County of Sonoma
State of California

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ATTEST: August 12, 2025
M. CHRISTINA RIVERA, Clerk/Secretary
BY Noelle Francis

Date: August 12, 2025

Item Number: 42
Resolution Number: 25-0390

☒ 4/5 Vote Required

Resolution Of The Board Of Supervisors Of The County Of Sonoma, State Of California, Amending The Sonoma County General Plan To Repeal The Public Safety Element And Adopt The Safety Element Update, And Adopting An Addendum To The General Plan 2020 Environmental Impact Report

Whereas, California Government Code Section 65300 requires each city and county to adopt a general plan; and

Whereas, the Safety Element is a mandatory element of the General Plan, and adoption of the Safety Element is a General Plan amendment, as provided in Government Code Section 65350 et. seq.; and

Whereas, Government Code Section 65302(g) requires and establishes the legislative framework for general plan safety elements and requires safety elements to be reviewed, and if necessary, revised upon each revision of the housing element or local hazard mitigation plan, but not less than once every eight years; and

Whereas, Government Code Section 65302(g)(4) requires that the safety element be reviewed and updated as necessary to address climate adaptation and resiliency strategies beginning on or before January 1, 2022; and

Whereas, Government Code Section 65302(g)(5) requires that the safety element be reviewed and updated as necessary to identify residential developments in any hazard area identified in the safety element that do not have at least two emergency evacuation routes,

upon revision of the housing element on or after January 1, 2020; and

Whereas, Government Code Section 65302.15 requires that on or after January 1, 2022 the safety element shall be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability and evacuation locations under a range of emergency scenarios; and

Whereas, on September 23, 2008, the Board of Supervisors adopted the Sonoma County General Plan 2020 ("General Plan 2020"), including the Public Safety Element, by Resolution No. 08-0808, and certified the Final EIR for General Plan 2020 by Resolution No. 08-0807 on the same date; and

Whereas, on September 9, 2014, the County updated the Public Safety Element of General Plan 2020 by Resolution No. 14-0355; and

Whereas, on August 23, 2023, the Board of Supervisors adopted an update to the General Plan Housing Element by Resolution No. 23-0429; and

Whereas, the County of Sonoma is updating the Sonoma County General Plan 2020 Public Safety Element ("Safety Element Update") and preparing a new Environmental Justice Element, in accordance with Government Code Section 65302(h), in advance of a comprehensive update to the General Plan to comply with state requirements for general plan updates; and

WHEREAS, on June 19, 2024 the County sent invitations to consult under Government Code Section 65352.3 and the California Environmental Quality Act (CEQA) to California Native American tribe provided by the Native American Heritage Commission, and no Tribe requested consultation; and

Whereas, on July 23, 2024, the Sonoma County Board of Supervisors held an informational workshop at its regular public meeting time to discuss the proposed Safety Element Update and provide direction to staff on policy approaches; and

Whereas, the County conducted extensive community engagement and outreach since

December 2022, including working directly on project components with a community advisory group, attending community events, hosting focus groups, conducting an online survey, and joining community advisory council and community group meetings; and

Whereas, Assembly Bill 2140, passed in 2006, enacted Government Code Sections 8685.9 and 65302.6, which allow California cities and counties to be eligible for additional state cost-share on eligible public assistance projects under the California Disaster Assistance Act if the city or county adopts their local hazard mitigation plan into the general plan safety element; and

Whereas, on December 7, 2021, the Board of Supervisors adopted Resolution No. 21-0494, adopting designated portions of the Sonoma County Multi-Jurisdictional Hazard Mitigation Plan, designating the adopted Sonoma County Multi-Jurisdictional Hazard Mitigation Plan ("Hazard Mitigation Plan") as the Sonoma County Hazard Mitigation Plan incorporated by reference into the General Plan Public Safety Element, and resolving to integrate the adopted Hazard Mitigation Plan by reference into the Public Safety Element Update, in accordance with Government Code sections 65302, 65302.6, and 8685.9; and

Whereas, the County has prepared a Safety Element Update that substantively addresses all State law requirements for general plan safety elements, including but not limited to the requirements of Government Code Sections 65302(g) and 65302.15, and incorporates by reference the County's current Hazard Mitigation Plan; and

Whereas, the County published a draft of the Safety Element Update for a public review period from March 28, 2025 to April 30, 2025; and

Whereas, the County solicited public input on the draft Safety Element Update during the public review period through an online survey, a virtual community workshop held on April 23, 2025, and written public comment; and

Whereas, the County considered and incorporated community feedback where appropriate; and

WHEREAS, on April 23, 2025, consistent with Government Code Section 65352, the County sent a notice of the pending general plan amendment and availability of the draft Safety Element to listed public entities and all California Native American tribes provided by the Native American Heritage Commission; and

Whereas, County staff submitted the draft Safety Element Update to the California Department of Forestry and Fire Protection (CAL FIRE) during the public review period, to which CAL FIRE recommended minor revisions that were subsequently incorporated by staff; and

Whereas, the County submitted the draft Safety Element Update to the California Geological Survey of the Department of Conservation on April 23, 2025 in accordance with Government Code Section 65302.5, and as of August 1, 2025 the County has not yet received a response; and

Whereas, pursuant to CEQA Guidelines Section 15164, the County prepared an Addendum to the Sonoma County General Plan 2020 Environmental Impact Report ("General Plan 2020 EIR"), attached as Exhibit B and incorporated by reference. The Addendum documents that the analysis in the General Plan 2020 EIR adequately addresses the potential environmental effects associated with implementation of the update to the Safety Element as part of General Plan 2020; that the Safety Element update project would not trigger any of the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent or supplemental EIR; and therefore that preparation of an addendum to the General Plan 2020 EIR is appropriate, consistent with CEQA Guidelines Section 15164; and

Whereas, on June 5, 2025**,** the Planning Commission held a duly noticed public hearing to hear and consider public testimony and make recommendations to the Board of Supervisors regarding the Safety Element Update; and

Whereas, the Planning Commission adopted a resolution recommending that the Board of Supervisors repeal the existing Public Safety Element and adopt the Safety

Element, and adopt the addendum to the General Plan 2020 EIR; and

Whereas, on July 22, 2025, CAL FIRE staff presented the County's Safety Element Update to the California Board of Forestry and Fire Protection at its regular monthly meeting as required by Government Code Section 65302.5(b) prior to adoption of the Safety Element; and

Whereas, the Board of Forestry and Fire Protection approved the County's Safety Element Update, inclusive of its Appendices B and C regarding evacuation, with positive feedback on the Element's information, policies, and analysis, and made non-substantive, editorial recommendations that were subsequently incorporated into the Safety Element Update presented to the Board of Supervisors; and

Whereas, on August 12, 2025, the Board of Supervisors conducted a duly noticed public hearing to take public testimony and consider adoption of the Safety Element Update and addendum to the General Plan 2020 EIR. The Board reviewed and considered the Safety Element, including its appendices and the Hazard Mitigation Plan, which is incorporated into the Safety Element Update by reference; the recommendations of the State Board of Forestry and Fire Protection; all oral and written public comments; and all other pertinent materials; and

Now, Therefore, Be It Resolved, that the Board of Supervisors makes the following findings, based on substantial evidence in the record:

A. The Safety Element Update, including its appendices and the incorporated Hazard Mitigation Plan, substantively addresses all requirements provided under Government Code Sections 65302(g) and 65302.15:

    a. The Safety Element Update establishes goals, policies, and implementation measures to protect the community from unreasonable risks associated with seismically induced hazards, geologic hazards, flooding, and wildland and urban fires, and to address climate vulnerabilities with adaptation and resilience strategies.

b. The Safety Element Update incorporates information about hazards affecting Sonoma County from a variety of federal, state, and local data sources.

c. The Safety Element Update provides maps of regulatory hazard areas using the most current available data.

d. The Safety Element Update identifies residential developments in hazard areas that have fewer than two emergency evacuation routes and includes an implementation measure for additional review of residential areas with limited emergency egress.

e. The Safety Element Update identifies potential evacuation routes and assesses the capacity, safety, and viability and potential evacuation locations under a range of emergency scenarios, and further includes an implementation measure for additional review of evacuation constraints.

B. The Safety Element Update is consistent with and supportive of the overall goals and objectives of the other elements of the General Plan as follows:

a. The Safety Element Update's goals, policies, and implementation measures regulating development in known hazard areas to reduce risk are consistent with Goal LU-7 in the Land Use Element, and related objectives and policies, to prevent the unnecessary exposure of people and property to environmental risks and hazards and limit development on lands that are vulnerable or sensitive to environmental damage.

b. Policies and implementation measures in the Safety Element Update that support landscape restoration and conservation to improve resilience to climate hazards are consistent with the goals and policies in the Land Use Element and Open Space and Resource Conservation Element that encourage the protection of the County's natural landscapes and resources, including but not limited to Policy LU-11f, Goal OSRC-7 and

OSRC-8, and Policy OSRC-7o.

c. The goals, policies, and implementation measures of the Safety Element Update complement the Water Resources Element related to drought planning, water supply, and conservation.

C. The Board of Supervisors has considered the Addendum to the General Plan 2020 EIR, attached as Exhibit B and incorporated herein by reference, together with the General Plan 2020 Final EIR included as Attachments 8a-8c to the item summary and incorporated herein by reference. The Board finds that the Addendum to General Plan 2020 EIR was prepared consistent with CEQA, and demonstrates that none of the conditions listed in Public Resources Code Section 21166 and CEQA Guidelines Section 15162 exist that would require preparation of a subsequent or supplemental EIR.

Be It Further Resolved that the previously adopted Sonoma County Hazard Mitigation Plan, as defined herein, is incorporated by reference into the Safety Element Update.

Be It Further Resolved that the Board of Supervisors hereby amends the Sonoma County General Plan as follows:

1. The Public Safety Element is repealed.

2. The Safety Element Update, attached as Exhibit A and incorporated herein by reference, is adopted.

Be It Further Resolved that the Board of Supervisors designates the Director of Permit Sonoma or designee as the custodian of the documents and other material which constitute the record of proceedings upon which the decision herein is based. These documents may be found at the County of Sonoma Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, California 95403.

Supervisors:

Hermosillo: Aye Rabbitt: Aye Coursey: Aye Gore: Aye Hopkins: Aye

Ayes: 5 Noes: 0 Absent: 0 Abstain: 0

So Ordered.

EXHIBITS
Exhibit A. Safety Element Update and Appendices
Exhibit B. Addendum to the General Plan 2020 Environmental Impact Report

Sonoma County General Plan 2020

SAFETY ELEMENT

Board of Supervisors Adoption Draft August 2025

Sonoma County Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, California 95403

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Appendix A Sonoma County Climate Change Vulnerability Assessment
Appendix B Residential Egress Assessment (Government Code Section 65302(g)(5))
Appendix C Evacuation Routes and Locations Assessment (Government Code Section 65302.15)

1 Introduction

1.1 Purpose

The County of Sonoma is dedicated to protecting the community from natural and human-made environmental hazards and building resilience against projected climate change exposures. The Safety Element details the County's comprehensive approach to preparing for and responding to fire hazards, flooding, seismic and geologic hazards, hazardous materials, climate hazards such as extreme temperatures, and other hazards that may impact public health, safety, and welfare. This Element addresses the environmental hazards affecting Sonoma County and provides related goals, policies, and actions to protect all community members and minimize potential short- and long-term risks to people, property, and systems. While many hazards affect all of Sonoma County, some community members will experience the harmful impacts of climate change and other hazards more significantly than others due to systemic inequities. Therefore, some of the policies and actions in this Element prioritize the needs of certain groups to support equitable outcomes. The Safety Element also includes sections on disaster emergency preparedness, response, and recovery. Health related issues from environmental burdens, such as pollution, are addressed in the Environmental Justice Element of the General Plan.

Topics addressed in this Element include:

- Emergency Preparedness, Response, and Recovery
- Equitable Community Safety
- Resilient Facilities and Infrastructure
- Wildland and Structural Fires
- Flooding and Inundation
- Geologic and Seismic Hazards
- Hazardous Materials
- Sea Level Rise
- Air Quality and Extreme Temperatures
- Drought

1.1.1 Relationship to the Sonoma County Hazard Mitigation Plan

To be eligible for pre-disaster mitigation funds, the Federal Emergency Management Agency (FEMA) requires local agencies to adopt a Local Hazard Mitigation Plan (LHMP). The County of Sonoma's Local Hazard Mitigation Plan was prepared in partnership with local cities and special-purpose districts as part of a Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). The MJHMP includes a countywide risk assessment and separate annexes that together comprise each participating jurisdiction's individual LHMP. The MJHMP, which includes the LHMP for the unincorporated County, was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and following FEMA's Local Hazard Mitigation Plan guidance. The LHMP incorporates a process where hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed to reduce or eliminate hazard exposure. The implementation of these mitigation actions, which include both short and long-term strategies, involve planning, policy

changes, programs, projects, and other activities. References in this Element to the LHMP refer to portions of the MJHMP applicable to the County of Sonoma.

Both the Safety Element and the Local Hazard Mitigation Plan aim to reduce the risk of hazards to people, infrastructure, and the environment. They share the common goal of enhancing community safety and resilience. Both plans include characterization of the hazards and climate risks affecting the community and strategies to mitigate impact. Safety Elements are a required element in a jurisdiction's General Plan that characterize and set broader policy and programs for hazard mitigation, risk reduction, and response to natural and human-made hazards. Policies and programs in the Safety Element are aimed at reducing the potential short- and long-term risk of death, injuries, property damage, and economic and social dislocation resulting from hazards. Safety Elements are required to be reviewed and updated as needed upon revision of the LHMP or Housing Element.

LHMPs are not mandatory plans but must be updated every five years to maintain compliance with requirements for FEMA funding eligibility. LHMPs provide more detailed analysis, context, and specific mitigation strategies and actions to address identified hazards, while the Safety Element provides a broader policy framework that supports these actions and integrates them into overall planning and development processes. Aligning these plans ensures consistency in the County's overall safety and development approach. Additionally, regular updates to both plans ensure they remain in sync and responsive to evolving hazards and priorities.

The County's LHMP is incorporated in the Safety Element by reference and is located on the County's website.

1.1.2 Relationship to Other General Plan Elements and Planning Documents

The Safety Element supports and aligns with the other General Plan elements, focusing on community safety and resilience. The Land Use Element has the greatest relationship to the Safety Element, as it sets parameters for the safe location and design of buildings and land uses in identified hazard risk areas. The Safety Element also supports the Environmental Justice Element through aligned identification of systemically vulnerable communities, and goals and policies that aim to protect people who are most vulnerable to natural and human-made hazards, including but not limited to Environmental Justice (EJ) Communities. The Safety Element policies are also coordinated with the policies of the Circulation and Transit, Housing, Open Space and Resource Conservation, and Public Facilities and Services Elements. The remaining elements of the General Plan align with the strategies of the Safety Element to provide a comprehensive framework to safe and equitable land management in Sonoma County.

The Safety Element is one of several plans that addresses public safety, wildfire protection, hazard mitigation, and emergency response. In addition to the internal consistency with other General Plan elements, the Safety Element incorporates the County's Local Hazard Mitigation Plan and complements other County planning documents relevant to specific hazards or safety issues. Related County planning documents are organized by safety issue area in Table 1 below. For a detailed list of other related local planning documents reviewed by climate issue area, refer to Appendix A, the Climate Change Vulnerability Assessment (Vulnerability Assessment) prepared for this Element.

Table 1 Related County Planning Documents by Safety Issue Area

	Emergency Preparedness and Response	Equitable Community Safety	Resilient Facilities and Infrastructure	Wildland Fire	Flooding and Inundation	Geologic and Seismic	Hazardous Materials	Sea Level Rise	Air Quality and Extreme Heat	Drought
Multi-Jurisdictional Hazard Mitigation Plan	✓	✓	✓	✓	✓	✓		✓	✓	✓
Sonoma County Operational Area Emergency Operations Plan and Related Annexes	✓	✓		✓	✓	✓	✓		✓	✓
Sonoma County Operational Area Contingency Plan		✓	✓							
Sonoma County Climate Resilience Comprehensive Action Plan			✓							
Sonoma County Language Access Plan (2024) and Community Engagement Plan (2024)			✓							
Access Sonoma Broadband Action Plan			✓							
Sonoma County Climate Change and Health Profile Report									✓	
Sonoma Water Local Hazard Mitigation Plan										✓
Sonoma Water Urban Water Management Plan										✓
Sonoma Water Climate Adaptation Plan					✓					✓
Sonoma County Carbon Inventory and Sequestration Potential Study										✓
Sonoma Valley, Petaluma Valley, and Santa Rosa Plain Groundwater Subbasins Groundwater Sustainability Plans										✓
Sonoma County Russian River Flood Plan					✓					
Climate Ready Sonoma County: Climate Hazards and Vulnerabilities	✓				✓					
Sonoma Local Coastal Plan (LCP)	✓		✓	✓	✓	✓	✓	✓		
Sonoma County Fire District Strategic Plan	✓			✓				✓		
Joint Response Plan for Soil Movement in Burned Areas	✓			✓						
Sonoma County Community Wildfire Protection Plan	✓			✓						
Sonoma County Carbon Inventory and Sequestration Potential Study				✓						

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1.2 Statutory Requirements

State law requires that the General Plan include an element that addresses environmental hazards applicable to the jurisdiction such as fires, floods, droughts, earthquakes, landslides, climate change, and other human-made hazards (Government Code Section 65302(g)). This Element meets the legal requirements for a Safety Element and includes policies intended to reduce the potential short- and long-term impact of personal injury, property damage, and damage to the County's infrastructure. The Safety Element is internally consistent with other General Plan elements, as required by State law.

A Safety Element is required to address the following:

- **Protect the community from unreasonable risks** associated with a variety of hazards, including geologic and seismic hazards such as landslides and ground shaking from earthquakes, flooding, and wildland and urban fires (Government Code Section 65302(g)(1)).
- Map and assess the risk associated with **flood hazards**, and establish a set of goals and policies with related implementation measures to avoid or minimize flood risk to new development, protect essential public facilities from flooding, and establish cooperative relationships between public agencies responsible for flood protection (Government Code Section 65302(g)(2)).
- Map and assess the risk associated with **wildfire hazards**, and establish a set a goals and policies with related implementation measures to avoid or minimize wildfire risk associated with new uses of land, protect essential public facilities from wildfire, ensure adequate infrastructure for new development in fire hazard areas, and establish cooperative relationships between public agencies responsible for fire protection (Government Code Section 65302(g)(3)).
- Assess the vulnerability of populations, existing and planned development, and local assets and infrastructure to **climate change impacts** and establish a set of climate change adaptation and resilience goals and policies with related implementation measures to avoid or minimize climate change impacts from new land uses, protect essential public facilities, provide adequate infrastructure in at-risk areas, work cooperatively with relevant public agencies on reducing risks, and identify natural infrastructure that may be used for climate adaptation (Government Code Section 65302(g)(4).
- Identify "residential developments in any hazard area identified in the safety element that do not have **at least two emergency evacuation routes**" (Government Code Section 65302(g)(5)).

Government Code Section 65302.15 further requires that the Local Hazard Mitigation Plan or Safety Element **identify evacuation routes and their capacity, safety, and viability and evacuation locations** under a range of emergency scenarios.

The County of Sonoma has conducted a Climate Change Vulnerability Assessment in accordance with Government Code Section 65304(g)(4), a Residential Egress Assessment in accordance with Government Code Section 65302(g)(5), and an Evacuation Routes and Locations Assessment in accordance with Government Code Section 65302.15. These assessments are included with this Safety Element as Appendices A through C.

This Safety Element contains maps showing regulatory natural hazard areas that are designated by state and federal agencies. These include Figures 7 through 15, which depict regulatory natural hazard areas in Sonoma County, including:

- Fire hazard severity zones, designated by the State Fire Marshal for State Responsibility Areas (SRAs) as provided in California Public Resources Code Sections 4201-4204, and for Local Responsibility Areas (LRAs), pursuant to California Government Code Section 51178;
- Special flood hazard areas, designated by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program;
- Earthquake fault zones, delineated by the State Geologist pursuant to the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630); and
- Seismic hazard zones, including liquefaction zones, landslide zones, and tsunami zones, delineated by the State Geologist pursuant to the California Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699).

State law requires these maps to be included in the General Plan Safety Element. The County has no discretion or authority over the content of regulatory hazard maps, and the maps are periodically updated by the applicable agencies on those agencies' own timelines. However, the natural hazard zone maps provide vitally important data that guides and informs County planning and development review decisions. The regulatory hazard areas shown in Figures 7 through 15 are current as of the date this Safety Element is adopted by the Board of Supervisors. Because the hazard areas delineated in the maps are products of other agencies and do not reflect any discretionary policymaking action by the County, this Safety Element shall be deemed to automatically incorporate each regulatory hazard area in its most current form. The County will promptly update the appropriate figures after any regulatory hazard area map is updated by a State agency or FEMA, and, pursuant to Policies SE-9, SE-10a, and SE-12a and Program M.1 in this Element, will analyze each change to determine whether an updated map warrants amendments to the Safety Element or other County action.

1.3 Scope and Organization

This Element contains sections on the following topics, in accordance with Government Code Section 65302(g):

- Emergency Preparedness, Response, and Recovery
- Equitable Community Safety
- Resilient Facilities and Infrastructure
- Wildland and Structural Fires
- Flooding and Inundation
- Geologic and Seismic Hazards
- Hazardous Materials
- Sea Level Rise
- Air Quality and Extreme Temperatures
- Drought

Each section includes a discussion of the extent of the hazard, the risk of damage, the regulatory setting, and goals and policies to minimize impact. An implementation program is also included at

the end of the Element to provide an action plan for carrying out the policies included in this Element.

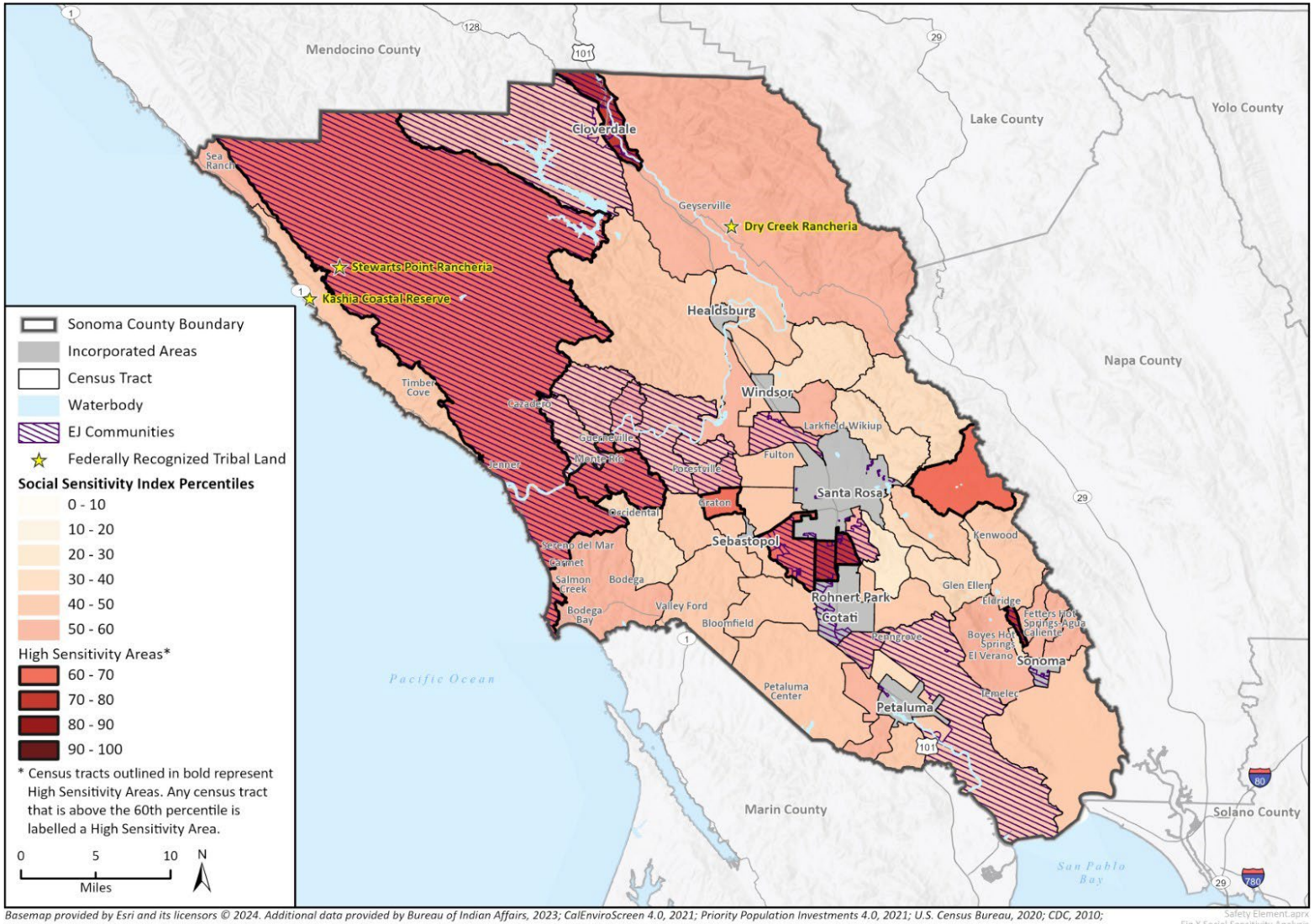
1.4 Climate Change Vulnerability Assessment Summary

Government Code Section 65302, as amended by 2015 Senate Bill 379, requires cities and counties across California to prepare a Climate Change Vulnerability Assessment (Vulnerability Assessment) that informs updates to the Safety Element of the General Plan. The County prepared a Vulnerability Assessment to inform this Safety Element in compliance with State law, provided in Appendix A. This assessment follows the methodology put forth by California Governor's Office of Emergency Services in the California Adaptation Planning Guide and relies on California Adaptation Forum and Ocean Protection Council for climate projection data.

1.4.1 Identified Sensitive Populations

The Vulnerability Assessment includes an assessment of the groups of individuals most susceptible to harm from environmental and climate changes, called "populations made sensitive by systems" in recognition of the systemic inequities that influence sensitivity levels. The Vulnerability Assessment follows California Adaptation Planning Guide's methodology for identifying and analyzing sensitive populations through the creation of a social sensitivity index. This assessment uses indicators found in the US Census American Community Survey and CDC PLACES Health data. Population data indicators were utilized based on characteristics that increase a person's physiological sensitivity to climate hazards, the ability of an individual to prepare for, cope with or recover from climate hazards due to social or economic factors, or a combination of both. The index is provided as **Figure 1**. For further details on how populations made sensitive by systems were identified, refer to Appendix A (Climate Change Vulnerability Assessment).

Figure 1 Systemically Vulnerable Communities: Populations Made Sensitive to Climate Change by Systems and Environmental Justice (EJ) Communities



Basemap provided by Esri and its licensors © 2024. Additional data provided by Bureau of Indian Affairs, 2023; CalEnviroScreen 4.0, 2021; Priority Population Investments 4.0, 2021; U.S. Census Bureau, 2020; CDC, 2010; American Community Survey (ACS) 2017-2021 5-year estimates, Table(s) B25070, B25091 & ACS, LEAD tool, 2018; Social Sensitivity Percentile Scores calculated by Rincon Consultants, Inc., 2022.

Safety Element.aprx
Fig X Social Sensitivity Analysis

Sonoma County is home to several populations made sensitive by systems, and who have already been disproportionately harmed by climate change, including:

- People with high outdoor exposure;
- Under-resourced individuals;
- Individuals facing societal barriers such as people experiencing poverty, unemployed individuals, individuals with no health insurance, households without a computer, households without broadband internet, households with limited computer skills, renters, individuals without vehicle access, single-female heads of households, individuals with educational attainment of less than 4 years of high school, individuals in overcrowded housing, mobile home households, households experiencing housing burden, households experiencing energy burden; and
- Individuals with chronic health conditions or sensitivities.

In addition to the population groups identified for the social sensitivity index in the Vulnerability Assessment, Environmental Justice (EJ) Communities identified in the Environmental Justice Element are also sensitive to climate change. EJ Communities in Sonoma County are census tracts that are low-income and disproportionately impacted by environmental pollution and housing burden. The full methodology for identifying the census tracts that make up the County's EJ Communities can be found in the the Environmental Justice Element and Environmental Justice Technical Report. In the Safety Element, populations made sensitive by systems, as identified in the Vulnerability Assessment, and Environmental Justice (EJ) Communities are referred to collectively as systemically vulnerable communities.

The Vulnerability Assessment programmatically evaluates the severity of impacts from climate hazards and the capacity to prepare for and adapt to climate hazards. The assessment focuses on systemically vulnerable communities, community assets, and critical facilities and services to better understand their vulnerability to hazards and to inform the safety and resilience strategies that are included in this Element. In Sonoma County, the impacts of climate change are expected to increase significantly by mid- and end-century including more frequent and longer lasting extreme heat events, extended droughts, more frequent and severe wildfires, rising sea levels, and increased precipitation events.

1.5 Determination of Acceptable Risks

The County is not able to guarantee that any particular development will not, at some time in the future, be adversely affected by the hazards identified in this Element because such hazards, by their nature, defy precise prediction. An "acceptable level" of risk means that level provides reasonable protection of public safety but does not guarantee it. Decisions on risk reduction measures to provide reasonable protection are made on a case-by-case basis for discretionary projects.

2 Safety Issue Areas and Policies[1]

2.1 Emergency Preparedness, Response, and Recovery

In recent years, Sonoma County has experienced a series of devastating and transformative disasters that overhauled the County's approach to emergency management. Following the 2017 wildfires, the County made significant investments in emergency planning and hazard mitigation to make us more resilient both at the government and community levels. The County focused on recovery and rebuilding as well as building resiliency to mitigate future harm. The Board of Supervisors went on to establish the Sonoma County Department of Emergency Management in 2019, which is now responsible for the mitigation, preparedness, planning, coordination of response, and recovery activities related to county emergencies and disasters.

The Department of Emergency Management is the lead agency for the Sonoma County Operational Area, which consists of the nine incorporated cities (Cloverdale, Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor), Sonoma State University, the Sonoma County Junior College District, and other special districts within the county's geographical boundary. Under the State of California's Standardized Emergency Management System (SEMS), the Operational Area is the primary level of coordination for response and recovery activities following an emergency or disaster. The Department of Emergency Management provides the umbrella under which all response agencies may function in an integrated fashion.

Since 2017, the County has made major improvements in early detection, alert and warning systems and evacuation planning, including the installation of fire cameras in remote areas of the county, faster, redundant alert systems across multiple platforms, and the creation of an evacuation zone map to allow residents to "know their zone" in advance and be prepared to leave, among other actions. The Department of Emergency Management implements an extensive emergency preparedness education program, attending community events throughout the year providing information and resources, and conducting evacuation drill exercises in various communities throughout the county. The Department is also working on the construction of community emergency resilience centers throughout the county, to provide supplies and equipment and logistic and operational support during an emergency.

This section of the Safety Element focuses on planning and coordination strategies to strengthen community resilience and ensure Sonoma County is adequately prepared to respond and recover from disasters. The goals and policies in this section of the Safety Element complement those in other sections that mitigate hazards and reduce risk for a more resilient Sonoma County.

[1] *Policies in this Element marked with an asterisk (*) are mitigating policies in accordance with the General Plan 2020 Environmental Impact Report (EIR). These policies were either directly carried forward from the previous Safety Element (2014), modified, or consolidated with other policies and ultimately have the same mitigation purpose.*

2.1.1 Emergency Preparedness and Response

In addition to household emergency preparedness, emergency communications and timely evacuations are an essential part of emergency operation planning and community safety. Barriers to evacuation can stem from deficiencies in the electrical grid, transportation system, telecommunication systems, language barriers, emergency facilities and services, evacuation locations, as well as inequitable access to and distribution of resources. Inability to evacuate in a timely fashion during a hazardous event can create direct impacts to health and safety and exacerbate chronic health problems, particularly in systemically vulnerable communities. Recent hazard events have prompted widespread evacuations in Sonoma County, including but not limited to the fires in 2017, 2019, and 2020 along with winter storms and atmospheric river events.

The Sonoma County Sheriff's Office is responsible for conducting evacuations, working closely with other public safety partners and the Department of Emergency Management. The Department of Emergency Management is responsible for preparing the Sonoma County Operational Area Emergency Operations Plan (EOP), a guidebook for phases of an all-hazards emergency management process within the county. The phases of emergency management include preparedness, response, and recovery, and mitigation. The EOP provides operational concepts, addressing how to mobilize resources, coordinate agencies and the community, and protect life, property, and the environment during an incident, especially vulnerable and hard to reach populations. The County's EOP includes supplementary, supporting annexes relevant to a specific threat or response action, including but not limited to an Evacuation Plan Annex, Mass Care & Shelter Plan Annex, and Community Alert & Warning Annex.

While the Emergency Operations Plan and its annexes provide operational guidance for dealing with an emergency or hazard disaster, this section of the Safety Element provides a complementary, longer-term planning framework for preparing Sonoma County for future emergencies and more efficient, coordinated response through advanced strategic coordination, ongoing partnerships, and hazard mitigation and emergency response planning.

2.1.2 Residential Egress Assessment

The County completed a Residential Egress Assessment as required by Government Code Section 65302(g)(5), provided in **Appendix B**. (The assessment required by Government Code Section 65302(g)(5) is sometimes referred to as an "SB 99" assessment, referring to the 2019 Senate Bill 99 that enacted the statute.) This assessment identifies residential developments in hazard areas that lack at least two emergency evacuation routes, specifically residential developments of 30 or more parcels with only a single access route.

The assessment differs from the approach used by CAL FIRE in the Subdivision Review Program mandated by California Public Resources Code 4290.5, which requires CAL FIRE to identify existing subdivisions with 30 or more dwellings that are in either a State Responsibility Area or a Very High Fire Hazard Severity Zone in a Local Responsibility Area, and that are without secondary egress routes. While the residential egress assessment requirement for the Safety Element and the CAL FIRE Subdivision Review Program are different programs, they are parallel efforts intended to inform evacuation and planning efforts in preparation for wildfire and other hazards. The Residential Egress Assessment conducted as part of this Safety Element update is an initial screening effort to identify communities that may have limited access. The assessment may be further broadened and refined by community input and additional analysis over time with direction from the Board of Supervisors. The assessment does not provide a comprehensive status of evacuation

accessibility for individual parcels in the unincorporated county. This Element calls for additional evaluation of evacuation constraints to inform future planning and hazard mitigation efforts (see Policy SE-2i and Implementation Program 2).

The Residential Egress Assessment found that there are twelve clusters of residential parcels with a single access roadway under the assumptions and methodology used. **Figure 2** shows the parcel clusters in relation to fire hazard severity zones in the State Responsibility Area and **Figure 3** shows the parcel clusters in relation to delineated flood hazard areas.

2.1.3 Evacuation Routes and Locations Assessment

The County conducted an Evacuation Routes and Locations Assessment as required by Government Code Section 65302.15. (The assessment required by Government Code Section 65302.15 is sometimes referred to as an "AB 747" assessment, referring to the 2019 Assembly Bill 747 that enacted the statute.) This assessment, provided in **Appendix C**, evaluates roadway capacity and the time required to evacuate geographically large areas under current and projected future population conditions in three scenarios. The assessment reviews scenarios in which the following areas of the county must evacuate: Scenario 1) the mountain western portions of the County from the coast to the valley floor, Scenario 2) the mountainous areas in the northeast of the County, including Alexander Valley and the Mayacamas Mountains north of Mark West Springs, and Scenario 3) the southeastern portions of the County, including Sonoma Valley, parts of Santa Rosa east of Farmers Lane, and the Sonoma Mountains south of Mark West Springs.

The assessment aims to give a broad understanding of the transportation system capacity during evacuations but does not guarantee that actual evacuations will match the modeled scenarios. The modeling results show areas of the county road network that could be heavily congested during the evacuation scenario under the specific assumptions used, and the time it would take for traffic to return to free flow conditions. The assessment includes further details on the scenarios modeled, assumptions used, mapped results of the modeling analysis showing, and recommendations that were incorporated into this section of the Safety Element as appropriate.

The assessment does not guarantee the time it will take to evacuate any given area in any given emergency scenario but rather provides limited information about areas of the County where evacuation conditions may be less efficient for planning purposes. The results should be viewed as sources of information and not a complete picture of evacuation considerations within the county. This Element calls for additional evaluation of evacuation constraints to inform future planning and hazard mitigation efforts (see Policy SE-2i and Implementation Program 2).

Government Code Section 65302.15 also requires the Safety Element to identify evacuation locations. The Evacuation Annex and Mass Care & Shelter Annex of the Sonoma County Emergency Operations Plan describe the process and criteria for establishing temporary evacuation points and evacuation shelters during an emergency incident.

2.1.4 Post-Disaster Recovery

A core part of resilience is the ability to recover quickly from an event. Post-disaster recovery entails restoring and improving the living conditions, infrastructure, and overall well-being of the County following any type of disaster. This phase involves not only rebuilding physical structures but also addressing the social, economic, and emotional needs of affected individuals. Effective recovery efforts in Sonoma County will focus on providing immediate relief, such as temporary housing and medical care, while also implementing long-term strategies to enhance resilience and reduce future

harm. For example, after the 2017 fires, the County created the Resiliency Permit Center and temporarily waived or reduced certain policies or requirements to expedite permits and inspections for reconstruction.

In Sonoma County, post-disaster recovery efforts must address the disparities in resource access between different community groups. For example, renters often face greater challenges compared to homeowners, as they may lack insurance and face displacement without the means to secure new housing. Similarly, families with citizenship status have more straightforward access to aid and resources, while mixed-documentation-status households encounter barriers that hinder their recovery. These systemic inequities mean that systemically vulnerable communities struggle more to land on their feet after a disaster. Policies for recovery emphasize the importance of the County's response to immediate needs, such as medical care, as well as longer-term efforts to restore homes, livelihoods, and the environment.

