Although Moraga's LHMP is a separate Town document, it is adopted by reference in this Element and influences other parts of the General Plan.

The concept of "resilience" is central to this Element. It refers to the ability of communities to maintain their quality of life and adapt to changing conditions, including natural disasters, climate

change, and public health emergencies. Moraga is committed to enhancing its resilience through collaborations with residents and businesses, partnerships with other agencies, its own operations, and long-term planning efforts.

This Element includes an overview of existing conditions and then presents goals and policies organized around the following eight topics:

- Hazard Reduction and Emergency Preparedness
- Public Safety and Law Enforcement
- Wildfire Hazards
- Geologic Hazards
- Flooding and Streambank Erosion Hazards
- Hazardous Materials
- Climate Resilience
- Noise

The Noise policies meet the Government Code requirement to include a noise element in the General Plan; noise contour diagrams are included in an Appendix.

11.1 HAZARD PROFILE OF MORAGA

HAZARD MITIGATION AND PUBLIC SAFETY

Overview

The Contra Costa County Local Hazard Mitigation Plan (LHMP) incorporates hazard mitigation principles and practices into the routine government activities and functions of the County and its cities and towns. The LHMP recommends specific actions to protect people and community assets from losses to those hazards that pose the greatest risk. The Town of Moraga is considered a municipal planning partner under the LHMP. An "annex" (appendix) of the Countywide LHMP specifically addresses hazards in Moraga.

Table 11-1 summarizes hazards in the Moraga Planning Area, and the likelihood and extent of their impacts. The greatest local hazards identified are earthquakes, landslides, wildfires, and flooding. An overview of these hazards is provided in this chapter.

Commons Park

Table 11-1: Moraga Hazard Identification Assessment

Hazard Event	Probability Factor	Geographic Extent	Vulnerability	Impact	Consequence	Total Risk Score
Earthquake	Medium	Very High	Very High	High	High	68
Landslide	High	Medium	Medium	Medium	Medium	62
Wildfire	Medium	High	Very High	High	High	58
Heavy Rainfall	High	Medium	High	Medium	Medium	56
Flash Flood	Medium	High	Medium	High	High	55
Severe T-Storm	High	Low	High	Medium	Medium	54
Strong Winds	High	Medium	Medium	Medium	Medium	54
Extreme Heat	High	High	Medium	Medium	Medium	51
Utility Disruption	High	Medium	Medium	Medium	Medium	51
Drought	Medium	Very High	Medium	Medium	Medium	50
Stream Flooding	Medium	Medium	Medium	High	Medium	47
HazMat Incident	Medium	High	Medium	Medium	Medium	41
Dam Failure	Low	High	Medium	High	High	32
Tornado	Low	Low	Low	Medium	Medium	16
Sea Level Rise	None	None	None	None	None	0
Tsunami	None	None	None	None	None	0

Source: Local Hazard Mitigation Plan Annex for Town of Moraga, 2024. Ratings correspond to numeric rankings and weighted averages based on an assessment of the likelihood of occurrence for each hazard along with its impacts on people, property, and the economy. ***A total score of 55 or higher is considered a high risk, a score of 25-54 is a medium risk, and a score of less than 25 is a low risk.***

Public Safety

The mission of the Moraga Police Department is to create and maintain a sense of well-being and security for every resident and visitor in Moraga. The Department's responsibilities include facilitating traffic safety and lawful traffic operations, deterring crime through effective patrol services and community cooperation, responding quickly and safely to reports of crimes and apprehending those responsible, investigating crimes, and administering programs that enhance community safety and the quality of life.

Emergency preparedness and disaster response is an important part of the Police Department's mission. The Department works in collaboration with Moraga-Orinda Fire District (MOFD), local utilities, and other Town departments to update the Town's emergency evacuation plans, including conducting drills and training Town staff in disaster preparedness and emergency operation center (EOC) functions. It also promotes participation in community notification and warning systems and resident preparedness for disasters.

Overall crime rates in Moraga are low. Statistics in every category of reported crimes are below national and state averages. However, further growth and development in Moraga may require additional staff and investment in communication capacity and technology.

WILDFIRE

Overview

A wildfire is an uncontrolled fire in an extensive area of combustible vegetation. Primary factors that increase an area's susceptibility to wildfire include slope and topography, vegetation type and condition, and weather and atmospheric conditions. A large percentage of the Moraga planning area contains undeveloped grasslands that may be subject to wildfire, particularly during the hot summer and fall months.

The Moraga-Orinda Fire District (MOFD) defines Wildland Urban Interface (WUI) areas as geographic areas where structures and other human development intermingle with wildland or vegetative fuels. The Governor's Office of Planning and Research (OPR) has provided land use planning guidance for WUI areas across California. OPR indicates that approximately one-third of California's single-family homes are located in WUI areas.[1] Decades of fire suppression, coupled with invasive vegetation and introduced tree species, has increased fuel loads in Contra Costa County. Today, parts of Lamorinda include forested neighborhoods with narrow roads, wood-frame homes, and combustible vegetation. MOFD has adopted special codes and regulations to address in these areas.

The direct effects of wildfire include the loss of human life, property, natural resources, and economic assets. The indirect effects are also significant. In addition to stripping the land of vegetation, soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thereby increasing flood hazards, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards. Wildfire smoke can create air quality problems that increase cardiovascular and respiratory health issues.

[1] Source: OPR Fire Hazard Planning Technical Advisory, 2022

Moraga residents have identified wildfire hazards as their leading safety concern in surveys, public meetings, and written correspondence associated with the 2040 General Plan. This is in part due to catastrophic wildfires experienced in California over the past decade, along with the anticipated increase in wildfire frequency associated with rising global temperatures. Heightened concerns are also related to the extent of urban wildland interface in Moraga, the access and evacuation constraints associated with Moraga's location and road network, and the potential for communication systems (including cell phones) to fail during a wildfire event. More recently, the availability of fire insurance and non-renewal of numerous policies in WUI areas has become an issue of serious concern for Lamorinda residents.

Training exercise near Moraga's Painted Rock
Photo Credit: Sora O'Doherty, Lamorinda Weekly

Factors Influencing Wildfire Risk and Behavior

Moraga's landscape is comprised of ridgelines, hillsides, valleys, canyons, and streams. The ridge and hillside landscape is mostly dry and many of the slopes are covered with grasses or oak chaparral. The relationship between vegetation and wildfire is complex. Some vegetation is naturally fire resistant, while other vegetation is

extremely flammable. According to the California Department of Forestry and Fire Protection (CAL FIRE), sloped land increases susceptibility to wildfire because fire typically burns faster up steep slopes. Slopes facing south to southwest tend to be higher risk than those facing northerly to northeast, as they are warmer and drier.

Wildfire behavior depends on the type of fuels present. Surface fuels include grasses, logs, and stumps low to the ground. Ladder fuels, such as tall shrubs, young trees, and the lowest branches of mature trees, provide a path for fire to climb upward into the crowns of trees. Aerial fuels include upper limbs, foliage, and branches not in contact with the ground. Ample spacing between tree crowns and trimming of lower branches close to the ground can help prevent fire from igniting the crown of a tree or spreading from an ignited tree to adjacent trees.

Wind, temperature, and relative humidity are the most influential weather elements in fire behavior and susceptibility. Fire moves faster under hot, dry, and windy conditions. Wind may also blow embers ahead of a fire, causing its spread. Drought conditions lead to extended periods of excessively dry vegetation, increasing the fuel load and ignition potential.

Wildfire Hazards in Moraga

After the devastating Oakland/Berkeley Hills fire in 1991, the State passed legislation to minimize the effects of urban/wildland fires in the State's most at-risk areas. The California Department of Forestry and Fire Protection (CAL FIRE) is required by law to map areas of significant fire hazards across the state based on vegetation, terrain, slope, weather, density, and other relevant factors.