Figure 2 Single Access Residential Parcel Clusters and SRA Fire Hazard Severity Zones

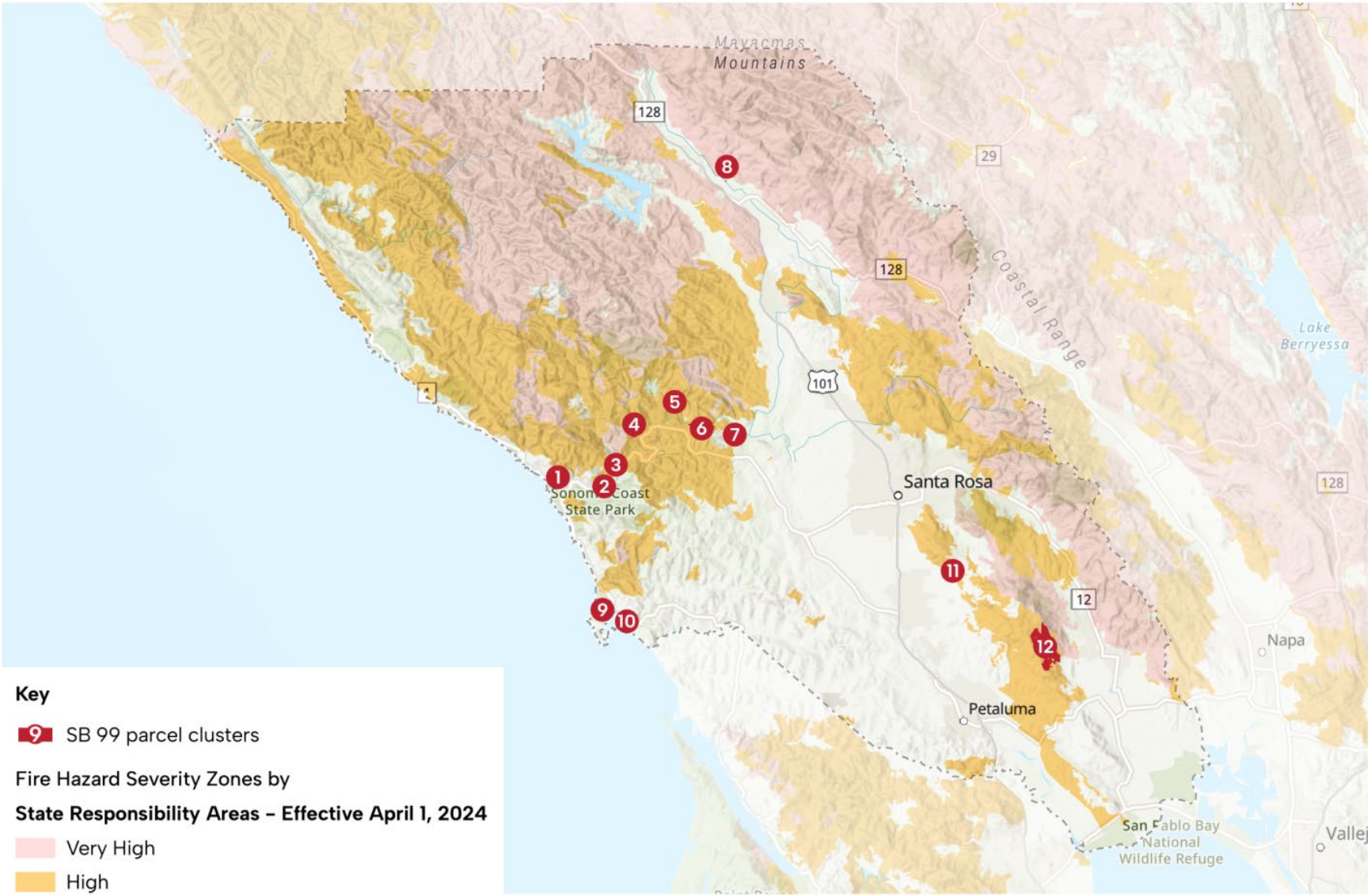
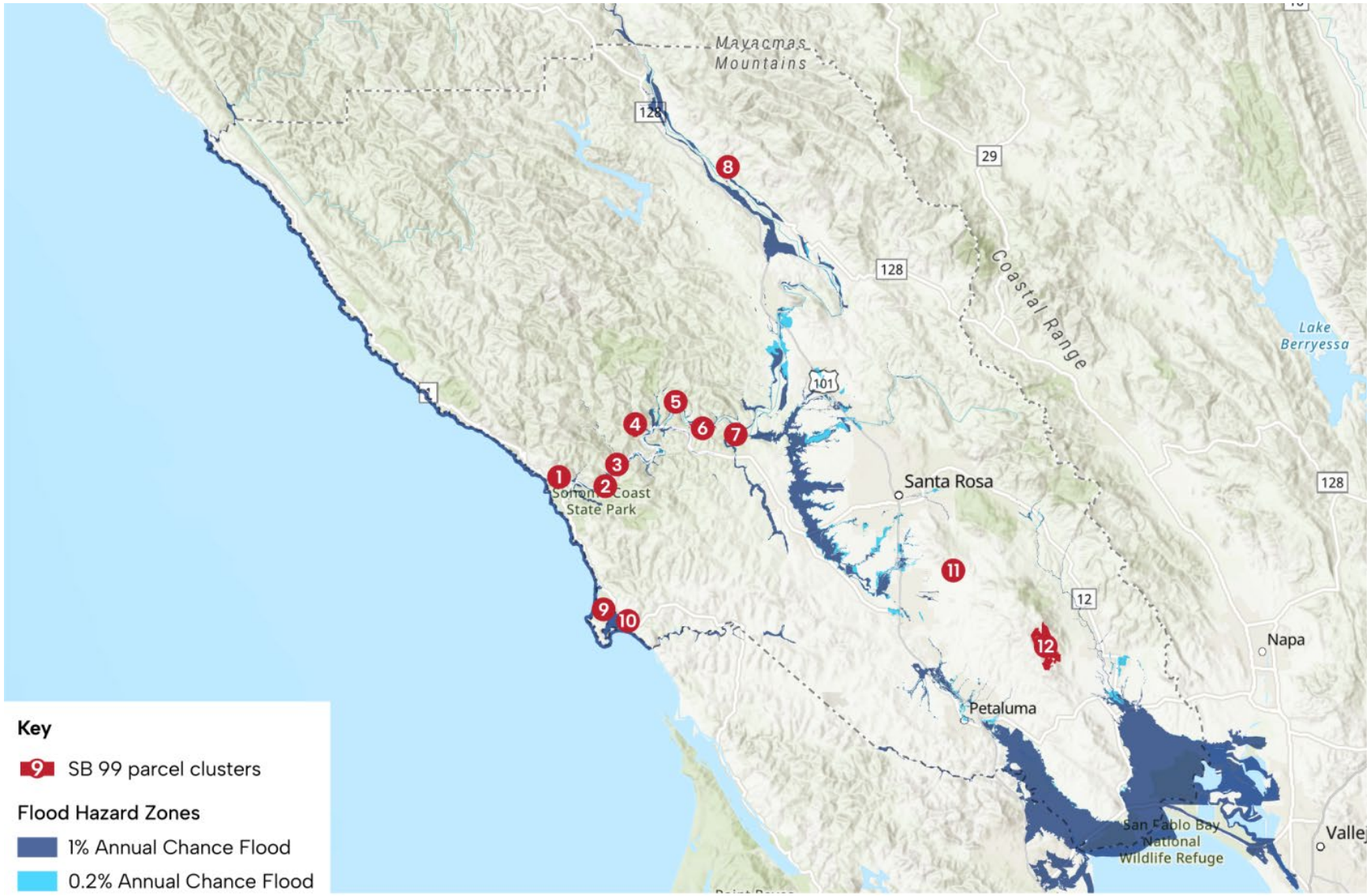


Figure 3 Single-Access Residential Parcel Clusters and Flood Hazard Areas



Policies: Emergency Preparedness, Response, and Recovery

Goal SE-1: Prepare community members and County staff for emergencies through information and resources, training, planning, and assessment.

Policy SE-1a: Maintain and update as necessary the Sonoma County Operational Area Emergency Operations Plan and associated annexes, including evacuation protocols.

Policy SE-1b: Update the Hazard Mitigation Plan every five years and use the plan to guide mitigating actions to protect the whole community and the environment.

Policy SE-1c: Continue to prepare for increased capacity and redundancy during emergencies through strategic coordination and partnerships, such as through memorandums of understanding, before disasters occur between community-based organizations, fire agencies, CAL FIRE, the Department of Emergency Management, the Sheriff's Office, and other public safety partners.

Policy SE-1d: Invest in building trust and relationships with community-based organizations to improve communication systems, address language access needs, and develop a shared understanding of community needs and resources available (such as legal or medical support, transportation, and evacuation or resilience centers) as a core strategy for emergency preparedness. Assist with building community-based organizations capacity to support their community members during a disaster.

Policy SE-1e: Coordinate, assist, and promote community-specific emergency preparedness and evacuation planning through new and existing programs like Community Emergency Response Training (CERT), Communities Organized to Prepare for Emergencies (COPE), and Map your Neighborhood (MYN) to increase disaster preparedness at the community/neighborhood level. Prioritize efforts in high hazard areas and systemically vulnerable communities, and coordinate with community organizations to target hard-to-reach populations.

Policy SE-1f: Promote a culture of self-preparedness for residents and businesses to increase readiness for and resilience to disaster events.

Policy SE-1g: Continue to conduct community evacuation exercises in known hazard areas.

Policy SE-1h: Provide and support opportunities for inter-agency training with local fire agencies, the Sheriff's Office, the Department of Emergency Management, and other emergency services and response staff to effectively coordinate multi-agency response and mutual aid in the event of a wildfire or other hazard incident.

Goal SE-2: Support safe and efficient emergency response and evacuation through accessible and effective alerts, improved safety of evacuation routes, and emergency response planning.

Policy SE-2a: Continue to use and refine early warning notification systems to provide emergency response information, alert community members of the need to evacuate, provide the location of evacuation routes and locations, and identify how to access transportation support. Distribute evacuation information in multiple languages and increase the number of channels of communication.

Policy SE-2b: Continue to refine protocols for dissemination of information during an emergency through all available media sources to ensure that messages are coordinated, accurate, and available in multiple languages. Coordinate information flow between frontline emergency personnel, media sources, school districts, and other community channels.

Policy SE-2c: Continue to explore and implement strategies to enhance safe evacuation protocols for workers inside evacuation zones.

Policy SE-2d: Encourage undergrounding of utilities where feasible along evacuation routes to prevent downed wires.

Policy SE-2e: Ensure road design supports efficient and safe evacuations during emergencies.

Policy SE-2f: Explore the viability of on-street parking limitations to ensure that access roads are not blocked by parked vehicles.

Policy SE-2g: Ensure that fire departments and fire districts have adequate access to all locations in the County, including gated communities and critical infrastructure within the County's jurisdiction.

Policy SE-2h: Require new development and redevelopment to provide adequate access for fire and emergency services consistent with local and State regulations.

Policy SE-2i: Continue to evaluate constraints to safe and efficient evacuation, building upon existing efforts and studies. Use data on demographics, infrastructure, and environmental factors to continue to explore the safety, viability, and capacity of the local road network and to identify additional areas of the unincorporated county without at least two evacuation routes. Incorporate findings into future updates to the General Plan, the Hazard Mitigation Plan, and the County's Emergency Operations Plan as appropriate.

Policy SE-2j: Develop traffic control strategies as part of emergency response planning and explore traffic control improvements that reduce vulnerability and allow for dynamic emergency response.

Policy SE-2k: Consider the presence of non-residents, including visitors and tourists, in all evacuation planning efforts.

Policy SE-2l: Work with the Sheriff's Office and Department of Emergency Management to explore decision-support tools that provide insight into real-time evacuation conditions. Consider technological solutions to monitor traffic to identify problem areas, determine the effectiveness of responses, and change responses as needed. Seek to provide evacuees with information on evacuation route conditions and rerouting information to decrease travel times and reduce congestion on highly traveled roads.

Policy SE-2m: Partner with Caltrans, cities, and neighboring jurisdictions on measures to protect and maintain critical evacuation routes. Work with local agencies to develop contingency plans that address disconnected routes and explore roadway improvements for better emergency access.

Policy SE-2n: Continue to develop and maintain evacuation options for populations with Access and Functional Needs.

Goal SE-3: Increase the community's ability to recover from a disaster event.

Policy SE-3a: Work collaboratively with disaster survivors, the community, County departments and agencies, key groups and stakeholders, and other local and regional governments to develop and implement a Post-Disaster Recovery Framework, including a strategic plan for damage assessment and recovery of County-owned public facilities after a major disaster.*

Policy SE-3b: Use disaster relief funding to support long-term recovery efforts, targeting small businesses and systemically vulnerable communities. Create dedicated funds to provide immediate financial assistance to those affected by disasters, ensuring that mixed-documentation-status households and other marginalized groups have access.

Policy SE-3c: Partner with the cities, community groups, and other relevant agencies or organizations to ensure people have access to medical and mental health services and resources in the aftermath of disasters. Where feasible, deploy mobile clinics to provide medical and mental health services in affected areas, ensuring accessibility for people with physical limitations or transportation barriers.

Policy SE-3d: Establish streamlined rebuilding processes and temporary housing programs, including measures that support displaced renters and low-income households, for post-disaster recovery.

Policy SE-3e: Assist property owners with debris removal and site remediation post-disaster through coordinated resources and information.

Policy SE-3f: Work with County departments and agencies, conservation organizations, and property owners to support efforts to restore wildfire-impacted landscapes and protect against post-fire flooding and soil movement by removing debris along watercourses, implementing erosion control measures, replanting native vegetation, and educating property owners on soil stabilization.

2.2 Equitable Community Safety

Natural and human-made disasters affect virtually all populations in a community, but systemically vulnerable communities and individuals with access and functional needs (AFN) (i.e. people with physical, developmental, or intellectual disabilities, older adults, children, people limited English proficiency, and transportation disadvantaged) are disproportionately impacted due to inequitable policies, practices, and access to resources. Ensuring equitable safety means providing resources and investments where they are needed most and integrating the needs of the whole community in emergency management systems.

Many unincorporated communities in Sonoma County are at disproportionate risk of impacts from hazards and climate change, including the areas around Cloverdale, south Santa Rosa, the Sonoma Valley Springs, and the Lower Russian River, due to proximity to hazardous areas and the presence of sensitive populations. Systemically vulnerable communities have higher risk and fewer resources to respond to emergency events. This inequitable access to resources, critical services and facilities, and resilient infrastructure hinders the ability to prepare for, cope with, and recover from hazard events. Systemically vulnerable communities experience barriers to emergency preparedness such

as financial constraints, fear of rent increases, physical limitations or disabilities, social isolation, and language barriers.

The policies in this section are intended to improve overall community resilience against all types of hazards and ensure that emergency preparedness, response and recovery resources and services are equitably distributed, with a focus on removing barriers that make it harder for people to prepare for emergencies and get the help they need to recover.

Policies: Equitable Community Safety

Goal SE-4: *Support all community members in preparing for, responding to, and recovering from emergencies through equitable resources, investments, and services.*

Policy SE-4a: Provide resources for risk reduction in areas that are vulnerable to hazards and within systemically vulnerable communities, including public education about risk reduction and effective resilience improvements, and information on funding options.

Policy SE-4b: Collaborate with health care providers to augment physical and mental health care capacity in areas with systemically vulnerable communities during and after emergencies.

Policy SE-4c: Continue to incorporate diversity, equity, inclusion, and belonging (DEIB) principles and language access into County Emergency Operations Center operations and emergency services to ensure culturally responsive emergency management.

Policy SE-4d: Increase peak capacity of emergency services to respond to anticipated increased demand during climate hazards events and other disasters.

Policy SE-4e: Strengthen communication between County departments and agencies, cities, and emergency service providers to reduce gaps and enhance coordination of emergency service provision countywide.

Policy SE-4f: Promote household awareness and personal preparation for evacuation scenarios. Support the development of evacuation strategies for all community members, including those with limited or no access to transportation in the event of an emergency.

Policy SE-4g: Engage and involve the Sonoma County community, especially systemically vulnerable communities and access and functional needs populations, in emergency planning.

Policy SE-4h: Provide culturally appropriate emergency preparedness, response, and recovery communications in multiple languages and through a variety of channels, strategies, and media, including radio.

2.3 Resilient Facilities and Infrastructure

Sonoma County's critical facilities and infrastructure face high risks to all hazards discussed in this Element and will be further challenged by climate change impacts, particularly during times of emergency response. Critical facilities and infrastructure are those that are essential to the safety and welfare of the community. Resilience is the ability to adapt to changing conditions and

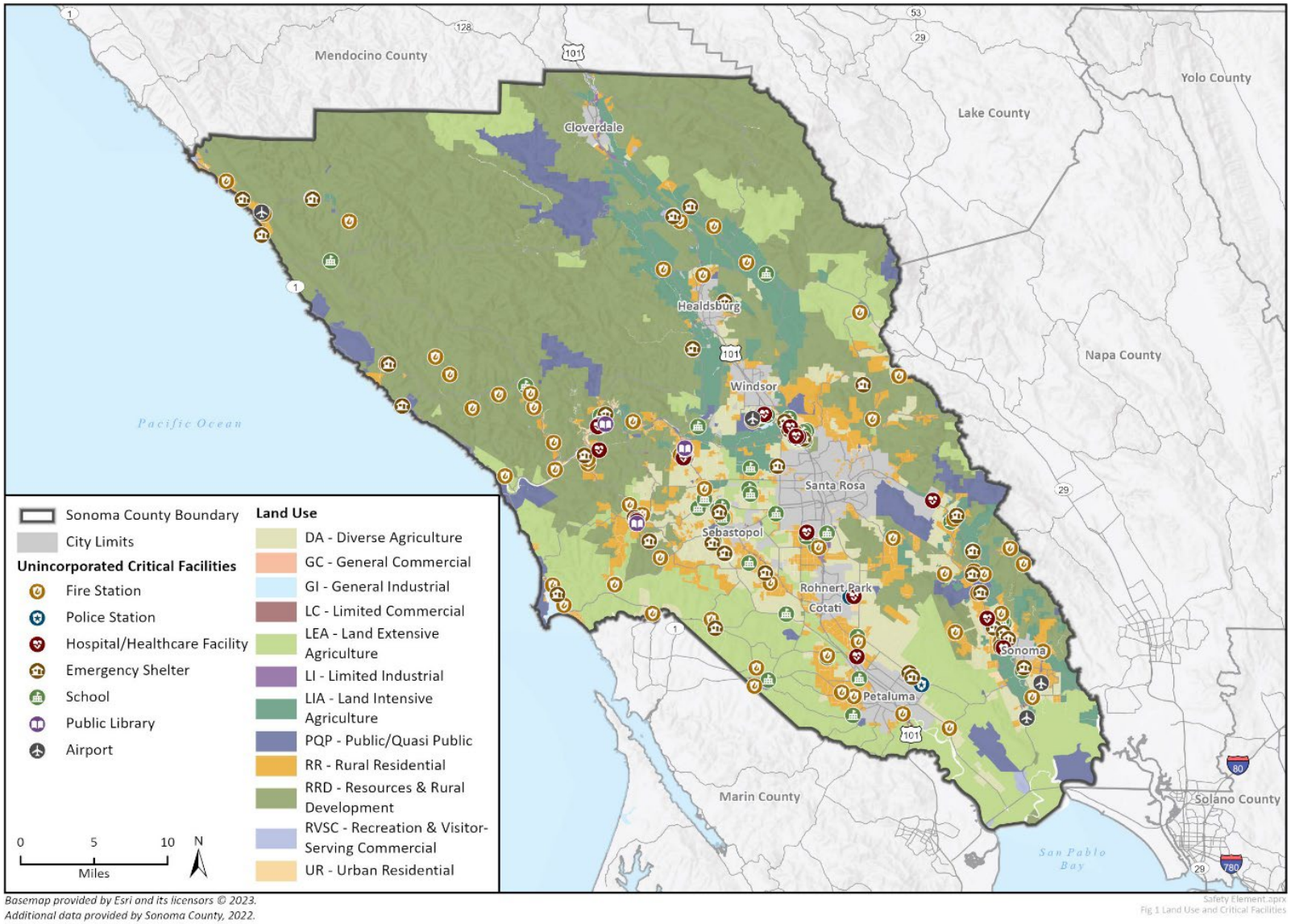
withstand and rapidly recover from disruption due to emergencies. Resilient facilities and infrastructure are crucial to ensuring community safety during disasters, post-disaster recovery, and economic stability. Safe roads, bridges, utilities, and other facilities are critical to continuity of essential services, including emergency response.

2.3.1 Critical Facilities and Infrastructure

Some of Sonoma County's existing roads, bridges, communications networks, and public buildings were not designed to modern standards capable of withstanding the impacts of fires, floods, seismic activity, and extreme weather. Infrastructure and facilities are vulnerable to significant physical damage from these hazards, which could cause disruption of critical services such as water supply lines and roadways necessary for evacuation. Extreme heat and wind events can cause increased power outages impacting occupants of buildings not adequately weatherized and straining communication networks, medical services, and emergency responders. These power outages have significant cascading impacts on communication networks impairing the ability of critical service providers to function effectively. The County's aging infrastructure requires rehabilitation, replacement, and ongoing investments to enhance and safeguard services to the community. Creating resilient infrastructure is an investment in the future of Sonoma County and vital to ensuring a healthy economic foundation for the community.

Figure 4 identifies some of the County's critical facilities necessary for a community's response to and recovery from emergencies. Critical facilities must continue to operate during and following a disaster to reduce the severity of impacts on the community and accelerate recovery. Additional information about critical facilities is available in the Hazard Mitigation Plan incorporated by reference.

Figure 4 Land Use and Critical Facilities in Sonoma County



2.3.2 Broadband and Telecommunications Access

The Sonoma County Broadband Action Plan (2021) finds that the County lacks a comprehensive, cohesive, and diverse broadband network. Underserved communities are usually located in low density and rural areas where wireline deployment can be cost prohibitive due to lower demand and difficult terrain. It is estimated that 9 percent of households countywide do not have access to internet and 5 percent do not have access to a computer. Cellular service can also be unreliable in the more rural areas of the county. Damage to communication infrastructure and an inability to reach the people who have limited internet and telecommunications access would hinder emergency communications, potentially impacting the health and safety of emergency personnel and community members.

Policies: Resilient Facilities and Infrastructure

Goal SE-5: *Protect the well-being of community members and emergency personnel through resilient facilities and infrastructure.*

Policy SE-5a: Seek to close gaps in backup power availability for critical services and community members with underlying health conditions or sensitivities that require uninterrupted power sources.

Policy SE-5b: Maintain defensible space and additional vegetation management around critical transportation and utility infrastructure at-risk to wildfire hazards.

Policy SE-5c: Prioritize road design improvements and maintenance that increase safe ingress and egress for emergency responders and residents, and resilience to anticipated climate extremes.

Policy SE-5d: Engage and empower rural communities by expanding self-sufficiency resources for disaster-isolated communities.

Policy SE-5e: Assess risks to and vulnerability of County-owned critical facilities to all hazards and climate change impacts and evaluate adaptation and resilience strategies such as a relocation or hardening.

Policy SE-5f: Continue to explore funding sources for capital improvements necessary for emergency response. Prioritize capital improvements and maintenance of existing at-risk facilities and infrastructure serving the greatest number of people and systemically vulnerable communities, and improvements to existing facilities that ensure they can operate as resilience centers, local assistance centers, or other community resource centers during emergency events.

Policy SE-5g: Prioritize equity in the capital improvement plan process by engaging systemically vulnerable and underserved communities and using data to assess impacts and benefits.

Policy SE-5h: Pursue redundancy of critical transportation infrastructure, such as roadways, bridges, and traffic control measures, to allow for continued access and movement in the event of an emergency or power outage.

Policy SE-5i: Locate new critical facilities, such as hospitals and health care facilities, emergency shelters, fire stations or police stations, emergency command centers, and other

emergency service facilities and infrastructure to minimize exposure to hazards identified in this Element where feasible, except those facilities that provide frontline access. New facilities that must be located in hazard areas should be designed, located, and sufficiently protected to remain operational during hazard events.

Policy SE-5j: Consider climate impacts and risk in the design of capital improvements.

Goal SE-6: Improve telecommunication and broadband access and communication system resilience.

Policy SE-6a: Provide and expand alternative channels of communication, such as radios, for emergency personnel and community emergency notification in the case of telecommunication system disruption.

Policy SE-6b: Promote the availability of backup power at telecommunication facilities in alignment with state and federal requirements.

Policy SE-6c: Support efforts to improve the reliability of critical communications facilities during disasters.

Policy SE-6d: Streamline permitting for new telecommunication and broadband facilities.

Policy SE-6e: Identify underserved broadband areas and support efforts of the Economic Development Collaborative through its Access Sonoma Broadband program to coordinate countywide broadband planning and broadband deployment, grant application development, and outreach.

2.4 Wildland and Structural Fires

The combination of highly flammable fuel, long dry summers, steep slopes, and strong winds create a significant natural hazard of large wildland fires in many areas of Sonoma County. Wildland fire can result in death, injury, property damage and economic losses, displacement, and a large public investment in firefighting efforts and emergency management. In addition to the loss of homes and businesses, wildfire can destroy woodlands and other natural vegetation with impacts to timber, wildlife habitat, scenic quality, and recreation. Loss of vegetation or changes in soil or slope stability reduce the ability of the landscape to handle stormwater runoff, which can exacerbate risks of flood, debris flow, and landslides.

While many Sonoma County residents have been impacted by wildfire, certain population groups are disproportionately affected by fire events, including but not limited to low-income persons, unsheltered individuals, outdoor workers, and individuals with underlying health conditions. These groups are often more challenged in responding to and recovering from fire events due to limited resources and physical conditions.

Fires have caused historic devastation throughout the County, and some of California's largest and most destructive fires in history have occurred in Sonoma County in the past decade. The boundaries of historical wildfire events since the year 2000 are shown in **Figure 5**. Additional information on historical wildfire events and past impacts can be found in the Sonoma County Local Hazard Mitigation Plan and Sonoma County Community Wildfire Protection Plan.

Due to climactic change, wildfire occurrence, size and intensity are projected to increase through the end of the century. Since 2015, wildfires have burned over 400,000 acres in Sonoma County and

projected annual burned acreage is expected to increase. Projected changes in wildfire probability over the next several decades are shown in **Figure 6** based on a high greenhouse gas emissions scenario (Representative Concentration Pathway (RCP) 8.5). Beyond human impacts, this increase in wildfire frequency and severity could have serious impacts to wildlife and ecosystems, and lost habitat may not recover in some areas.

Communities located within higher wildfire hazard areas, as well as County assets such as parks, natural resources, and agricultural land, are highly vulnerable to wildfire. While many residents have taken measures to prepare for wildfire, financial constraints are a common obstacle to adequate wildfire risk reduction and preparation. Certain Sonoma County communities may be at risk of severe health impacts, significant disruption due to evacuations and recovery efforts, and threats to property and life as wildfire risks escalate in the future.

Industry standard strategies to reduce risks of wildfire to life, property, and the environment may include:

- **Structural modifications** that make buildings more resistant to ignition from wildfire;
- **Forest and wildland management**, including:
  - Vegetation management and creating defensible space around structures; and
  - Landscape-scale projects such as fuel breaks and shaded fuel breaks, wherein fire fuels are strategically reduced to reduce risk to entire communities, ecosystems, or infrastructure; and
- **Education and pre-fire planning**.

Recent wildfire events have prompted several large-scale evacuations in Sonoma County. The County has made significant strides in evacuation readiness since the 2017 wildfires. Section 2.1 (Emergency Preparedness, Response, and Recovery) discusses evacuation constraints, such as limited egress routes and high volumes, and includes policies to improve the safety and efficiency of evacuations.

2.4.1 Regulatory Setting

Responsible Agencies

Primary responsibility for preventing and suppressing wildland fires in the County is divided between local firefighting agencies and the State. Local firefighting agencies have the primary responsibility in areas designated a Local Responsibility Area (LRA). The California Department of Forestry and Fire Protection (CAL FIRE) has the primary responsibility in areas designated a State Responsibility Area (SRA). Sonoma County is in CAL FIRE's Sonoma-Lake-Napa Unit, and fire management efforts in the County's SRAs are guided by the Sonoma-Lake-Napa Unit Fire Management Plan.

At the time of this writing, there are 19 local fire agencies in Sonoma County, including Fire Protection Districts (FPDs) or Community Services Districts (CSDs) and city fire departments. There are 7 volunteer fire departments operating under a single management structure known as North Bay Fire. There are no areas within the unincorporated county that lack emergency fire services. The Sonoma County Fire Prevention and Hazardous Materials Division of Permit Sonoma is responsible for programs, procedures, and projects for preventing the outbreak of fires within the unincorporated areas of the County. The Division reviews commercial and residential development plans for compliance with State and local fire codes and regulations and performs inspections. In

addition to code adherence, the Fire Prevention and Hazardous Materials Division is responsible for hazardous materials incident response, fire investigations, and emergency scene management support.

Fire Hazard Severity Zones

The State Fire Marshal designates Fire Hazard Severity Zones (FHSZs) and classifies lands within State Responsibility Areas into FHSZs, pursuant to Public Resources Code Sections 4201-4205. Government Code Section 51178 also requires the State Fire Marshal to classify lands within Local Responsibility Areas into Moderate, High, or Very High FHSZs. FHSZs are mapped based on statewide criteria and the severity of fire hazard that is expected in those areas. Current State-designated and locally adopted FHSZs are shown in **Figure 7**. FHSZ maps are updated periodically, and the latest maps are available through CAL FIRE's Fire and Resource Assessment Program (FRAP) website and incorporated into this Element by reference. The County's interactive geographic information system (GIS) Zoning and Land Use Map also includes layers showing State and Local Responsibility Areas and current FHSZs.

California Civil Code Sections 1103-1103.15 require disclosure through a Natural Hazard Disclosure Statement in real estate transactions if the property is located in a Very High FHSZ in an LRA, designated pursuant to Government Code Section 51178, or if the property is within an SRA, pursuant to Public Resources Code Section 4125.

CAL FIRE's FHSZ maps represent "hazard," not "risk." The FHSZ classification measures the hazard for a given area, which is based on physical conditions, including vegetation and other fuels, topography, and weather, that create a likelihood and expected fire behavior over a 30 to 50 year period without considering mitigation actions such as home hardening or fuel reduction. "Risk" is the potential damage a fire can do under existing conditions, which may be mitigated by activities including fuel reduction projects, defensible space activities, and ignition-resistant building construction.

Development Regulations

Fire Hazard Severity Zone (FHSZ) designations are used to govern building construction and property development. All development within FHSZs in State Responsibility Areas (SRAs) and in Very High FHSZs in Local Responsibility Areas (LRAs) must comply with building construction requirements in **Chapter 7A of the California Building Code** (Title 24, Part 2 of the California Code). Starting in 2026, development within High FHSZ in LRAs will also be subject to Chapter 7A.

Development within SRAs and designated Very High FHSZs in LRAs are also subject to more stringent requirements by the State, listed below, for vegetation management and defensible space, fuel modification standards, road and driveway standards for emergency fire equipment access and public evacuation, water supply, and standards for identifying streets, roads, and buildings.

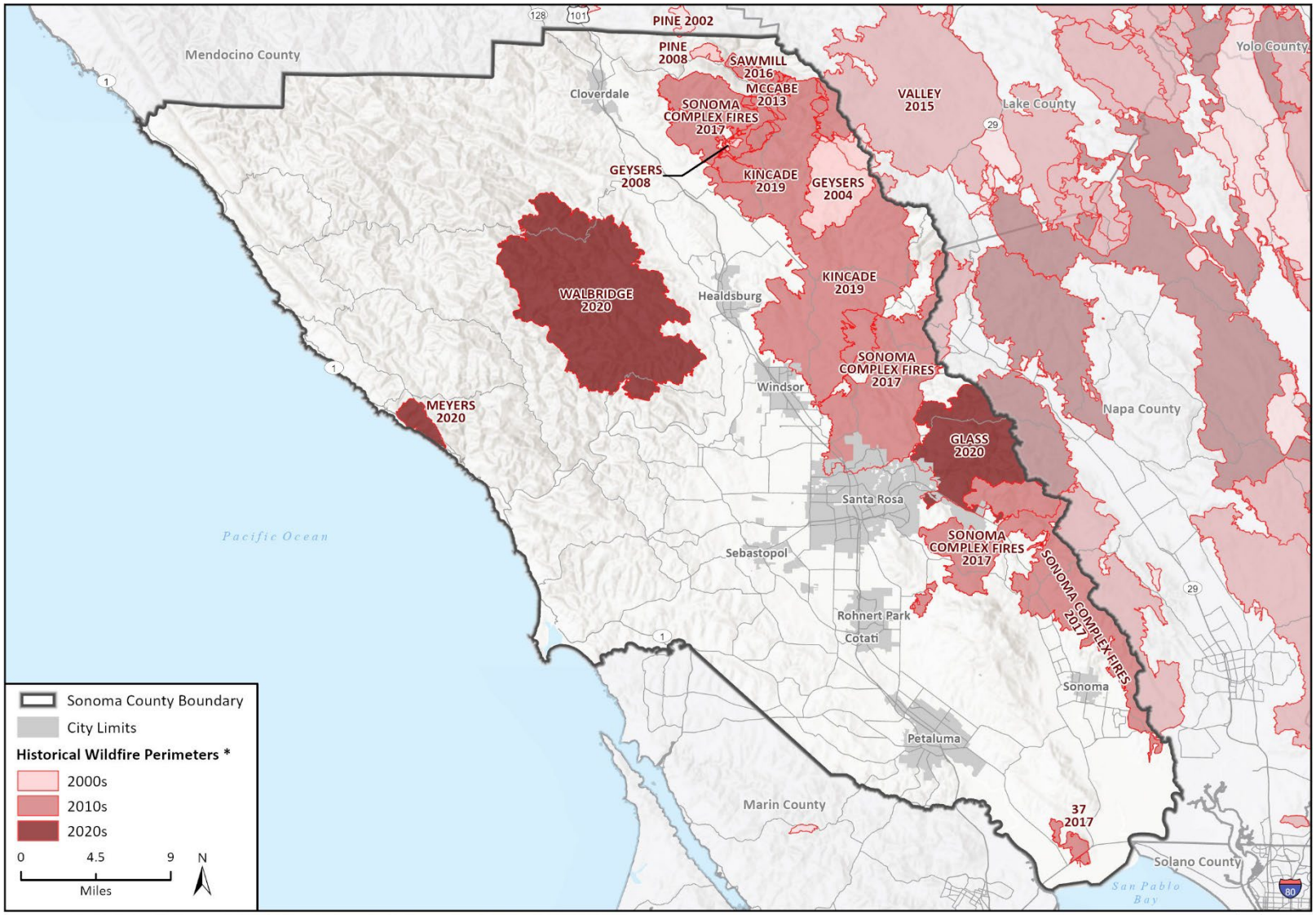
- **State Minimum Fire Safe Regulations** (Public Resources Code Section 4290; California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 2, beginning with Section 1270).
- **Defensible Space Regulations for Parcels with a Building or Structure in the SRA** (Public Resources Code Section 4291; California Code of Regulation, Title 14, Sections 1299.01-1299.05).
- **Defensible Space Regulations for Parcels with a Building or Structure in Very High FHSZs in LRAs** (Government Code Section 51182)

- **Tentative Map and Parcel Map Requirements for Parcels in the SRA and Very High FHSZs in LRAs** (Government Code Section 66474.02).

Sonoma County Code Chapter 13 (Sonoma County Fire Safety Ordinance) adopts and amends the California Fire Code (Title 24, Part 9 of the California Code) and constitutes the County Fire Code. Chapter 13 also establishes Fire Safe Standards for development within LRAs that is not also within a Very High FHSZ. The Fire Safe Standards include but are not limited to requirements for emergency access, road naming and addressing, minimum emergency water supply and sprinklers to ensure a supply of water to fight or defend property from a fire, fuel modification and defensible space to reduce the possibility and intensity of a wildfire, and other fire protection measures. Due to the severe fire hazard in many areas of the County, the County's Fire Safe Standards are more stringent than those required by the California Fire Code.

Sonoma County Code Chapter 13A (Duty to Maintain Defensible Space and Abate Hazardous Vegetation and Combustible Material) provides for the removal of hazardous vegetation and combustible material near structures and roadway frontages on all unimproved parcels (i.e. without a building or structure) in the unincorporated County and on improved parcels within the Local Responsibility Area.