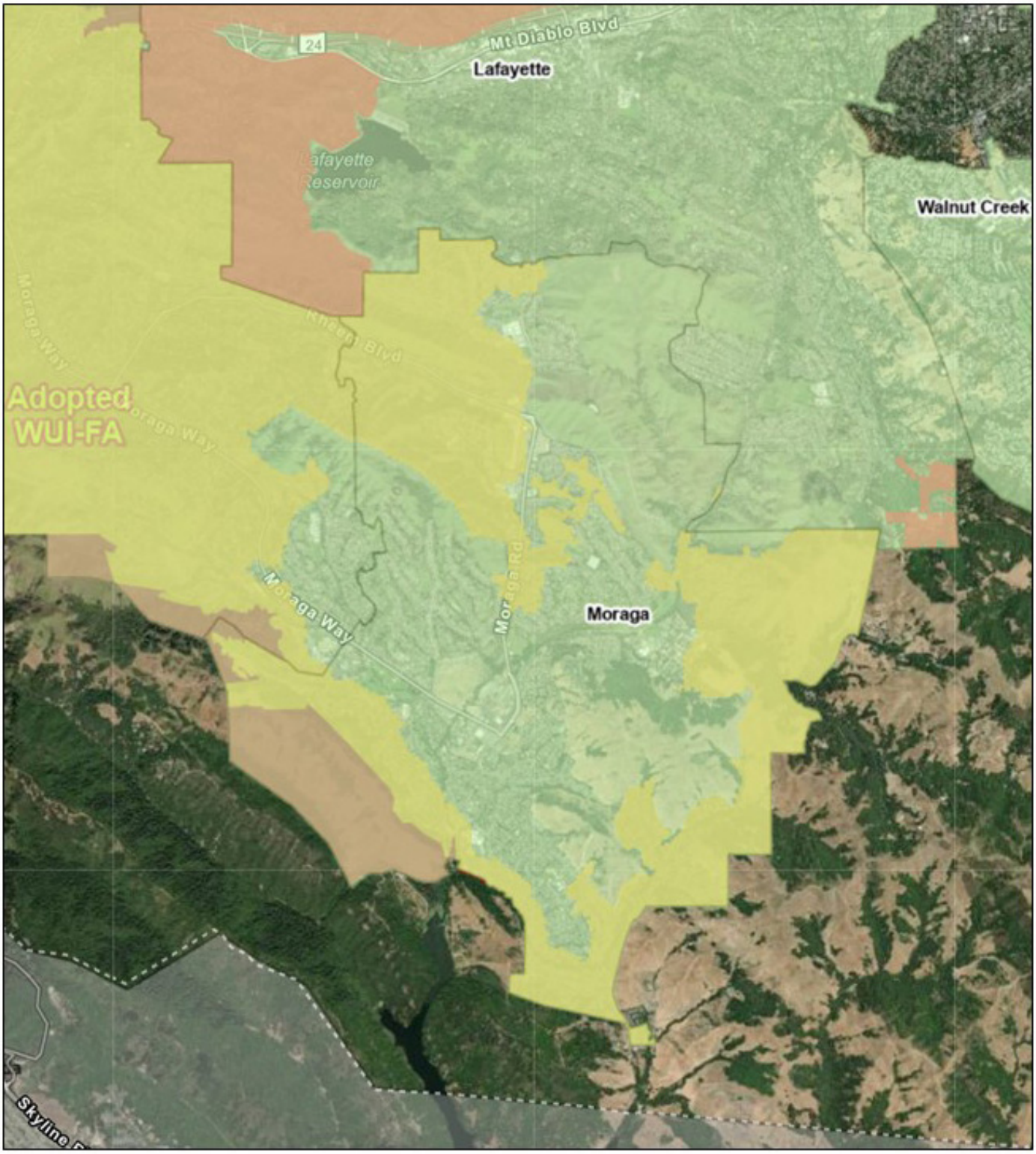
In State Responsibility Areas (SRAs), which are unincorporated non-federal lands, the CALFIRE maps identify Fire Hazard Severity Zones (FHSZs) using a three-tiered rating system: Moderate, High, and Very High. In Local Responsibility Areas (LRAs), which are associated with incorporated cities and towns and all non-SRA and federal lands, the CALFIRE maps only show Very High Severity Zones. Future CALFIRE maps will also identify "High" and "Moderate" rated areas within cities and towns.

Different standards for building construction have been established for each fire hazard severity zone. Under state regulations, areas within FHSZs must comply with specific building and vegetation management requirements intended to reduce property damage and loss of life. In addition, MOFD has adopted a Wildland Urban Interface designation that triggers specific building requirements.

Figure 11.1 shows Very High Fire Hazard Severity Zones and Wildland-Urban Fire Areas (WUI-FA) areas in Moraga. This designation triggers heightened requirements related to fire safety. The only area in Moraga's Town limits designated as "Very High" is the undeveloped Indian Valley area on the southwest edge of town. In unincorporated Contra Costa County, the very high designation extends west into the Berkeley/ Oakland Hills and south and southeast of Moraga toward Las Trampas Ridge. Unincorporated areas east of Moraga are generally designated as "High" Fire Hazard Severity Zones.

The most recent significant wildfire activity in Moraga was a 40-acre fire adjacent to Merrill Drive in Sanders Ranch in 2019. More significant fires have occurred in nearby communities including the 1991 Tunnel Fire in the Oakland-Berkeley Hills (1,622 acres) and a 1998 fire in Sibley Regional Park (200 acres). Much larger fires have affected the nine-county Bay Area in the last decade, including the 2019 SCU Complex Fire (396,000 acres) and the 2020 LNU Complex fire (305,000 acres), and the Tubbs, Nuns, and Glass Fires in Napa and Sonoma counties (2017, 2020).

Figure 11.1: MOFD Adopted Wildland-Urban Interface Fire Area



Town Limits
WUI-Fire Area (MOFD, Ord. 20-02)
Adopted Very High FHSZ

Town of Moraga, California
General Plan Update

0 0.25 0.5 1 Mile

N

Moraga-Orinda Fire District (MOFD)

The MOFD was formed in 1997 as an integrated independent special district. The MOFD consolidated the Moraga Fire Protection District and the Orinda Fire Protection District to increase efficiency in fire protection and emergency medical services. The District provides services to Moraga, Orinda, and surrounding areas such as Canyon and unincorporated Bollinger Canyon from five fire stations located in the district. Stations 41 and 42 are located in Moraga.

The MOFD is governed by a five-member Board of Directors. The Board is responsible for providing strategic leadership, fiscal oversight, and policy direction, including adoption of plans, codes, and regulations. This includes adoption of the California Fire Code (inclusive of the International Fire Code) and local amendments. In 2020, MOFD adopted regulations requiring ember resistant construction in areas classified as High and Very High Fire Hazard Severity.

In addition to wildfire prevention, suppression, and response, MOFD also responds to structure fires, accidents and rescues, hazardous material incidents, and emergency medical calls. The District provides a range of community-based education and preparedness programs, and participates in County and State mutual aid systems. MOFD operates a number of programs to reduce the risk of fire and the potential for loss of life and property. This includes working with East Bay Municipal Utility District (EBMUD) to ensure an adequate water supply, reviewing development proposals to ensure compliance with relevant fire codes and fire prevention measures, operating a weed abatement program to reduce fire hazards, and implementing defensible space standards.

Planning for and Mitigating Wildfire Hazards

Development patterns in Moraga during the 1950s, 60s, and 70s tended to exacerbate wildland-urban interface conditions due to densities, lot patterns, and vegetation growth. More recently and through this General Plan, the Town is focusing future development in the most secure areas—primarily in accessible commercial districts located on valley floors. Today's construction and landscaping standards, as well

A 2021 fire burned 40 acres near Sanders Ranch | Photo Credit: MOFD

as ingress and egress requirements, reduce hazard levels but do not eliminate them entirely.

Additional measures have been taken to reduce wildfire hazards and improve wildfire response capacity. These include:

- Fire Safe Road Regulations, including requirements for road width, surface treatments, grade, radius, turnarounds, turnouts, structures, driveways, and gate entrances. These regulations are intended to ensure safe access for emergency wildland fire equipment and civilian evacuation.
- California Fire Code Requirements. These establish minimum requirements to safeguard public health, safety, and general welfare from hazards in new and existing buildings and provide safety for firefighters and emergency responders. The provisions of this Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout California.

  The Fire Code addresses such topics as exterior materials and construction methods, interior finishes, fire protection systems, and means of egress, including fire apparatus access road width requirements. The Code also contains regulations for vegetation and fuel management to maintain clearances around structures, including requirements for ignition-resistant construction standards for new buildings in WUI areas.
- Contra Costa County and Moraga-Orinda Community Wildfire Protection Plans. The countywide plan was developed with input from many organizations and aims to reduce hazards through increased information and education aout wildfires, hazardous fuel reduction, and actions to reduce structure ignitability. The Moraga-Orinda Plan is an appendix to this Plan and focuses on local actions.
- Emergency Operations Plans (EOPs). Both the Town and the County have adopted EOPs related to disaster management and emergency preparedness. These are addressed in the implementation section of this chapter.

Volunteers at MOFD Station 41 practice using a water supply trailer | Photo Credit: MOFD

GEOLOGIC HAZARDS

Earthquakes

The San Francisco Bay Area is one of the most seismically active regions in the United States. There are several active fault zones that affect Moraga, including the Hayward Fault (3 miles southwest at its closest point), the Calaveras Fault (2 miles east at its closest point), the Concord-Green Valley Fault, and the San Andreas Fault. There are also two fault lines that run through Moraga, but both are considered inactive.

The northern section of the San Andreas is capable of generating a magnitude 8.3 earthquake, while the Hayward and Calaveras faults can generate a 7.5 earthquake, and the Concord Fault can generate a 7.0 earthquake.[2] Earthquakes of this magnitude are sufficient to cause major damage to structures, foundations, and utility lines.

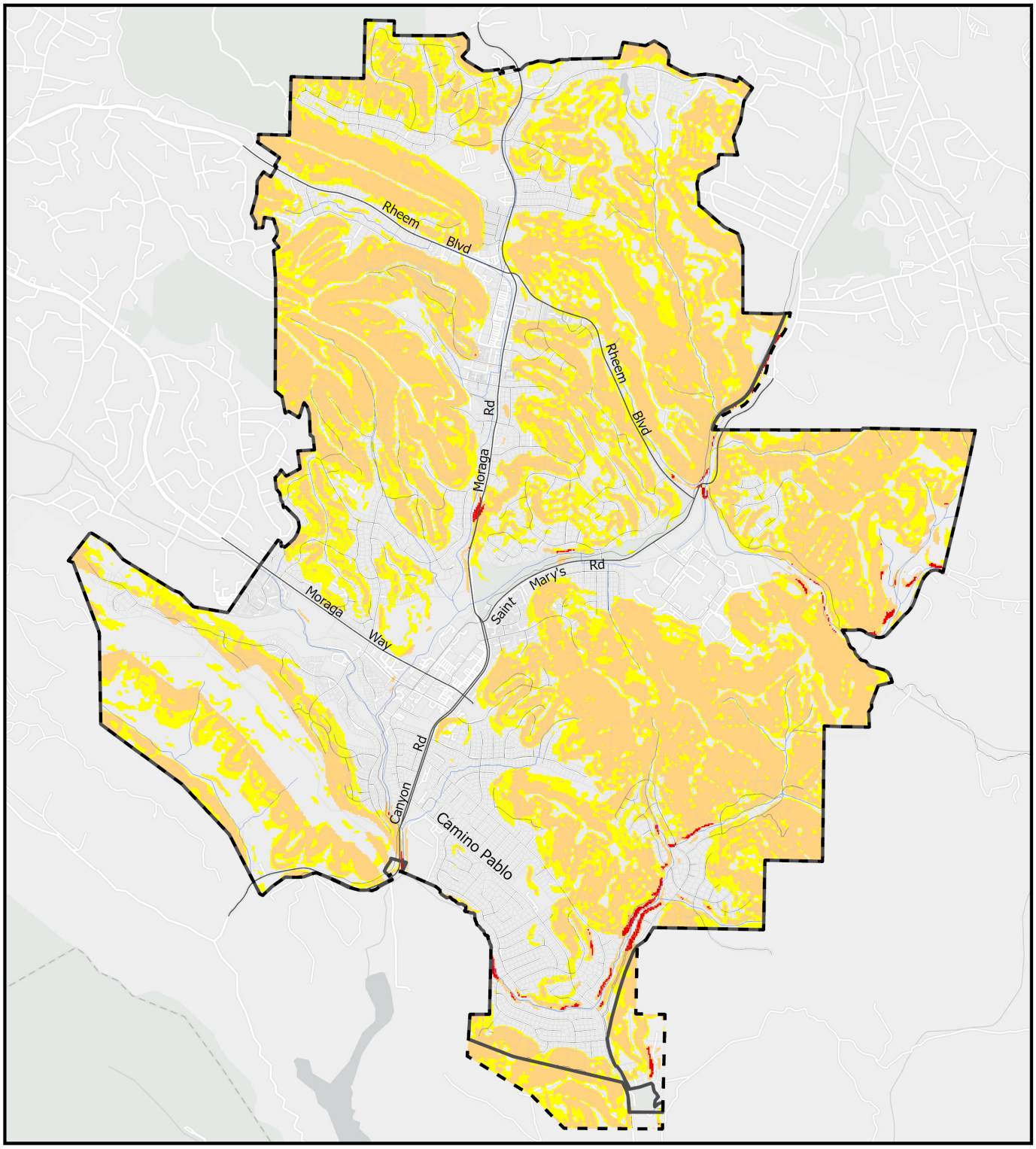
The major seismic hazard affecting Moraga is ground shaking. The town has been impacted by ground shaking from regional earthquakes in the past and will likely be impacted again. The severity of shaking increases with proximity to the epicenter of the earthquake. Structures on bedrock tend to perform better than structures underlain by alluvium and other unconsolidated (or fill) materials. In addition to the hazard posed to buildings, ground shaking can also damage utilities and roads, potentially affecting entry and exit routes to neighborhoods and the town itself.

Other earthquake-related hazards in the Bay Area are surface rupture, liquefaction, and landslides. Surface rupture risks occur along active fault lines, and the risk in Moraga is very low. Liquefaction is a seismic phenomenon where soils lose their strength during high intensity ground shaking. This risk typically occurs on filled soils and along streambanks with unconsolidated sediment. Liquefaction hazards are rated "low" in most of Moraga but are rated "moderate" along the town's creeks. Landslides occur when slopes become unstable due to ground shaking, and masses of earth material move downslope. This hazard is also associated with heavy rain events and is discussed below.

Moraga sits between the Hayward and Calaveras Faults
Source: UC Berkeley Seismology Lab

[2] Earthquakes are measured using the Richter scale, which assigns a numeric rating based on the value of the amplitude of the highest seismic wave. The measurements are logarithmic (i.e., a magnitude 5 quake is 10 times the amplitude of a magnitude 4 quake, and so on). A 5.0 is considered a moderate quake, while a 6.0 is considered a strong quake and a 7.0 is considered a major quake. However, even quakes of 4.0 may cause damage.

Figure 11.2: Landslide Susceptibility Ratings



Landslides

Like other hillside communities in the Bay Area, Moraga's hillsides are vulnerable to landslides and may become unstable when saturated with heavy rainfall. Landslides range from slow continuous movement of soil such as a slump to the rapid movement of soil such as a debris flow.

Figure 11.2 shows landslide susceptibility based on maps prepared by the California Division of Mines and Geology. Susceptibility is grouped into classes ranging from zero to ten based on rock strength and slope. Rating above seven indicate very high landslide susceptibility and include most sloped property in Moraga. Many of these slopes are undeveloped areas, but some include residential development. The Town requires geotechnical studies to determine landslide potential on development sites and requires measures to remediate hazards and reduce potential on-site and off-site damage.

A 2023 landslide in Orinda, a few blocks from the Moraga border
Photo Credit: City of Orinda

Other Geologic and Soil-Related Hazards

Other geologic and soil conditions affect the safety of existing development and the suitability of land for future development. These are highlighted below:

- **Expansive soils** are found throughout Moraga and are typically associated with high clay content. These soils can expand when wet and shrink when dry, causing foundations and floors to crack. Foundations constructed on expansive soils require special design considerations. Sometimes expansive soils must be removed entirely and replaced with engineered backfill.
- **Ground settlement** refers to the compression of loose soil deposits or fill over time. Settlement occurs as the material adjusts to the load (foundation and building weight) being added. The amount of settlement depends on the characteristics of the underlying soil. On fill, soft sediments, and clay soils, post construction settlement potential can be substantial and must be addressed through engineering and design.
- **Impermeability**, or the rate of percolation, can produce structural problems if water collects beneath or within the foundations of buildings. This may also occur in Moraga, and requires drainage improvements to prevent supporting soils from becoming weakened by saturation.
- **Erosion** refers to the removal of soil by water or wind and may be exacerbated by construction and grading. Factors that influence erosion include the properties of the soil, amount of rainfall and wind, length and steepness of the slope, and amount and type of vegetative cover. Erosion potential is relatively low in Moraga but may be a hazard requiring remediation near streams and on cut and filled slopes.