Figure 5 Historical Wildfire Events in Sonoma County



Basemap provided by Esri and its licensors © 2025. Additional data provided by Sonoma County, 2022; CAL FIRE FRAP, 2024.
** Fires less than 200 acres were excluded.*

Safety Element.aprx
Fig 7 Historical Wildfire Events

Figure 6 Changes in Decadal Wildfire Probability in Sonoma County

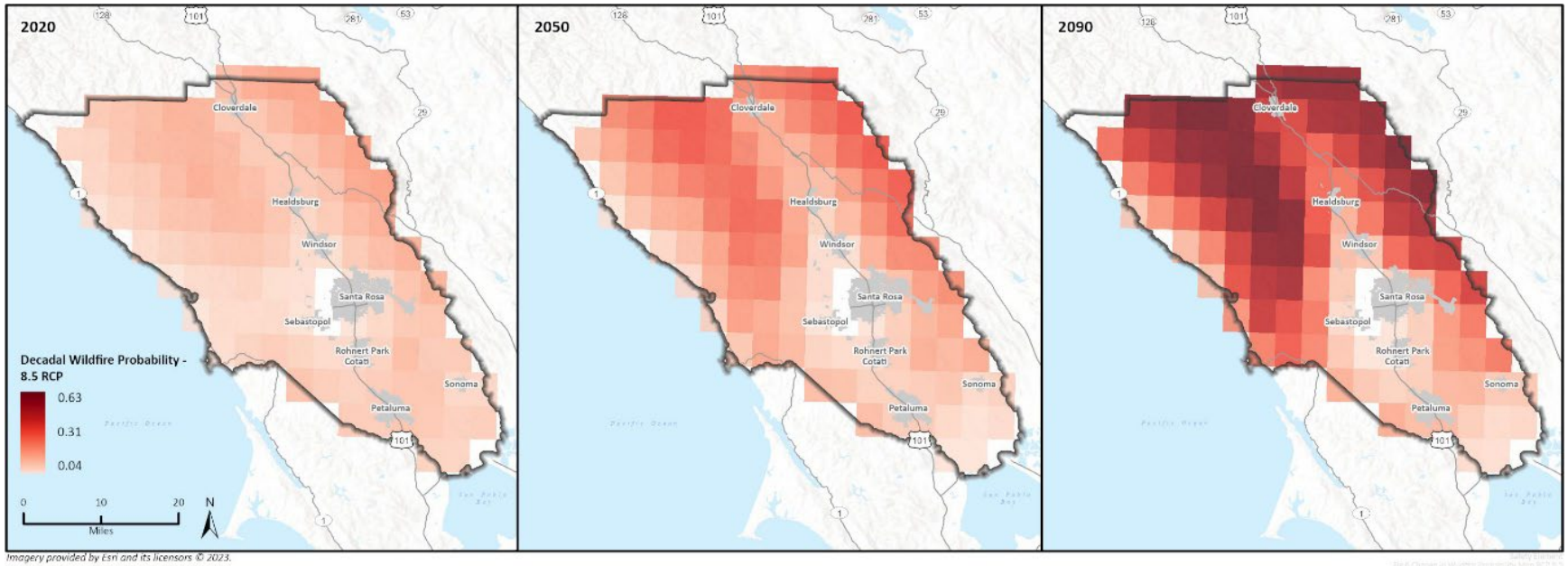
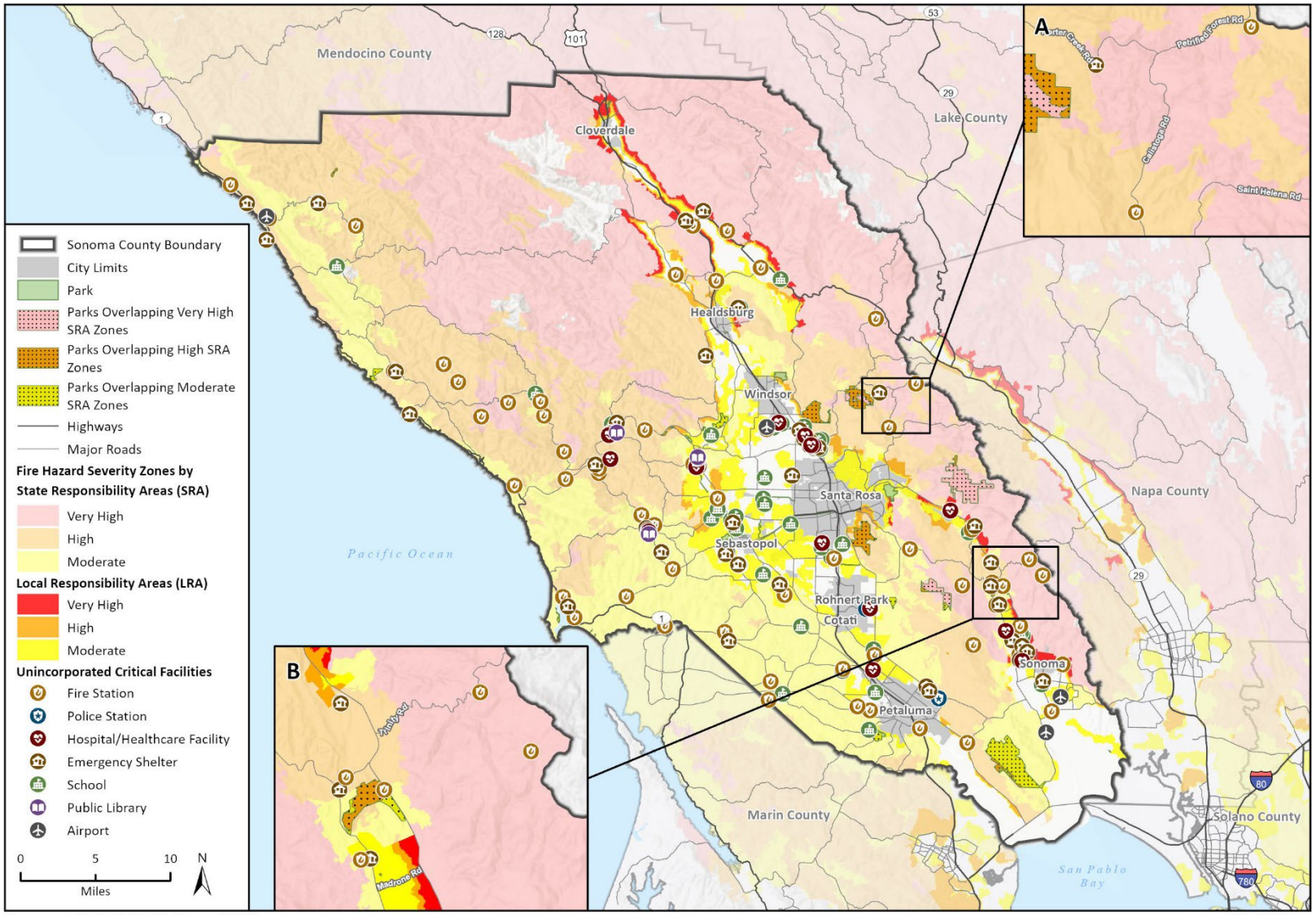


Figure 7 Fire Hazard Severity Zones in Sonoma County



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Additional data provided by Sonoma County, 2022; CAL FIRE, SRA 2024/LRA 2025.

Safety Element.aprx
Fig 3 Hazard Severity Zones with Critical Facilities and Parks

Policies: Wildland and Structural Fire

Goal SE-7: Minimize risk and vulnerability to fire hazards to protect people, property, and environmental resources.

Policy SE-7a: Identify existing development and public roads that do not conform to contemporary fire safety standards and, as feasible, assist in the retrofit and/or upgrade of such development to meet current standards.

Policy SE-7b: Ensure that redevelopment of property within the State Responsibility Area and Very High Fire Hazard Severity Zones in Local Responsibility Areas complies with the Office of the State Fire Marshal and California Board of Forestry and Fire Protection requirements, including adequate provisions for emergency access, vegetation management, and firefighting, in compliance with current fire codes.

Policy SE-7c: Establish and maintain community fire breaks and fuel modification or reduction zones, including public and private road clearance in areas at risk to wildfire. Work cooperatively with local agencies, Fire Safe Councils, community organizations, and private landowners to achieve long term maintenance of fuel reduction projects.

Policy SE-7d: Through inspection programs, community education, and grant seeking, provide assistance to systemically vulnerable communities to help ensure that all properties and private roadways comply with applicable state and local regulations for defensible space and vegetation management.

Policy SE-7e: Where feasible, support the development of additional points of ingress and egress, roadway improvements, and other fire safety measures in single access neighborhoods identified by this Element, in subdivisions identified by the CAL FIRE Subdivision Review Program pursuant to Public Resources Code Section 4290.5, in High and Very High Fire Hazard Severity Zones, and in areas that have experienced repeated fires over time.

Policy SE-7f: Encourage utility undergrounding projects to reduce potential fire ignition sources. Promote and support vegetation management around high voltage utility lines as necessary to maintain public safety.

Policy SE-7g: As part of regular roadway maintenance, keep public roads clear of encroaching vegetation, prioritizing critical evacuation routes, areas with high hazard risk, or areas with a history of repeated fire events.

Policy SE-7h: The Fire Prevention Division of Permit Sonoma shall continue to offer assistance to local fire agencies in adoption and enforcement of fire safety regulations and continue work with local agencies to develop proposed improvements to County codes and standards to align with changing State legislation and current industry research.*

Policy SE-7i: Continue enforcement of the Office of the State Fire Marshal requirements for fire safety.*

Policy SE-7j: Continue to identify local funding sources and leverage grant funding to support and participate in wildfire risk reduction and forest health projects, including strategic placement, creation and maintenance of shaded fuel breaks, targeted

vegetation management, prescribed/cultural burning, maintenance of fire roads, and other priorities as identified in the current Hazard Mitigation Plan, the Sonoma-Lake-Napa Unit Strategic Fire Plan, the Sonoma County Community Wildfire Protection Plan and other planning documents.

Policy SE-7k: Continue the Permit Sonoma addressing and road naming program that improves and standardizes the County street addressing system in order to reduce emergency service response times. Where applicable, coordinate the program with the cities and local tribal governments.*

Policy SE-7l: Continue to provide fire hazard information signs in areas at risk to wildfire in a manner consistent with Area Plans and that does not degrade Scenic Corridors and scenic views.*

Policy SE-7m: Evaluate regulatory barriers to vegetation management activities and identify opportunities for streamlining.

Goal SE-8: Regulate new development to prevent unnecessary exposure of people and property to risks of damage, injury, or loss from fire hazards.

Policy SE-8a: Consider the severity of natural fire hazards (as may be exacerbated by climate change), potential damage from wildland and structural fires, and adequacy of fire protection and mitigation measures, consistent with the General Plan, in the review of discretionary projects.*

Policy SE-8b: Maintain and update County building and fire codes and regulations to meet or exceed State requirements and reflect contemporary fire safe practices.*

Policy SE-8c: In reviewing development projects, maintain stringent initial site design and ongoing maintenance standards, and incorporate adequate mitigation measures as necessary to achieve an acceptable level of risk. Development must meet State Minimum Fire Safe Regulations (Title 14, California Code of Regulations (CCR), §§ 1270-1276.05), State Fire Hazard Reduction Around Buildings and Structures Regulations (Title 14 CCR, §§ 1299-1299.05) the California Building Standards Code (Title 24, CCR), and the County Fire Code as applicable.

Policy SE-8d: Continue to refer projects and code revisions to the Fire Prevention and Hazardous Materials Division of Permit Sonoma and responsible fire protection agencies for their review and comment.*

Policy SE-8e: Continue to require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, agricultural exempt buildings, and certain accessory dwelling units.*

Policy SE-8f: In Very High Fire Hazard Severity Zones, avoid new residential development and new or expanded commercial or industrial development that involves highly flammable materials or that could place large numbers of occupants at unreasonable risk of wildfire, where feasible. Prioritize new housing in areas with lower wildfire hazard.

Policy SE-8g: Require fire protection plans for all new discretionary developments in all High and Very High Fire Hazard Severity Zones. Ensure the plans include a site-specific risk analysis and address fire response capabilities, compliance with fire safety requirements including but not limited to defensible space, access and water supply, building materials and site design, emergency preparedness and evacuation plans, property maintenance, and other hazard and risk reduction measures.

Policy SE-8h: Require all new development to have adequate water supply to meet fire suppression needs and comply with applicable fire flow requirements.

Goal SE-9: Increase wildfire and climate resilience through strategic coordination in fire preparedness planning, response, and land management.

Policy SE-9a: Continue to utilize the most recent available data and information on wildland and structural fire hazards from CAL FIRE and research institutions. Make fire hazard maps available to the public.*

Policy SE-9b: Continue to work with CAL FIRE, local fire agencies, and community members to identify areas of high fire fuel loads and take advantage of opportunities to reduce those fuel loads, particularly in areas where fuels may increase fire spread to nearby communities.*

Policy SE-9c: Partner with Fire Safe Sonoma, local Fire Safe councils and FireWise Communities, CAL FIRE, local fire districts, Resource Conservation Districts and other community groups to provide educational opportunities for residents and property owners on the best available science for defensible space, home hardening, and vegetation management. Continue to promote emergency preparedness including "know your evacuation Zone" efforts, pre-emergency planning and supplies for family safety, and executing evacuation drills. Target at-risk populations such as older adults, individuals with disabilities, non-English speaking residents, and individuals with chronic health conditions.*

Policy SE-9d: Coordinate with Sonoma Water, Santa Rosa Plain Groundwater Sustainability Agency (GSA), Petaluma Valley Groundwater Sustainability Agency (GSA), Sonoma Valley Groundwater Sustainability Agency (GSA), other water districts and agencies, CAL FIRE, and fire districts as appropriate to support the provision of adequate water supply and storage to meet peak fire demands during times of peak domestic demand.

Policy SE-9e: Coordinate with local fire agencies to support funding availability to maintain all fire equipment in an operable state and adequate to respond to a major disaster. Ensure adequate equipment, staffing, training, and resources are provided to meet current and future projected service demands and fire protection needs.

Policy SE-9f: Regularly evaluate the county's fire suppression capacity and future water supply availability as part of the Sonoma County Hazard Mitigation Plan updates.

Policy SE-9g: Support and prioritize wildfire resilience projects on natural and working lands, including wildlands, that have multiple benefits, including but not limited to wildfire hazard and risk reduction, species and habitat protection, agricultural and forest resource protection, water quality, and carbon sequestration and storage. Consider the ecological, environmental, social, and economic benefits and tradeoffs. Utilize

existing plans and guidance, such as the Climate Resilient Lands Strategy, to inform project design.

Policy SE-9h: Balance and integrate fuel modification with habitat and open space management, and vegetative soil cover and erosion management to reduce conflicts between safety and environmental goals.

Policy SE-9i: Encourage efforts to restore wildfire impacted areas and reduce the potential for post-fire flooding and landslides through replanting of native vegetation cover using best practices and slope stabilization measures.

2.5 Flooding and Inundation

Sonoma County is susceptible to riverine flooding, urban flooding, and coastal flooding. Flood hazard areas are located along the coastline, in central county, adjacent to major rivers such as the Russian River, and in south county along the San Pablo Bay. Although floods are primarily associated with the overflow of rivers and creeks during storms, flooding and inundation can also be caused by dam failure, tsunamis, seiches, ocean surges and higher waves during storms, and sea level rise. Localized flooding can occur from blocked or undersized storm water conveyance channels and infrastructure.

Flooding can move, destroy, or damage buildings, roads, infrastructure, and personal property, not only by inundation but also by the force of flowing waters. Flood damage may weaken building materials and increase mildew, mold, bacteria and other disease vectors. Floods can result in human injury and pose a threat to life. Floods may wash away soil, erode banks, destroy crops, and transport loose objects and flood debris downstream; and may end up degrading beaches or offshore marine habitats.

Climate change may cause low-lying and coastal areas of Sonoma County to experience more frequent and extreme flooding. Historically, the northern coastal mountains of Sonoma County experience the largest precipitation events across the San Francisco Bay Area region and can expect between 15 to 37 percent increase in rainfall volume by the end of the century. Major flood events in Sonoma County are generally associated with the Russian River, Sonoma Creek, Petaluma River, and Laguna de Santa Rosa. Climate change may cause more intense and frequent flood events resulting in increased strain on emergency services, stressed water drainage systems, property damage, habitat loss, injuries to people, the spread of water-borne disease, mental and behavioral stress, and loss of income.

A floodplain is the area adjacent to a river or creek, or the ocean and other tidally influenced areas, that becomes inundated during a flood. Floodplains have many natural beneficial functions, and disruption of them can have long-term consequences. Floodplains provide natural flood and erosion control through flood storage and conveyance, and reduce flood velocities; groundwater recharge; surface water quality maintenance; and fish and wildlife habitat protection.

Riverine Flooding

Flooding is most often associated with an overflowing stream or river. In Sonoma County, flooding occurs the most frequently along the Russian River, Petaluma River, Sonoma Creek, Laguna de Santa Rosa, and their tributaries. Along the lower Russian River, floods are characterized by high velocity and significant depth of flow due to the relatively narrow floodplain. The frequency of flooding in this portion of the river causes repetitive flood losses in the residential and commercial districts of

Mirabel Park, Duncans Mills, Monte Rio, Rio Nido, and Guerneville. The Petaluma River floods after multi-day storm events due to inadequate storm water infrastructure. Sonoma Creek frequently floods during relatively small winter storm events that cause flows to overtop the banks. The flooding is of short duration, but may last several days.

Tsunami and Seiche Inundation

Tsunamis are large ocean waves that can be caused by earthquakes. The areas in Sonoma County that have the greatest exposure to potential damages by inundation caused by tsunami are low elevation communities along the open coast and low elevation development near where streams and rivers meet the ocean or bays, shown in **Figure 8**.

Dam Failure Inundation

A dam is an artificial barrier that stores water, wastewater, or liquid-borne materials for purposes such as flood control, water supply, irrigation, livestock water supply, energy generation, mine tailings containment, recreation, or pollution control.

Dam failures can cause significant destruction to downstream ecosystems and communities through inundation. Causes of dam failure generally include floods, extreme rainfall, structural failure, settlement and cracking of concrete, piping and internal erosion of soil in embankment dams, inadequate operation, and earthquakes. Many dam failures in the US have been the result of disasters such as earthquakes, landslides, and extreme storms. Dam inundation is defined as the flooding which occurs because of the structural failure of a dam.

According to the Army Corps of Engineers' National Inventory of Dams, there are 65 dams that are in or have inundation areas that extend into Sonoma County. The two major dams that would have the most significant impact on Sonoma County in the event of dam failure are Warm Springs Dam in the north/central portion of the County, northwest of Healdsburg, and Coyote Valley Dam, located in Mendocino County, northeast of Ukiah. Failure of either of these two dams is considered very unlikely, even in a severe earthquake. The method of construction used for these dams, stringent federal standards for maintenance, and the stewardship of the United States Army Corps of Engineers (USACE), provide an expectation that failure will not occur. The other, smaller dams may pose a significant threat to specific and limited areas within Sonoma County. Most of these dams are used for agricultural purposes or to store drinking or storm water. Dam failure inundation areas in Sonoma County are shown in **Figure 9**.

2.5.1 Regulatory Setting

The primary method of reducing the risk of hazards and impacts from flooding is through floodplain management. A floodplain is the land area adjacent to a watercourse, drainage way, or creek which has been or may be covered by floodwaters. Floodplain management may include restrictions on the type and location of land uses and development in the floodplain. Land uses which can sustain periodic flooding and decrease flood hazards downstream are encouraged. Floodplain management may also include establishing development and construction standards that minimize vulnerability to flood hazards, such as requiring the first floor of structures to be one foot above the base flood elevation. Floodplain management may also include increased retention of stormwater runoff in the watershed, acquisition of property in flood hazard areas, public education and outreach, and other methods which reduce the need for costly construction projects and disaster relief.

In Sonoma County, implementation of floodplain management has reduced flood damage, primarily by limiting the kind and extent of new construction in identified flood hazard areas and by elevating existing structures above flood elevations. However, flood damage is still a major and persistent problem in the Russian River, the Petaluma River, and, to a lesser degree, Sonoma Creek. Sonoma County is one of the highest repetitive loss communities in the nation, indicating that a more proactive approach is needed.

Floodplain management is required by federal and state law. Various incentives such as flood insurance, loans, and State funding of flood control projects are offered if flood management practices are followed.

The Federal Emergency Management Agency (FEMA) prepares and periodically updates Flood Insurance Rate Maps (FIRMs), which show areas of flood hazard and risk, called Special Flood Hazard Areas (SFHA). SFHA are defined, in part, as the areas that will be inundated by a flood event that has a one percent chance of occurring in any given year. The one-percent annual chance flood is also referred to as the base flood or 100-year flood. The National Flood Insurance Program (NFIP) is a program that makes federally backed flood insurance available in communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. SFHA is the area where the NFIP floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies if a home or business has a federally backed mortgage. California Civil Code Sections 1103-1103.15 require disclosure through a Natural Hazard Disclosure Statement in real estate transactions if the property is in a SFHA designated by FEMA.

The FEMA maps show the 100-year (1-percent annual chance flood) and 500-year (0.2-percent annual chance flood) floodplains and are commonly used as the primary source of flooding information for planning and development review and floodplain management. Where a subject river or stream has been studied by detailed hydrologic and hydraulic methods, FEMA may also designate a floodway within the 100-year floodplain. A floodway is the portion of a stream channel and the adjacent flood plain that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface more than one foot. A floodway may be designated within the SFHA where the deepest, highest velocity flow is expected. Floodways should be kept free of obstructions and development to allow floodwaters to move downstream unobstructed. Any development in a floodway is subject to severe damage and high risks for occupants and emergency responders. Current 100-year and 500-year floodplains in Sonoma County are shown in **Figure 10**.

Sonoma County Code Chapter 7B (Flood Damage Prevention Ordinance) was adopted to reduce flood hazards in the 100-year floodplain. It regulates development through a permit review process and establishes review requirements and performance standards and restrictions in conformance with FEMA's National Flood Insurance Program (NFIP) regulations. The ordinance addresses the construction, location, extension, conversion, or alteration of structures or land in SFHA. These regulations apply to both new development and construction and modifications or repair of existing structures.

Sonoma Water was originally created as a special district to provide flood protection and water supply services, and later expanded its services to include the treatment and disposal of wastewater. Today, Sonoma Water provides flood protection as part of its core services through a variety of projects and facilities, including the maintenance of over 75 miles of streams throughout the County.

Figure 8 Tsunami Inundation Zones

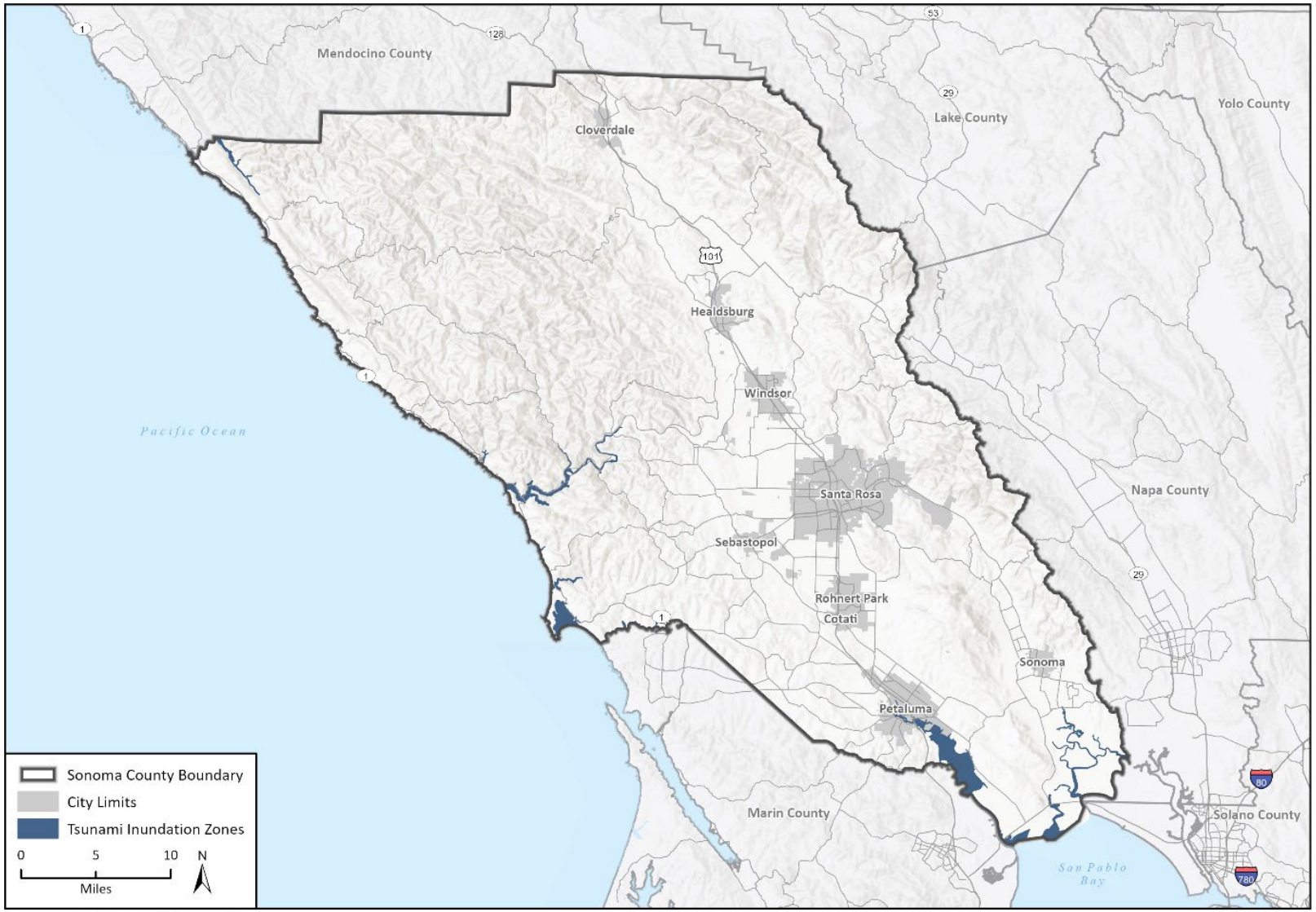


Figure 9 Dam Failure Inundation Areas

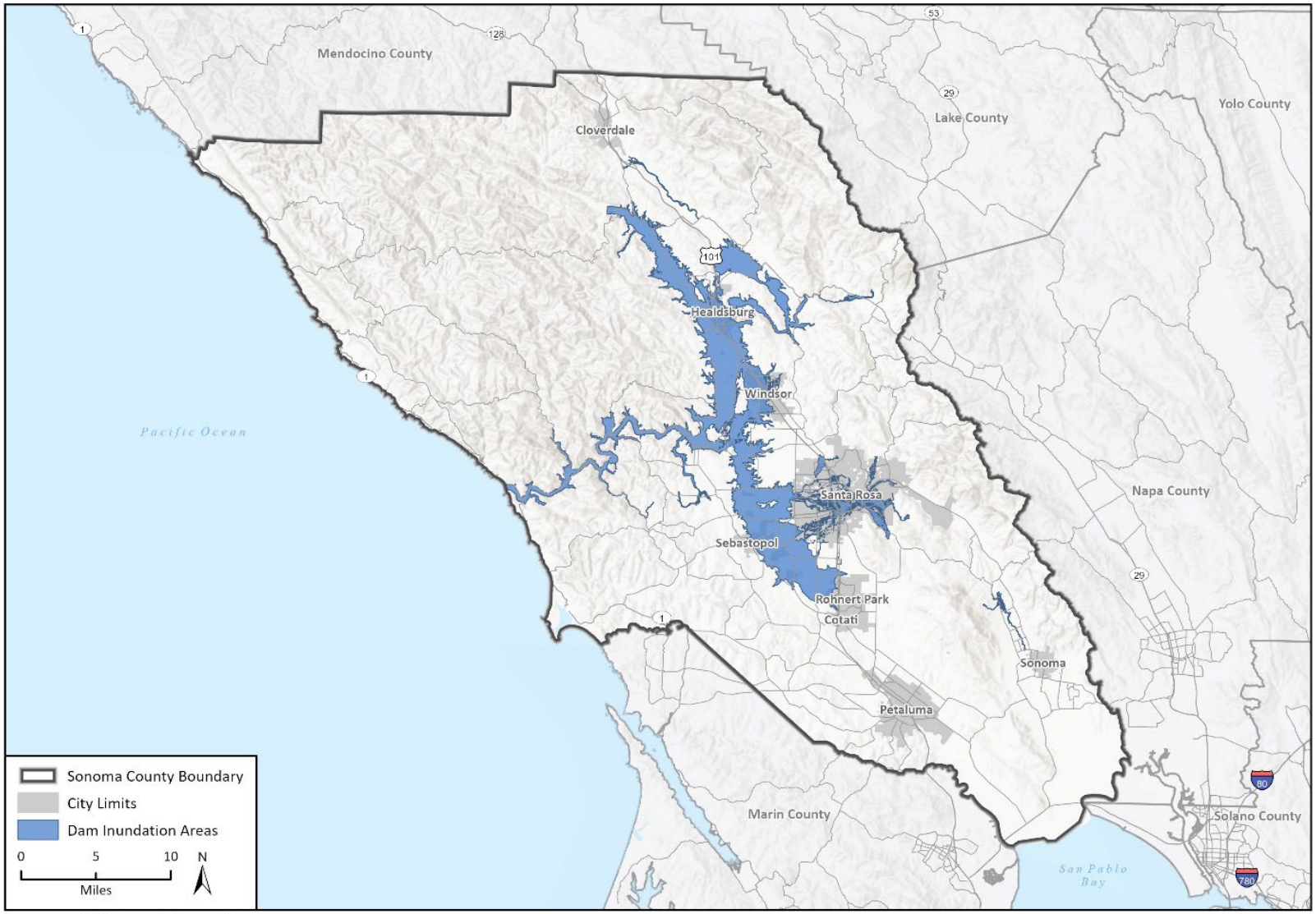
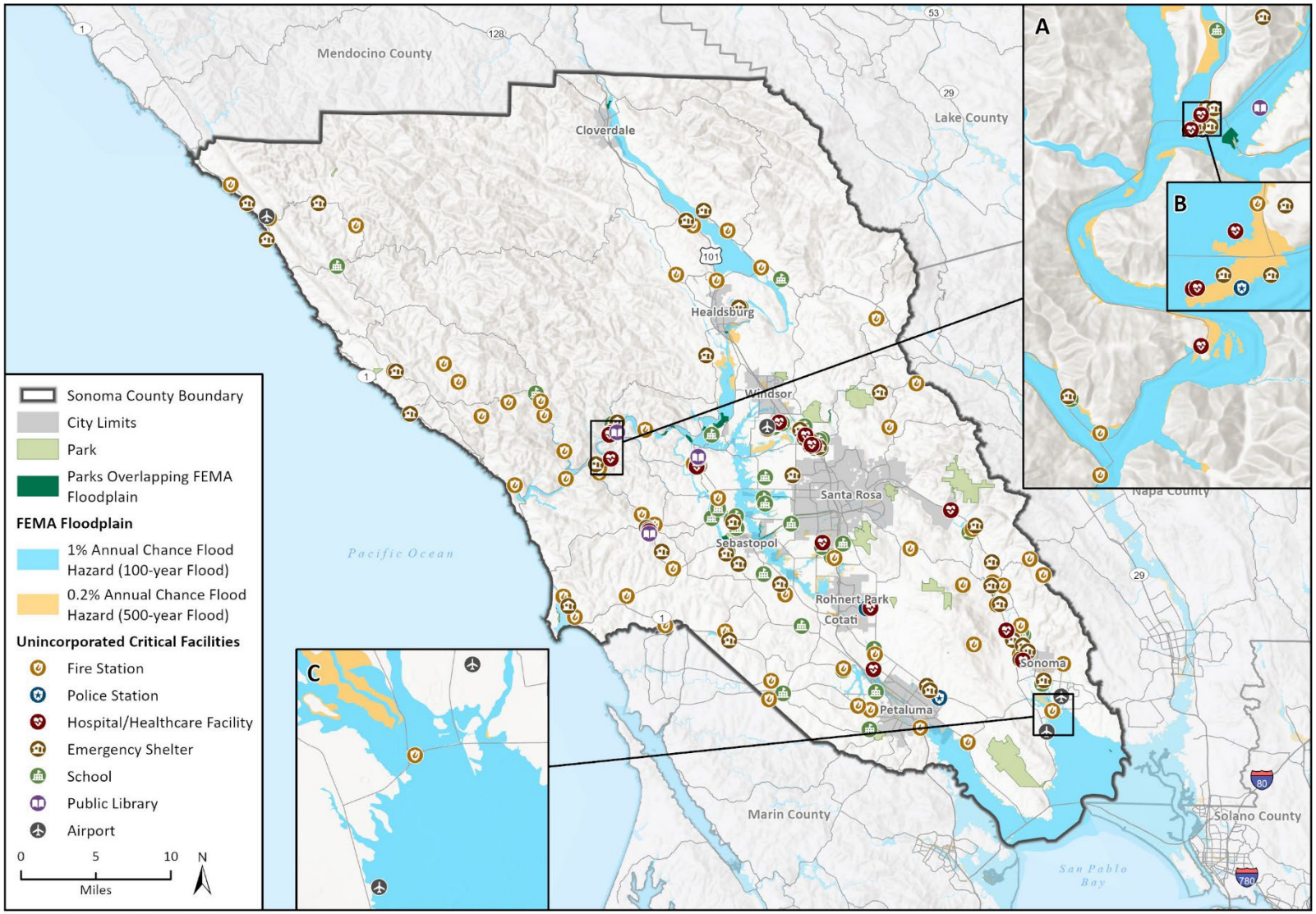


Figure 10 One-Hundred and Five-Hundred Year Floodplains in Sonoma County



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Additional data provided by Sonoma County, 2022; FEMA, 2025.

Safety Element.aprx
Fig 2 FEMA Flood Hazard with Critical Facilities and Parks

Policies: Flooding and Inundation

Goal SE-10: Reduce existing flood and inundation hazards and prevent unnecessary exposure of people and property to risks of damage, injury, or loss from flood hazards.

Policy SE-10a: Maintain data and information on flooding and flood hazards in the appropriate County departments and make flood hazard maps available to the public.*

Policy SE-10b: Support efforts to provide cost-effective strategies for reducing flood risk to low income communities located in nonurbanized areas.

Policy SE-10c: Partner with local, regional, State, and federal agencies, including but not limited to the cities, Sonoma Water, the U.S. Army Corps of Engineers, and the Federal Emergency Management Agency (FEMA), to develop and maintain an adequate information base on existing and potential flood hazards and drainage impacts for the County's major watersheds, prepare analyses and risk assessments, and identify and implement floodplain management activities and other strategies to reduce flooding impacts. Request changes in FEMA flood hazard maps where appropriate to reflect new data or analyses.*

Policy SE-10d: Work with regional flood protection responsible agencies, the public, and other stakeholders to develop and implement a long-term plan for reducing repetitive flood losses in the Russian River basin. As part of the plan, consider upstream improvements that could expand flood storage capacity and existing regulatory barriers to flood prevention projects.*

Policy SE-10e: Continue to participate in the National Flood Insurance Program (NFIP) by maintaining and enforcing County code requirements on construction in flood hazard areas and other adopted floodplain management regulations. Consider participating in the NFIP's Community Rating System to qualify Sonoma County property owners for discounted flood insurance.*

Policy SE-10f: Continue and expand public awareness programs to inform the general public, property owners and renters about flood hazards, potential dam failure inundation, flood elevation and risk reduction resources, and the importance of watershed management.

Policy SE-10g: Continue to enforce zero net fill requirements in the 100-year FEMA Special Flood Hazard Area to retain floodplain storage capacity. Avoid fill in areas outside of the 100-year FEMA Special Flood Hazard Area that retain or could retain flood waters.*

Policy SE-10h: When making land use decisions and during development review:

a) On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards;

b) Use FEMA flood hazard maps and data, or parcel specific scaled interpretations of these maps and site specific elevation data;

c) Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of amendments to the General Plan Land Use Map; and

d) Consider the potential risk of damage from flooding in the design and review of projects, including projects that could facilitate floodplain development.*

Policy SE-10i: Avoid variances to building setbacks along streams and in the 100-year floodplain.*

Policy SE-10j: Regulate development, water diversion, vegetation management, grading, and fills to minimize any increase in flooding and related damage to people and property.*

Policy SE-10k: Require that tentative and final subdivision maps and development site plans show flood hazard areas as designated by FEMA.*

Policy SE-10l: Give priority to floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where possible, maintain flood channel capacity.*

Policy SE-10m: Require that the design and construction of drainage facilities be subject to the review and approval of Permit Sonoma. The costs of drainage facilities to handle surface runoff from new development shall be the responsibility of the developer.*

Policy SE-10n: Support Sonoma Water in the prioritization and implementation of flood hazard mitigation projects within waterways subject to the policies of the Open Space and Resource Conservation Element.*

Policy SE-10o: Require that the design and location of new dams and levees be in accordance with applicable design standards and specifications and accepted design and construction practices.

Policy SE-10p: Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitative maintenance needs as appropriate.*

Policy SE-10q: Explore funding sources, such as the Building Resilient Infrastructure and Communities, Flood Mitigation Assistance, and Hazard Mitigation grant programs from the Federal Emergency Management Agency, to further support retrofitting and relocation of structures in flood-prone areas. Consider developing a voluntary, community-led relocation program through public purchase of flood-prone property, prioritizing repetitive loss areas.

Goal SE-11: Build long-term flood resilience.

Policy SE-11a: Encourage and participate in multi-benefit, nature-based solutions, such as restoration and conservation projects on natural and working lands, that increase flood resilience, reduce risks of related hazards such as landslides and erosion, and improve watershed management.

Policy SE-11b: Work with agencies and private providers that operate public facilities, such as wastewater treatment plants, gas, electrical, and water systems, located within areas subject to 100- and 500-year frequency floods to relocate or retrofit facilities to minimize or eliminate potential flood damage.

Policy SE-11c: Consider projected increases in precipitation from climate change in the design of upgraded flood control channels and basins, and design and siting of new critical facilities and infrastructure.

Policy SE-11d: Identify areas in need of expansion of stormwater and flood protection infrastructure capacity to accommodate changes in precipitation and extreme weather events.

Policy SE-11e: Prioritize flood prevention efforts in areas with high flood hazard exposure and systemically vulnerable communities.

Policy SE-11f: Balance the need for continuity of existing resident-serving businesses and services in flood-prone communities with risk reduction goals to protect life and property in the creation of new or modified development standards and rebuilding policies.

2.6 Geologic and Seismic Hazards

Sonoma County is seismically active with several major geologic faults running through the county. All of Sonoma County is classified by the California Department of Conservation as a high-risk area for ground shaking from a seismic event. Areas along the coastline, adjacent to major rivers, and in central and south county also face moderate, high, and very high liquefaction susceptibility. Additionally, areas of the county with weak rocks, and steep hills, particularly along the coastline, in northwest county, and in pockets of west county, are characterized by the California Geological Survey as having very high and high landslide susceptibility.

Sonoma County faults are part of or a subsystem of the San Andreas Fault system that extends along the California coast. There are at least four major known active faults with potential impacts in Sonoma County including the San Andreas Fault, Rodgers Creek Fault, Healdsburg Fault, and Maacama Fault, as shown in **Figure 11**. According to the Sonoma County Emergency Operations Plan Earthquake Annex, a large seismic event could lead to structural damage due to shaking, simultaneous ignitions, a high number of fatalities and injuries, interruptions to water, power, and gas services, transportation disruptions, breaks in wastewater collection or treatment, damage to critical government facilities, and the generation of tons of debris.

The entire population of Sonoma County is at risk of direct damage from earthquakes, as well as indirect impacts like business interruptions, road closures, and utility outages. Scenarios for the Maacama, Rodgers Creek, and San Andreas Faults were modeled in the County's Local Hazard Mitigation Plan, each with magnitudes greater than 7 and epicenters located near Santa Rosa, Cloverdale, and Sebastopol. Altogether, these scenarios could displace over 6,000 households in the County.

Seismically-induced hazards with the potential to affect unincorporated Sonoma County include ground shaking, ground failure such as liquefaction and landslides, and ground displacement (i.e. surface fault rupture). Other geologic hazards include expansive soils and erosion. Secondary effects of earthquakes may include fires, tsunamis, seiches, dam failure, and hazardous materials releases, that can cause additional property damage and human injury post-earthquake. Tsunami and dam failure are discussed in more depth in the Tsunami and Seiche Inundation and Dam Failure Inundation sections. Policies to reduce the risks of wildfire are located in the Wildland and Structural Fire section.

Additional background on geologic and seismic hazards, including past events, can be found in the Sonoma County Local Hazard Mitigation Plan.

2.6.1 Ground Shaking

Ground shaking from earthquakes affects the most people and can cause the most damage among geologic hazards. The intensity of ground shaking depends on the earthquake's magnitude, the distance from the epicenter, and the type of earth materials in between. Ground shaking hazard areas in Sonoma County are shown on **Figure 12** and are based on data from the U.S. Geological Survey and California Geological Survey. **Figure 13** shows NEHRP Soil Classifications in Sonoma County, which are one of the geological factors that can contribute to seismic response including the severity of shaking.