FLOODING

Flooding in Moraga is primarily associated with overbank flooding along local streams and standing water due to clogged storm drains after severe rain events. The Federal Emergency Management Agency (FEMA) flood insurance maps for the town show narrow bands of 100-year flood risk along Laguna Creek, Moraga Creek, Rimer Creek, and Las Trampas Creek. Creek setbacks and buffers mitigate the potential for structure damage in most locations.

The area potentially impacted by a 500-year flood (e.g., a flood that has a one in 500 chance of occurring in any given year) is considerably larger than the 100-year flood zone. It includes portions of the Rheem Valley Shopping Center, the area along Canyon Road south of Moraga Center, and portions of the Moraga Country Club. A 500-year flood could have destructive impacts on creekside parcels and cause larger-scale flooding.

Dam failure is another potential cause of flooding, although those risks are low in Moraga. The town is not located downstream of any major dam, with runoff generally flowing to Upper San Leandro Reservoir to the south. The only water body in the town regulated by the California Division of Safety of Dams is the East Bay Municipal Utility District storage facility off Claudia Court in the Rheem Valley Manor neighborhood. If this facility were breached, it would flood between 15 to 30 homes, plus athletic fields and parking areas at Saint Mary's College.

As an inland community, Moraga is not vulnerable to tsunamis. The Town is also not directly vulnerable to sea level rise.

HAZARDOUS MATERIALS

Hazardous materials are substances that can be harmful to human health or the environment. They include toxic substances, ignitable substances, corrosive materials, and reactive materials. These materials may be carcinogenic, cause burns or explosions, or produce toxic gases. Improper handling, storage, transportation, or disposal of these wastes can contaminate soil, water, and air.

Before the 1980s, the disposal of chemicals on land was largely unregulated, leading to widespread contamination of industrial sites and public landfills. Many of these contaminated sites have been officially identified; some have been remediated and others still pose risks. Common contaminated sites include gas stations with leaking underground tanks and brownfields from past industrial activities. Both state and federal agencies maintain databases and maps of these sites. In Contra Costa County, the Environmental Health Services Division oversees hazardous materials regulations at the local level, including reporting and compliance. They also handle emergency responses to chemical spills, pipeline leaks, and illegal dumping.

Moraga does not have industrial land uses or concentrations of activities typically associated with hazardous materials. However, the town has clean-up program sites associated with dry cleaning businesses in the two shopping centers. There were also several underground storage tanks identified as cleanup sites, but they are listed as remediated.

Despite the absence of heavy industrial activity, businesses such as hardware stores, auto repair, and dry cleaners frequently use hazardous materials. Private residents also use hazardous materials in and around their homes. Household hazardous materials include cleaning products, paints, solvents, and chemicals for pools, as well as fertilizers and pesticides. Improper handling or disposal of these materials can pose health risks, and spills during transportation can create hazards.

Programs have been developed to educate the public and local businesses on the proper handling and disposal of hazardous materials. These include a disposal facility for household hazardous waste in Martinez run by the Central

Contra Costa Sanitary District. The facility accepts items such as oil, paint, household cleaners, and car batteries at no charge.

Hazardous materials also include outdated building materials with known health risks, such as asbestos (used in buildings from 1945 to 1978) and lead-based paint. Asbestos and lead can cause severe health issues, including cancer and cognitive or cardiovascular problems. Specific remediation measures are required during the remodeling, renovation, or demolition of buildings containing these materials to protect public health.

Hazmat warning at a utility enclosure in the Painted Rock Open Space

AVIATION HAZARDS

Moraga is not subject to aviation hazards, as it does not have an airport and is not in any designated airport safety zone or land use compatibility zone. The nearest airports are San Francisco Bay Oakland International and Buchanan Field, both of which are more than 10 miles away.

11.2 KEY SAFETY AND RESILIENCE ISSUES

EMERGENCY PREPAREDNESS AND EVACUATION

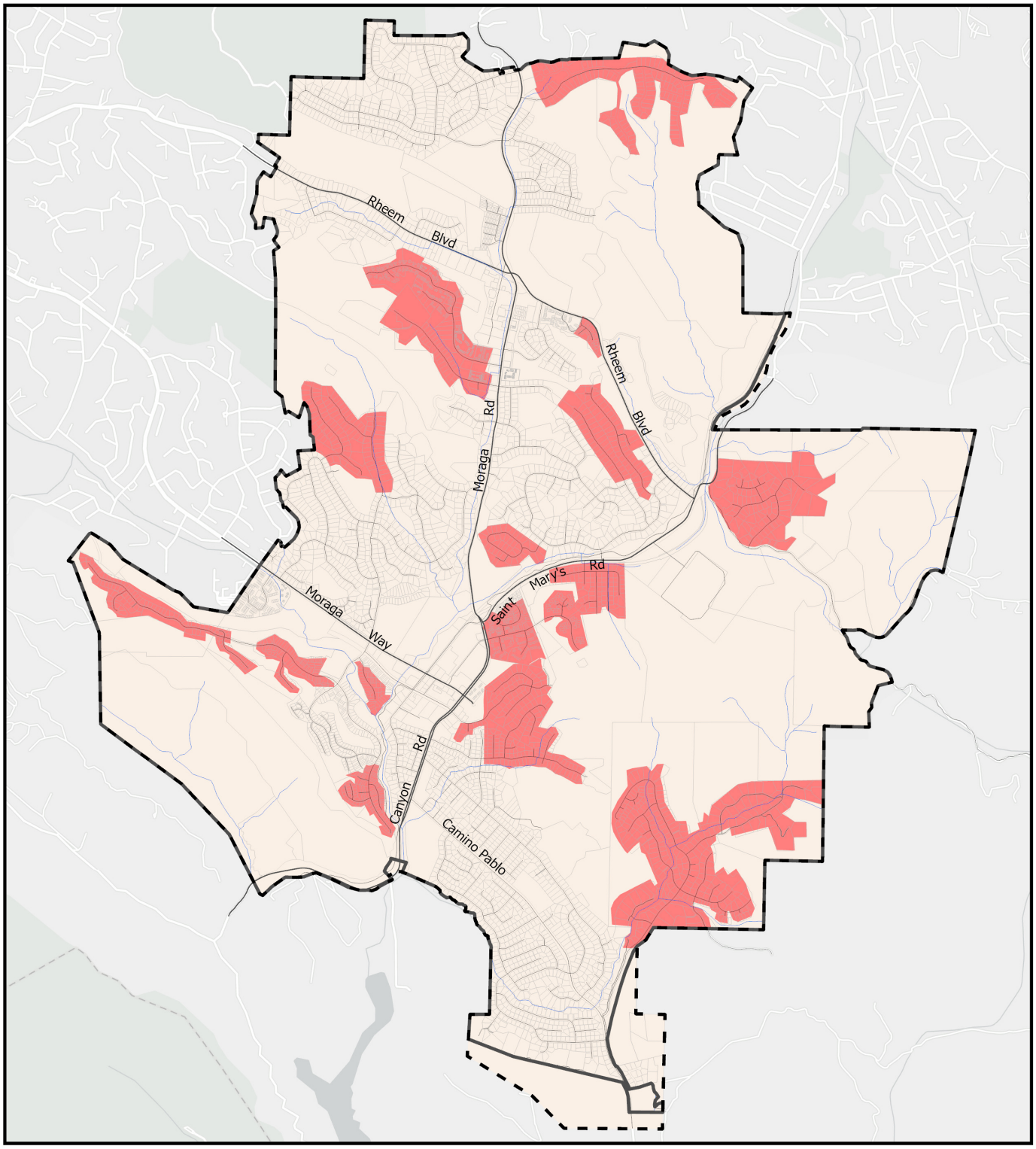
Moraga's location in an area prone to earthquakes, landslides, floods, and wildfires makes it essential to be prepared in the event of an emergency. The Town works collaboratively with the Moraga Orinda Fire District (MOFD), the cities of Lafayette and Orinda, and several County agencies to reduce exposure to hazards, implement training programs for residents, and ensure effective response and recovery.