2.6.2 Ground Failure: Liquefaction and Landslides

Damage from ground shaking can be exacerbated by ground failure, including liquefaction and landslides. Liquefaction occurs when water-saturated soil temporarily loses its strength and behaves like a semi-liquid, removing support from foundations and causing buildings and utilities to shift or subside. Areas of the County subject to liquefaction hazards are shown on **Figure 14**.

Strong ground shaking can also destabilize slopes and result in landslides. Landslides are a general term for the downslope mass movement of rock and/or soil. Many areas in the county are susceptible to landslides, as shown in **Figure 15**. A number of geological and climatic factors contribute to landslide risk including steepening slopes, adding weight to slopes, water saturation, weak soils, erosion or vegetation removal. Landslides are usually triggered by seismic activity, heavy rain or misdirected stormwater runoff. Landslide frequency is expected to increase because of climate change, as detailed further in Appendix A.

2.6.3 Ground Displacement Along Fault Traces

Ground displacement, or surface fault rupture, refers to the movement or shifting of the Earth's surface due to movement along a fault, which can result in cracks, fissures, or shifts in the land, potentially affecting structures and infrastructure. During the 1906 earthquake, horizontal displacement along the San Andreas fault averaged 15 feet in Sonoma County. The Healdsburg, Rodgers Creek, and Mayacamas Faults are also identified as active faults with evidence of ground displacement during the past 11,000 years. The known geologic faults in Sonoma County are shown on **Figure 11**.

2.6.4 Expansive Soils

Buildings, utilities, and roads can be damaged by underlying soils rich in clay that swell each winter and shrink each summer depending on rainfall. This is a less obvious geologic hazard than earthquakes or landslides, but the gradual cracking, settling, and weakening of buildings over time could be significant.

2.6.5 Regulatory Setting

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface fault rupture by preventing the construction of buildings used for human occupancy on the surface trace of active faults. The Act does not address hazards associated with earthquakes such as ground shaking, landslides, or liquefaction. The Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to designate Earthquake Fault Zones surrounding the surface traces of active faults where movement of the earth's surface has taken place during the last 11,000 years, and provides that no structure for human occupancy may be placed over the surface trace of an active fault or within fifty feet from the fault. Single-family dwellings built on parcels with approved geologic reports, and those with no more than two stories when part of a development of three or fewer dwellings, are exempted. The State Geologist has identified active faults and mapped Earthquake Fault Zones around the surface traces of the faults. The maps are provided to local agencies which must regulate development projects within the Earthquake Fault Zones. Current Alquist-Priolo Fault Zones are shown in **Figure 11**.

Seismic Hazards Mapping Act

The 1990 Seismic Hazards Mapping Act seeks to protect the public from the hazards caused by earthquakes. The Act requires the State Geologist to delineate and designate areas subject to strong ground shaking, landslides, and liquefaction as Seismic Hazard Zones; and for the California Geological Survey to prepare maps of these Hazard Zones. Counties must regulate certain types of development projects and withhold development permits for sites within Seismic Hazard Zones until the geologic and soil conditions of the project site are investigated and appropriate mitigation measures, if any, are incorporated into the project plans. Counties must also take these Seismic Hazard Zones into account when adopting and revising land use planning and permitting ordinances and reviewing building permits. California Civil Code Sections 1103-1103.15 require disclosure through a Natural Hazard Disclosure Statement in real estate transactions if the property is located in an Earthquake Fault Zone or Seismic Hazard Zone.

Figure 11 Sonoma County Fault Lines and Alquist-Priolo Earthquake Fault Zones

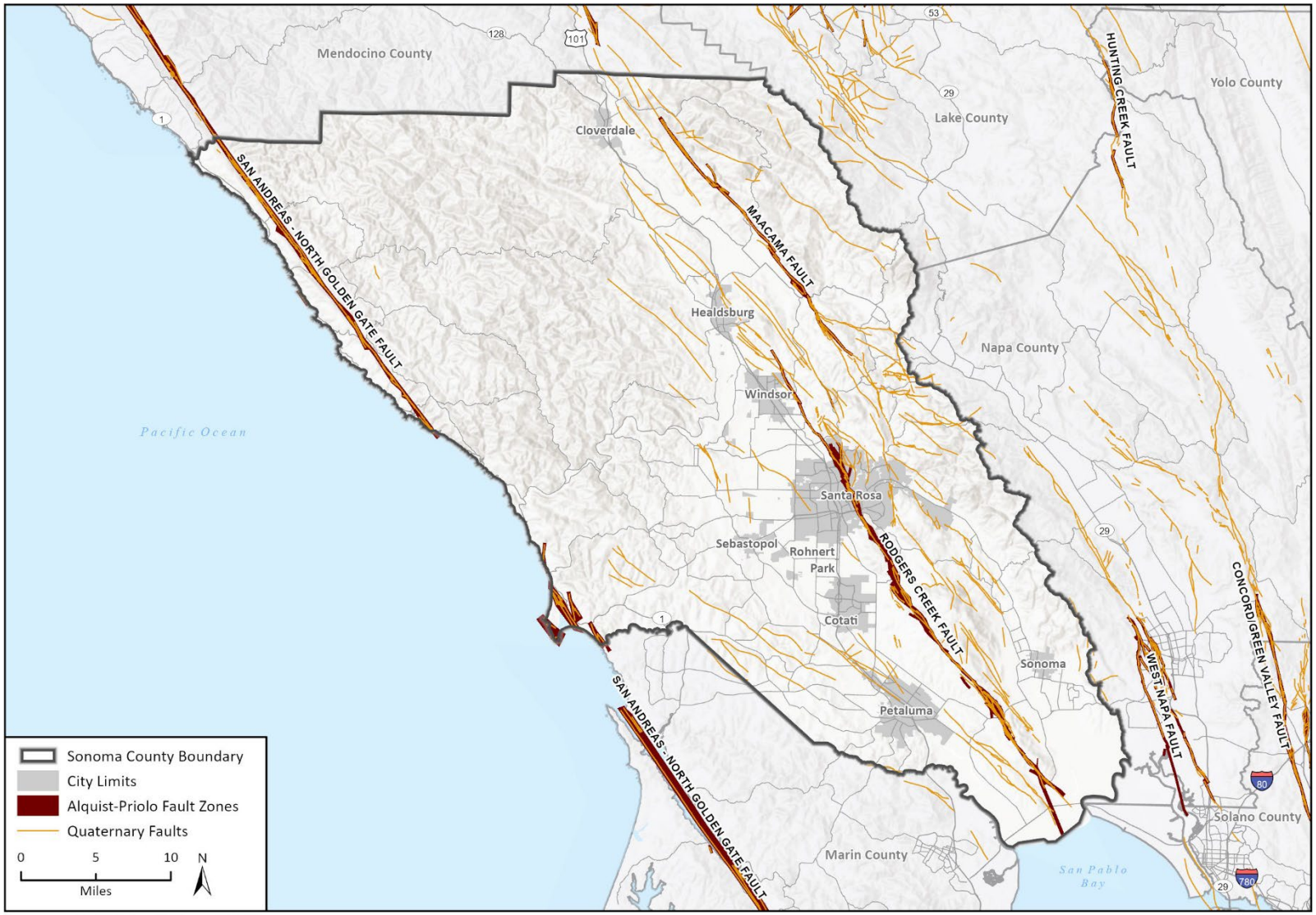


Figure 12 Sonoma County Ground Shaking Hazard Areas

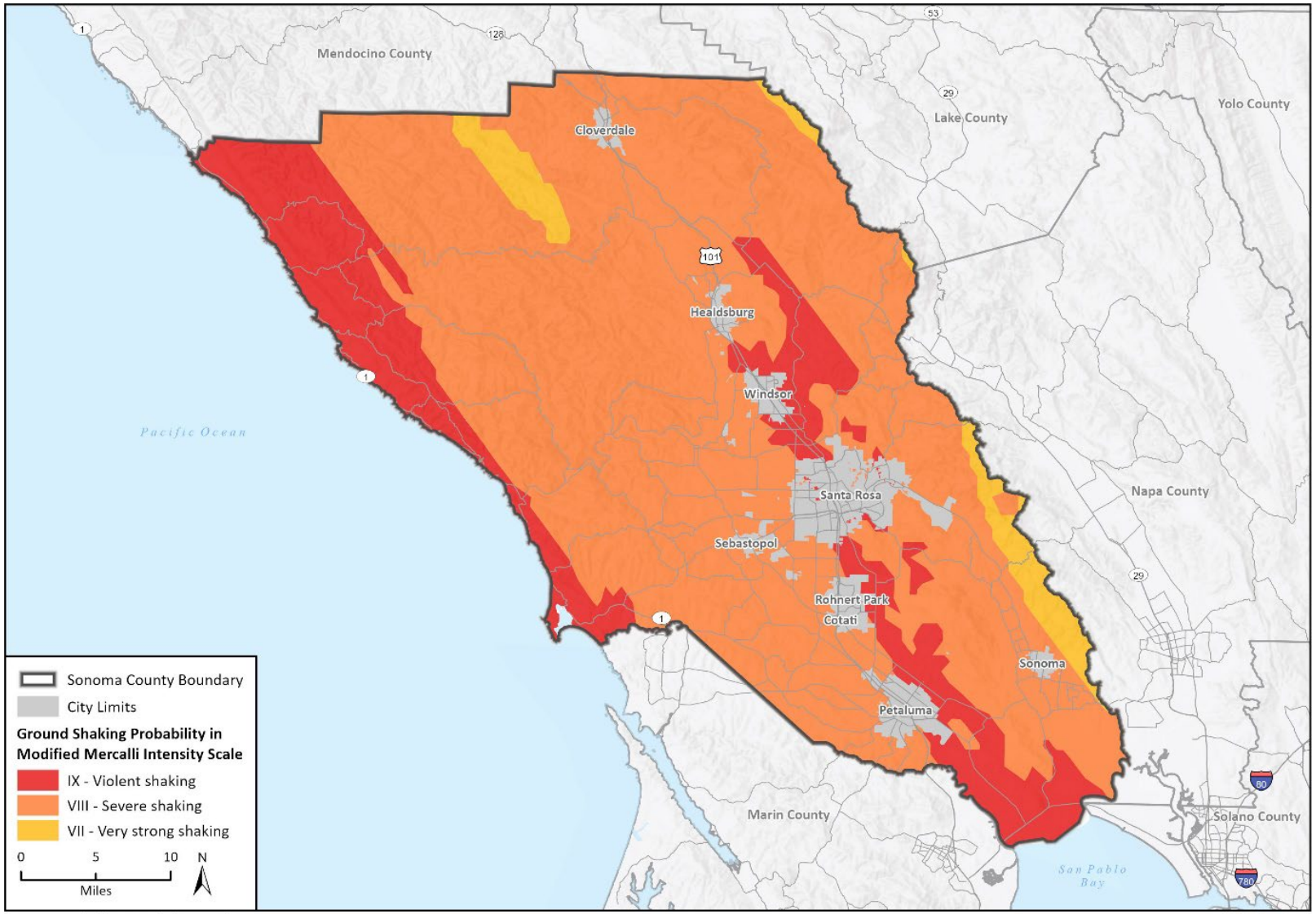


Figure 13 National Earthquake Hazards Reduction Program (NEHRP) Soil Class



Figure 9-3. NEHRP Soil Class

C (Dense soil/soft rock)
D (Stiff soil)
E (Soft clay)
Cities
County Boundary
Highways

N
0 5 10 Miles
Data Sources: Sonoma Co, CGS

Figure 14 Liquefaction Susceptibility

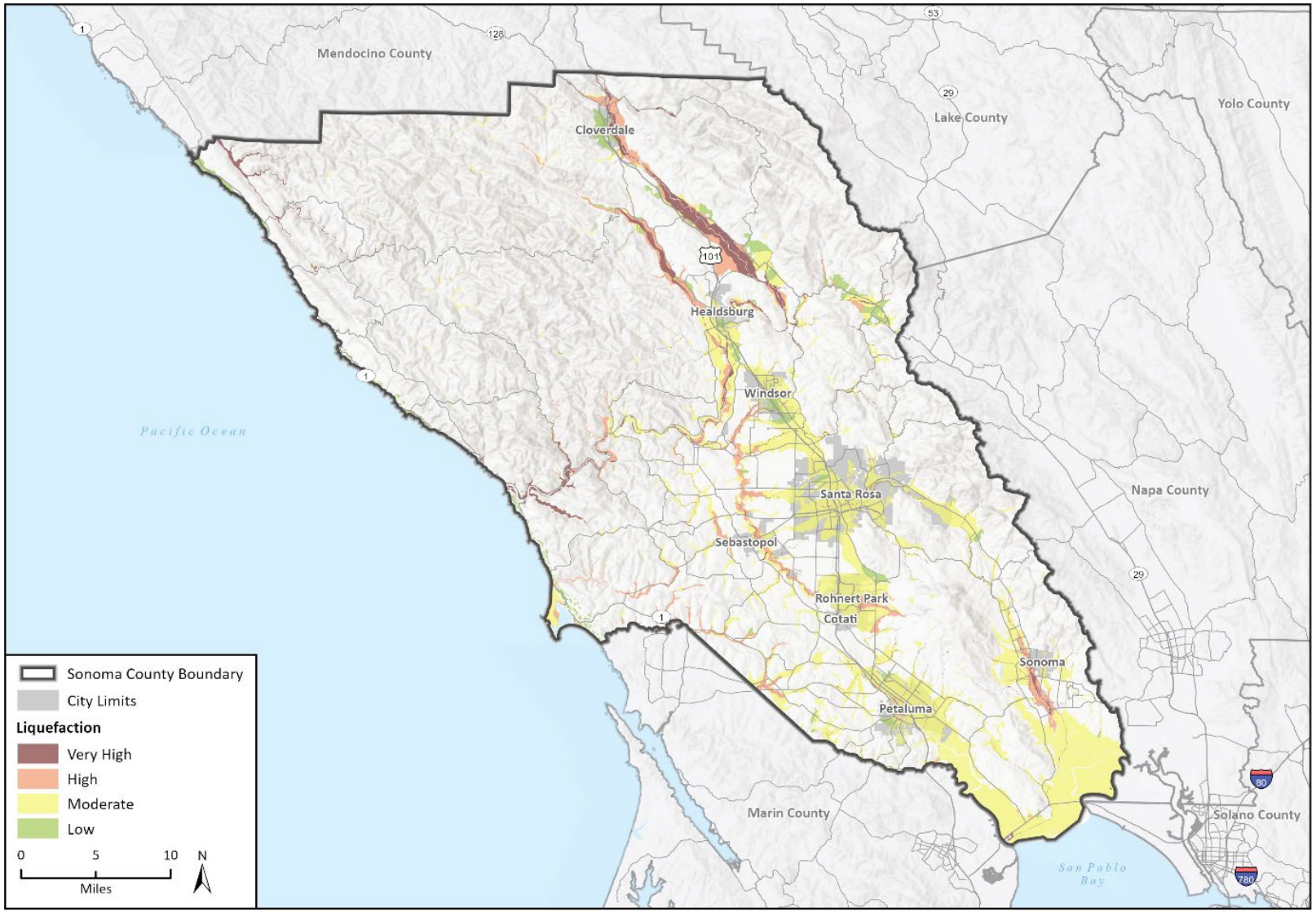
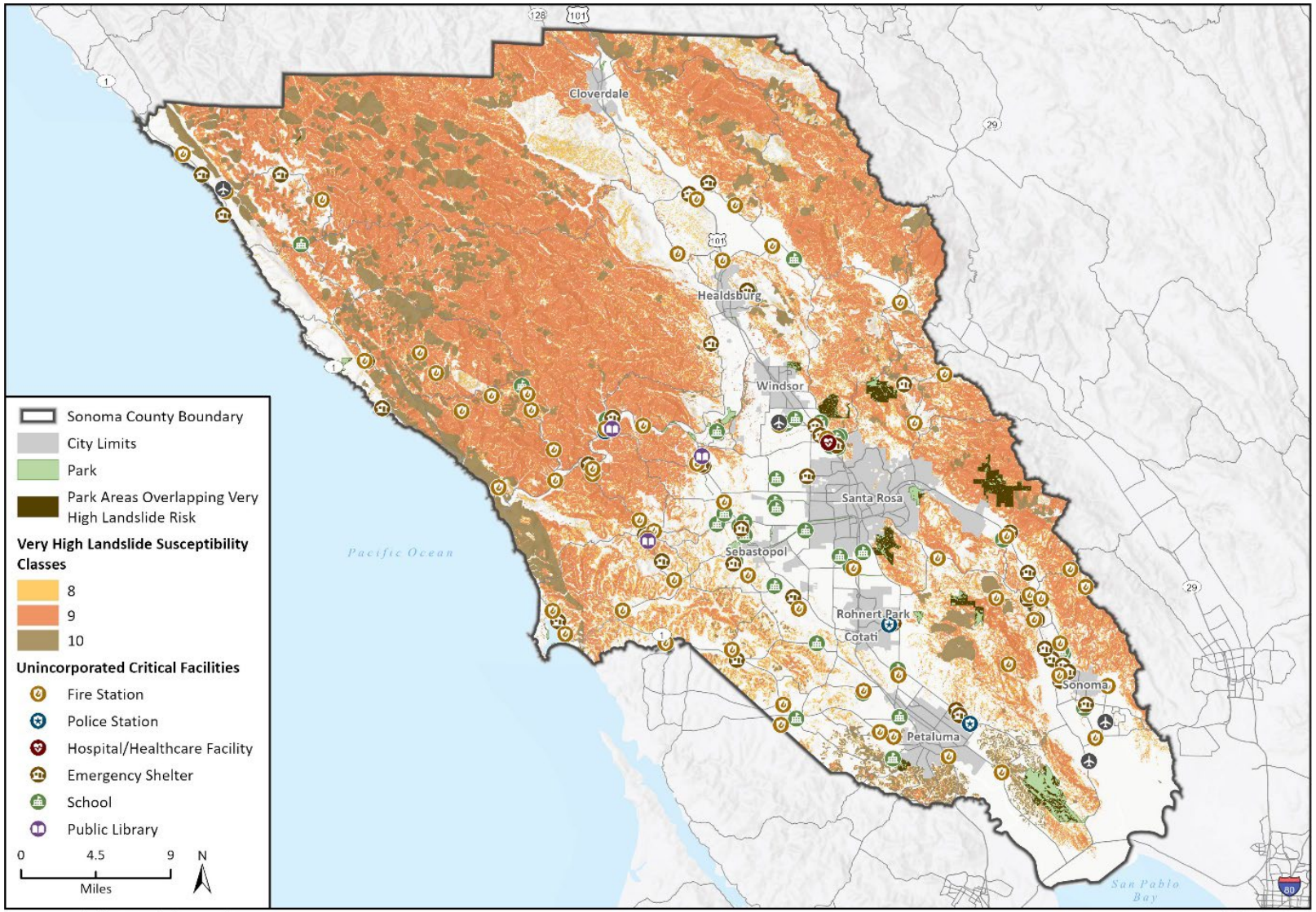


Figure 15 Landslide Susceptibility in Sonoma County



Basemap provided by Esri and its licensors © 2024.
Additional data provided by Sonoma County, 2022; CGS, Map Sheet 58, 2018.

Safety Element.aprx
Fig 5 High Landslide Susceptibility with Critical Facilities

Policies: Geologic and Seismic Hazards

Goal SE-12: Prevent unnecessary exposure of people and property from risks of damage, injury, or loss from geologic and seismic hazards.

Policy SE-12a: Continue to use the most recent available data on geologic hazards and related risks from the appropriate agencies. Make available to the public all maps identifying geologic hazards in Sonoma County.*

Policy SE-12b: Upon each update to the Safety Element, review and update building standards to ensure up-to-date considerations of earthquake and liquefaction risk in building siting and design. Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the Uniform Building Code which increase resistance of structures to ground shaking and other geologic hazards.*

Policy SE-12c: Seek grant funding opportunities to support building retrofits, particularly in systemically vulnerable communities, to improve seismic resilience.

Policy SE-12d: Continue to require appropriate studies of geologic and seismic hazards during the development review process. In earthquake fault zones, geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability. For regulatory hazard areas covered by the Seismic Hazards Mapping Act, require the preparation of and review of geotechnical reports and geologic hazards assessments by a California Registered Geologist, Civil Engineer, or Soils Engineer prior to decisions on projects within or in close proximity to geologic or seismic hazards, including landslide, ground rupture, liquefaction, and ground shaking areas.*

Policy SE-12e: Continue to prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Earthquake Fault Zoning Act and implementing provisions of Title 14 of the California Code of Regulations) within 50 feet of the surface trace of any fault. Continue to implement existing regulations in the County Code governing development in designated Earthquake Fault Zones.*

Policy SE-12f: Pursuant to the Seismic Hazards Mapping Act (SHMA) of 1990 (Public Resources Code, Chapter 7.8), the County shall not authorize the subdivision of land nor permit any structure for human occupancy, as defined by the Act, within designated Seismic Hazard Zones unless the specific provisions of the Act and Title 14 of the California Code of Regulations have been satisfied.

Policy SE-12g: Minimize soil erosion by maintaining compatible land uses, suitable building designs, and appropriate construction techniques. Contour grading, where feasible, and revegetation shall be required to mitigate the appearance of engineered slopes and to control erosion.

Policy SE-12h: Discourage avoidable alteration of land that will increase landslide hazards, including concentration of water through drainage, irrigation, or septic system

installation, removal of vegetative cover, and steepening or undercutting of unstable slopes.

Policy SE-12i: To address the increased frequency and severity of landslides, explore enhanced landslide monitoring and improved response protocols.

Policy SE-12j: Reduce vulnerability and safeguard essential services by relocating or hardening critical facilities within tsunami hazard areas.

Policy SE-12k: Require dynamic analysis of structural response to earthquake forces prior to County approval of building permits for structures whose irregularity or other factors prevent reasonable load determination and distribution by static analysis.*

Policy SE-12l: Enforce State seismic safety requirements for design and construction of buildings and facilities subject to State and Federal standards such as bridges, dams, power plants, hospitals and schools.*

Policy SE-12m: Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.*

Policy SE-12n: Use the following criteria in siting and design of essential service buildings and facilities, particularly those of high public occupancy:

(1) To the extent feasible, avoid siting such buildings and facilities in areas subject to a Modified Mercalli Index (MMI) Groundshaking Intensity Level of Very Violent (X), Violent (IX), or Very Strong (IIX).

(2) Where such buildings and facilities must be located in the above areas, design and construct them to the highest feasible safety standard.*

Policy SE-12o: Support and integrate research on geologic hazards, their probabilities, and their effects within Sonoma County.*

Policy SE-12p: Develop a program, including outreach, regulation, and funding, to strengthen and/or reinforce unreinforced masonry buildings throughout the County. Consider the cost of the work and the value, frequency of use, and level of occupancy of the buildings in designing the program. *

2.7 Hazardous Materials

The California Health and Safety Code defines a hazardous material as "any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and the environment if released into the workplace or the environment." Common hazardous materials include pesticides, new and used oil, gasoline, diesel fuel, propane, antifreeze, solvents, and compressed gases.

Hazardous materials are found at many locations in Sonoma County, and while their presence may not be a significant hazard, the release of hazardous materials in an uncontrolled manner or in certain locations can pose risks to people and the environment. For example, the electrical generating plants in the Geysers geothermal area use and produce hazardous materials hauled on winding mountain roads, and spills and releases of such materials have occurred from transporting this material.

2.7.1 Regulatory Setting

The California Accidental Release Prevention (CalARP) program, managed by the California Environmental Protection Agency at the State level, is intended to prevent accidental releases of substances that can cause serious harm to the public and the environment, and to minimize the damage if releases do occur. The County's Hazardous Materials (HazMat) Unit, part of the Fire Prevention and Hazardous Materials Division, has the responsibility for implementing the CalARP program through the County's Certified Unified Program Agency (CUPA) programs, which oversee the management of hazardous materials at the local level in California. CUPA programs ensure businesses comply with regulations for the safe storage, use, handling, and disposal of hazardous materials by conducting inspections, overseeing emergency response plans, and maintaining hazardous material business plans (HMBPs). The programs also work to prevent accidental releases and protect public health and the environment. The HazMat Unit also conducts hazardous materials incident response and enforces portions of the California Fire Code that address hazardous materials, working closely with local fire departments and the County's Environmental Health department.

Pesticides are another hazardous material commonly used in Sonoma County by agricultural operations as well as residential and commercial land uses. While the State Department of Pesticide Regulation oversees pesticide requirements, local enforcement of these requirements are overseen by County Agricultural Commissioners, and local jurisdictions can take measures to reduce pesticide exposure through education and land use planning, as well as pesticide use on publicly owned land. For policies addressing pesticide use and mitigation, refer to the Environmental Justice (EJ) Element.

Policies: Hazardous Materials

Goal SE-13: Regulate the handling, storage, use, and disposal of hazardous materials to minimize community exposure and reduce risks of damage and injury to people and environmental resources.

Policy SE-13a: Ensure that facilities involving the storage, handling, disposal, or use of hazardous materials or hazardous wastes be designed, constructed, and operated in accordance with applicable federal, state, and local hazardous materials and waste management laws and regulations, including requirements for management plans, security precautions, and contingency plans.*

Policy SE-13b: Maintain existing hazardous materials programs administered by the County's Hazardous Materials Unit acting as the Certified Unified Program Agency (CUPA).

Policy SE-13c: Continue to promote the reduction of the use of hazardous materials in County operations, private businesses, and households.*

Policy SE-13d: Support and coordinate with regulatory agencies to ensure the safe transportation of hazardous materials. *

Policy SE-13e: Continue to encourage and educate the public about green business opportunities, safe alternatives to common hazardous materials, and resources and programs for the proper management and disposal.*

Policy SE-13f: Continue to require remediation, cleanup, and risk evaluation on known contaminated sites prior to development.

Policy SE-13g: Consider siting and design during application review for new and redevelopment projects to minimize impacts of hazardous materials to surrounding uses and people due to runoff, aerial spray, or other means of exposure.

Policy SE-13h: Continue to design and operate County owned solid waste disposal facilities to prevent improper disposal of and contamination by hazardous materials.*

Policy SE-13i: Require a use permit for any commercial or industrial use involving hazardous materials in threshold quantities as determined by Federal and State laws. Require development applications to include detailed information concerning hazardous waste reduction, recycling, and storage. Hazardous materials management plans shall be required as a condition of approval for such permits.*

Policy SE-13j: Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal in any area subject to a very strong ground shaking hazard as identified in this Element or within one quarter mile of schools.*

Policy SE-13k: Avoid siting of hazardous waste repositories, incinerators, or similar facilities intended primarily for hazardous waste disposal in any area designated for urban residential or rural residential use or on agricultural lands or at County approved solid waste disposal facilities.*

Policy SE-13l: Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.*

Policy SE-13m: Maintain inventories of sites with storage or use of hazardous materials in threshold quantities as determined by Federal and State laws.*

Policy SE-13n: Maintain the Hazardous Materials Area Plan, consistent with State requirements, which provides for effective responses to releases of hazardous materials, the safe disposal of hazardous wastes, and a public information program.*

2.8 Sea Level Rise

While the Sonoma coast regularly experiences erosion, flooding, and significant storm events, sea level rise would exacerbate these natural processes, and lead to significant social, environmental, and economic impacts. Sea level rise is a significant threat to the safety and well-being of Sonoma County communities along the Pacific Ocean coastline as well as the San Pablo Bay shoreline, through exposure to increased inundation and erosion. Projected sea level rise will impact the built and natural environment, through the direct loss of critical facilities and infrastructure, recreational areas, homes and businesses; groundwater contamination from saltwater intrusion; bluff and beach erosion; and habitat loss. Several critical facilities, including Sonoma Valley wastewater treatment plants and storm drainage systems, are at risk of inundation, posing public health concerns. **Figure 16** shows what could happen in Sonoma County if sea levels rise by two and seven feet, combined with a storm surge that happens every hundred years. This figure illustrates the areas that would be affected and the extent of potential flooding.

In addition to the Climate Change Vulnerability Assessment incorporated into this Element, as may be amended from time to time, the Sonoma County Local Coastal Plan (LCP) includes background on

the best available science to predict sea level rise, sea level rise projections, and potential public roads and facilities that are projected to be inundated or flooded from sea level rise. The LCP also includes a focused vulnerability assessment for Bodega Bay that identifies potential adaptation strategies for that community.

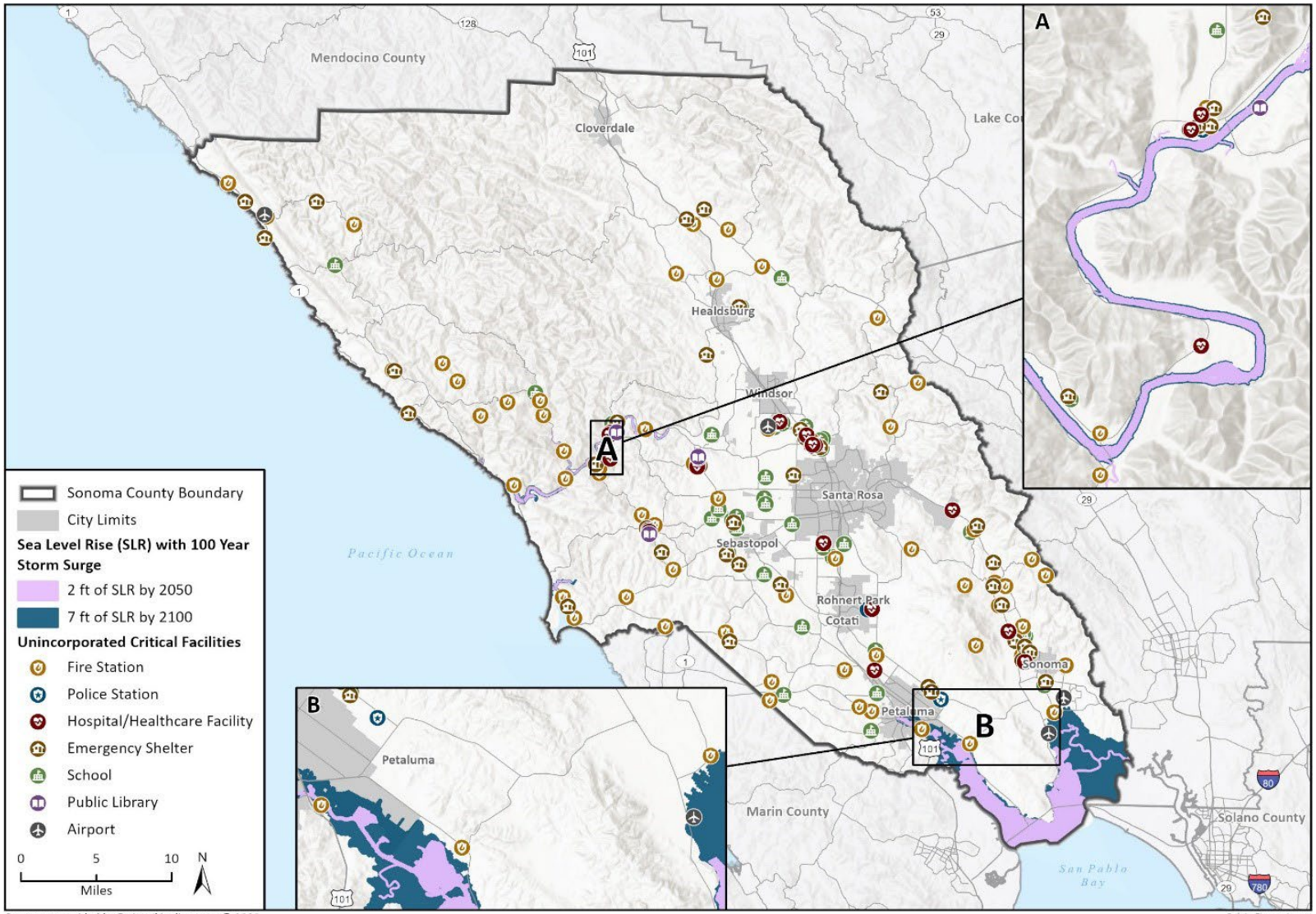
The General Plan Safety Element and LCP Safety Element policies and programs are aligned and together present a coordinated land use approach to reduce the risks to people, property, and environmental resources from sea level rise. Policy and program strategies focus on the importance of using updated data and the best available science to predict sea level rise and evaluate impacts, a complete understanding of the scope of impacts, and developing and implementing adaptation actions such as planned retreat or relocation, retrofits, or use of green infrastructure to increase coastal resiliency (e.g. habitat restoration or conservation).

2.8.1 Regulatory Setting

Section 30006.5 of the California Coastal Act identifies sea level rise as one of the topics for which additional scientific and technical analysis and recommendations are necessary to aid coastal planning, conservation, and development decisions. Section 30270 of the California Coastal Act states that the California Coastal Commission shall take into account the effects of sea level rise in coastal resources planning and management policies and activities in order to identify, assess, and, to the extent feasible, avoid and mitigate the adverse effects of sea level rise. The Sonoma County Local Coastal Plan (LCP), as certified by the Coastal Commission, includes policies to address hazards from sea level rise to enhance the safety of residents and visitors, while providing a framework for consideration and permitting of coastal development projects. The LCP acknowledges the threat of sea level rise and supports appropriate responses, while recognizing that sea level rise is a global rather than a purely local issue.

The San Francisco Bay Conservation and Development Commission (BCDC) is a State agency with land use planning and regulatory authority over the Bay and the areas within 100 feet inland from the shoreline. BCDC establishes land use policies for the Bay as a resource and for development of the Bay and shoreline in the Bay Plan, which provides the basis for the Commission's review and actions on proposed projects. In 2023, Senate Bill 272 was signed into law, which charges all local governments within the coastal zone or within the jurisdiction of BCDC to prepare a sea level rise plan as part of either a local coastal program that is subject to approval by the California Coastal Commission or a subregional San Francisco Bay shoreline resiliency plan that is subject to approval by BCDC, on or before January 1, 2034 (Public Resources Code Section 30985).

Figure 16 Sea Level Rise with One-hundred Year Storm Surge in Sonoma County



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Additional data provided by Sonoma County, 2022; CoSMoS, 2022.

Safety Element.aprx
Fig 4 Sea Level Rise with Critical Facilities

Policies: Sea Level Rise

Goal SE-14: Increase community resilience to sea level rise, and prevent unnecessary exposure of people, property, and environmental resources to risks of damage, injury, or loss from the impacts of sea level rise.

Policy SE-14a: Update hazard data every 5 years or at intervals recommended by responsible agencies, whichever is more frequent, using the best available scientific estimates, aligning with projections used by regional, state and federal agencies.

Policy SE-14b: Use the best available science and technical analyses available in combination with site-specific information when evaluating discretionary land use or development proposals in areas vulnerable to sea level rise.

Policy SE-14c: Identify and assess risks to existing development, critical facilities and infrastructure, and environmental resources that are vulnerable to projected sea level rise inundation, and develop an adaptation plan, consistent with the directives of the Local Coastal Plan.

Policy SE-14d: Coordinate with groundwater sustainability agencies, public water system operators, and private groundwater users to develop and implement strategies to limit saltwater intrusion from sea level rise and avoid impacts caused by saltwater intrusion to beneficial uses of freshwater aquifers.

Policy SE-14e: Coordinate land use strategies with the Local Coastal Plan to ensure a cohesive approach to protecting communities, critical facilities and infrastructure, and environmental resources from sea level rise.

Policy SE-14f: Regulate the location, design, and construction of development and redevelopment in areas vulnerable to sea level rise. In coastal areas, follow the directives of the Local Coastal Plan.

Policy SE-14g: Continue to coordinate with local, regional and State entities, and engage the broader community, to address sea level rise and align adaptation efforts. In the development and implementation of adaptation strategies, consider the impacts and benefits to vulnerable communities.

2.9 Air Quality and Extreme Temperatures

All communities in Sonoma County are significantly exposed to poor air quality from wildfire smoke and more frequent and severe extreme heat events, especially Environmental Justice (EJ) Communities that experience disproportionate impacts due to systemic inequities. Exposure to poor air quality and extreme heat, coupled with inequitable access to resources, can exacerbate health issues for these communities and across Sonoma County. Changes in wildfire frequency and annual average maximum temperatures will further compound these concerns as conditions worsen over the next several decades. Sonoma County has an average baseline maximum temperature of 69.2°F and an average baseline minimum temperature of 42.8°F. The average maximum and minimum temperatures are expected to increase, with projected upward shifts of the temperature range by 3.9°F by mid-century shown in **Figure 17**, and 7.0°F through the end of the century as shown in **Figure 18**. These temperature increases represent an overall trend that influences the frequency

and severity of extreme heat events. Change in temperature is observed spatially with the greatest increases occurring mainly in central Sonoma County, roughly east of highway 101. Heat-related illnesses can become life-threatening, increasing the demand for cooling centers, hospitals, and emergency personnel. With anticipated temperature increases, emergency services will also face challenges providing adequate services due to power interruptions, staffing shortages, and lack of systems and infrastructure to provide equitable community access to emergency facilities.

Increasing the availability and use of warming and cooling centers and clean air refuges (i.e. resilience centers) will improve the County's capacity to adapt to changing conditions, especially for systemically vulnerable communities such as outdoor workers and people with pre-existing health conditions.

2.9.1 Regulatory Setting

The Extreme Temperature Annex to the Sonoma County Operational Area Emergency Operations Plan (EOP) outlines procedures that guide a collaborative response by local governments, special districts, and allied agencies in the Sonoma County Operational Area to extreme temperature incidents. The Extreme Temperature Annex defines a concept of operations to guide a coordinated response to extreme temperature incidents.