The Town has adopted an Emergency Operations Plan that assigns functions and tasks to staff consistent with California's Standard Emergency Management System, including coordination with other jurisdictions. The Plan designates an Emergency Operations Center and addresses each aspect of emergency planning (including mitigation, preparedness, response, and recovery). Moraga also works in collaboration with MOFD to implement a Wildfire Action Plan, including strategies for community preparedness and risk reduction. The Plan includes measures to reduce structure ignitability, as well as fuel hazard reduction standards and development standards. As noted earlier, the Town also maintains and periodically updates a Local Hazard Mitigation Plan.

MOFD also administers Community Emergency Response Training (CERT) for the Lamorinda area. CERT helps residents be better prepared for disasters and trains residents to assist first responders following an emergency. CERT members also help with non-emergency projects that improve readiness and community safety.

MOFD has prepared a Residents Guide for Lamorinda residents focused on wildfire preparedness and evacuation. It includes tips for what to do when a fire is near and when an

Figure 11.3: SB 99 Constrained Ingress/Egress Map



evacuation is ordered. Moraga is divided into 23 Evacuation Zones to aid first responders. The zones are a communication tool for fire, police, and the Community Warning System. Evacuation routes are dependent on the location of the disaster. Moraga Road, Moraga Way, and Saint Mary's Road function as the primary routes in and out of Moraga.

In 2019, the California legislature adopted SB 99, requiring the General Plan to include a map showing residential developments in hazard areas that do not have at least two evacuation routes. **Figure 11.3** shows the location of these areas in Moraga.[3] They include long cul-de-sac streets with 30 or more homes, subdivisions with a single means of ingress and egress, and streets such as Donald Drive and Ascot Drive, where numerous multi-family structures are served by a single street.

Given the configuration and capacity of Moraga's road network and the community's susceptibility to wildfire, this General Plan prioritizes further evacuation analysis and planning as an implementation measure.

IMPACTS OF CLIMATE CHANGE ON SAFETY AND RESILIENCE

Many of the hazards described in this Element are likely to be exacerbated by climate change. Rising temperatures and more frequent droughts are likely to increase the risk of wildfire. Extreme storms can amplify flood hazards and landslide risks. As these events become more frequent, so do the risks to life and property. In the case of wildfire, there may also be an increase in air quality issues even when the fires are many miles away. Extreme weather events can also increase the frequency of damage to infrastructure such as roads, bridges, and utilities.

Increasing temperatures and reduced precipitation also have direct impacts on public health, our economy, and ecosystems. Higher temperatures can result in heat-related illness and mortality, particularly among older adults. Drought often brings severe economic impacts, threatening local vineyards, orchards, ranches, and landscaping. Heat and precipitation also affect biodiversity and ecosystems, potentially resulting in the loss or migration of species.

At the same time the Town is working to reduce greenhouse gas emissions, it is also working to adapt to the "new normal" and become more resilient. This is achieved through disaster preparedness, hardening of infrastructure, improving evacuation capacity, and limiting development in the town's most hazardous areas. Moraga has made these activities a priority and will continue to do so.

11.3 NOISE

The State Government Code requires every General Plan to identify and appraise local noise problems. Noise is a potential environmental hazard and can affect mental health, interfere with communication, disturb sleep, and cause hearing loss.

Guidelines have been developed by the State Office of Noise Control to ensure that new development considers the ambient noise environment. The focus of the State Guidelines is to avoid the exposure of new developments to high noise levels from highways, railroads, airports, industry and other common noise sources. The General Plan must include contour diagrams showing current and projected noise levels around major sources, including highways.

Moraga has a relatively quiet acoustical environment, given its distance from noise sources and predominantly residential character. The town does not have freeways, railroad, airports, or industry. The primary ambient noise source in the town is its road system, particularly arterial roads such as Moraga Road and Moraga

[3] **Figure 11.3** excludes areas cul-de-sacs and dead end streets serving fewer than 30 homes.

Way. Certain land uses, such as schools and childcare facilities, are more sensitive to noise than others. The State's guidelines aim to avoid the exposure of sensitive uses to high noise levels through site selection, building design, and buffering.

Other sources of noise in Moraga include construction activity and domestic activities such as leaf blowing and lawn mowing. Residential heating, ventilation, and air conditioning (HVAC) systems may also contribute to ambient noise. These activities and sources are regulated by the Moraga Noise Ordinance, which is part of the Town's Municipal Code. The Noise Ordinance also regulates vehicle repair and amplified sound.

Appendix A of the 2040 General Plan includes Moraga's noise contour diagrams for 2022 and 2040. Contours generally follow the town's arterial streets, and include areas where ambient noise levels exceed 60, 65, and 70 dBA.[4] The Town does not anticipate significant increases in noise levels or new noise sources during the planning period.

Some of the development anticipated over the next 20 years is located along arterial roads where existing ambient noise levels may exceed 60 dBA. The text box at right highlights some of the ways that potential noise impacts in new development can be mitigated through building design and site planning. Acoustical studies may be required to determine the measures most appropriate on each site, based on the ambient noise environment.

Photo Credit: Wikimedia Commons, Mongarort2

Reducing Noise Through Planning and Design

Some of Moraga's new housing sites are on arterial roads with high noise levels. Site planning, design, and construction measures can reduce potential interior and exterior noise levels and improve habitability. These measures include:

- Using berms and landscaping to buffer areas from noise
- Siting noise sensitive rooms such as bedrooms so they do not face the primary street, and less sensitive rooms such as garages close to the street
- Orienting buildings to shield outdoor spaces from noise
- Placing motorized equipment (such as air conditioning units) away from noise sensitive rooms.
- Installing double-paned windows and insulation to reduce the penetration of exterior noise to indoor spaces
- Increasing wall thickness and using sound-absorbing materials such as carpeting and acoustical tiles

[4] Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response. The A-weighting filters out very low and very high frequencies.

11.4 SAFETY AND RESILIENCE ELEMENT GOALS AND POLICIES

GOAL S-1: HAZARD REDUCTION

MINIMIZE THREATS TO PUBLIC HEALTH, SAFETY, AND WELFARE RESULTING FROM NATURAL AND HUMAN-CAUSED HAZARDS.

Policy S-1.1: Adoption of Local Hazard Mitigation Plan

The Contra Costa County Local Hazard Mitigation Plan and the Town of Moraga Annex, including any updates approved by the Federal Emergency Management Agency following adoption of this General Plan, are hereby incorporated into this Safety Element by reference, as permitted by California Government Code Section 65302.6.

Policy S-1.2: Risk Assessment

Where appropriate, require an assessment of natural hazard risks for development proposals to permit an adequate understanding of those risks and the possible consequent public costs in order to achieve a level of 'acceptable risk.' Public costs should be expressed in terms of effect on life and property. Cost data should be made available to the public for review and comment and should be used to inform decisions about the allocation of public resources.

Policy S-1.3: Development Review for Emergency Response Needs

Evaluate new development proposals to identify emergency response needs and potential constraints. Require that proposed development be located in areas with sufficient police, fire and emergency service capacity to meet project needs, or in areas where the necessary capacity will be provided as part of the proposed development activities.

Policy S-1.4: Emergency Preparedness

Undertake emergency preparedness planning, training, and community participation programs, including multi-jurisdictional programs involving Lafayette, Orinda, MOFD, and appropriate County agencies. These programs should provide direction and identify responsibilities following a disaster.

Policy S-1.5: SEMS Response

Coordinate with local and State Emergency Management agencies using the Standardized Emergency Management System (S.E.M.S.) and National Incident Management System (N.I.M.S.) to facilitate multiagency emergency response.

Policy S-1.6: Coordination with Other Agencies

Continue to cooperate with other public agencies to ensure that adequate medical and other emergency services are provided on a day-to-day basis.

Policy S-1.7: Equitable Response

Ensure that communication, educational and informational materials, assistance in preparedness activities, and evacuation and short-term recovery activities are available in multiple languages and formats appropriate for people with special needs.

Policy S-1.8: Federal and State Aid

In the event of a public health or safety-related emergency, utilize available Federal and State economic and technical aid to supplement local resources.