Figure 17 Annual Average Maximum Temperature Mid-Century

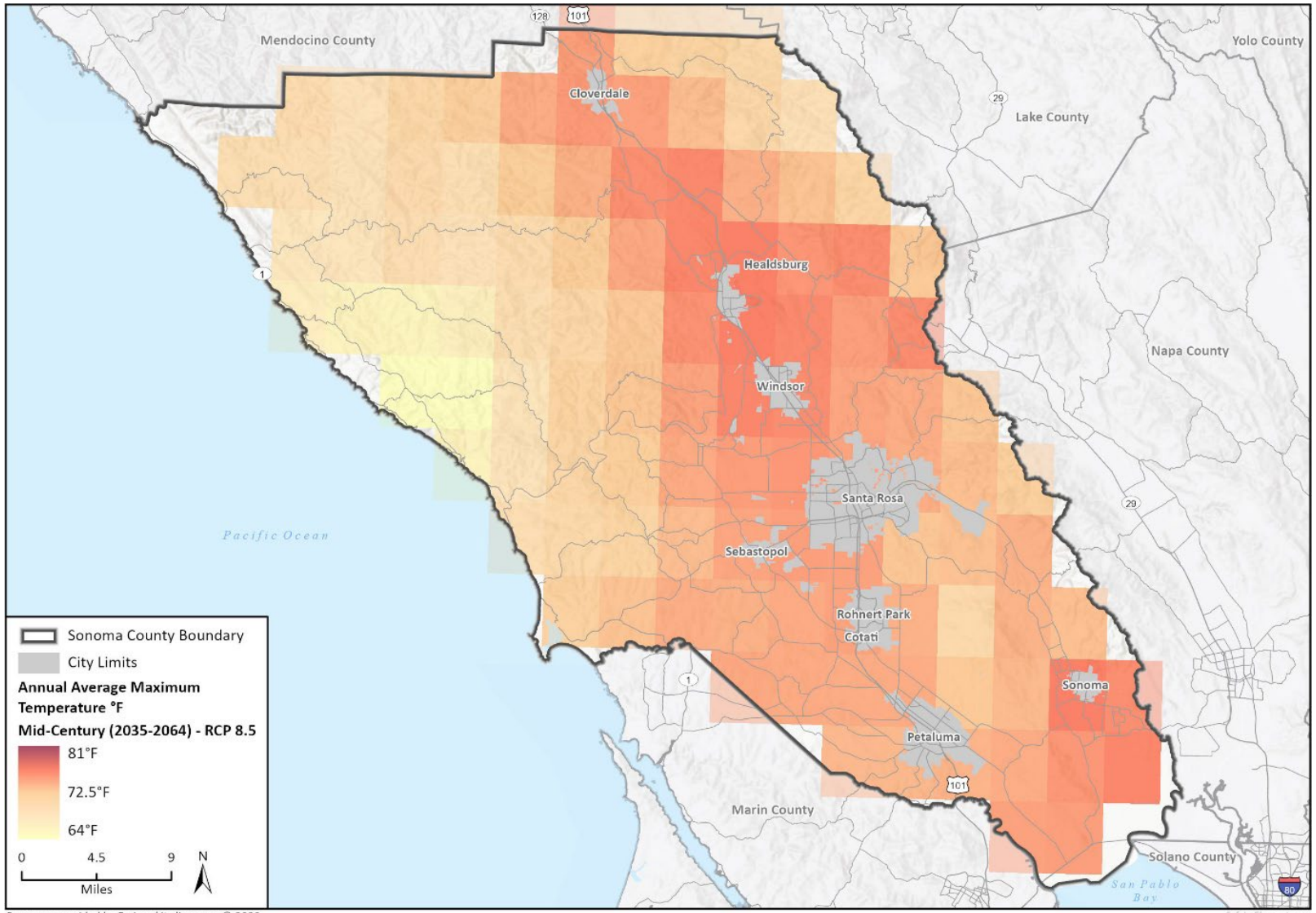
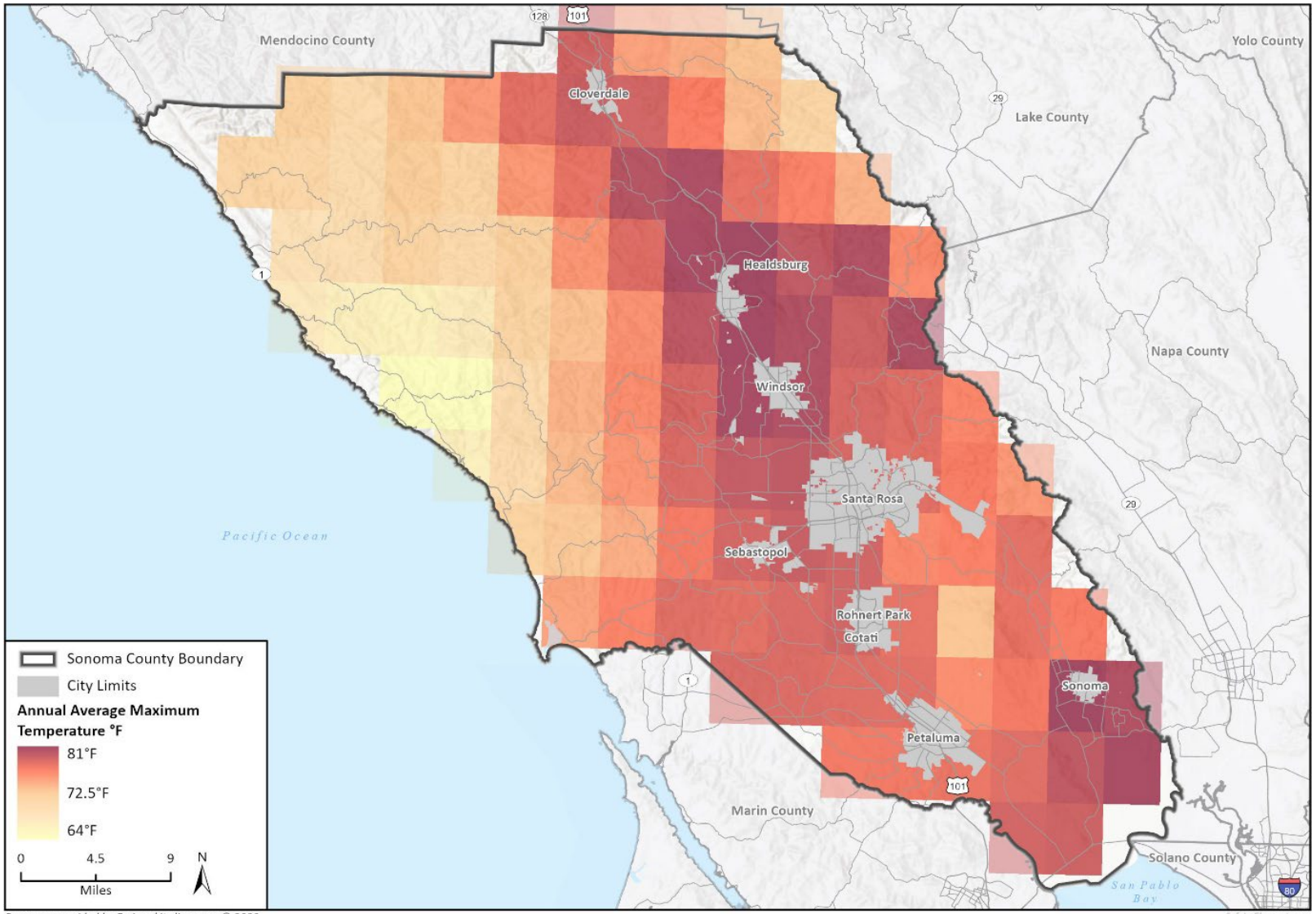


Figure 18 Annual Average Maximum Temperature End-Century



Policies: Air Quality and Extreme Temperatures

Goal SE-15: Reduce the community's exposure to poor air quality and extreme temperature events and build community capacity to adapt to a changing climate.

Policy SE-15a: Broaden the functionality and expand the locations of resilience centers, beginning in systemically vulnerable communities.

Policy SE-15b: Support transportation access to resilience centers for systemically vulnerable communities and people with mobility or transportation constraints.

Policy SE-15c: Consider lowering threshold temperature or air quality triggers for the activation and operation of resilience centers.

Policy SE-15d: Seek grant funding to identify and map existing community facilities that can serve as resilience centers.

Policy SE-15e: Incentivize, promote, and establish standards for temporary resilience centers on private property, especially clean air refuges for outdoor workers.

Policy SE-15f: Explore the development of programs for private employers to provide hazard pay to include employees working during extreme heat events, wildfires, and unhealthy air quality days.

Policy SE-15g: Work with energy service providers to promote programs encouraging reduced energy use during extreme heat events without negatively impacting the health and wellbeing of community members.

Policy SE-15h: Require parking lots for new commercial and industrial uses to mitigate heat gain through installation of shade trees, shade structures with solar arrays, or other emerging cooling technologies. Prioritize the use of solar arrays where feasible and appropriate.

Policy SE-15i: Utilize drought-tolerant plantings and shade structures, including solar arrays, as part of cooling strategies for County projects located in areas with impermeable surfaces to help reduce heat islands and energy demand during extreme heat events.

2.10 Drought

Over the past two decades, Sonoma County has experienced more frequent and longer contiguous droughts. California experienced multi-year statewide droughts from 2012-2017 and 2008-2011. Most recently, on April 21, 2021, Governor Gavin Newsom proclaimed an emergency drought for Sonoma and Mendocino Counties. On April 27, 2021, the Sonoma County Board of Supervisors also proclaimed a drought emergency for Sonoma County.

Extended drought conditions exacerbate water supply concerns, leading to water shortage, increased water costs, and diminished water quality. This often disproportionately affects Environmental Justice Communities, where water supply and quality may already be a concern, and many households are dependent on well water. While groundwater levels in most areas of Sonoma County have been stable, there are specific areas of concern, such as Sonoma Valley, that have experienced declines. Drought can have widespread environmental, economic, and social impacts.

Additional background on past drought periods, potential drought impacts, and related planning efforts can be found in the Climate Change Vulnerability Assessment and Local Hazard Mitigation Plan.

2.10.1 Regulatory Setting

Sonoma County has two principal sources of water for residential, commercial, industrial, and agricultural use: the Russian River and groundwater. Additional water sources include diversions from small streams and springs and numerous reservoirs. Most residents of the unincorporated County are outside urban service areas and are dependent on individual onsite wells or small-scale shared water supply systems.

The Sonoma County Water Agency (Sonoma Water), a special district separate from the County government, serves the urbanized areas of Sonoma County and northern Marin County with water from the Russian River. The agency's extensive water supply infrastructure generally mitigates the effects of short-term dry periods for most water users. As a wholesaler of potable water, Sonoma Water is required by the Urban Water Management Planning Act to update its Urban Water Management Plan (UWMP) every five years, which must include a water shortage contingency plan. Sonoma Water's UWMP discusses existing water supplies and transmission facilities, projected water demands and supplies, climate change impacts to water supply, conservation activities, and more.

Recent changes to State law now require counties to establish and maintain a standing drought and water shortage task force to "facilitate drought and water shortage preparedness for state small water systems and domestic wells within the county's jurisdiction," (California Water Code Section 10609.70). The law also requires counties to "develop a plan that includes potential drought and water shortage risk and proposed interim and long-term solutions." This also requires small community water systems to now have their own water shortage contingency plans, which may in turn, place more demand on the County for providing technical support and guidance.

Policies: Drought

Goal SE-16: Proactively plan for drought and improve the reliability and safety of water supply during periods of drought.

Policy SE-16a: Proactively coordinate with public agencies, private agencies, and community organizations that have roles in drought preparedness and response on conditions monitoring, hazard and risk assessments, contingency planning, and water resources management.

Policy SE-16b: Continuously monitor drought conditions, weather, and water availability.

Policy SE-16c: Provide drought information resources, including the timely and accurate assessments of drought impacts on agriculture, industry, government, wildlife, tourism, health, and other areas.

Policy SE-16d: Provide resources, guidance, and technical assistance, as feasible, to groundwater well users, small water suppliers, and other water users vulnerable to drought on water quality testing and water conservation measures. Prioritize resources for low-income households.

Policy SE-16e: Identify and support the pursuit of State and federal drought resources and funding.

Policy SE-16f: Improve drought resiliency and minimize economic risk through assessment of past drought periods in Sonoma County to identify barriers and opportunities.

Policy SE-16g: Encourage and support nature-based solutions for increasing the resilience of the watershed.

Policy SE-16h: Support the implementation of the Groundwater Sustainability Plans for the Santa Rosa Plain, Sonoma Valley, and Petaluma Valley groundwater subbasins.

Policy SE-16i: Evaluate, prioritize, and implement water saving features and stormwater best management practices to promote groundwater recharge in existing and newly constructed County facilities.

Policy SE-16j: Explore opportunities to update design guidelines and building or zoning codes to require or incentivize low impact development, recycled and greywater use, rainwater capture, water-efficient landscaping, and other water conservation measures.

Policy SE-16k: Consider developing pre-approved design details for low impact development and greywater systems to reduce design and permitting costs.

3 Implementation Plan

The following table includes specific actions called “Implementation Programs” that address the County’s safety issues as discussed in the prior sections. Each of the actions identifies “Lead Department/Agency”, which indicates departments or agencies that will lead and/or coordinate on implementing the action, “Supporting Department/Agency”, which indicates departments or agencies that may support implementing the action, and a “Timeframe”, which indicates the timing in which the action will be targeted for completion. The “Metric” is the measurement of success for each program.

Program #	Program	Lead Department/ Agency	Supporting Department/ Agency	Timeframe	Implementing Policy(ies)	Metric
Emergency Preparedness, Response, and Recovery						
Goal SE-1: Prepare community members and County staff for emergencies through information and resources, training, planning, and assessment.						
1	Continue to maintain and update as necessary the Sonoma County Emergency Operations Plan and associated annexes. Develop new annexes as warranted.	Emergency Management	N/A	Ongoing	SE-1a	Updated Emergency Operations Plan
2	Update the Local Hazard Mitigation Plan (LHMP) for Sonoma County, incorporated by reference into this Element, at least every five years and use the plan to guide decisions on mitigating actions to protect the community and the environment, particularly vulnerable communities. With each LHMP update, evaluate the County's fire suppression capacity and future water supply availability. Where feasible, coordinate and collaborate on hazard mitigation planning with other jurisdictions and special districts within the County. During the comprehensive update to the General Plan, update and expand upon the evacuation route assessment required by Government Code Section 65302.15 and the residential egress assessment required by Government Code Section 65302(g)(5), based on the availability of new information, data, or assessment techniques, to evaluate the capacity, safety, and viability of evacuation routes and locations under a range of emergency scenarios and areas of the unincorporated county in hazard areas without at least two evacuation routes. Use the findings from the updated studies to inform the land use and circulation elements, and future updates to the Safety Element and LHMP.	Emergency Management	Permit Sonoma and others	Every 5 years	SE-1b, SE-2i	Updated Local Hazard Mitigation Plan
3	Identify collaborative networks and community-based organizations within the County that provide emergency services, such as Sonoma Community Organizations Active in Disaster (COAD), and meet bi-annually to identify opportunities for the County to work in collaboration with these community-based organizations (CBOs) in their emergency response approach and discuss how to fill gaps in community needs and resources for emergency preparation, response, and recovery.	Emergency Management	Health Services	Annually	SE-1c, SE-1d	Number of meetings held
4	Identify funding streams to provide community-based organizations involved in the County's emergency planning with grants or other forms of compensation for their planning and action efforts.	Emergency Management	Health Services	2029	SE-1c, SE-1d	Funding secured
5	Continue supporting and administering community preparedness programs, such as Community Emergency Response Training (CERT), Communities Organized to Prepare for Emergencies (COPE), and Map your Neighborhood (MYN), to foster neighbor to neighbor collaboration efforts. Prioritize efforts in high hazard areas and systemically vulnerable communities, and coordinate with community organizations and partners to target hard-to-reach populations.	Emergency Management	N/A	Ongoing	SE-1e	Events/trainings held
6	Conduct alert and warning, and evacuation exercises at the neighborhood or community levels, prioritizing high hazard areas and single-access communities, to provide public safety agencies an opportunity to test the County alert system and residents an opportunity to practice evacuating. To reduce last-minute evacuations and concentrated demand on the roadway network, encourage advanced preparation, leaving early, and limiting the number of evacuating vehicles during the exercises and as part of other emergency preparedness public information initiatives.	Emergency Management	Various	Ongoing	SE-1g	Alert, warning, and evacuation exercises held
Goal SE-2: Support safe and efficient emergency response and evacuation through accessible and effective alerts, improved safety or evacuation routes, and emergency response planning.						
7	Continue to provide easy to access public emergency response information on the County's website and social media pages.	Emergency Management	Information Systems	Ongoing	SE-2b	Updated County website
8	Work with schools and local businesses to promote emergency preparedness, distributing age-appropriate educational materials or business continuity planning resources.	Emergency Management	County Administrator's Office	Ongoing	SE-2b	Number of outreach events
9	Partner with local media, including popular local social media pages, to provide information on emergency preparedness and response.	Emergency Management	County Administrator's Office	Ongoing	SE-2b	Number of media blasts
10	Secure funding to assess on-street parking on County-owned roads in Moderate, High, or Very High Fire Hazard Severity Zones to evaluate parking constraints to safe and efficient egress. If the assessment indicates potential constraints, explore options to implement more stringent on-street parking limitations.	Permit Sonoma	Sonoma Public Infrastructure	2029	SE-2f	Assessment completed
11	Conduct a study to identify vulnerable areas for traffic signal improvements and contingency plans for loss of power and communications grids. Investigate adaptive signal control (ASC) systems that can adjust traffic signal timing to account for high volumes that occur during hazard events.	Sonoma Public Infrastructure	Emergency Management	2030	SE-2j	Areas of improvement identified
Goal SE-3: Increase the community's ability to recover from a disaster event.						
12	Work with community stakeholders and County agencies/departments to prepare a Post-Disaster Recovery Framework to increase the County's capacity to recover after disaster events.	Emergency Management	Permit Sonoma, County Administrator's Office	2026	SE-3a	Framework developed

Program #						
13	Secure funding for and develop a strategic plan for damage assessment and recovery of County-owned public facilities after a major disaster event.	Sonoma Public Infrastructure	Emergency Management, County Administrator's Office, Permit Sonoma	2030	SE-3a	Plan developed
14	Secure funding for long-term recovery efforts for small businesses and systemically vulnerable communities through federal and state disaster relief funds and local budget.	County Administrator's Office, Economic Development Collaborative	Permit Sonoma	Ongoing	SE-3b	Funding secured
15	Partner with local hospitals, clinics, and non-profit organizations to secure medical staff, equipment, and supplies for mobile clinics following disaster.	Health Services	Emergency Management, Permit Sonoma	As needed	SE-3c	Funding and resources secured; staffing plan established
16	Update the County code to establish streamlined rebuilding standards and procedures, and temporary housing allowances that apply after proclamation of a local emergency.	Permit Sonoma	N/A	2027	SE-3d	
17	Create an at-home hazard guide, focusing on hazards identified in the Safety Element and Hazard Mitigation Plan, for residents in multiple languages that provides details on hazard avoidance, prevention, and response, and points to various funding sources, such as the Green and Resilient Retrofit Program or local programs, for residents seeking climate-resilient home retrofits. Distribute guides in English and Spanish at community events and provide guides in additional languages upon request.	Emergency Management	County Administrator's Office, Permit Sonoma	2028	SE-4a	Guide completion and distribution
18	Partner with healthcare providers throughout the County to regularly meet with the Sonoma County Mobile Support Team (MST), Community Oriented and Equity (CORE) Team, Specialized Assistance for Everyone (SAFE) Team, and other crisis response or mental health services teams to create an Emergency Medical Assistance Plan identifying opportunities to provide mobile mental and physical health services and coordinated operations during and after an emergency event.	Health Services	Emergency Management	2028	SE-3c, SE-4b	Preparation and implementation of an Emergency Medical Assistance Plan
19	Partner with healthcare providers to identify funding sources to support efforts to increase physical and mental health care capacity during emergencies and post-disasters, including the Centers for Disease Control, California Department of Public Health, California Department of Social Services, and the California Department of Managed Health Care. Assist in applying for funding through collaborative partnerships, information sharing, and technical support as needed.	Health Services	N/A	Ongoing	SE-3c, SE-4b	Funding secured
20	Establish and train a formalized network of community organizations and volunteers to provide additional support during emergencies and post-disasters. This can include mental health first aid training, establishing community health worker programs, and creating support networks for vulnerable populations.	Health Services	N/A	2030	SE-3c, SE-4b, SE-4d	Network established
21	Continue to host regular seasonal readiness meetings that include public safety partners, community-based organizations, and County agencies to discuss the capacity of emergency services to serve all community members equitably.	Emergency Management	Office of Equity	Annually, at minimum	SE-4c, SE-4d, SE-4e	Annual meetings
22	Continue to integrate Diversity, Equity, Inclusion, and Belonging (DEIB) principles into Emergency Operations Center (EOC) operations through the EOC Management positions of Equity Officer and Access and Functional Needs Coordinator, in alignment with the Sonoma County Strategic Plan Racial Equity and Social Justice Pillar for departments engaged in emergency and safety related and post-disaster recovery programs.	Emergency Management	Office of Equity	Ongoing	SE-4c	Updated plans, procedures, or protocols
23	Schedule regular meetings between County departments and public agencies working on projects or initiatives related to emergency response or services to discuss ongoing projects, share updates, and address any communication gaps.	Emergency Management	County Administrator's Office, Permit Sonoma, Sonoma Public Infrastructure	Ongoing	SE-4e	Number of meetings
24	Identify funding for and conduct an evacuation transportation needs assessment to identify areas of the County with populations that have access and functional needs that need transportation support to evacuate safely and timely during a disaster event. The assessment should be informed by data and community input. Log the findings in a GIS database for reference by the Emergency Operations Center during disaster response and planning efforts.	Emergency Management	Various	2030	SE-4f	Funding secured; assessment prepared
25	Encourage and support community or neighborhood efforts in developing localized emergency response plans, in alignment with the County Emergency Operations Plan, by providing hazard data and technical guidance and coordination with local fire agencies and other public safety partners.	Emergency Management	N/A	Ongoing	SE-4f	Neighborhood and community emergency preparedness plans created

Program #	Program	Lead Department/				
26	Create a public information campaign in multiple languages and using multiple forms of media, including through trusted community-based organizations, informing the public of various existing emergency alert options and where to look for information regarding public emergencies, hazards, resilience center openings, and safety instructions. Provide this information virtually and in frequented public locations, such as libraries, with printouts of the necessary links and numbers residents may call, text, or search for additional information on emergencies and evacuation routes. Collaborate with County departments and agencies that work closely with the public, such as Health Services, to disseminate information.	Emergency Management	County Administrator's Office, Health Services, others	Ongoing	SE-2a, SE-4h	Resources and information distributed
27	Address language and accessibility barriers to emergency alert programs and emergency preparedness resources by ensuring County emergency response operations follow the County of Sonoma's Language Access Plan and require that contractors hired by the County follow the County's Language Access Plan.	Emergency Management	Office of Equity	2027	SE-4h	All alerts and preparedness materials in multiple languages
28	Provide information and handouts on preparedness resources and procedures at County events and tabling opportunities.	Emergency Management	County Administrator's Office	Ongoing	SE-1e, SE-4h	Number of outreach events
29	Identify funding to acquire additional sources of backup power, power storage, and/or onsite power generation for critical facilities and services, and resilience centers.	Sonoma Public Infrastructure	Emergency Management	2032	SE-5a	Funding secured; power storage at critical facilities established
30	Conduct a feasibility study to identify potential areas to install neighborhood microgrids and battery energy storage facilities to improve electricity grid resilience. Prioritize areas with systemically vulnerable communities.	County Administrator's Office	Permit Sonoma	2032	SE-5a	Study completed
31	Work with utility providers to establish and adhere to standards for maintaining defensible space around critical infrastructure such as power lines, electrical substations and other energy facilities, cell phone towers and communications facilities, broadband infrastructure, water pipelines, reservoirs, wastewater facilities, solid/hazardous waste facilities, and recycling facilities.	Sonoma Public Infrastructure	Permit Sonoma	2030	SE-5b	Established set of standards
32	Continue to regularly assess County-maintained roads and facilities and conduct any needed vegetation clearing or maintenance to ensure defensible space is maintained.	Sonoma Public Infrastructure	N/A	Ongoing	SE-5b	Assessment completed
33	Conduct a study to identify County transportation infrastructure that is critical for the provision of emergency services such as evacuation, or that provide access to critical facilities that are located within high-risk wildfire, landslide, or flood hazard areas. Integrate information into a GIS-based database for critical transportation infrastructure to incorporate into emergency plans and to help prioritize and track improvements and upgrades.	Emergency Management	Sonoma Public Infrastructure	2030, then ongoing	SE-5c	Critical transportation infrastructure identified and logged
34	Identify strategies for near- and long-term hardening/resilience projects of critical transportation infrastructure, especially those needed for the continuation of critical services in highly impacted and systemically vulnerable communities during climate hazards. Hardening projects may include widening evacuation routes, strengthening bridges, raising drainage and creek crossings, repaving flood-prone roads with permeable pavement, regular hazardous fuels clearing, and other projects and maintenance activities.	Sonoma Public Infrastructure	Emergency Management, Permit Sonoma	2030	SE-5c	Hardening and resilience strategies identified
35	Using the countywide Community Engagement Plan as a guide, increase participation of community members in small and isolated rural communities in emergency planning and decision-making processes and disaster preparedness events. Strategies should include locating engagement events in small and isolated rural communities, timing events outside of work hours, providing child-friendly options at the events, running bilingual engagement events, and providing tangible resources to improve self-sufficiency and disaster preparedness when feasible.	Emergency Management	Office of Equity	Ongoing	SE-1f, SE-5d	Number of engagements with new communities
36	Conduct a detailed assessment of vulnerability and risks to County-owned critical facilities and infrastructure from all hazards and climate change impacts, and identify adaptation and resilience strategies to reduce risks and ensure continuity of services. Integrate findings and recommended projects into the Capital Improvement Plan.	Sonoma Public Infrastructure	County Administrator's Office	2028	SE-2.5, SE-12g	Vulnerability assessment completed and adaptation strategies identified
37	Identify and apply for funding that may be used for capital improvements necessary for emergency response. Explore funding sources that could be used for assessment or physical improvements of critical facilities and infrastructure throughout the county. Prioritize capital improvements that serve the greatest number of people and systemically vulnerable communities, and that allow existing facilities to be used during emergency events.	Sonoma Public Infrastructure	Department of Emergency Management	2030	SE-5f	Funding identified and applied for

Program #	Program	Lead Department/				
38	Conduct a programmatic equity impact assessment with each update to the County's Capital Improvement Plan. Gain input from community leaders of systemically vulnerable communities to ensure the equity impact assessment addresses concerns meaningfully. This can be achieved by organizing community forums and focus groups, conducting surveys, and holding one-on-one interviews.	Sonoma Public Infrastructure	Office of Equity	With each update to the Capital Improvement Plan	SE-5g	Equity impact assessment completed
39	During the comprehensive update to the Sonoma County General Plan, review existing land use designations for public facilities in relation to planned critical facilities, evacuation routes, and hazard areas. Work with Sonoma Public Infrastructure and the Department of Emergency Management to identify necessary changes to the land use map to accommodate planned projects.	Permit Sonoma	Sonoma Public Infrastructure, Emergency Management	2029	SE-5i	Updated General Plan land use map
40	Continue the existing Auxiliary Communication Service program to supplement government emergency communications with professional, unpaid volunteer staff.	Department of Emergency Management	Sonoma Public Infrastructure	Ongoing	SE-6a	Program continued
41	Assess new technologies and seek funding as needed to upgrade County emergency response communications equipment.	Sonoma Public Infrastructure, Department of Emergency Management	N/A	Ongoing	SE-6c	Funding secured; emergency communication equipment updated
42	Work with the federal Cybersecurity & Infrastructure Security Agency to obtain free telecommunications priority services by enrolling in programs such as Wireless Priority Service (WPS) or the Government Emergency Telecommunications Service (GETS). Notify County public safety partners of the availability of these programs.	Information Systems	Emergency Management, Sonoma Public Infrastructure	2030	SE-6c	Enrollment completed
43	Evaluate zoning requirements and explore opportunities to streamline the permitting process for new or modified telecommunication and broadband facilities. Explore the development of guidelines for microtrenching to support broadband deployment without harming infrastructure.	Permit Sonoma	Sonoma Public Infrastructure	2027	SE-6d	Updated County Code
44	Coordinate with the Economic Development Collaborative's Access Sonoma Broadband initiative to expand and improve wireless broadband services in the county.	Permit Sonoma	Economic Development Collaborative	Ongoing	SE-6e	Expanded broadband internet infrastructure in unserved and underserved areas
45	Identify and map public roads in the State Responsibility Area that do not meet the standards of the State Fire Safe Regulations. Make the map publicly available on the County's online GIS mapping hub.	Permit Sonoma	Sonoma Public Infrastructure, Department of Emergency Management	2026	SE-7a	GIS map developed
46	Review and evaluate the County's existing defensible space and vegetation management regulations in Sonoma County Code Chapter 13A (Duty to Maintain Defensible Space and Abate Hazardous Vegetation and Combustible Material) to identify amendments to better align the regulations with State legislation and current industry research.	Permit Sonoma	N/A	2027	SE-7h	Updated County Code
47	Continue the work of the Resilience Coordination Team, led by the County Administrator's Office, and its corresponding technical advisory committees and/or working groups to coordinate the scope, organization, management, and funding mechanisms of wildfire resilience programs, projects, and initiatives across County departments, agencies, and partners.	County Administrator's Office	Various	Ongoing	SE-7c, SE-7d, SE-7j, SE-9b, SE-9g	Number of meetings held
48	Actively seek grant funding for defensible space and vegetation management projects. Coordinate project identification, prioritization, and selection with the County Resilience Coordination Team (Program SE-14.11.1).	Permit Sonoma	County Administrator's Office	Ongoing	SE-7c, SE-7d, SE-7j, SE-9b, SE-9g	Grant funding secured
49	Working through the Resilience Coordination Team (Program SE-14.11.1), conduct an assessment of regulatory barriers to vegetation management activities and identify opportunities for streamlining, including the use of the California Vegetation Treatment Program (CalVTP) and Program Environmental Impact Report for eligible projects in the State Responsibility Area. The assessment should recommend updates to Sonoma County Code, plans, or policies to reduce barriers.	Permit Sonoma	County Administrator's Office	2028	SE-7j, SE-7m	Assessment completed
50	Publish on the County's website information, resources, and guidance to assist development applicants with complying with the County's Fire Safe Standards (Sonoma County Code Chapter 13, Article V) and the State Fire Safe Regulations, including instructions on the process for applying for exceptions to standards.	Permit Sonoma	N/A	2025	SE-8c	Website updated

Program #	Program	Lead Department/				
51	Track Exceptions to Standards with Same Practical Effect Determinations made by the Director and County Fire Marshal pursuant to State Minimum Fire Safe Regulations (Title 14, California Code of Regulations (CCR), division 1.5, chapter 7, subchapter 2) through the publicly available permit information and parcel history available through Permit Sonoma.	Permit Sonoma	N/A	Ongoing	SE-8c	Determinations available online
52	Review and update as necessary relevant County Code sections and application submittal checklists to require fire protection plans for all discretionary development projects in High and Very High Fire Hazard Severity Zones in both the Local and State Responsibility Areas. Required plans shall include a site-specific risk analysis and address fire response capabilities, compliance with fire safety requirements including but not limited to defensible space, access and water supply, building materials and site design, emergency preparedness and evacuation plans, property maintenance, and other hazard and risk reduction measures. Risk reduction measures should be incorporated into project design or conditions of approval.	Permit Sonoma	N/A	2027	SE-8g	Updated County Code and application submittal checklists
53	In partnership with Fire Safe Councils, local fire agencies, CAL FIRE, and other community groups and agencies, implement a public information campaign in multiple languages and through multiple forms of media on defensible space, home hardening, and vegetation management. Educational materials should discuss the risk reduction impact, regulatory requirements, and resources available to support property owners and renters on implementing hardening or fuels reduction activities.	Permit Sonoma	Emergency Management	2027	SE-7d, SE-9c	Resources and information distributed
54	Develop fire-safe landscaping guidelines, including native, fire- and drought-resistant plant palettes and defensible space measures.	Permit Sonoma	N/A	2027	SE-7d, SE-9c	Guidelines created
55	Explore the feasibility of a pilot program to provide emergency towing services during flood events for travel trailers occupied by tenants renting space in RV or mobile home parks sited in flood hazard areas to reduce damage or loss of housing units.	Permit Sonoma	Emergency Management	2026	SE-10-b	Funding and process identified
56	Secure funding to establish the Countywide Flood Risk Assessment Management Partnership as recommended by the 2024 Countywide Flood Risk Management Assessment Project report. The Partnership, composed of organizations and agencies with flood risk management roles and responsibilities in Sonoma County, should meet quarterly to build relationships across flood risk management functions and jurisdictions, facilitate interorganizational communication, and carry out the recommendations identified in the 2024 Assessment report related to: policies and standards; monitoring, modeling, and decision support; stream maintenance; and communication and community engagement.	Emergency Management, Sonoma Water	County Administrator's Office, Permit Sonoma, Sonoma Public Infrastructure	2027	SE-10c	Partnership formed; quarterly meetings held
57	Develop a systematic approach for conducting proactive technical review on Sonoma County waterways for the purpose of updating the Flood Insurance Rate Maps (FIRMs) through collaboration with the Federal Emergency Management Agency (FEMA).	Permit Sonoma	N/A	2030	SE-10c	Approach developed
58	Secure funding to conduct a flood risk and vulnerability assessment then prepare a flood mitigation and adaptation plan for the Russian River watershed to develop long-term strategies to reduce repetitive flood losses and build flood resilience. The plan should include systematic collection of flood data and damage, community engagement and outreach, and coordination with relevant partner agencies and jurisdictions. The mitigation and adaptation plan should consider strategies such as the acquisition of properties in flood hazard areas; an ongoing flood elevation program; permit fee reductions for structure elevations; floodplain conservation and restoration; updates to policies and regulations; and site- or area-specific projects. The planning process should evaluate potential upstream improvements that could expand flood storage capacity and existing regulatory barriers to flood prevention projects.	Permit Sonoma	Sonoma Water, Sonoma Public Infrastructure, Department of Emergency Management, County Administrator's Office	2032	SE-10c, SE-10d	Completed assessment and plan
59	Update the County website to expand on and integrate existing informational resources to create a comprehensive public information program on flood and inundation hazards, risk reduction resources, and the importance of watershed management.	Permit Sonoma	N/A	2026, Ongoing	SE-10f	Updated County website
60	Secure funding to identify, evaluate, and prioritize conservation projects to implement on County-owned lands to mitigate flooding, drought, and sea level rise.	County Administrator's Office	Sonoma Public Infrastructure, Regional Parks, Permit Sonoma, Sonoma Water	2030	SE-11a, SE-14c, SE-14g, SE-16g	
61	Update Sonoma County Code Chapter 7B (Flood Damage Prevention Ordinance) and Chapter 26 (Zoning), including standards for construction or fill in special flood hazard areas and regulations limiting the reconstruction of non-conforming uses, to make amendments necessary to support the replacement of damaged or destroyed resident-serving businesses and services in repetitive loss, flood-prone areas to ensure that communities continue to have access to daily resources and services, such as grocery stores. Proposed code amendments should support existing residents and businesses while continuing to implement necessary floodplain management regulations to maintain compliance with the National Flood Insurance Program and provide for adequate retention of floodplain capacity and protection for structures located within special flood hazard areas.	Permit Sonoma	N/A	2026	SE-10e, SE-10g, SE-11f	Updated County Code

Program #	Program	Lead Department/				
62	Adopt Appendix A of the California Existing Building Code entitled Guidelines for the Seismic Retrofit of Existing Buildings.	Permit Sonoma	N/A	With each building code cycle	SE-12b	Updated County Code
63	Update the County Code to require geologic hazard assessments or geotechnical reports for new development within or in close proximity to geologic or seismic hazards, including landslide, ground rupture, liquefaction, and ground shaking areas.	Permit Sonoma	N/A	2028	SE-12d	Updated County Code
64	Explore the deployment of advanced monitoring technologies to detect early signs of landslides and review existing response protocol.	Emergency Management	Permit Sonoma	2030	SE-12i	Monitoring technologies identified
65	Using the County's existing inventory of unreinforced masonry buildings, conduct outreach to property owners to gather and confirm data on existing unreinforced buildings. Then apply for grant funding from sources like the California Office of Emergency Services to conduct a seismic retrofit feasibility study, adopt an ordinance requiring the strengthening and/or retrofitting of unreinforced masonry buildings, and fund necessary retrofits for identified structures in the county, prioritizing retrofits to buildings in systemically vulnerable communities.	Permit Sonoma	N/A	2030	SE-12c, SE-12p	Updated County Code, number of buildings retrofitted
66	Maintain existing hazardous materials programs administered by the County's Hazardous Materials Unit acting as the Certified Unified Program Agency (CUPA). Provide program information on the County website.	Permit Sonoma	N/A	Ongoing	SE-13b	Programs maintained
67	Update the County website and provide resources to educate residents and businesses about integrated pest management principles and ways to reduce or discontinue the use of pesticides and herbicides on their property.	Agricultural Commissioner's Office	Permit Sonoma	2027	SE-13c	Updated County website
68	Develop a maintenance program for all County facilities that specifies the least toxic maintenance methods and materials.	Sonoma Public Infrastructure	Health Services	2030	SE-13c	Program development and implementation
69	Update the relevant pages of the County's website to include information about common household chemicals or items that can be hazardous, such as electronic cigarettes, and that require safe disposal practices. Include the common examples of household hazardous wastes list generated by the Zero Waste Sonoma, safer alternatives, and information on resources and programs for safe disposal.	Permit Sonoma	Health Services	2027	SE-13c, SE-13e	Updated County website
70	Continue to use data from sources like the California Department of Toxic Substances Control to ensure buildings and sites have been adequately remediated prior to development or redevelopment. If there is reason to believe an existing building or site may contain hazardous materials that pose a threat to occupants, require investigation for the presence of hazardous materials or contamination and risk evaluation prior to development. Continue to require remediation and construction techniques as conditions of approval where necessary for adequate protection of construction workers, future occupants, adjacent residents, and the environment from hazards associated with contamination.	Permit Sonoma	N/A	Ongoing	SE-13f	Sites reviewed
71	Prepare updated sea level rise and coastal hazard assessments and adaptation plans for the Sonoma County outer-coast, San Pablo Bay and Petaluma area shorelines based on the best available science and State guidance, and in compliance with State legislation (Public Resources Code Section 30985) and the directives of the Local Coastal Plan. The assessments and plans shall evaluate vulnerability and identify adaptation strategies, including policy recommendations and potential projects for private development, critical public facilities, infrastructure and land, and natural ecosystems. Coordinate with the City of Petaluma, Coastal Commission, and the San Francisco Bay Conservation and Development Commission on this effort.	Permit Sonoma	County Administrator's Office	2034	SE-14c, SE-14g	Hazard Assessments and Adaptation Plans completed
72	In coordination with the local Groundwater Sustainability Agencies, study, monitor, develop, and implement a plan to mitigate the impacts to groundwater from saltwater intrusion resulting from sea level rise and storm events based on the best available science.	Permit Sonoma	N/A	2032	SE-14d	Plan developed

Program #	Program	Lead Department/				
73	Complete an analysis of physical locations and County-owned assets within the County that have the potential to serve as resilience centers, in coordination with community-based organizations that serve systemically vulnerable communities. Identify opportunities to establish new resilience centers or expand the functionality of existing centers. Develop a searchable database, accessible across all county departments, of all County-owned facilities that can function as resilience centers, and update regularly to reflect improvements and retrofit or hardening efforts.	Emergency Management	Sonoma Public Infrastructure, Permit Sonoma, Health Services	2028	SE-15a	Assessment completed, database developed
74	Coordinate with local transit providers to publicize transit options to reach resilience centers during emergency events.	Emergency Management	Sonoma Public Infrastructure	Ongoing	SE-15b	Publicized transit options
75	Secure grant funding to work with the community to identify and map existing community facilities that could serve as potential resilience centers in partnership with the County. Document existing conditions, capabilities, and resources of each facility such as air conditioning, heat pumps, air filters, backup power, or emergency supplies.	Emergency Management	Permit Sonoma	2029	SE-15d	Map developed and data logged
76	Update the County Code to establish permitting, design, development, and operation standards for temporary resilience centers on private property. Use community input to inform the Code update.	Permit Sonoma	Emergency Management	2030	SE-15e	Updated County Code
77	Use County communication channels to promote methods of safe energy conservation during extreme heat events in alignment with energy providers' messaging. Share information on improvements that are low-cost and low-effort, such as caulking, door sweeps, portable fans, and home window insulation.	County Administrator's Office	Emergency Management	Ongoing	SE-15g	Energy conservation communication pushes
78	Update the County Code to require parking lots for new commercial and industrial uses to incorporate cooling strategies such as landscaping or shade structures. Enforce requirement during application review, providing flexible options for compliance.	Permit Sonoma	N/A	2030	SE-15h	Updated County Code
79	Maintain and regularly convene the Sonoma County Drought Task Force, led by the Department of Emergency Management with support from Sonoma Water, in compliance with California Water Code Section 10609.70. The Task Force shall proactively coordinate with public agencies, private agencies, and community organizations that have roles in drought preparedness and response on conditions monitoring, hazard and risk assessments, contingency planning, and water resources management. The Task Force shall monitor drought conditions, weather, and water availability; identify and support the pursuit of State and federal drought resources and funding; and during periods of drought, provide public report outs on drought impacts to agriculture, industry, government, wildlife, tourism, health, and other areas.	Emergency Management	Sonoma Water	Ongoing	SE-10a, SE-10b, SE-10c, SE-10d	Meetings held; public information distributed
80	Review and evaluate the Sonoma County Code and development design guidelines for opportunities to require or incentivize low impact development, recycle and greywater use, rainwater capture, water-efficient landscaping, and other water conservation measures. Explore the development of pre-approved design details for low impact development or greywater systems to reduce costs to applicants.	Permit Sonoma	N/A	2030	SE-16j, SE-16k	Updated County Code
M.1	Periodically review and update as necessary the General Plan to include new information related to climate adaptation and resiliency strategies and geologic and seismic, flooding and inundation, and wildfire hazards, as required by Government Code Section 65302.15. Continue to use data from appropriate agencies and research institutions to inform the Safety Element. Make hazard maps available to the public and maintain and share hazard data across departments and agencies.	Permit Sonoma	N/A	Ongoing	SE-9a, SE-10a, SE-12a	Updated Safety Element
M.2	When updated or new hazard maps that impact land use and development regulations are produced by state or federal agencies, notify property owners that are directly impacted by changes. Hazard maps include but may not be limited to Earthquake Fault Zones mapped by the California Department of Conservation, Fire Hazard Severity Zones mapped by the State Fire Marshal, and Special Flood Hazard Areas mapped by the Federal Emergency Management Agency.	Permit Sonoma	N/A	Ongoing	SE-9a, SE-10a, SE-12a	Notices sent to affected property owners

Sonoma County General Plan 2020

SAFETY ELEMENT

Appendices A-C

Sonoma County Permit and Resource Management Department

2550 Ventura Avenue

Santa Rosa, California 95403

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Appendix A
Sonoma County Climate Change Vulnerability Assessment







Sonoma County

Climate Change Vulnerability Assessment

May 2024

Prepared by
Rincon Consultants, Inc.



DISCLAIMER:

Rincon Consultants, Inc. (hereinafter referred to as "Rincon") prepares vulnerability assessments that evaluate climate change hazards, including wildfire, based on numerous sources, including third party consultants, State and Federal mapping resources, and various software modeling programs that are considered industry standard best practices. The Climate Change Vulnerability Assessment prepared for the Safety Element it accompanies, evaluated wildfire hazards based on CAL FIRE's Fire Hazard Severity Zones available at the time the report was prepared. Wildfire is unpredictable, and the specific conditions of wildfire could result in fire behavior that diverges from the assumptions used in this analysis. There is no guarantee that wildfire behavior and specific treatment to avoid such behavior will follow or prevent wildfire impacts. Rincon is not responsible for any damage to life or property that might occur based on the results of the vulnerability analyses in this Climate Change Vulnerability Assessment, and any accompanying recommendations.

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Executive Summary

The Sonoma County Climate Change Vulnerability Assessment provides an evaluation of potential climate change impacts on community members rendered vulnerable by systemic inequities; parks and natural resources; agriculture; and critical facilities, buildings, services, and infrastructure in unincorporated Sonoma County. While there may be overlap of infrastructure and services in incorporated areas, this assessment addresses risks to populations and assets in unincorporated Sonoma County because this is the area the County has land use jurisdiction. However, the impacts of climate change cross jurisdictional boundaries, and strengthening the County's climate resilience requires coordinated effort across local and regional jurisdictions. This assessment is intended to assist the County with developing climate adaptation goals, policies, and implementation programs for an update to the Safety Element of the Sonoma County General Plan.

Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth's surface raising global average temperatures in what is referred to as the greenhouse effect. This increase in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry. Climate change models[1] indicate that Sonoma County is expected to experience the impacts presented in this assessment by the end of the century (see Figure 1 for a summary of impacts).

Community Engagement

Incorporating input from the community into the development of this Climate Change Vulnerability Assessment provides critical context for how recent climate-driven events in Sonoma County have impacted critical infrastructure and services and community members. It also serves to identify existing government-run programs or initiatives within the county and remaining gaps. Interviews with asset managers, technical experts, community experts, and frontline responding agencies in Sonoma County elicited information on existing and planned efforts to manage climate change impacts now and in the future. The information shared by these stakeholders will further inform climate adaptation policies and programs in the County's Safety Element update and will continue to provide ongoing guidance on implementation strategies that address key community needs and concerns. Detailed summaries of stakeholder interviews can be found included as Appendix A.

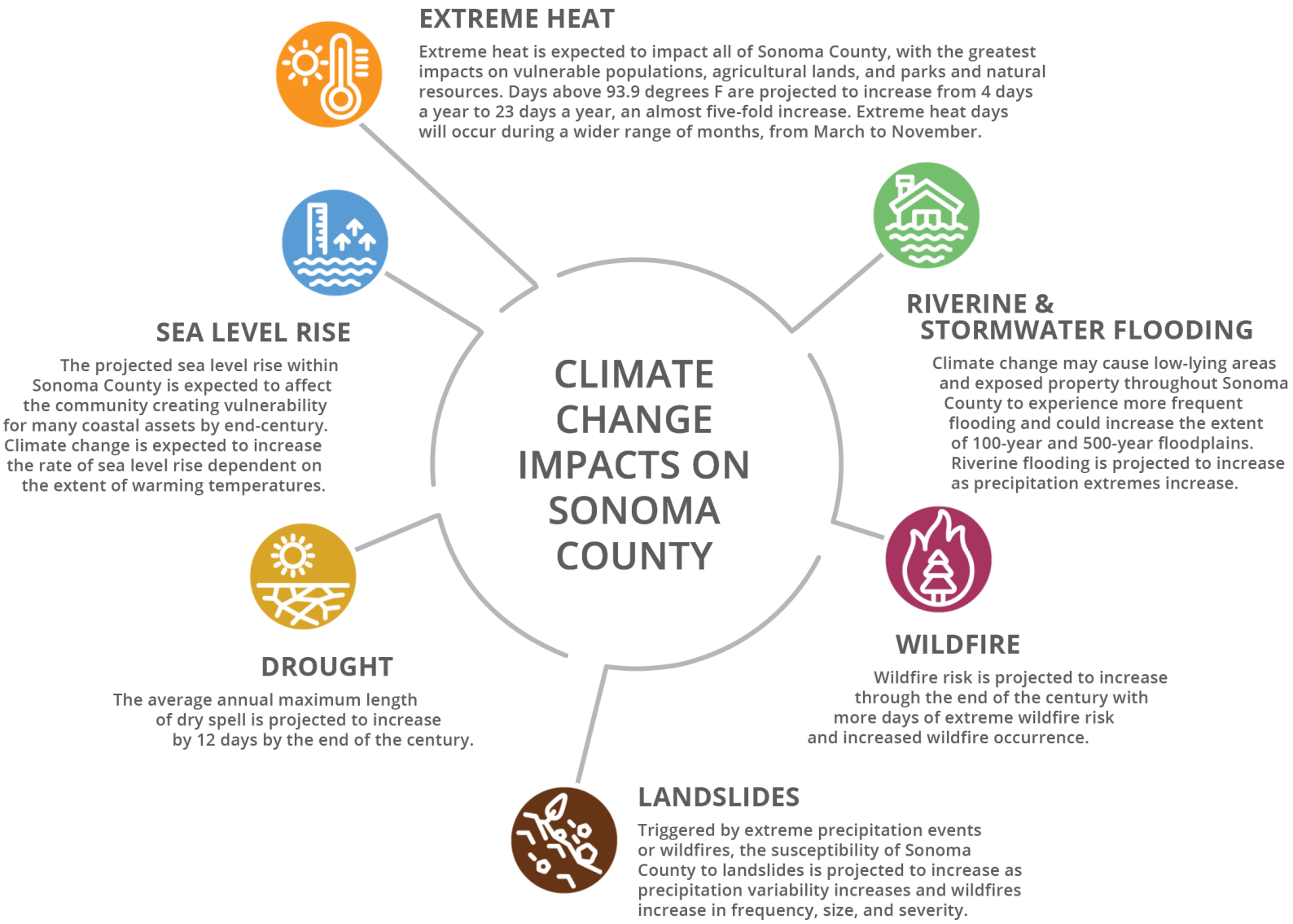
An Equity Working Committee was also formed to help shape environmental justice policies and risk reduction planning for wildfire and other hazards by centering the expertise of under-resourced communities. The Equity Working Committee is an advisory group of community members that are invested in developing climate adaptation and environmental justice solutions that meet the needs of the diverse communities in Sonoma County.

[1] Cal-Adapt 2.0 is an online tool that presents historic and modeled projections based on 10 different global climate models. The tool was developed and is maintained by the University of California, Berkeley Geospatial Innovation Facility with funding and oversight by the California Energy Commission (CEC). This tool was used to present projection data related to minimum and maximum temperature, precipitation, extreme heat, warm nights, drought, and wildfire

The Equity Working Committee provided critical feedback on the following aspects of this assessment: the social sensitivity index and populations made sensitive by systems in Sonoma County.

A public survey was conducted to further guide the development of the Sonoma County Safety Element update. The survey responses provide insight into challenges people face during climate change-related hazard events and what actions they are taking to be better prepared to face those challenges. The survey results were incorporated throughout the assessment and provided key insights to vulnerabilities that Sonoma County residents face. More detailed information about this survey including summaries and responses can be found in Appendix B.

Figure 1 Sonoma County Climate Change Impacts



Overview

The Sonoma County Climate Change Vulnerability Assessment describes the impacts climate change is expected to have on community members, assets, and critical facilities and services, and the degree to which they are susceptible (e.g., vulnerable). Vulnerability is a function of exposure, sensitivity, and potential impact. The Sonoma County Climate Change Vulnerability Assessment also evaluates the ability for the community and assets to recover from and adjust to the consequences of climate change (e.g., adaptive capacity). This assessment explores each of these factors qualitatively then estimates vulnerability for each population or asset at risk.

This assessment is organized as follows:

- **Section 1**, Introduction, describes the purpose of this assessment, community input gathered, key terms, and includes a note on existing County efforts to evaluate climate impacts and increase resiliency.
- **Section 2**, Methodology, explains the methodology used to prepare the Sonoma County Climate Change Vulnerability Assessment and its reliance on the California Adaptation Planning Guide.
- **Section 3**, Exposure to Climate Hazards, provides an overview of projected changes to the climate and the County's exposure to climate hazards.
- **Section 4**, Sensitivity, characterizes the sensitivity of populations, assets, and critical facilities and services in Sonoma County. Sensitivity is the degree to which a species, population, natural system, community, asset, or other associated system may be affected by changing climate conditions. Note that this section received significant input and direction from Equity First.
- **Section 5**, Vulnerability Analysis, evaluates potential impacts and adaptive capacity of sensitive population groups, the County's natural resources and park assets, agriculture, and critical facilities, buildings, services, and infrastructure. Based on a combination of potential impacts and adaptive capacity, the vulnerability of each population group, asset, or critical facility and service is ranked as either high, medium, or low.
- **Section 6,** Vulnerability Summary, presents key findings, including problem statements which characterize the major impacts Sonoma County will experience from climate change.

The following sensitive populations, assets, and critical facilities and services were identified as those that are most susceptible to climate change hazards in Sonoma County and evaluated in this assessment.

Populations

While all people in a community will experience climate change, some are already and will continue to be more harmed by it than others. Systemic inequities render some populations more sensitive to climate change impacts. Populations made sensitive by systems experience heightened risk to climate change and have fewer resources to adapt and recover from climate change impacts. Sonoma County is home to several populations made sensitive by systems, and who have already been disproportionately harmed by climate change, including:

- **Individuals with High Outdoor Exposure.** Outdoor workers, people experiencing houselessness, visitors, people recreating outdoors.
- **Under-Resourced Individuals.** People experiencing poverty, unemployed individuals, individuals with no health insurance, households without a computer, households without broadband internet, households with limited computer skills, renters, individuals without vehicle access, single-female heads of households, individuals with educational attainment of less than 4 years of high school, individuals in overcrowded housing, mobile home households, households experiencing housing burden, households experiencing energy burden.
- **Individuals Facing Societal Barriers.** Black, Indigenous, and People of Color (BIPOC), Native Americans, limited and non-English speakers, immigrants, people who are undocumented.
- **Individuals with Chronic Health Conditions or Health Related Sensitivities**. Seniors, young children, people who are differently abled, individuals with asthma, individuals with cardiovascular disease, military veterans.

Parks and Natural Resources

- Open spaces
- Forested land
- Critical habitat
- Waterways
- Regional parks
- Hillsides
- Vegetation communities

Critical Facilities, Buildings, Services, and Infrastructure

- Fires Stations
- Police Stations
- Hospital/Healthcare Facilities
- Emergency Shelters
- Schools
- Public Libraries
- Airports

Agriculture

- Cropland
- Rangeland

Adaptive Capacity

Adaptive capacity is the ability to recover from and adjust to the consequences of climate change. Types of adaptive capacity include adjustments in behavior, resources, processes, and technologies. Sonoma County has actively taken steps to increase the County's adaptive capacity through various existing policies, plans, programs, and institutions that increase the County's resilience to climate change.

Although there are initiatives in place to mitigate the impacts of wildfire, flooding, and drought on agricultural lands, parks and natural resources, and critical facilities and services, as well as to reduce the impacts of extreme heat, drought, and wildfire on community members, none of the sensitive populations, assets, and critical facilities and services evaluated in this assessment were ranked as having a High adaptive capacity score. The County has the

opportunity to identify additional programs or adjustments to existing programs to improve adaptive capacity as part of the Safety Element update.

The adaptive capacity of the County's sensitive populations, assets, and critical facilities and services are described and scored in Section 5, *Vulnerability Analysis*. A non-exhaustive list of some of the County's most important initiatives to increase adaptive capacity can be found in Appendix C.

Vulnerability Analysis

This assessment evaluates how climate change may impact community members who are rendered vulnerable by climate change and systemic inequities, parks and natural resources, and critical facilities, buildings, services, and infrastructure in Sonoma County. The report provides a prioritized list of population groups in Section 4.1, *Populations*, for which adaptation policies and programs should be developed and implemented to increase resilience.

A complete list of the population groups and other asset categories with high-vulnerability scores is provided in Table 1. The following is a list of key vulnerability findings from this assessment:

- All populations made sensitive by systems are highly vulnerable to all climate hazards, particularly in the case of extreme heat, drought and landslides which had lower adaptive capacity scores.
- Parks and natural resources are highly vulnerable to extreme heat, drought, wildfire, landslides, and sea level rise. Impacts to natural resources include habitat conversions, damage, and mortality, and scarcity of resources for plants and wildlife.
- Critical facilities, buildings, services, and infrastructure are highly vulnerable to wildfire, landslides, extreme heat, and sea level rise. There are many critical facilities, including fire stations and emergency shelters in the County's wildfire hazard zones. Infrastructure and dependent populations experience additional cascading impacts due to power outages from downed utility lines, public safety power shut offs and grid overload. All forms of power outages can affect how emergency services are able to perform their needed functions during an emergency or extreme weather event. Wildfires can result in direct impacts to properties, triggering evacuations and can lead to permanent displacement.
- Sonoma County agriculture is highly vulnerable to drought, extreme heat, wildfires, and landslides. Vulnerability is largely attributed to the potential for high impacts to livestock, crops, and agricultural workers.

This assessment establishes a foundation for identifying adaptation policies and programs that can increase resilience in Sonoma County. The Sonoma County Safety Element will include policies and programs to increase the resilience of the population groups and asset categories with the highest vulnerability to climate change.

Table 1 Vulnerability Analysis of Populations and Asset Groups by Climate Hazard

Climate Hazard			
Extreme Heat	High	Low	**5-High**
Wildfire	High	Medium	**4-High**
Riverine and Stormwater Flooding	Medium	Low	**4-High**
			High-4
			High-4
			High-5
			4-High
			4-High
			4-High
			4-High
			4-High
			4-High
			4-High
Extreme Heat	High	Low	**High-5**
Drought	High	Medium	**High-4**
Wildfire	High	Medium	**High-4**
Landslides	High	Low	**High-5**
Sea Level Rise	High	Medium	**High-4**
Extreme Heat	Medium	Low	**High-4**
Wildfire	High	Medium	**High-4**
Landslides	High	Medium	**High-4**
Sea Level Rise	High	Low	**High-5**

Climate Hazard			
Extreme Heat	High	Low	**High-5**
Drought	High	Medium	**High-4**
Wildfire	High	Medium	**High-4**
Landslides	High	Low	**High-5**

1 Introduction

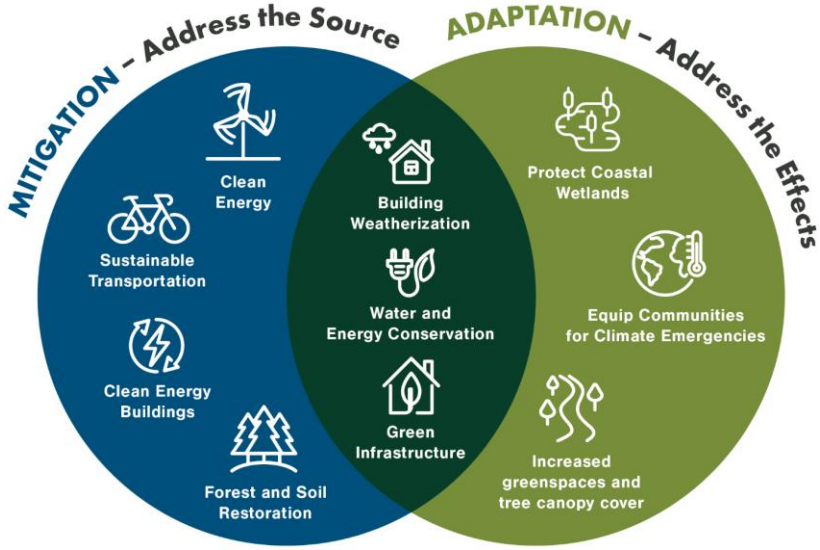
Purpose

This assessment evaluates how climate change will continue to impact vulnerable community members, natural resources and parks and open spaces, agriculture, critical facilities, buildings, services, and infrastructure in unincorporated Sonoma County. Government Code § 65302, as amended by Senate Bill (SB) 379, requires cities and counties across California to prepare a Climate Change Vulnerability Assessment that informs updates to the Safety Element of the General Plan. Understanding Sonoma County's vulnerabilities to climate change provides a foundation to develop required climate adaptation goals, policies, and implementation programs for the Safety Element. The guiding methodology used in this assessment is based on the California Adaptation Planning Guide, which is discussed in Section 2, *Methodology*. Climate change can also be addressed by mitigating the production of greenhouse gas emissions through reduction measures. The difference between climate mitigation and adaptation is further explained in Figure 2.

Causes of Climate Change

Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth's surface raising global average temperatures in what is referred to as the greenhouse effect. This increase in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry (NASA 2022). According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years (IPCC, 2021). The dramatic increase in GHGs is attributed to human activities beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing (NASA 2022).

Figure 2 Climate Change Mitigation and Adaptation



Sonoma County Snapshot

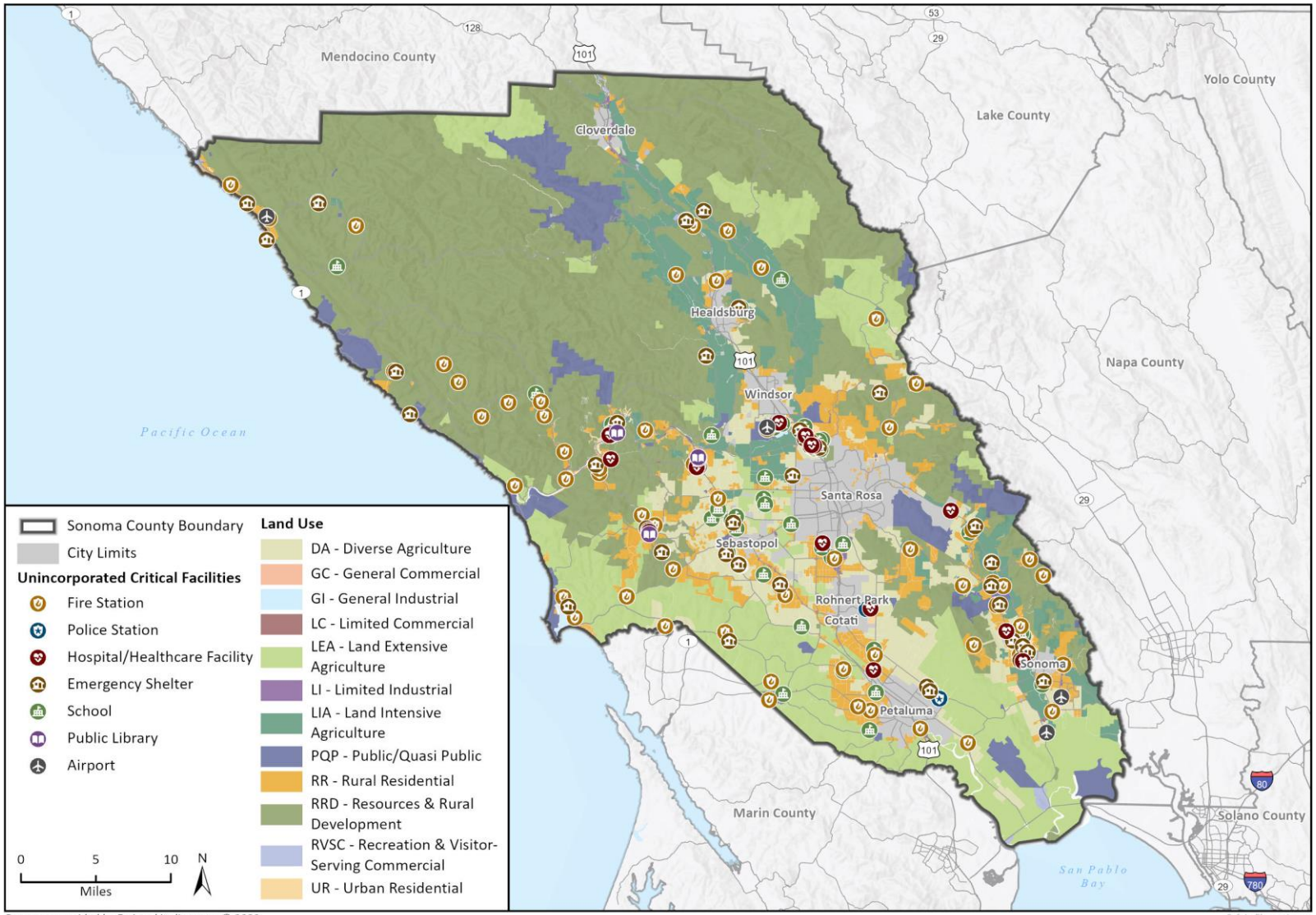
Sonoma County is located at the northern-most edge of the greater San Francisco Bay Area region. The County's 1,515 square miles contain nine incorporated municipalities and 13 unincorporated communities. Sonoma County has the 17th largest County population of California's 58 counties at approximately 494,336 people with major population centers in the cities of Santa Rosa, Petaluma, and Rohnert Park. Sonoma County borders Marin County and San Pablo Bay to the south, Solano, Napa and Lake Counties to the east, Mendocino County to the north, and the Pacific Ocean to the west. U.S. Highway 101 is the main highway in the county, running north to south through the county's center. Other major roadways are State Highways 12, 37, 116, 121 and 128. Airports include Charles M. Schulz–Sonoma County Airport in Santa Rosa and the Sonoma Valley Airport and Sonoma Skypark in the City of Sonoma. Sonoma County Transit buses run countywide. The SMART Train (Sonoma–Marin Area Rail Transit) carries passengers from the Charles M. Schulz–Sonoma County Airport to Larkspur in Marin County; future extensions as far north as Cloverdale are planned.

The County is home to federally owned lands including parks, wildlife areas and other public lands (Sonoma County 2022). The General Plan designates the vast majority of unincorporated Sonoma County as Resources and Rural Development or Agriculture, as can be seen in Figure 3. Existing critical facilities are also shown in Figure 3 and represent facilities necessary for a community's response to and recovery from emergencies. Critical facilities must continue to operate during and following a disaster to reduce the severity of impacts on the community and accelerate recovery.

The following critical facilities are included in this assessment:

- Fires Stations
- Police Stations
- Hospital/Healthcare Facilities
- Emergency Shelters
- Schools
- Public Libraries
- Airports

Figure 3 Sonoma County Critical Facilities and General Plan Land Use Designations



Glossary

Several words and phrases are used throughout the report to illustrate climate vulnerabilities within Sonoma County.

- **Adaptation.** The process of adjustment to actual or expected climate and its effects, either to minimize harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate (IPCC, 2012).
- **Adaptive Capacity.** The ability for a community to cope with and adjust to the impacts of climate change (Cal OES 2020).
- **Asset.** Reference to a resource, structure, facility, or service that is relied upon by a community.
- **Cascading Impact.** Climate hazard-caused impacts that compromise infrastructure or disrupt critical services (i.e., power supply or water conveyance) broadening the scope of impact past a singular subject to reliant subsystems and populations (Collins et al. 2019).
- **Climate Driver.** A change in the climate which acts as the main source of change for subsequent climate hazards. Climate drivers relevant to the County and discussed in this assessment are temperature and precipitation.
- **Climate Hazard**. A dangerous or potentially dangerous condition created by the effects of the local climate (Cal OES 2020). Climate hazards of concern for Sonoma County are extreme heat, drought, wildfire, landslides, riverine and stormwater flooding, and sea level rise.
- **Compounding Risk.** When two or more extreme events or average events occur simultaneously and increase the scope of impact or severity of the event; an additional risk brought about by increased frequency of events from climate change (Seneviratne et al. 2012).
- **Impact.** Effects on natural and human systems including effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate hazards and the vulnerabilities of the system or asset effected (IPCC 2012).
- **Mitigation.** An act or sustained actions to reduce, eliminate, or avoid negative impacts or effects (Cal OES 2020).
- **Resilience.** The capacity of an entity (an individual a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (Cal OES 2020)
- **Sensitivities**. The degree to which a species, natural system, community, asset, or other associated system would be affected by changing climate conditions (Cal OES 2020).
- **Populations made sensitive by systems.** Populations that experience heightened risk and increase sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts due to systemic inequities (Cal OES 2020).
- **Vulnerability.** The propensity or predisposition to be adversely affected (IPCC 2012).

Community and Stakeholder Engagement

Incorporating input from the community into the development of this Climate Change Vulnerability Assessment provides critical context for how recent climate-driven events in Sonoma County have impacted critical infrastructure and services and community members. It also serves to identify existing government-run programs within the county and remaining gaps. Interviewing asset managers, technical responders, and frontline responders in Sonoma County elicited information on existing and planned efforts to manage climate change impacts now and in the future. Information shared by stakeholders will further inform climate adaptation policies and programs in the County's Safety Element update and will continue to provide ongoing guidance on implementation strategies that address key community concerns.

Stakeholder Focus Group Interviews

Sonoma County hosted three stakeholder focus group interview sessions to guide and support the development of this assessment. Equity First Consulting hosted a fourth focus group interview to gain insight and knowledge from community experts who were directly involved in serving communities impacted by recent disasters within Sonoma County. Each stakeholder focus group brings unique expertise within Sonoma County. Incorporating this knowledge is critical in understanding the breadth of impacts, vulnerabilities, and existing adaptive capacity in the county. Members from Sonoma County departments, community-based organizations, state and regional partners, and other local key entities include:

- CAL FIRE
- Community Organizations Active in Disaster (Prior Staff)
- Dutton Ranch
- Generation Housing
- Gold Ridge Resource Conservation District
- Greenbelt Alliance
- Health Action Together
- La Luz Sonoma Valley (Prior Staff)
- La Plaza
- North Bay Jobs with Justice
- North Bay Organizing Project
- PG&E (Pacific Gas & Electric)
- Permit Sonoma
- Roseland Community Building Initiative
- Santa Rose-Sonoma County NAACP (National Association for the Advancement of Colored People)
- Sonoma County Climate Action and Resiliency Division
- Sonoma County Community Development Commission
- Sonoma County Department of Health Services
- Sonoma County Economic Development Board
- Sonoma County Emergency Operations Center
- Sonoma County Farm Bureau
- Sonoma County Fire District
- Sonoma County Permit & Resource Management Department
- Sonoma County Public Infrastructure
- Sonoma County Regional Climate Protection Authority
- Sonoma County Regional Parks
- Sonoma County Sheriff's Office
- Sonoma Immigrant Services

- Sonoma Resource Conservation District
- Sonoma Valley Community Health Center
- Sonoma Water
- Transportation Land Use Coalition

The stakeholder focus group interviews were hosted on December 12, 2022, December 20, 2022, January 20, 2023, and August 22, 2023. The County provided the focus group attendees with an overview of climate change projections. Attendees provided input on their primary climate hazards of concern, experiences during recent regional climate hazard events, barriers faced when preparing for and/or responding to climate hazards, and plans, programs, and resources they engage with that increase their adaptive capacity. This assessment includes key findings from the stakeholder focus group interviews, which are integrated primarily in Section 5, *Vulnerability Analysis*. Summaries of the stakeholder focus group interviews are included as Appendix A.

Equity Working Committee

Sonoma County assembled an Equity Working Committee to help shape environmental justice policies and risk reduction planning for wildfire and other hazards by centering the expertise of under-resourced communities. The Equity Working Committee is an advisory group of community members that are invested in developing climate adaptation and environmental justice solutions that meet the needs of the diverse communities in Sonoma County. The Equity Working Committee provided critical feedback on the social sensitivity index and populations made sensitive by systems in Sonoma County, which are discussed in Sections 4 and 5 below.

Safety Element Survey

A safety element survey was distributed to the public to understand how the community has been impacted by climate change, their perceptions of climate change, how they are preparing, and what barriers they have faced to preparing for more extreme weather events as the result of climate change. The survey responses provided insight into the community's understandings and perceptions of climate change. Common themes from the survey are incorporated primarily in Section 5, *Vulnerability Analysis*. Summaries and responses for each survey question can be found in Appendix C.

Existing Climate Efforts and Alignment

The Sonoma County Board of Supervisors adopted a Climate Change Action Resolution on May 8, 2018 (Resolution Number 18-0166). This Resolution is intended to support a countywide framework for coordinated implementation of greenhouse gas reduction measures. The Resolution identifies that monitoring climate change, and its effects is an important action to help Sonoma County in its goal to increase resilience. This assessment supports that directive. It builds upon and complements the County's earlier climate efforts with a focus on understanding local vulnerabilities to inform the development of adaptation and resilience strategies for the Sonoma County General Plan Safety Element update.

Current climate action work within the County organization is largely guided by the Sonoma County Regional Climate Protection Authority (RCPA) and the County Administrator's Office Climate Action and Resiliency Division (CARD). The RCPA was formed in 2009 through locally sponsored State legislation to coordinate countywide climate protection efforts among Sonoma County's nine incorporated jurisdictions and multiple countywide agencies. The

RCPA coordinates the activities of local jurisdictions with regional, state, and federal entities at both policy and administrative levels across three primary areas of focus: decarbonization, carbon sequestration, and resilience. The RCPA performs a variety of important functions including advocacy, project management, planning, finance, grant administration, and research. CARD helps the County organization implement the goals and objectives within the Climate Action and Resiliency Pillar of the County's 2021-2026 Strategic Plan.

CARD's Climate Resilient Lands Strategy helped inform this assessment. The Climate Resilient Lands Strategy centers on increasing the resilience of the County's natural and working lands through conservation, land management, restoration, and more. It provides useful information on potential climate impacts on natural and working lands through an ecological lens and can be used in complement to this assessment for a more comprehensive understanding of the County's vulnerability to climate change. Where relevant, this assessment notes when the Climate Resilient Lands Strategy can provide additional information.

The County's Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), updated in 2021, provides a comprehensive overview of hazard risk and exposure countywide, describes adaptive capacity, and identifies ways to minimize risks. While the MJHMP's primary focus is the current risk that hazards pose, it also provides a brief discussion on how climate change will exacerbate existing hazard risk. The MJHMP informed aspects of the exposure, impacts, and adaptive capacity components of this assessment.

2 Methodology

Introduction

This section describes the methodology used to develop the Sonoma County Climate Change Vulnerability Assessment. It includes reference to key guidance documents and data used to inform this assessment. The methodology used to generate the Social Sensitivity Index is discussed, as well as the vulnerability scoring approach used to rank the vulnerability of community members, assets, and critical facilities and services.

California State Law on Climate Change

Government Code Section 65302 (as amended by Senate Bill 379) requires cities and counties to prepare a climate change vulnerability assessment as part of an update to the General Plan Safety Element. The information that must be included in a climate change vulnerability assessment is stipulated in Section 65302 (g)(4)(A)(ii), and included below:

- Information from the internet-based Cal-Adapt tool.
- Information from the most recent version of the California Adaptation Planning Guide.
- Information from local agencies on the types of assets, resources, and populations that will be sensitive to various climate change exposures.
- Information from local agencies on their current ability to deal with the impacts of climate change.
- Historical data on natural events and hazards, including locally prepared maps of areas subject to previous risk, areas that are vulnerable, and sites that have been repeatedly damaged.
- Existing and planned development in identified at-risk areas, including structures, roads, utilities, and essential public facilities.
- Federal, state, regional, and local agencies with responsibility for the protection of public health and safety and the environment, including special districts and local offices of emergency services.

This assessment follows the requirements per Government Code Section 65302.

California Adaptation Planning Guide

This assessment follows the vulnerability assessment process recommended by the California Governor's Office of Emergency Services, as documented in the 2020 California Adaptation Planning Guide (Cal APG). The adaptation planning process outlined by the Cal APG consists of four phases, illustrated in Figure 4 below, with Phase 1 and 2 focused on the vulnerability assessment process (Cal OES 2020). The Sonoma County Climate Change Vulnerability Assessment is prepared consistent with applicable portions of Phase 1 as well as the entirety of Phase 2 of the Cal APG and is composed of the sections outlined in Figure 5. The County's development of climate adaptation strategies for incorporation into the General Plan's Safety Element will occur consistent with Phase 3. The County's implementation of the policies and programs in the General Plan's Safety Element is associated with Phase 4 and will continue until the County's next update to the General Plan Safety Element.