Lamorinda Evacuation Drill, 2023

Policy S-1.9: Evacuation Assistance for Persons with Limited Mobility

Develop and implement an evacuation assistance program, in coordination with CCTA and local community organizations and paratransit providers, to help those with limited mobility or lack of access to a vehicle to evacuate safely.

Policy S-1.10: High Risk Areas

To the extent consistent with federal or state law, prohibit development in 'high risk' open space areas as defined by the Moraga Municipal Code and Moraga Open Space Ordinance.

(High-risk areas occur in MOSO Open Space areas and are defined and mapped in the Open Space and Parks Element. They do not relate to fire hazard severity.)

Policy S-1.11: Development in Other Hazardous Areas

Outside of 'high risk' open space (see Policy S-1.10), avoid building in areas within 100 yards of active or inactive landslides, or on unstable soils such as colluvial deposits. Where it is not possible to avoid building in such areas entirely due to parcel configuration, limit development to the extent permitted by State law through density regulations, density transfer, clustering, and specific requirements for site engineering, road design, and drainage control.

Policy S-1.12: Hillside and Ridgeline Areas

Regulate land use and development in Hillside Areas and on and near Ridgelines in a manner that prioritizes the protection of residents, neighbors, and the community at large from landslides, earthquakes, wildfires, and other natural hazards.

Policy S-1.13: Control of Nuisances and Unsafe Conditions

In the event any structure is identified as unsafe or hazardous based on adopted codes, take measures to promptly remediate the hazard or remove the structure.

GOAL S-2: PUBLIC SAFETY

KEEP MORAGA A SAFE COMMUNITY WITH LOW CRIME RATES AND EFFICIENT, PROFESSIONAL LAW ENFORCEMENT SERVICES.

Policy S-2.1: Police Services

Provide police services to maintain the peace, respond to localized emergencies and calls for service, undertake crime prevention, enforce traffic laws, and facilitate evacuation and incident command and response in the event of an emergency.

Policy S-2.2: Level of Service

Maintain police services at or above current levels, with the number of staff expanded at a level commensurate with population and business growth. The Town should invest in the equipment and facilities necessary to ensure rapid responses time, professional service delivery, and a high level of public safety.

National Night Out | Photo Credit: Vera Kochan, Lamorinda Weekly

Policy S-2.3: Address Visibility

Support measures that help police, firefighting crews and emergency response teams respond to fire hazards or work under low-visibility conditions, such as high-visibility signage for streets and building addresses.

Policy S-2.4: Expansion of Technology and Communication Capacity

Expand technology and communication capacity in ways that detect criminal activity, improve operations and enhance the ability to deliver outstanding service to the community.

Policy S-2.5: Public Safety and Design

Ensure that the design and siting of buildings reduces opportunities for crime. Engage the Police Department in the development review process to address potential security and safety issues. Provide related information to the public on the steps residents and businesses can take to improve security and reduce crime.

GOAL S-3: WILDFIRE HAZARDS

AVOID AND MINIMIZE THE RISK OF LOSS OF LIFE, INJURY, AND PROPERTY FROM FIRE.

Policy S-3.1: MOFD Collaboration

Collaborate with the Moraga-Orinda Fire District in developing standards, guidelines, and local ordinances to ensure provision of adequate fire protection and emergency medical service for all persons and property in the community.

Policy S-3.2: Fire Stations

Work with the Moraga-Orinda Fire District to ensure that at least two fire stations are maintained in Moraga, and to support an ongoing facility improvement program.

Policy S-3.3: Fire Protection

Continue to require a high level of fire protection for all new development to avoid and minimize wildfire hazards, consistent with MOFD standards.

Policy S-3.4: Fuel Breaks

Coordinate with MOFD and landowners to develop and maintain fuel breaks and fire access easements in dedicated open space areas, consistent with the State Fire Code.

Policy S-3.5: Fire Flows

Coordinate with the East Bay Municipal Utility District to maintain an adequate water supply for fire-fighting purposes in the community. Ensure that minimum fire flow requirements for new development meet the adopted standards of the Moraga Orinda Fire District.

Policy S-3.6: Fire-Resistant Construction

Reduce the potential for damage and structure loss through fire-resistant construction, interior sprinklers, and other preventative measures. This should include:

(a) Fire safety devices in new construction, additions, and remodels, in accordance with all applicable adopted codes and standards. This may include special requirements for built-in fire protection systems based on building size, use, or location, consistent with MOFD standards.

(b) Fire resistant roofing of Class A or better in all new construction and when replacing roofs on existing structures, regardless of CalFire hazard map designation.

Policy S-3.7: Development Review by the Moraga-Orinda Fire District

Continue to require Planning Department and Moraga-Orinda Fire District (MOFD) review prior to the issuance of development permits for proposed construction projects and conceptual landscaping plans. MOFD shall submit conditions of approval for such projects so that they meet adopted fire safety standards. Plans for proposed development shall include, at a minimum:

(a) Site plan, planting plan, planting palette, and irrigation plan to reduce the risk of fire hazards, with consideration given to site conditions, slope, structures, and adjacencies.

(b) Defensible space maintenance plan.

(c) Multiple points of ingress and egress to improve evacuation, emergency response, and fire equipment access, and adequate water infrastructure for water supply and fire flow.

(d) Ember-resistant vents, to the extent required, when adding a new or replacement roof.

Applicants shall further comply with MOFD and Fire Code requirements for project-specific fire prevention plans where applicable.

MOFD controlled burn | Photo Credit: Vera Kochan, Lamorinda Weekly

Policy S-3.8: Emergency Vehicle Access

Require proposed development to provide adequate access for fire-fighting and emergency vehicles and equipment in accordance with fire access standards of the Moraga-Orinda Fire District and Town of Moraga Ordinances.

Policy S-3.9: Preemptive Devices at Traffic Signals

Equip all new traffic signals with preemptive devices for emergency response services. In the event an existing traffic signal will be significantly impacted by new development, require retrofit with preemptive devices at the developer's cost.

Policy S-3.10: Wildland Urban Interface (WUI) Areas

Apply applicable MOFD fire protection standards to all new developments in wildland-urban interface areas, as defined by MOFD. Fire prevention measures such as removal of dry grass and brush, landscaping with fire and drought-resistant vegetation, interior and exterior sprinklers, provision of adequate water supplies

and access for fire-fighting vehicles shall be required to reduce the risk of wildland fires. All new structures located in hazardous fire areas shall be constructed with fire resistant exterior materials consistent with applicable building codes and standards.

Policy S-3.11: Vegetation Management

Require that all properties be maintained in a manner consistent with MOFD standards to preclude combustible material and hazardous vegetation that permits the spread of fire from one property to another. Encourage preventive measures such as non-combustible zones around homes to maintain defensible space and reduce fire risks.

Policy S-3.12: Fire-Resistant Landscaping in New Development

Continue to uphold fire-resistant landscaping requirements for new residential and commercial development. All new residential development must comply with MOFD and CALFIRE regulations.

Policy S-3.13: Fire Roads and Trails

Require adequate fire access to open space areas in accordance with Moraga-Orinda Fire District standards.

Policy S-3.14: Evacuation Routes

Continue to identify and maintain evacuation routes, and ensure the adequate capacity, safety, and viability of those routes in the event of an emergency.

Policy S-3.15: Road and Access Improvements

Identify existing public and private roadways in fire hazard severity zones and the wildland-urban interface (WUI) that are not in compliance with current fire safety regulations, including road standards for evacuation and emergency vehicle access, vegetation clearance, and other requirements of Sections 1273 and 1274 of the California Code of Regulations (Title 14, Division 1.5, Chapter 7, Articles 2 and 3). Strive to retrofit Town-owned roadways as needed to meet current standards and require private property owners to do the same, to the extent feasible and given site constraints.

GOAL S-4: GEOLOGIC HAZARDS

MINIMIZE RISKS TO LIFE AND PROPERTY DUE TO EARTHQUAKES AND OTHER GEOLOGICAL HAZARDS

Policy S-4.1: Geotechnical Study Requirements

Require development proposals to address potential geologic hazards, including but not limited to landslides, surface instability, erosion, shrink-swell (soil expansiveness), and seismic vulnerability. Geotechnical reports shall be prepared by an independent licensed soil engineer, geologist, and/or structural engineer, approved by the Town and at the expense of the developer. All technical reports shall be reviewed by the Town and found to be complete prior to approval of a development plan.