Figure 4 California Adaptation Planning Guide Phases

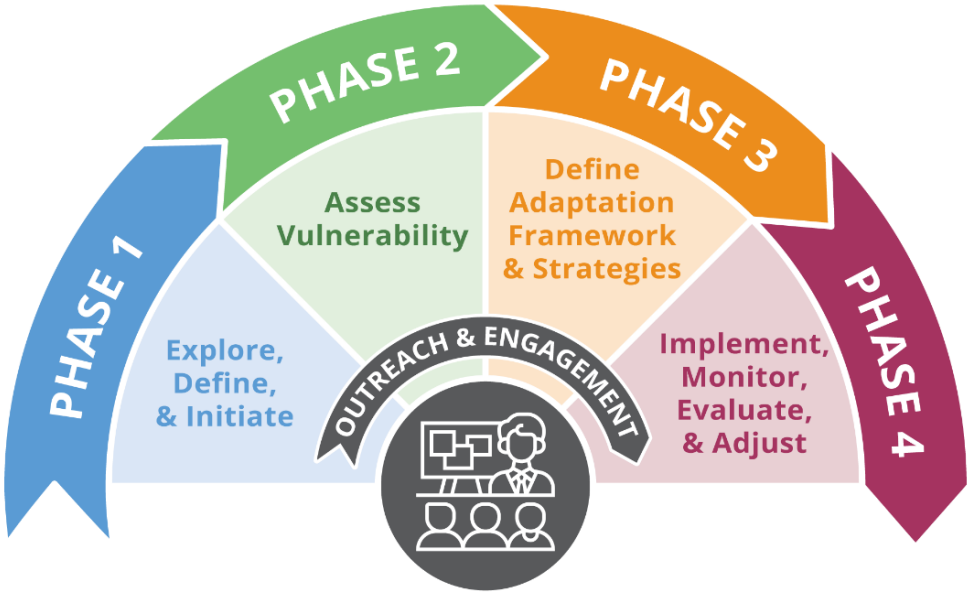
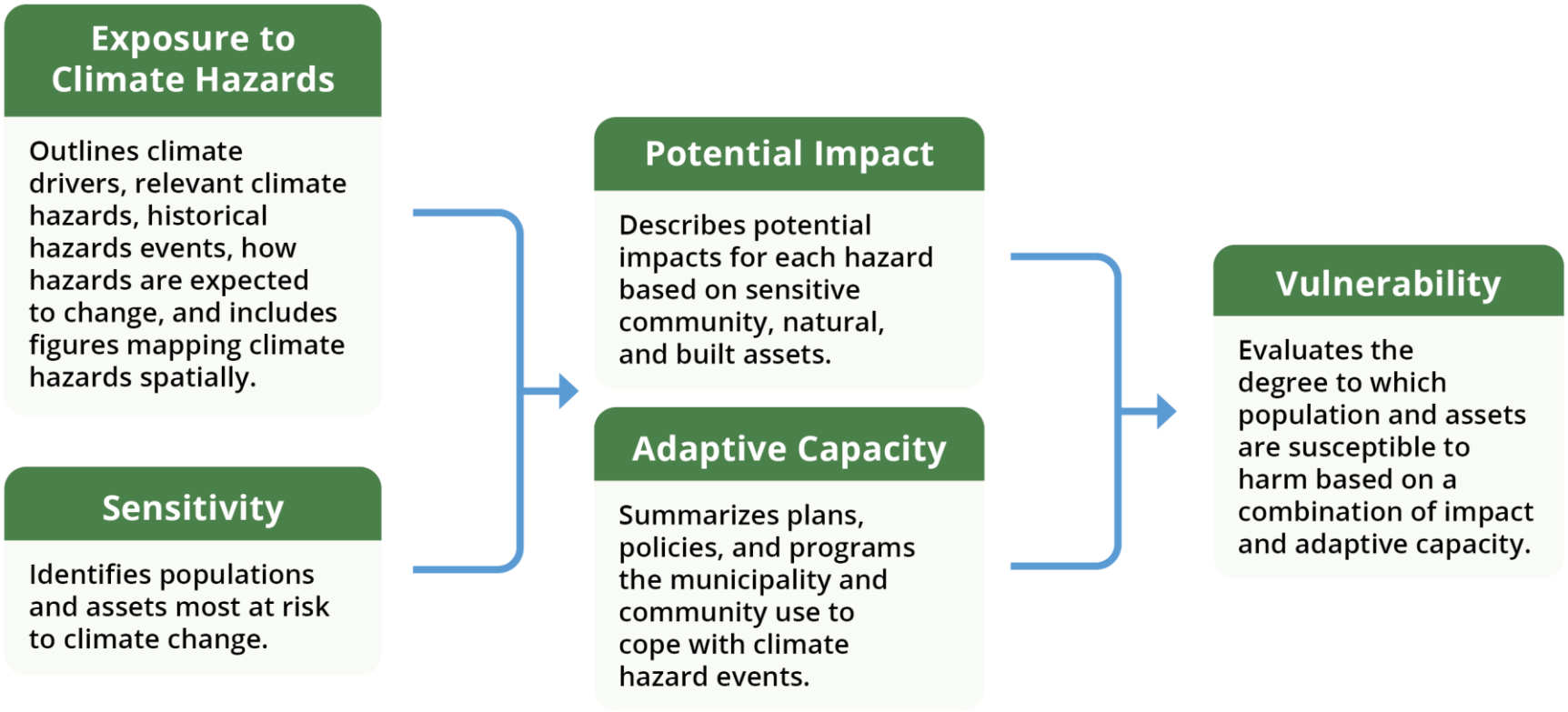


Figure 5 Steps under Phase 2 Assess Vulnerability of Cal APG



Key Data Sources

The following data sources and tools, many of which are recommended within the Cal APG, were used in preparation of this assessment.

- **Cal-Adapt 2.0** is an online tool that presents historic and modeled projections based on 10 different global climate models. The tool was developed and is maintained by the University of California, Berkeley Geospatial Innovation Facility with funding and oversight by the California Energy Commission (CEC). This tool was used to present projection data related to minimum and maximum temperature, precipitation, extreme heat, warm nights, drought, and wildfire (CEC 2021).
- **California's Fourth Climate Change Assessment** was developed by the CEC and other State of California coordinating agencies to present up-to-date climate science, projections and potential impacts associated with climate change. The CEC and coordinating agencies developed nine regional reports to provide regional-scale climate information to support local planning and action. The San Francisco Bay Area Region Summary Report (2018) presents an overview of climate science, regional projections, specific strategies to adapt to climate impacts, and key research gaps needed to spur additional progress on safeguarding the San Francisco Bay Area Region from climate change. The San Francisco Bay Area Region Summary Report was used to understand regional changes that may affect Sonoma County both directly and indirectly (Ackerly et al. 2018).
- **Sonoma County Climate Resilient Lands Strategy** is a non-regulatory framework for how the County and its partners can conserve, manage, and restore natural and working lands to build climate resilience. The Strategy provides an overview of climate hazards, describes Sonoma County land types and eco-regions, and offers recommendations and guidance for the planning, design, and implementation of resilience-related projects. The Strategy was used as background…
- **Sonoma County Multi-Jurisdictional Hazard Mitigation Plan** presents information on existing processes and plans in place that address Sonoma County's ability to prepare for climate change impacts and informed the adaptive capacity discussion of this assessment. The Multi-Jurisdictional Hazard Mitigation Plan (2021) was also used to identify recent historical events, determine hazard exposure, and characterize the vulnerability of certain assets. It also contains sites in Sonoma County that have been repeatedly damaged by climate hazards, as required by Government Code 65302 (g)(4) (A)(ii).
- **U.S. Census, 2021 American Community Survey** presents demographic data by census tract. U.S. Census data was used to identify the Sonoma County population and household statistics that correspond with the Social Sensitivity Index and people made sensitive by systems (see more information below).
- **The Center for Disease Control's (CDC) PLACES Health Data (2021)** presents health demographic data by census tract. CDC PLACES Health Data was used to identify the Sonoma County population health statistics that correspond with the Social Sensitivity Index and people made sensitive by systems.
- **United States Geological Survey Costal Storm Modeling System** is used for future scenarios related to sea level rise, coastal flooding, storm flooding, and erosion. The tool is intended to provide publicly accessible information for increased public resilience, mitigation efforts, and management of resources along the coast.
- **U.S. Department of Energy Low-Income Energy Affordability Data (LEAD)** presents population data on low- and moderate-

income households that carry a disproportionate energy burden, as included in the Social Sensitivity Index.

- **U.S. Department of Housing and Urban Development Comprehensive Housing Affordability Strategy (CHAS)** data was used to identify housing burdened households in Sonoma County, as included in the Social Sensitivity Index.

Data Limitations

The limitations of this assessment and analysis stem from gaps in data availability and completeness of data methods. Census data can miss portions of the population (e.g., homeless populations, undocumented immigrants), which results in general demographic information not fully identifying the extent of populations vulnerable to climate change (Cantwell 2021). Federal Emergency Management Agency (FEMA) 100-year and 500-year flood plains do not account for climate change projections; zones are instead based on historical information. The California Department of Forestry and Fire Protection (CalFire) Hazard Severity Zones are based on vegetation, fire history, and terrain but also have similar limitations in not projecting fire zones into the future based on changing climate conditions (OSFM 2022). Extrapolating landslides in the context of climate change is difficult and the estimates of exposure to these hazards are likely to be underestimated (Fernandez-Bou et al. 2021).

The data presented in Cal-Adapt tools are projections, or estimates, of future climate conditions. The limitation in these projections is that the long-term behavior of the atmosphere is expressed in averages – for example, average annual temperature, and average monthly rainfall. The averages discussed often downplay the extremes by which daily weather events occur and when presented as an average, only show moderate changes within the climate. What is often lost in averages is that the frequency of extremes, like atmospheric rivers, may increase while low-moderate intensity weather events decrease through the end of the century. In instances of modeled precipitation projections, it maintains an average similar to historic levels which does not account for anticipated fluctuations in extremes (CEC 2021).

Social Sensitivity Index Methodology

The presence and overall distribution of sensitive populations in unincorporated Sonoma County were identified based on U.S. Census ACS data and CDC PLACES Health data. This assessment follows Cal APG's methodology for identifying and analyzing sensitive populations.

A social sensitivity index was developing using 23 population data indicators (e.g., race, income status) listed in Table 4 in the Sensitivity section below. To develop the social sensitivity index, an analysis was conducted to identify the concentration of each indicator within unincorporated Sonoma County census tracts. Each indicator statistic was compared against the state-wide average and then standardized into a Z-score for each census tract. A z-score is a statistical measurement that describes a value's relationship to the mean of a group of values. Z-score is measured in terms of standards deviations[2] from the mean[3]. If a Z-score is 0, it indicates that the data point's score is identical to the mean score. If a Z-Score is 1, it indicates that the data point is one standard deviation from the mean. Z-scores were averaged for each census tract and then converted into the social sensitivity index percentile, which

[2] Standard deviation is a statistic that measures the dispersion of a dataset relative to its mean and is calculated as the square root of the variance.

[3] Mean refers to the average of a set of values.

ranges from 0% to 100%. Using a Z-Score methodology shows where each census tract is positioned within the data distribution of social sensitivity in Sonoma County. Unincorporated County census tracts with high proportions of populations made sensitive by systems, relative to State statistics, have higher percentile rankings on the 0% to 100% scale.

In addition to the social sensitivity index, census tracts identified as Environmental Justice Communities are included in this assessment. The methodology for identifying Environmental Justice Communities can be found in the Environmental Justice Technical Report (Sonoma County Environmental Justice Technical Report 2023).

Vulnerability Scoring Methodology

The vulnerability score is a combination of the impact score and adaptive capacity score. The impact and adaptive capacity scores are developed using a qualitative methodology outlined in the Cal APG, as shown in the scoring rubric in Table 2. Impact and adaptive capacity scores are identified for community members, assets, and critical facilities and services for each climate hazard.

The vulnerability score is prepared by combining the impact score and the adaptive capacity score as demonstrated in Table 3. The range of potential impacts spans 1 through 5 with 1 being low, 2-3 being medium, and 4-5 being high vulnerability. Vulnerability scores are assigned by hazard under each asset group in Section 5, *Vulnerability Analysis*.

Table 2 Impact and Adaptive Capacity Scoring Rubric

Score	Impact	Adaptive Capacity
Low	Impact is unlikely based on projected exposure; would result in minor consequences to public health, safety, and/or other metrics of concern.	The population or asset lacks capacity to manage changes; major changes would be required due to a lack of adopted Sonoma County or utility plans and programs.
Medium	Impact is somewhat likely based on projected exposure; would result in some consequences to public health, safety, and/or other metrics of concern.	The population or asset has some capacity to manage climate impact; some changes would be required. There are some adopted Sonoma County or utility plans and programs, but strategies are not specific.
High	Impact is highly likely based on projected exposure; consequences to public health, safety, and/or other metrics of concern.	The population or asset has high capacity to manage climate impact; minimal to no changes are required. Sonoma County and utilities have adopted plans and programs in place that include specific strategies and projects that are actively being implemented.

Source: Cal OES 2020

The impact and adaptive capacity scores are combined to form the vulnerability score based on the approach presented in Table 3, which is consistent with methodology from Cal APG.

Table 3 Vulnerability Score Matrix

Potential Impacts				
	High	3	4	5
	Medium	2	3	4
	Low	1	2	3
		High	Medium	Low
		Adaptive Capacity		

Source: Cal OES 2020

3 Exposure to Climate Hazards

Climate change is a global phenomenon that can impact local health, natural resources, parks, infrastructure, emergency response, and many other aspects of society. Projected changes to the climate are dependent on location. The Cal-Adapt tool provides climate data from global scale models that have been localized (downscaled) to 3.7 mile by 3.7-mile grids (CEC 2021). The data in Cal-Adapt specific to Sonoma County is combined with information from the California Fourth Climate Change Assessment San Francisco Bay Area regional report to describe projected future changes for specific types of hazards. Projections throughout this section are presented consistent with the Governor's Office of Planning and Research (OPR) using Representative Concentration Pathway (RCP) 8.5 as a conservative approach to assessing and adapting to climate change (CEC 2021). RCP 8.5 is a high greenhouse gas emissions scenario in which global emissions continue to rise through the end of the 21st century.

Additionally, projections are forecasted to mid-century (2035-2064) and end-of-century (2070-2099) as 30-year averages and are compared to a modeled historical baseline (1961-1990) (CEC 2021). Sea-level rise projections are presented based on United States Geological Survey CoSMoS data, consistent with the California Coastal Commission's most recent 2018 Sea Level Rise Policy Guidance document.

The Methodology section provides a more detailed discussion of data sources used to inform the preparation of this assessment.

This section presents information on temperature and precipitation, which are characterized as climate drivers. The Hazard Exposure section provides information on projected changes to extreme heat, drought, wildfire, landslides, riverine and stormwater flooding, and sea level rise resulting from changes to the climate drivers. Chapter 3 and Appendix E of the Sonoma County Climate Resilient Lands Strategy similarly outlines historical and projected impacts of a warming climate, changing rainfall patterns, drought, wildfire, and sea level rise, with a particular emphasis on ecosystems. The projections in the Resilient Lands Strategy and this Vulnerability Assessment both align with models that assume the RCP 8.5 emissions scenario.

Climate Drivers

In Sonoma County, the climate drivers of concern include Temperature and Precipitation.

Temperature

Sonoma County has an average baseline maximum temperature of 69.2°F and an average baseline minimum temperature of 42.8°F (CEC 2021). The average maximum and minimum temperatures are expected to increase, which will shift the temperature range by up to 3.9°F by mid-century projections shown in Figure 6, and 7.0°F (RCP 8.5) through the end of the century as shown in Figure 7 (CEC 2021). Change in temperature is observed spatially with greatest increases occurring mainly in central Sonoma County, roughly east of highway 101.

Temperature increases influence extreme heat, drought, and wildfire (discussed under Hazard Exposure below).

Figure 6 Change in Annual Average Maximum Temperature, Mid-Century

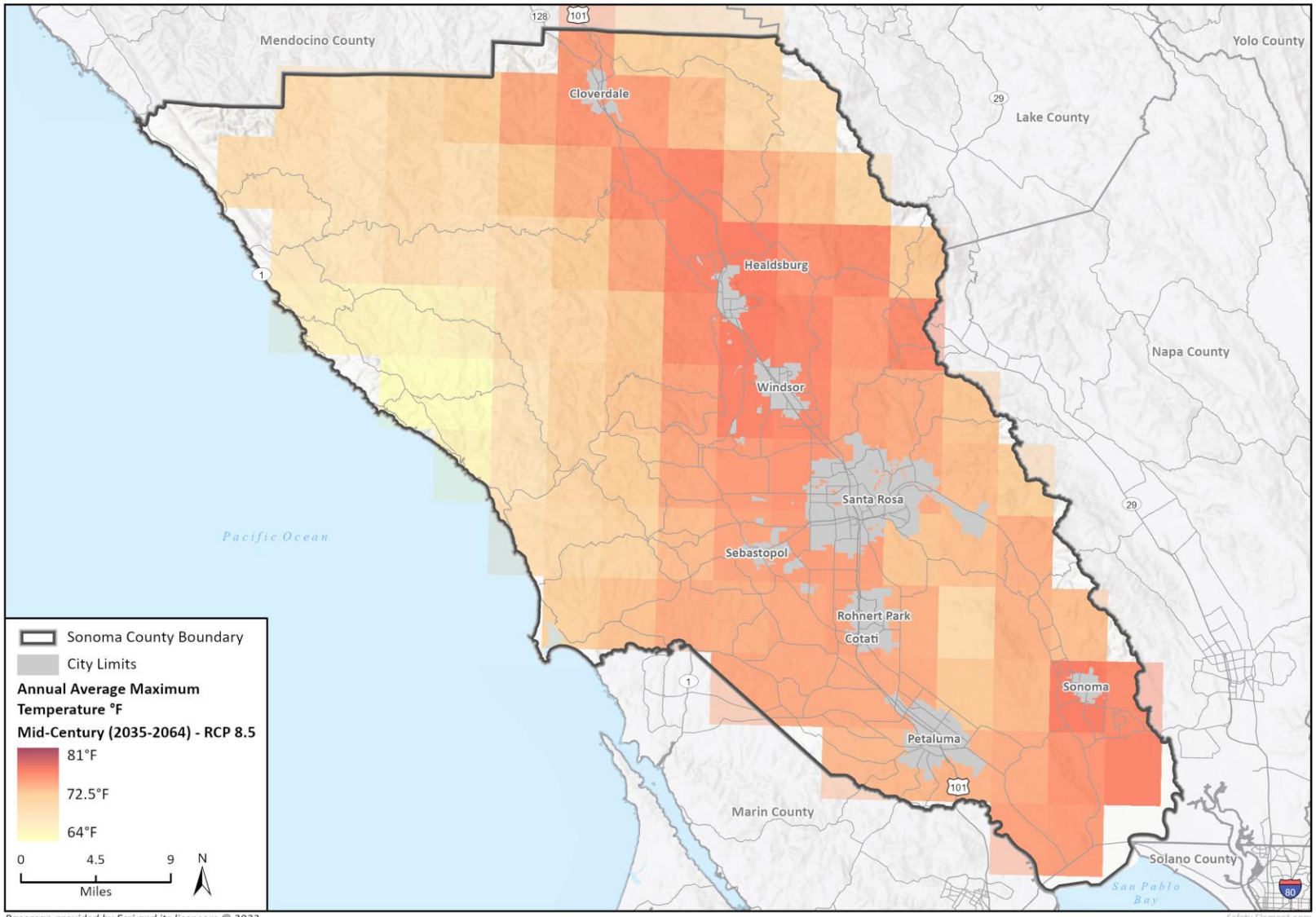
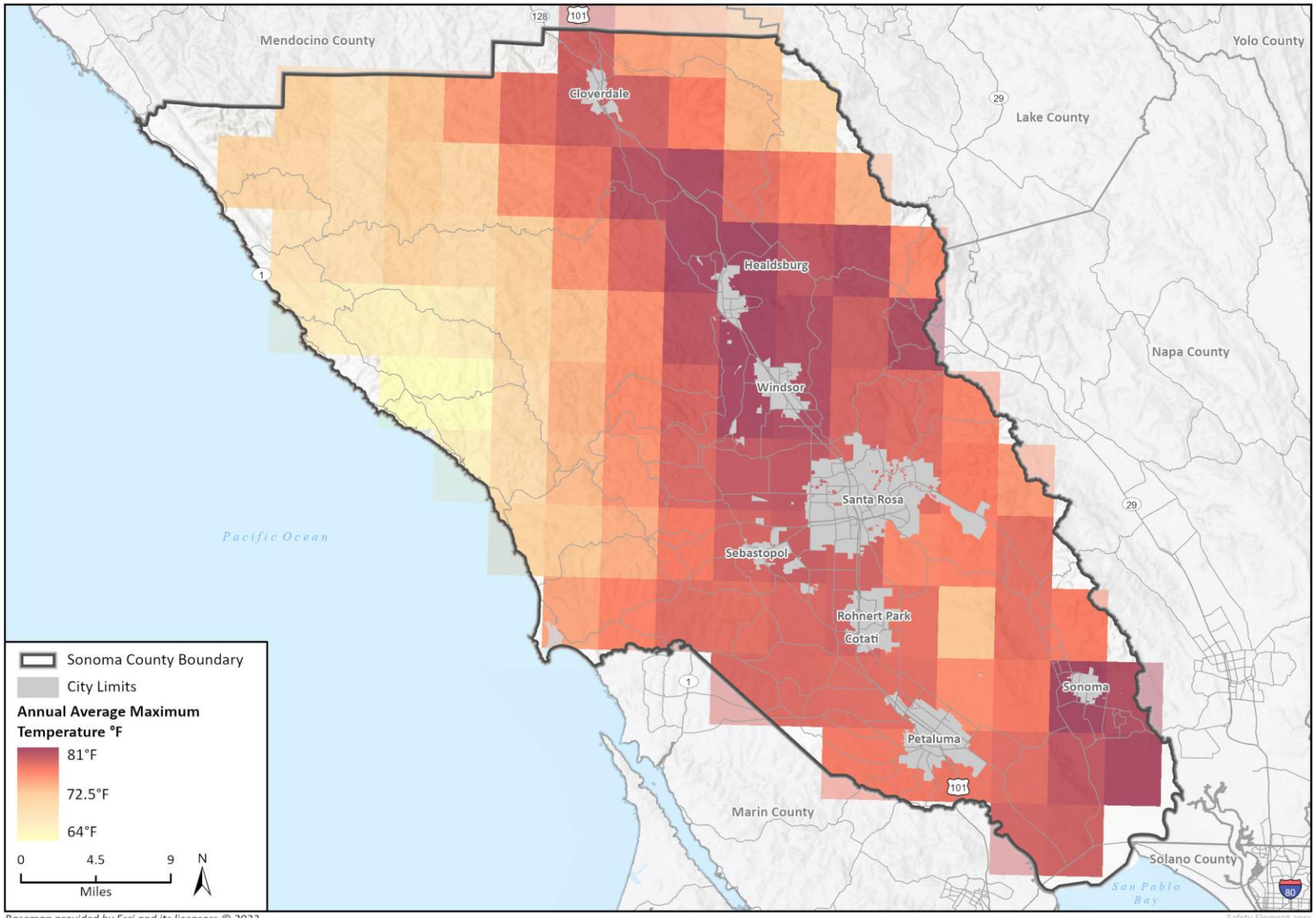


Figure 7 Change in Annual Average Maximum Temperature, End-of-Century



Precipitation

Increased intensity of precipitation events is expected for the greater San Francisco Bay Area, including Sonoma County, through the end of the century. It is projected that more precipitation will occur during extreme storms with wet extremes occurring more often and with greater intensity (Ackerly et al. 2018). The projections show that there will be more dry periods punctuated by increased precipitation intensities of the largest storms or wet periods, producing little net change in precipitation totals but more extreme conditions (Ackerly et al. 2018). Precipitation changes are expected to affect the occurrence of hazards events, including wildfire, drought, landslides, and riverine stormwater flooding. Historically, the northern coastal mountains of Sonoma County experience the largest precipitation events across the San Francisco Bay Area region and can expect up to a 37% increase in rainfall volume by the end of the century (Ackerly et al. 2018).

Sonoma County precipitation projections under RCP 8.5 demonstrate a 1.6-inch mid-century increase and a 3.7-inch end century increase in annual precipitation totals (CEC 2021). However, as already observed in recent decades precipitation changes are largely experienced as more extreme variability with intensely wet years followed by extreme droughts (Ackerly et al. 2018). It is projected that the wettest day every year will reflect an increase in rain volume by the end of the century in the San Francisco Bay Area region (Ackerly et al. 2018).

This translates into longer dry seasons with less precipitation on average that may lead to increased groundwater pumping to compensate for the diminished surface water supplies.

Hazard Exposure

Changes in temperature and precipitation are expected to influence the frequency, duration, and magnitude of the following climate hazards. The following pages present key climate data in both graph and map formats based on Cal-Adapt, USGS, CAL FIRE, FEMA, and US Census data. Information is also included on major historical events. High level impacts on key assets and community members are provided, however refer to see Section 5, *Vulnerability Analysis*, for a more detailed impacts discussion.

The Sonoma County Multi-Jurisdictional Hazard Mitigation Plan (Volume 1) includes more quantitative details on the exposure of population, property, and critical facilities to various hazards countywide. The Resilient Lands Strategy also provides a percentage breakdown of hazard exposure by ecoregion (e.g., Bodega Coastal Hills, Sonoma-Mendocino Mixed Forest) as they are defined within the Strategy.


Extreme Heat


Drought


Wildfire


Landslides


Riverine and Stormwater Flooding

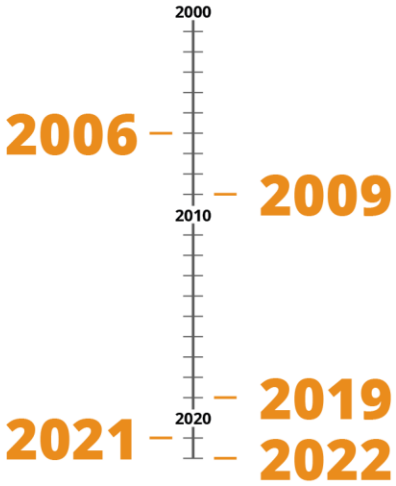

Sea Level Rise

EXTREME HEAT

PAST

Extreme heat events across the state have presented historic challenges for all communities (Sonoma County MJHMP 2021a).

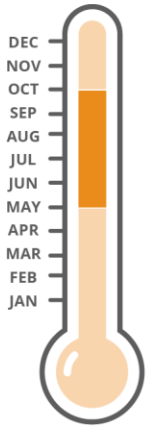
Extreme Heat Events



PRESENT

Extreme heat events are presently defined as days in which the temperature exceeds the 98th percentile of 93.9°F. Current extreme heat days occur between the months of May to October while the 30-year baseline average is 4 days annually (CEC 2021).

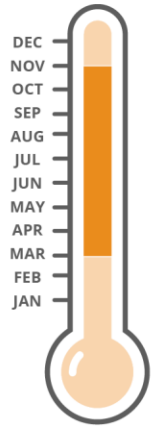
Extreme Heat Months
(Baseline Years)



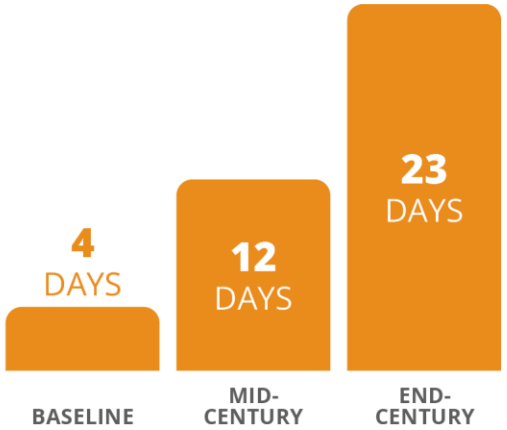
FUTURE

Extreme heat is expected to impact all of Sonoma County, with the greatest impacts on vulnerable populations, agricultural lands, and parks and natural resources. Days above 93.9 degrees F are projected to increase from 4 days a year to 23 days a year, an almost five-fold increase. Extreme heat days will occur during a wider range of months, from March to November (CEC 2021).

Extreme Heat Months
(Mid & End-century Years)



Projected Annual Average of Extreme Heat Days



IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT

- REDUCED CROP YIELD
- CRACKED PAVEMENT
- GRID OVERLOAD
- VEGETATIVE STRESS
- STRAINED EMERGENCY SERVICES

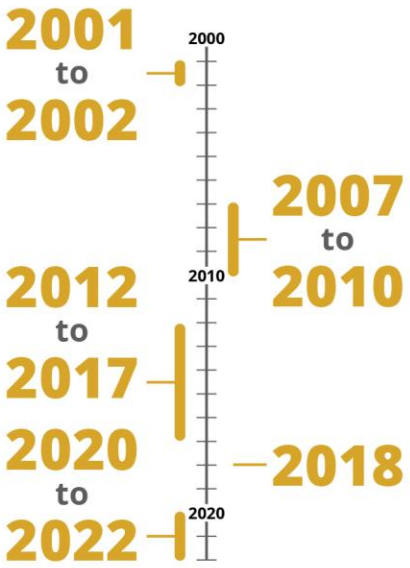
IMPACTS ON ENVIRONMENTAL JUSTICE COMMUNITIES AND OTHER COMMUNITY MEMBERS

- DEHYDRATION
- HEAT STROKE
- HEALTH-RELATED MORTALITY
- HEART DISEASE
- RESPIRATORY ILLNESS
- MENTAL AND BEHAVIORAL HEALTH

DROUGHT

PAST

Over the past two decades, Sonoma County has experienced more frequent and longer contiguous droughts (NOAA 2023).



PRESENT

All of Sonoma County is vulnerable to droughts which have the potential to impact all community members through water restrictions, economic losses, and increased energy costs (Sonoma County MJHMP 2021a).

During the Fall of 2022

483,878

People in Sonoma County were Affected by Drought

74% **Community Categorized as D2**

26% **Community Categorized as D3**



D0 ABNORMALLY DRY

D1 MODERATE DROUGHT

D2 SEVERE DROUGHT

D3 EXTREME DROUGHT

D4 EXCEPTIONAL DROUGHT

FUTURE

The average annual maximum length of dry spell is projected to increase by 12 days by the end of the century (CEC 2021).

Projected Annual Average Dry Spell Duration



IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT

- VEGETATIVE STRESS
- WATER SCARCITY
- HABITAT LOSS

IMPACTS ON ENVIRONMENTAL JUSTICE COMMUNITIES AND OTHER COMMUNITY MEMBERS

- FOOD SECURITY
- AIR QUALITY DECLINES
- RESPIRATORY ILLNESS
- MENTAL AND BEHAVIORAL HEALTH
- INCOME LOSS

ADDITIONAL AFFECTED ASSETS

- PUBLIC WATER SYSTEMS
- SMALL WATER SYSTEMS
- PRIVATE WELLS

WILDFIRE

PAST

The frequency and intensity of wildfires have increased significantly within Sonoma County over the past two decades (Sonoma County MJHMP 2021a).

Sonoma County Fires Since 1996

Year	Fire Name	Acres Burned	Structures Burned
2020	Glass	67,484	661
2020	LNU Lightning Complex *(Wallbridge and Meyers)*	57,563	303
2019	Kincade	77,753	371
2017	Tubbs	36,807	5,643
2017	Sonoma Complex Fires *(Tubbs, Nuns, Pocket, Presley, Young)*	86,039	5,636
2015	Valley	76,067	1,955
2013	McCabe	3,505	-
2008	Pine	989	0
2008	85	322	0
2004	Geysers	12,000	6
2000	Berryessa	5,731	15
1999	Geyser Road	1,300	0
1996	Cavedale	2,100	0
1996	Porter Creek	300	0

PRESENT

Wildfires can be catastrophic, damaging forests and habitat, destroying homes and businesses, disrupting Essential Services, and damaging critical infrastructure (Sonoma County MJHMP 2021a). There are 13 Environmental Justice Community census tracts and 3 Environmental Justice Tribal Communities that overlap State Responsibility Area Fire Hazard Severity Zones in the County.

Number of People in Wildfire Hazard Areas

220,253

Number of Households in Wildfire Hazard Areas

88,072

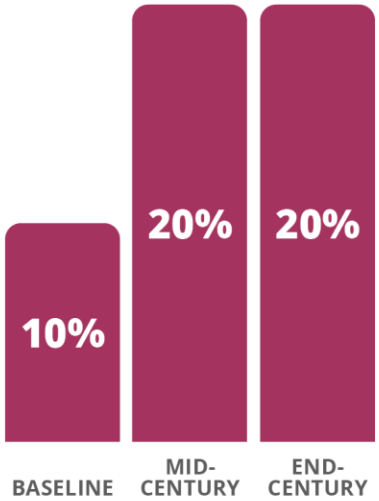
Exposed Structures in Fire Hazard Severity Zones

	Moderate, High, Very-High
Number of Buildings Exposed	32,218
Total Exposed Value as % of Planning Area Total	28.4%

FUTURE

Wildfire risk is projected to increase through the end of the century with more days of extreme wildfire risk and increased wildfire occurrence (CEC 2021).

Projected Annual Wildfire Probability



IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT

- WORSENING AIR QUALITY
- WORSENING WATER QUALITY
- POWER DELIVERY DISRUPTION
- STRUCTURE & PROPERTY DAMAGE
- PUBLIC HEALTH & SAFETY RISKS
- HABITAT LOSS
- STRAINED EMERGENCY SERVICES
- REDUCED CROP YIELDS

FACTORS AFFECTING WILDFIRES

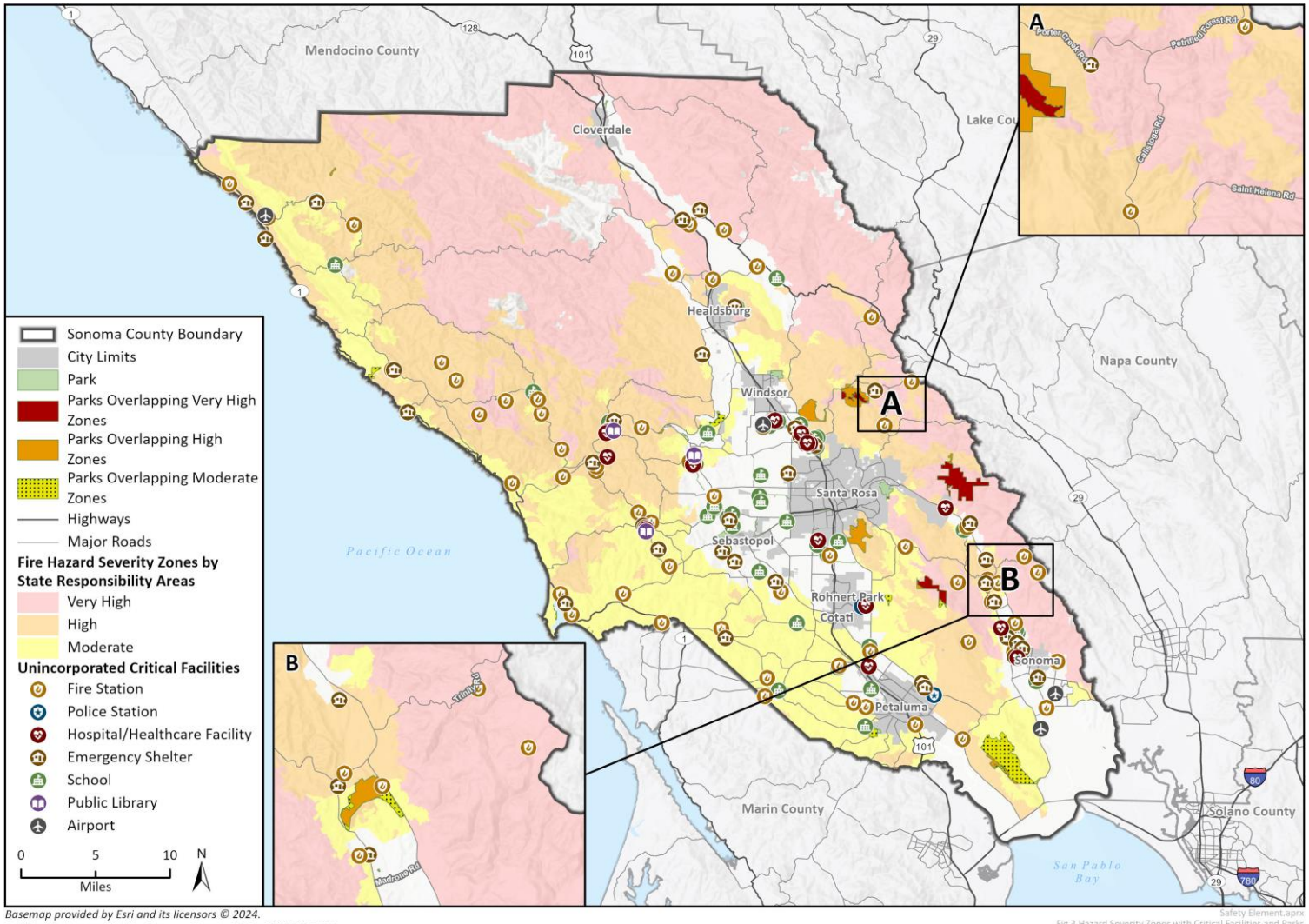
- WEATHER
- TOPOGRAPHY
- VEGETATION AND FUELS
- FIREFIGHTING RESOURCES

PROJECTED CHANGE IN ANNUAL AVERAGE AREA BURNED



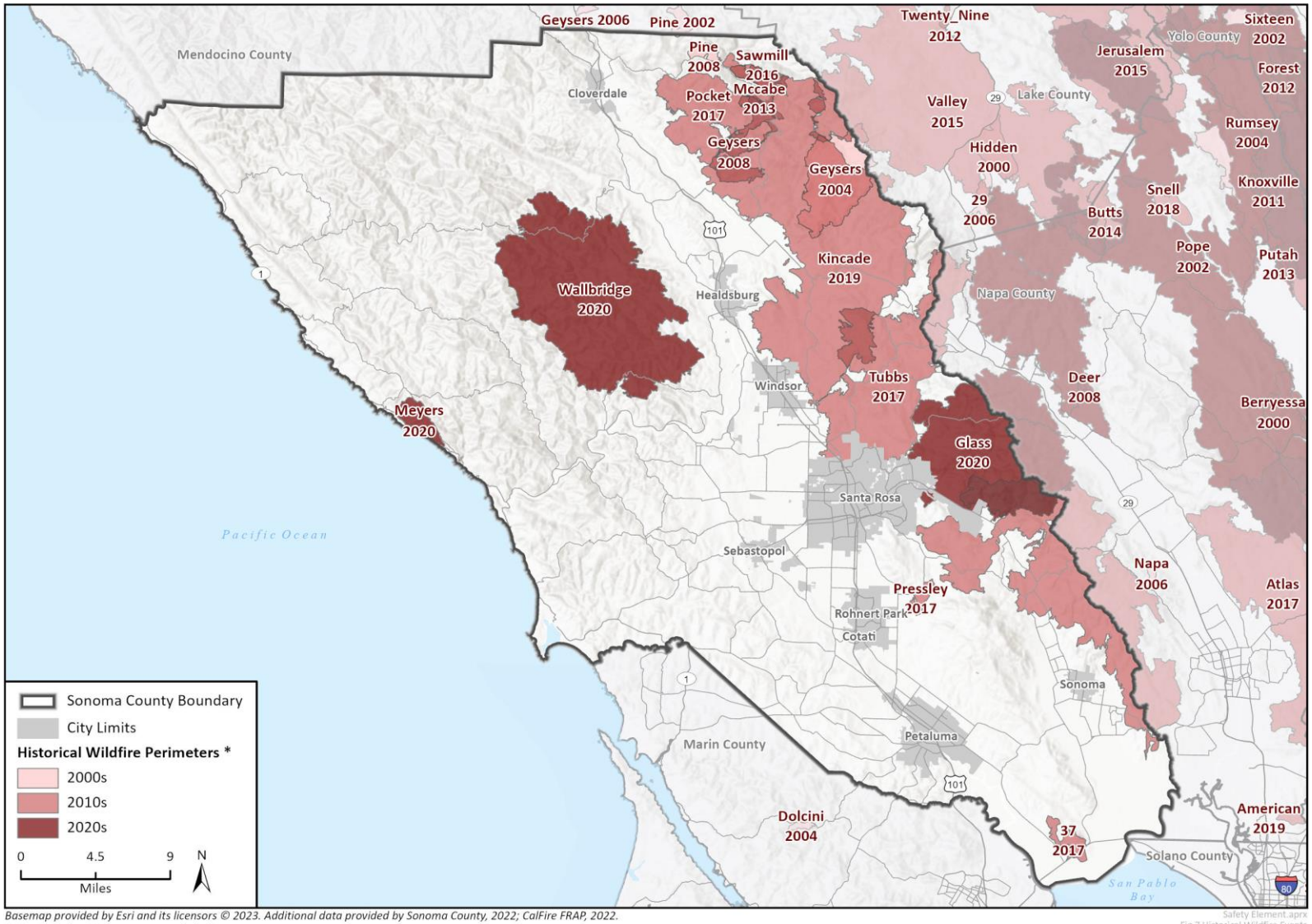
The majority of Sonoma County is at risk to wildfire with varying severity of risk. Sonoma County Communities within Very High Fire Hazard Severity Zones are: Cloverdale, Geyserville, Glen Ellen, Kenwood, and Stewarts Point (CEC 2021).