Policy S-4.2: Development in Geologic Hazard Areas

Allow development only where and to the extent that any identified geologic hazards have been eliminated, corrected, or mitigated to acceptable levels, based on the findings of the geotechnical study.

Policy S-4.3: Densities in Hazard Areas

Minimize the density of new development in areas prone to geologic hazards such as landslides and soil instability.

Policy S-4.4: High Occupancy Structures

Do not locate community buildings or other structures designed to accommodate large numbers of people near fault lines or any area where seismically induced slides are possible.

Policy S-4.5: Public Facilities and Utilities in Landslide Areas

Prohibit the financing and construction of public facilities or utilities in potential landslide areas.

Policy S-4.6: Construction Standards

Ensure that all new construction and applicable remodeling/ reconstruction projects are built to established standards with respect to seismic and geologic safety. Periodically update codes and regulations in response to state laws and changes in technology which reduce seismic hazards.

Policy S-4.7: Construction Oversight

Adopt and follow inspection and code enforcement procedures that ensure that the design and mitigation measures identified in approved plans are incorporated in building construction.

Policy S-4.8: Unsafe Structures

Properly disclose information pertaining to structures and facilities found to be unsafe. Remove or retrofit such structures and facilities to adequate construction standards.

Policy S-4.9: Water Storage Reservoirs

Permit domestic water supply storage reservoirs only in locations that will pose no hazard to neighboring development. Support retrofitting and maintenance of existing storage facilities to minimize future hazards.

Policy S-4.10: Retaining Walls

Discourage the use of retaining walls and other engineered structures to mitigate geologic hazards, permitting them only when necessary to decrease the possibility of personal injury or property damage. When used, retaining walls shall:

- blend with the natural terrain and avoid an artificial or structural appearance
- be appropriately screened by landscaping
- avoid creating a tunnel effect along roadways
- ensure unrestricted views for vehicular and pedestrian safety
- be designed to minimize public and/or private maintenance costs.

Installation of shear walls on a hillside home can help stabilize the structure during an earthquake

Policy S-4.11: Maintenance of Hillside Areas

Facilitate successful long-term maintenance of hillside areas held as common open space.

Policy S-4.12: Public Information on Seismic and Geologic Safety

Educate the general public regarding methods to improve seismic safety. This should include information for hillside homeowners to minimize landslide and erosion hazards, as well as general information on earthquake preparedness (turning off gas, securing water heaters, anchoring furniture, etc.).

(see also Policy OSP2-2 and OSP 2-3 in the Open Space Element for regulation of grading activity)

GOAL S-5: FLOODING AND STREAMBANK EROSION

MINIMIZE RISKS TO LIFE AND PROPERTY DUE TO FLOODING AND STREAMBANK EROSION.

Policy S-5.1: Development in Flood Hazard Areas

Comply with all applicable federal requirements for flood hazard areas, including restricting new development in floodways and avoiding new structures in flood-prone areas along stream courses.

Policy S-5.2: Existing Structures in Flood Hazard Areas

Require the rehabilitation, retrofitting, or removal of structures that are subject to flooding or streambank erosion, in accordance with applicable county, state, and federal standards.

Policy S-5.3: Mitigation of Flood Impacts

Mitigate the potential for on-site and downstream flood and erosion impacts through design and site planning. This includes compliance with Countywide Clean Water Program ("C3") requirements for stormwater retention, as well as best management practices (BMPs) to minimize runoff, avoid erosion, and stabilize streambanks.

Policy S-5.4: Flood Control

Coordinate with the Contra Costa County Flood Control and Watershed Conservation District to minimize flood hazards in Moraga, maintain flood control facilities, and utilize new flood control measures where appropriate to avoid damage to creeks, riparian areas, and unstable slopes.

Policy S-5.5: Public Information on Flood Hazard Mitigation

Educate streamside property owners regarding potential flooding and streambank erosion hazards, their responsibilities for streambank maintenance and repair, and mitigation measures that may be used to address potential hazards.

GOAL S-6: HAZARDOUS MATERIALS

PROTECT MORAGA RESIDENTS FROM HEALTH AND SAFETY IMPACTS RELATED TO THE USE, STORAGE, MANUFACTURE, AND TRANSPORT OF HAZARDOUS MATERIALS.

Policy S-6.1: Consideration of Prior Uses

As part of the development review and approval process, consider potential risks associated with the previous uses of property that may have involved hazardous material handling, storage, or disposal. Require hazardous materials studies and remediation where such hazards exist to ensure the health and safety of future occupants.

Policy S-6.2: Hazardous Material Transport

Ensure the safe transport of any hazardous materials through Moraga. Require permits

in accordance with all applicable State and federal regulations.

Policy S-6.3: Hazardous Material Use

Continue to work with the Contra Costa County Health Services Department as the Certified Unified Program Agency (CUPA) for Moraga to ensure the safe storage, handling, and disposal of hazardous materials.

Policy S-6.4: Household Hazardous Waste

Support expanded public education on household hazardous waste and the locations where such waste can be safely and properly disposed.

GOAL S-7: CLIMATE RESILIENCE

PREPARE FOR THE IMPACTS OF CLIMATE CHANGE ON COMMUNITY SAFETY AND EMERGENCY PREPAREDNESS NEEDS.

Policy S-7.1: Climate Informed Decision-Making

Incorporate climate projection data in any modeling of future conditions conducted as part of capital improvement programming, utility planning, engineering standards, disaster preparedness planning, and natural resource management projects.

Policy S-7.2: Prioritizing Public Safety

Prioritize capital improvements and operational procedures that improve public safety and resilience.

Policy S-7.3: Community Readiness

Collaborate with MOFD on Community Emergency Response Team (CERT) programs and periodic training drills and exercises that help residents prepare for disasters. Work with the County to deploy warning systems for climate-related events, including alert and notification systems.

Policy S-7.4: Location of New Critical Facilities

Locate critical public facilities such as fire stations, schools, and Town offices, outside of flood hazard zones, very high fire hazard severity zones, and Wildland-Urban Interface zones. If facilities must be located in vulnerable areas, design and site them to minimize potential damage and increase their ability to remain operational during and after hazard events.

Policy S-7.5: Nature-Based Resilience

Use nature-based solutions, such as green infrastructure and tree planting, to improve resilience. Restore degraded ecosystems such as riparian areas and woodlands in ways that enhance their natural capacity to sequester carbon and absorb runoff.

Policy S-7.6: Utility and Energy Resilience

Work with local gas, electric, cable, water, sewer, and other utility providers to maintain and retrofit their facilities and ensure their ability to function or be quickly restored following a disaster. To the extent feasible, minimize stress on the electrical grid and provide backup sources of energy by encouraging microgrids, battery storage systems, and decentralized energy supplies. Identify grants, incentives, and other funding opportunities that help support energy storage programs, especially for essential businesses and services.

Policy S-7.7: Communication Resilience

Ensure that communication systems used by emergency responders and key Town staff have sufficient redundancy and resiliency to meet Town needs during and after a hazard event. Coordinate with the operators of telecommunications infrastructure and mobile networks to enable continuity of service or rapid restoration of service.

Residents learn about the Lamorinda CERT Program

Policy S-7.8: Urban Heat Island Effects

Reduce urban heat island effects by expanding landscaped surfaces in existing and new development, incorporating cool roofs and ample tree cover in new development, and reducing expanses of heat-absorbing pavement.

(See also urban forest and street tree policies in the Conservation Element)

(See also cool roof and green building policies in the Conservation Element)

Policy S-7.9: Climate Resilience Hubs

Work with community organizations, Saint Mary's College, MOFD, and the School Districts to identify public facilities that can serve as Climate Resilience Hubs. Such facilities should be capable of providing aid to vulnerable populations during periods of extreme heat, poor air quality from wildfire smoke, utility disruptions, and other climate-related hazards.

(see also Conservation Element Policy CON-3.7 on wildfire smoke)

Policy S-7.10: Data Sharing

Ensure that the Town is able to prepare for and respond to large-scale disasters through coordination and by sharing data, experience, and strategies with other emergency management agencies in state or regional disaster planning.

Policy S-7.11: Post-Disaster Recovery

As needed, develop and update programs that enable recovery and redevelopment after a natural or human-caused disaster and that reduce future vulnerabilities through site preparation, redevelopment layout design, fire resistant landscape planning, and more resilient building design and materials.

GOAL S-8: NOISE

MAINTAIN A QUIET ENVIRONMENT WITH LIMITED EXPOSURE TO EXCESSIVE NOISE.

Policy S-8.1: Noise Levels

Ensure that noise from all sources is maintained at levels that will not adversely affect adjacent properties or the community, especially during evening and early morning hours. Exceptions may be made in the interest of public safety. Acceptable noise levels should be identified in an updated Noise Ordinance.

Policy S-8.2: Noise-Sensitive Uses

Locate uses where they will be most acoustically compatible with the built and natural environments (see Appendix A). Where ambient noise levels exceed State compatibility guidelines, include measures to reduce noise to acceptable levels.

Policy S-8.3: Noise Impacts of New Development

Ensure that newly constructed development will not raise ambient noise on surrounding properties to unacceptable levels, based on State noise compatibility guidelines. Require measures to mitigate the potential for such impacts where appropriate.

Policy S-8.4: Acoustical Studies

Where appropriate, require the submittal of acoustical data as part of the development application process so that the noise impacts of proposed uses can be properly evaluated and mitigated.

Policy S-8.5: Construction Noise

Establish standard conditions of approval for future development projects to minimize construction noise impacts on roads and surrounding properties. Typical measures include sound mufflers, signage, temporary noise barriers, and the placement of noise-generating equipment in the least impactful locations.

Policy S-8.6: Vehicle Noise

Support efforts to mitigate the effects of transportation noise on adjacent properties, including landscaping and buffering, quieter transit vehicles, and enforcement of the California Motor Vehicle Code. Exceptions may be made for emergency response vehicles.

Policy S-8.7: Public Education

Whenever appropriate, use public information programs to educate the community on the effects of noise pollution, and Town requirements related to noise-generating activities.

11.5 SAFETY IMPLEMENTATION PROGRAMS

Program S-A: Local Hazard Mitigation Plan (LHMP)

Adopt, implement and periodically update the Contra Costa County Local Hazard Mitigation Plan (LHMP) and Moraga LHMP Annex, as directed by the California Governor's Office of Emergency Services and the Federal Emergency Management Agency.

Action S-A1: LHMP Adoption. *Adopt the 2024-2029 LHMP and participate in future updates.*

Program S-B: Mutual Aid Agreements

Maintain mutual-aid agreements with federal, state, and local public safety agencies as well as the private sector, to assist in:

1. Clearance of debris in the event of seismic hazards, collapsed buildings or structures, or other circumstances that could result in blocking emergency access or egress
2. Heavy search and rescue
3. Medical aid
4. Fire protection and suppression
5. Hazardous materials response
6. Temporary shelter
7. Geologic and engineering needs
8. Traffic and crowd control
9. Building inspection

Program S-C: Emergency Operations Plan

Periodically revise and update the Town of Moraga Emergency Operations Plan, including post-disaster reconstruction guidelines. The EOP specifies roles and responsibilities of Town staff and officials in the event of a disaster, including facilitating evacuation and traffic control.

Action S-C1: Communications Resiliency Plan. *Work with MOFD, Contra Costa County, adjacent cities, and the operators of telecommunications infrastructure and mobile networks to develop a communications system resiliency plan. The plan should provide for continuity of service and/or rapid restoration during and after an emergency.*

(See Action T-B1 for a description of the CCTA Evacuation Study and evacuation analysis and planning for Moraga)

Program S-D: Fire Code and MOFD Amendments

Work with the Moraga Orinda Fire District (MOFD) to implement and enforce the State Fire Code, inclusive of local amendments approved by the MOFD Board. This includes periodic Code updates to reflect new State laws and Board actions, and engagement of MOFD in the Town's development review process. The Town will actively work with MOFD in the review of planning and building applications, including enforcement of requirements for emergency vehicle access, fire protection systems, and fire-resistant design and landscaping.

Program S-E: Vegetation Management and Fire-Resistant Landscaping

Work with MOFD on vegetation management initiatives, including enforcement of defensible space and weed abatement requirements, controlled burns, and fire-resistant landscaping requirements.

Prescribed goat grazing to reduce fire hazards | Photo Credit: Michael Leicht

Program S-F: Moraga Orinda Wildfire Action Plan

Support implementation of the Moraga Orinda Wildfire Action Plan, including its strategies for reducing risks within the Wildfire-Urban Interface areas, and its recommendations for community preparedness, fire suppression, fuels mitigation, and monitoring and evaluation.

Action S-F1: Fire Insurance Advocacy. *Participate in discussion forums and advocacy for sustainable, affordable solutions to the fire insurance crisis in Lamorinda and the State of California.*

Program S-G: Geological Hazard Abatement Districts (GHAD)

Adopt Geologic Hazard Abatement Districts in accordance with State enabling legislation to mitigate geologic hazards in new development areas. GHADs are used to finance construction and maintenance of facilities to control landslides and reduce geologic hazards. A GHAD was created for the Bellavista development in 2015.

Program S-H: Building Code Safety Standards

In partnership with Contra Costa County's Department of Land and Conservation, implement the California Building Standards Code to maximize seismic safety and structural integrity, and to minimize structural risks associated with natural hazards such as landslides and erosion. This includes coordination with the County to enforce local building codes, periodically inspect critical public buildings, and inspect structures following earthquakes and other natural disasters.

Action S-H1: Soft-Story Buildings. *Develop an inventory of soft-story buildings in Moraga, and a strategy to support retrofitting these buildings to improve their seismic stability.*

Program S-I: Geotechnical Study Requirements

Require geotechnical reports for construction projects in accordance with requirements specified in the Moraga Municipal Code. This includes supplemental study and review requirements for sites with slopes greater than 20 percent. Geotechnical reports should be part

of the public record and may be referenced as benchmarks for related applications (see also Policy S-4.1).

Program S-J: Flood Control Ordinance and FIRM Maps

Maintain Flood Hazard Area regulations in the Moraga Municipal Code to minimize public and private losses due to flood conditions in specific areas identified by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps (FIRMs). The Ordinance establishes special permitting requirements for projects in flood-prone areas, floodways, and mudslide-prone areas, as well as standards for construction, utilities, RVs and manufactured homes, and subdivisions.

Program S-K: Hazardous Waste Management Program

Work with Contra Costa County Department of Environmental Health, in its capacity as the Certified Unified Program Agency (CUPA) for Moraga, and with other appropriate agencies, to ensure the safe management of hazardous materials in Moraga. This includes the permitting of hazardous materials storage and handling, transportation of hazardous materials through the Town, and remediation of any site-level contamination prior to development or redevelopment.

Program S-L: Noise Ordinance

Maintain provisions in the Moraga Municipal Code to restrict unnecessary, excessive and annoying noises from all sources under Town control.

Action S-L1: Noise Ordinance Update. *Update the Moraga Noise Ordinance to reflect current conditions, issues, and public input.*

Program S-M: Acoustical Study Requirements

Require acoustical studies during the development review process as required by CEQA. Such studies should ensure that development adjacent to major arterials includes site planning, design, and construction measures that reduce noise to acceptable levels, consistent with state law. As appropriate, acoustical studies should also address the reduction of noise from new stationary sources such as mechanical equipment and HVAC systems, and the reduction of noise from project-related construction activities.

Program S-N: Public Safety Outreach and Education

Support public outreach and education on environmental hazards such as wildfires and earthquakes. In partnerships with other agencies and organizations, provide information to the community on disaster preparedness, hazard mitigation, and resources following an emergency. This includes information on earthquake preparedness, management of drainage and streambanks to reduce landslide and flood hazards, and maintenance of defensible space and fire-safe vegetation around homes. It also includes promotion of MOFD's Community Emergency Response Team (CERT) training for Lamorinda area residents and businesses.

The following programs in other elements also implement Safety and Resilience policies (Program IDs are shown in parentheses):

- General Plan Diagram (LU-A)
- Zoning Ordinance (LU-B)
- Development Review (LU-C)
- Environmental Review/ CEQA compliance (LU-E)
- Hillside Development Permits (LU-H)
- Hillside and Ridgeline Ordinance (OSP-B)
- Grading Ordinance (OSP-C)
- Climate Action Plan (CON-A)