Figure 8 CALFIRE Wildfire Hazard Severity Zones in Sonoma County[1]



[1] CALFIRE's Fire Hazard Severity Zones Map is utilized to depict fire hazard in this Vulnerability Assessment to align with state law requirements for Safety Elements. Other local tools to evaluate wildfire hazard and risk include the Sonoma County Wildfire Hazard Index and Wildfire Risk Index developed in part to support the recent update to the County's Community Wildfire Protection Plan.

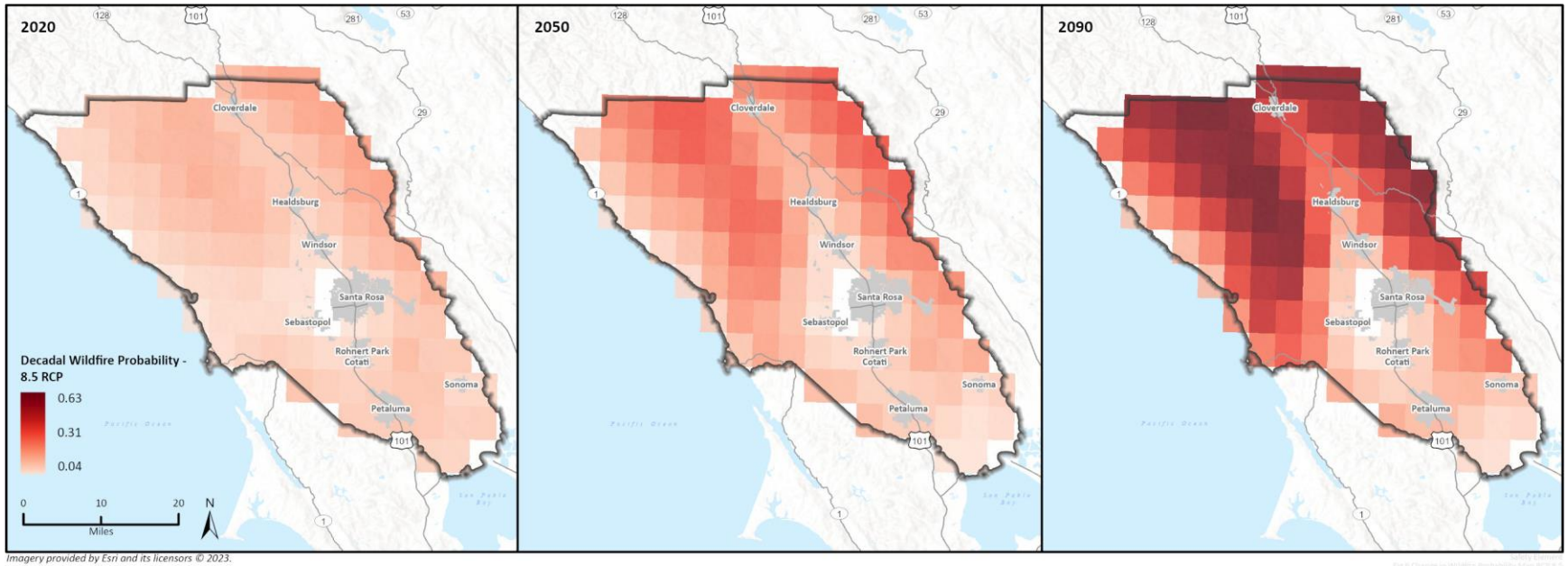
Figure 9 Historical Wildfire Perimeters in Sonoma County



Basemap provided by Esri and its licensors © 2023. Additional data provided by Sonoma County, 2022; CalFire FRAP, 2022.
** Fires less than 200 acres were excluded.*

Safety Element.aprx
Fig 7 Historical Wildfire Events

Figure 10 Change in Decadal Wildfire Probability in Sonoma County



LANDSLIDES

PAST

Landslide occurrences have historically affected Sonoma County during extreme precipitation events preceded by intense wildfire (Sonoma County MJHMP 2021a).

Major Landslide Occurrences by Year

2005	1
2006	1
2012	2
2017	2
2019	1

PRESENT

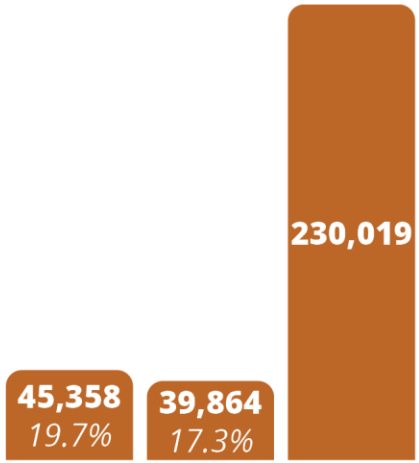
The highest risk of landslides are in areas with steep geography, as mapped by the California Department of Conservation. Wildfires can trigger heightened short-term landslide or mudflow risk in fire-scarred areas (Sonoma County MJHMP 2021a).

Population Exposed	Number of Buildings Exposed
54,240 Moderate Landslide Risk	**21,473** Moderate Landslide Risk
51,796 High Landslide Risk	**24,283** Moderate Landslide Risk
6,919 Very High Landslide Risk	**3,173** Moderate Landslide Risk

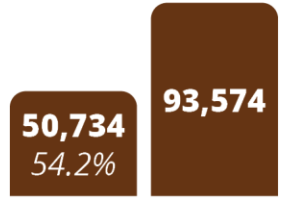
FUTURE

Triggered by extreme precipitation events or wildfires, the susceptibility of Sonoma County to landslides is projected to increase as precipitation variability increases and wildfires increase in frequency, size, and severity (CEC 2021, Sonoma County MJHMP 2021a).

Number of People Susceptible to Deep-seated Landslides



Number of Households Susceptible to Deep-seated Landslides



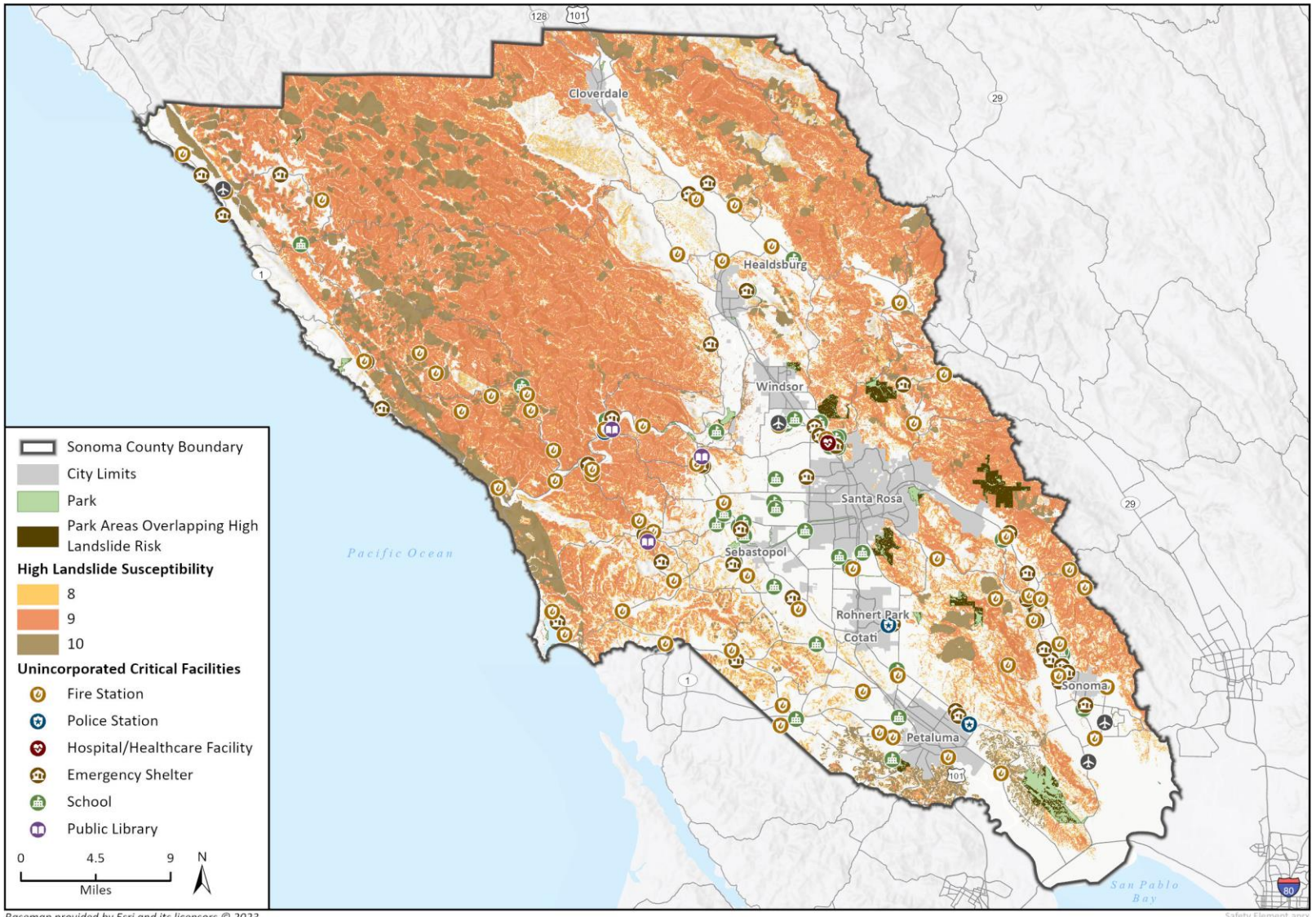
IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT

- HABITAT LOSS
- EROSION
- PROPERTY DAMAGE
- HUMAN INJURY
- STRAINED EMERGENCY SERVICES

IMPACTS ON ENVIRONMENTAL JUSTICE COMMUNITIES AND OTHER COMMUNITY MEMBERS

- FATAL & NONFATAL INJURY
- MENTAL AND BEHAVIORAL STRESSORS
- INCOME LOSS

Figure 11 Landslide Susceptibility in Sonoma County



Basemap provided by Esri and its licensors © 2023.
Additional data provided by Sonoma County, 2022; CGS, Map Sheet 58, 2018.

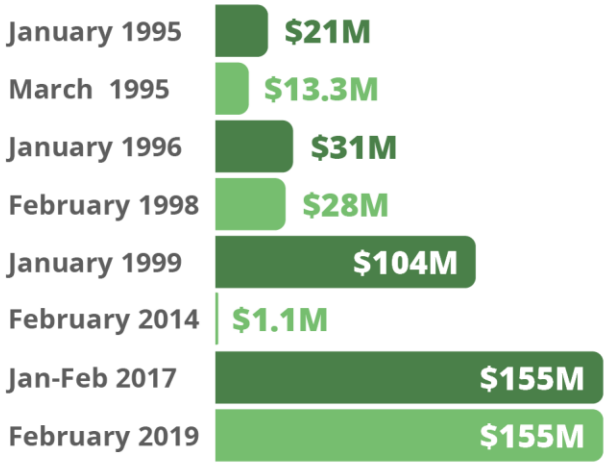
Safety Element.aprx
Fig 5 High Landslide Susceptibility with Critical Facilities

RIVERINE AND STORMWATER FLOODING

PAST

Historically, major flood events in Sonoma County are associated with the Russian River, Sonoma Creek, Petaluma River, and the Laguna de Santa Rosa. There have been several riverine and stormwater flooding events since 1995, which typically occur during winter (Sonoma County MJHMP 2021a).

Historic Flooding Events and Estimated Loss



PRESENT

Current exposure to flooding in the 100-year and 500-year floodplains includes 969 repetitive loss properties, several critical facilities, and up 3.7% of the County's population (Sonoma County MJHMP 2021a).

Repetitive Loss Properties in Sonoma County

Jurisdiction	Repetitive Loss Properties	Total Payments
Healdsburg	8	$358,237
Morro Bay	3	$107,144
Petaluma	39	$3,418,911
Santa Rosa	2	$27,135
Sebastapol	9	$1,319,635
Sonoma *(City)*	4	$207,314
Sonoma County	904	$85,487,431
Total	**969**	**$90,925,808**

Population Living Within the 100-year Flood Zone

7,768

(1.6% of Planning Area Population)

Population Living Within the 500-year Flood Zone

17,861

(3.7% of Planning Area Population)

FUTURE

Climate change may cause low-lying areas and exposed property throughout Sonoma County to experience more frequent flooding and could increase the extent of 100-year and 500-year floodplains. Riverine flooding is projected to increase as precipitation extremes increase.

As shown below exposed property in existing flood hazard zones may experience more intense and frequent flood events (CEC 2021, Sonoma County MJHMP 2021a).

Flood Zone Exposure

	100-year Chance Flood Zone	500-year Chance Flood Zone
Acres of Inundation Area	58,495	64,542
Number of Buildings Exposed	4,570	8,416
Total Exposed Property Value	$12,344,495,994	$17,587,549,317

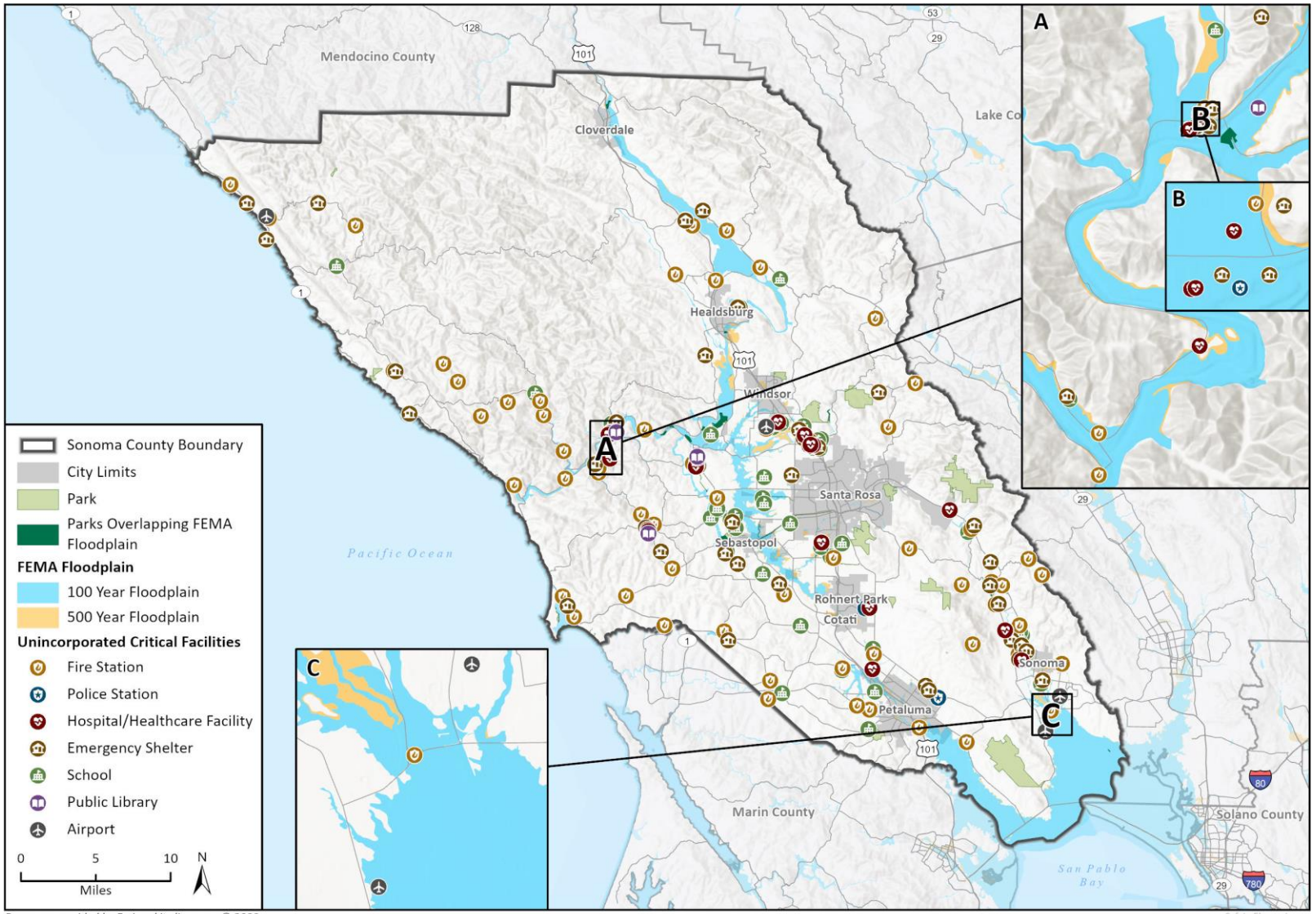
IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT

- STRAINED EMERGENCY SERVICES
- STRESSED WATER DRAINAGES
- PROPERTY DAMAGE
- HABITAT LOSS

IMPACTS ON ENVIRONMENTAL JUSTICE COMMUNITIES AND OTHER COMMUNITY MEMBERS

- FATAL & NONFATAL INJURY
- WATER-BORNE DISEASE
- MENTAL AND BEHAVIORAL STRESSORS
- INCOME LOSS

Figure 12 100-Year and 500-Year Floodplains in Sonoma County



SEA LEVEL RISE

PAST

The mean sea level has risen over the past decade and there are recent examples of coastal flooding events in Sonoma County (Sonoma County MJHMP 2021a).

In 2017 & 2019 Highway 37 was flooded due to high tides.

In 2021 the town of Jenner was placed under high surf advisory, low-lying areas were flooded along the Russian River.

In 2022 the entirety of the Sonoma Coast experienced a king tide affecting roadways, coastal trails, and loss of beach access.

PRESENT

Sea level rise (SLR) can negatively impact the coastal area of Sonoma County through regular tidal inundation, erosion, and storm flooding (Sonoma County MJHMP 2021a).

Current Population Exposed to 7 feet of SLR **1,106**

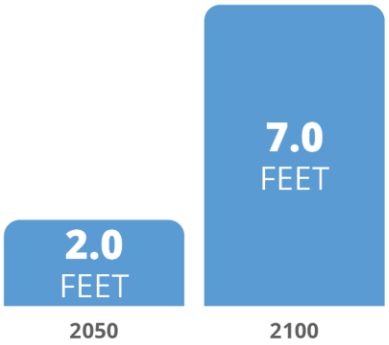
Current Number of Facilities Exposed to 7 feet of SLR

- Transportation: **25**
- Energy: **2**
- Communications: **2**
- Hazardous Material: **17**
- Health & Medical: **6**
- Safety & Security: **11**
- Food, Water, Shelter: **2**

FUTURE

The projected sea level rise within Sonoma County is expected to affect the community creating vulnerability for many coastal assets by end-century. Climate change is expected to increase the rate of sea level rise dependent on the extent of warming temperatures. Sonoma County tide gauge-specific projections reach up to 2 feet and 7 feet of sea level rise by 2050 and 2100 (USGS 2022).

Projected Sea Level Rise



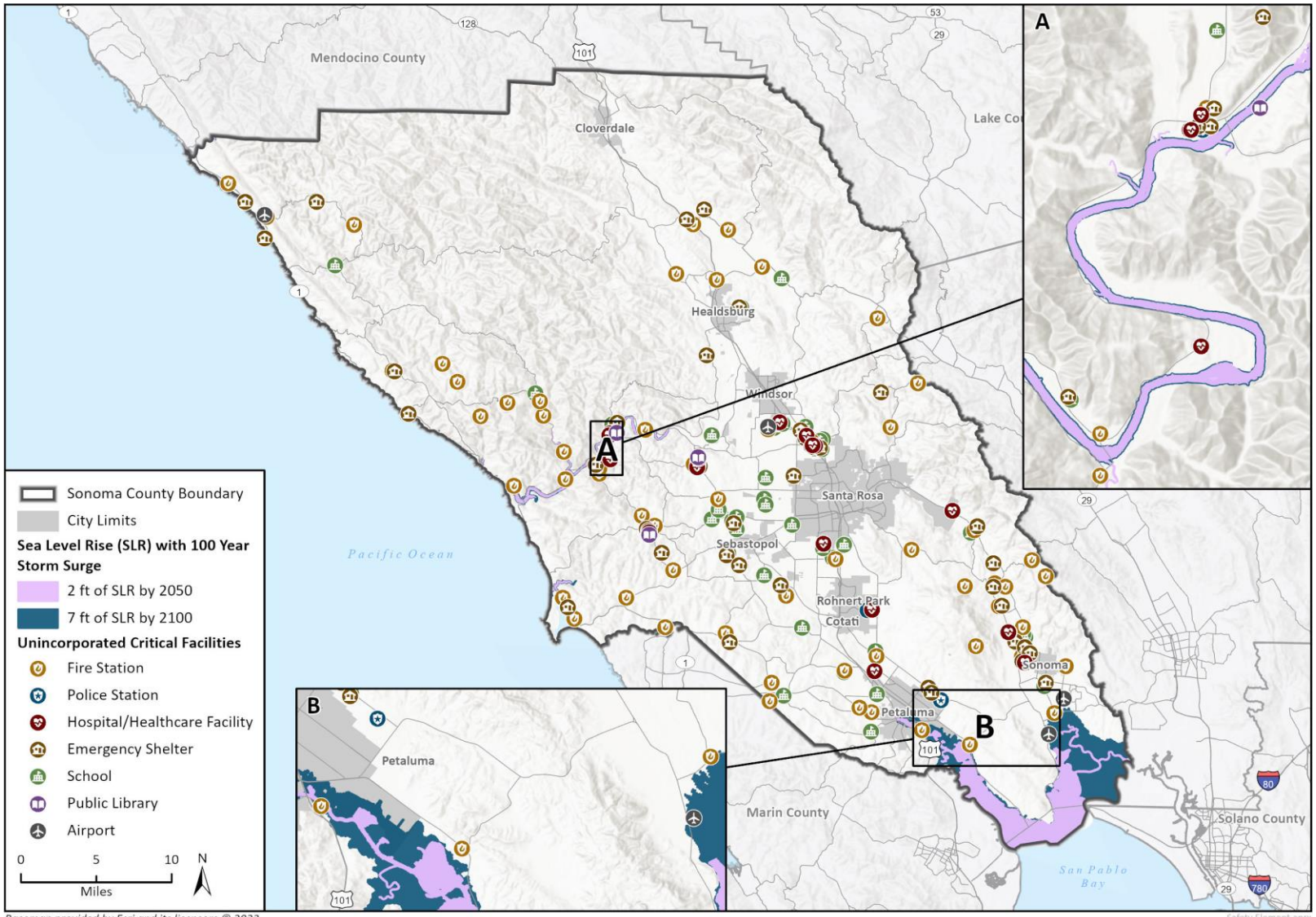
IMPACTS ON THE BUILT AND NATURAL ENVIRONMENT

- BLUFF AND BEACH EROSION
- CRITICAL INFRASTRUCTURE DAMAGE
- COASTAL FLOODING
- STRAINED EMERGENCY SERVICES
- HABITAT LOSS

IMPACTS ON ENVIRONMENTAL JUSTICE COMMUNITIES AND OTHER COMMUNITY MEMBERS

- FATAL & NONFATAL INJURY
- MENTAL AND BEHAVIORAL STRESSORS
- INCOME LOSS
- WATER-BORNE DISEASE

Figure 13 Two and Seven Feet of Sea Level Rise with 100-Year Storm Surge in Sonoma County



4 Sensitivity

Populations and assets are affected by climate change depending on their sensitivity to climate hazards. This section identifies Sonoma County's sensitivities across the following populations and assets:


Populations Made Sensitive by Systems


Parks and Natural Resources


Critical Facilities, Buildings, Services, and Infrastructure


Agriculture

Potential impacts from the climate hazards of concern, assessments of adaptive capacity, and vulnerability scores of populations and assets are presented in Section 5, *Vulnerability Analysis*.



Populations

Systemic inequities render some populations more sensitive to climate change impacts. While all people in a community will experience climate change, some are already and will continue to be more harmed by it than others. For example,

Relationship to Environmental Justice

Low-income communities along with communities of color are often disproportionately burdened with pollution and its associated health risks. In 2016, the State of California signed Senate Bill 1000 (SB 1000) into law, aiming to address inequitable distribution of pollution and its associated health risks specifically in low-income communities and communities of color. SB 1000 amended Government Code Section 63502, requiring both cities and counties to incorporate Environmental Justice (EJ) policies and programs into their general plan if two or more elements are being updated and/or revised concurrently and if the jurisdiction identifies any environmental justice communities present within the jurisdiction's planning area boundaries.

The County has identified Environmental Justice Communities, based on mapping tools including the CalEnviroScreen 4.0 provided by the California Environmental Protection Agency (Cal EPA). This process involved the characterization of the major challenges that Sonoma County's Environmental Justice Communities face who have been systemically disadvantaged, such as disproportionate exposure to adverse air quality or water quality caused by industrial activities. In many cases, climate hazards exacerbate pollution burdened communities. These Environmental Justice Communities are identified as higher risk due to systemic inequities and therefore vulnerable to the adverse effects of climate change. Environmental justice Communities are identified on Figure 14.

Through the policy development process, the County will develop strategies and programs to address issues that adversely affect Environmental Justice Communities.

older adults and young children may be more at-risk than the general population for heat illness during an extreme heat event. Several factors influence sensitivity to climate hazards, but all of them begin with systemic inequities. The unwillingness of government to systemically prioritize a safe environment over economic growth; the lack of sufficient, affordable/free, and culturally responsive healthcare systems and structures; the inequitable distribution of economic and educational resources; and housing segregation; among other structural inequities, render folks navigating chronic health conditions, seniors and young children, differently abled folks, people experiencing poverty, people who identify as BIPOC (Black, Indigenous, and People of Color), and others as particularly sensitive to increasing climate hazards (Cal OES 2020). Populations made sensitive by systems experience heightened risk to climate change and have fewer resources to adapt and recover from climate change impacts. Sonoma County is home to several populations made sensitive by systems, and who have already been disproportionately harmed by climate change (Table 2).

A social sensitivity index was created to understand where in Sonoma County concentrations of population groups who are systemically vulnerable to climate are present.

Social Sensitivity Index Score

A social sensitivity index was developed using data across 23 population data indicators listed in Table 4. Each indicator represents a characteristic that increases a person's physiological sensitivity to climate hazards, the ability of an individual to prepare for, cope with or recover from climate hazards, or a combination of both. Selected indicators are consistent with guidance in the Cal APG (Cal OES 2020). Four additional indicators (people experiencing houselessness, people who are undocumented, immigrants, and visitors) for which data was not available to be included in the index, are included in Table 4 For more information on why these population types are considered sensitive to climate change impacts, see Section 4.1, Populations.

The following population data indicators were included in the social sensitivity index based on feedback provided by the Equity Working Committee: mobile home households, households experiencing housing burden, and households experiencing energy burden.

Table 4 Populations Made Sensitive By Systems in Sonoma County

Population Type	Population Description	Percentage of Total Population/Household Type
People experiencing poverty	Household incomes less than 80 percent the State median household income	24%
People experiencing houselessness[1]	Individuals who currently lack fixed, regular, and adequate housing	0.6%
People who are undocumented[2]	Individuals residing in the United States without legal documentation	6%
Immigrants[3]	Individuals residing in the United States with legal documentation	Not Available
Unemployed	Percentage of population aged 18-64 who are unemployed	3%
Seniors	Individuals 65 years or older	27%

Population Type	Population Description	Percentage of Total Population/Household Type
Young children	Individuals 5 years and younger	4%
Single female heads of household with kids	Households with kids supported by a single female	25%
Miliary Veterans	Individuals who have served but are not currently serving in the US Armed Forces	7%
BIPOC	All individuals who do not identify as white	28%
Native Americans	Individuals who identify as American Native and Alaskan Native	0.1%
Renters	Housing units that are renter occupied	30%
Outdoor Workers	Individuals who are employed, 16 and older, and work outdoors	7%
Limited or non-English speakers	Households with individuals who are non or limited English-speaking	7%
People who are differently abled	Individuals with access and functional needs (physical and mental)	12%
Individuals with asthma	Individuals diagnosed with asthma	10%
Individuals with cardiovascular disease[4]	Individuals diagnosed with coronary heart disease	6%
Individuals without vehicle access	Individuals without access to a vehicle	3%
Individuals with no health insurance	Individuals aged 18 to 64 years old currently uninsured	5%
Individuals with education attainment less than four years of high school	Percent of people over age 18 without a high school education or higher	4%
Visitors[5]	Individuals who are not residents and are visiting the study area for a limited time	Not Available
People recreating outdoors[6]	Residents or visitors who recreate outdoors in Sonoma County	Not Available
Individuals in overcrowded households	Household with more than one person per room	4%
Mobile home households	Housing units that are mobile homes	4%
Households experiencing housing burden	Percentage of gross household income spent on housing costs	48%
Households experiencing energy burden	Percentage of gross household income spent on energy costs	2%
Households without a computer	Households without access to a computer	5%
Households without broadband internet	Households without access to broadband internet	9%

[1] People experiencing houselessness percentage includes data for incorporated Sonoma County from the County's 2022 Point in Time count. Data for this group was not available at the Census tract level for Sonoma County and therefore was not included in the Social Sensitivity Index.

[2]People who are undocumented percentage includes data for incorporated Sonoma County and is sourced from the California Immigrant Data Portal. Data for this group was not available at the Census tract level for Sonoma County and therefore was not included in the Social Sensitivity Index.

[3] Data for immigrants was not available at the Census tract or County level for Sonoma County and therefore was not included in the Social Sensitivity Index.

[4]Cardiovascular disease data for Sonoma County is currently unavailable, therefore coronary health disease data from CDC's PLACES Health Data was used as a proxy.

[5] Data for visitors was not available at the Census tract or County level for Sonoma County and therefore was not included in the Social Sensitivity Index.

[6] Data for people recreating outdoors was not available at the Census tract or County level for Sonoma County and therefore was not included in the Social Sensitivity Index.

Source: The percentages used in this table were acquired from the U.S. Census, 2016-2020- American Community Survey (ACS), and CDC's PLACES Health Data.

The above indicators were used to assess the geographic spread and proportion of populations made sensitive by systems within the County who may be more impacted by climate hazards. Data for these indicators was obtained from the Census Bureau's American Community Survey 2016-2020 and CDC's PLACES Health Data.

An analysis was conducted to identify the concentration of each population group in each unincorporated Sonoma County census tract. Figure 14 displays social sensitivity in unincorporated Sonoma County by census tract. Unincorporated County census tracts with high proportions of populations made sensitive by systems, relative to state statistics, have higher percentile rankings on the 0% to 100% scale.

Figure 14 also shows census tracts identified as Environmental Justice Communities, as identified in the Sonoma County Environmental Justice (EJ) Technical Report. The EJ Technical Report identifies 24 Environmental Justice Communities as well as three Environmental Justice Tribal Communities in Sonoma County. Environmental Justice Communities are areas that are low-income and are disproportionately affected by environmental pollution and other hazards. These communities are more likely to experience negative health effects, pollution and hazard exposure, and environmental degradation (Sonoma County Environmental Justice Technical Report 2023).

The areas of Sonoma County with the greatest concentration of populations made sensitive by systems are in the Cloverdale area, directly southwest of Santa Rosa, and around Fetters Hot Springs-Agua Caliente. Figure 14 denotes the location of federally recognized tribal land, including Stewart's Point Rancheria and Kashia Coastal Reserve, located northeast of Healdsburg, and Dry Creek Rancheria, located south of Point Arena. These tribal lands are identified as disadvantaged communities by Senate Bill 535 and are also highly socially sensitive due to existing systems and structures.

Figure 14 also shows locations of Environmental Justice Communities in the County. Environmental Justice Communities are located throughout the County, with most located in west, central, and south County. All high social sensitivity census tracts overlap with Environmental Justice Communities, except for two census tracts: one directly east of Santa Rosa and another near Graton. Stewart's Point Rancheria, Kashia Coastal Reserve, and Dry Creek Rancheria are also considered to be EJ Tribal Communities in Sonoma County.

Populations made sensitive by systems within Sonoma County are organized into four separate groups for the purposes of this assessment. Grouping populations allows the County to understand what systems and structures contribute to increased sensitivity to climate change hazards. Through identification of factors that contribute to population sensitivity, adaptation solutions can be developed that specifically address those contributing factors. Population groupings are as follows:

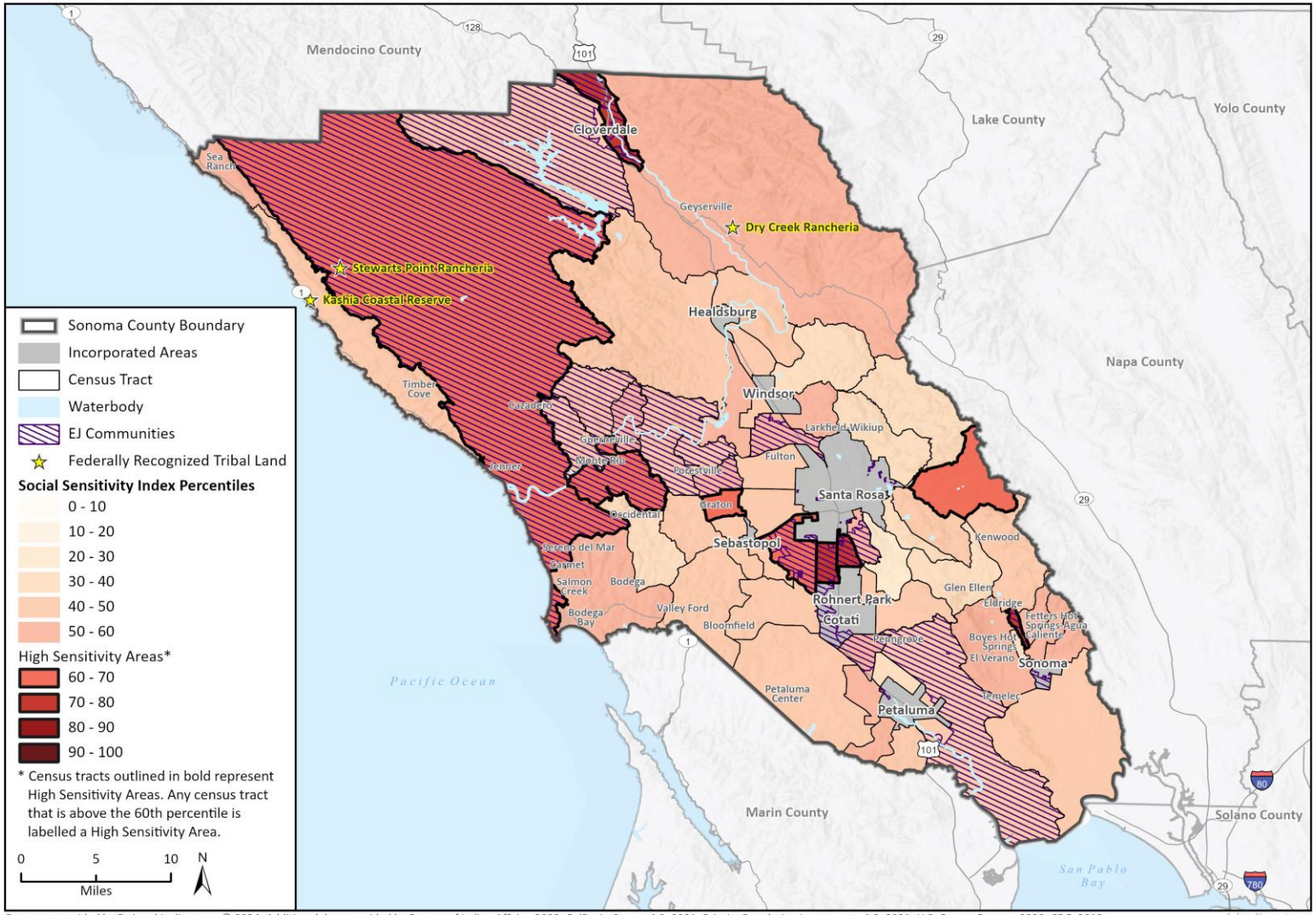
1. **Individuals with High Outdoor Exposure.** Outdoor workers, people experiencing houselessness, visitors, and people recreating outdoors.
2. **Under-Resourced Individuals.** People experiencing poverty, unemployed individuals, Individuals with no health insurance, households without a computer, households without a broadband internet, renters, individuals without vehicle access, single-female heads of households, individuals with educational attainment of less than 4 years of high school, individuals in overcrowded housing, mobile home households, households

experiencing housing burden, and households experiencing energy burden.

3. **Individuals Facing Societal Barriers.** BIPOC, Native Americans, limited and non-English speakers, immigrants, and people who are undocumented.
4. **Individuals with Chronic Health Conditions or Health Related Sensitivities.** Seniors, young children, people who are differently abled, individuals with asthma, individuals with cardiovascular disease, and military veterans.

Environmental Justice Communities, as identified in the EJ Technical Report, are determined based on a set of population characteristics (i.e., health conditions, education, housing burden, linguistic isolation, poverty, and unemployment) and level of pollution burden. Several of the population characteristics used to identify Environmental Justice Communities are also used in the social sensitivity analysis of this assessment to identify people made sensitive by systems. As these population characteristics are already assessed in the social sensitivity analysis, a separate sensitivity analysis and vulnerability analysis is not included for Environmental Justice Communities in this assessment.

Figure 14 Populations Made Sensitive to Climate Change by Systems and Environmental Justice Communities in Sonoma County



Basemap provided by Esri and its licensors © 2024. Additional data provided by Bureau of Indian Affairs, 2023; CalEnviroScreen 4.0, 2021; Priority Population Investments 4.0, 2021; U.S. Census Bureau, 2020; CDC, 2010; American Community Survey (ACS) 2017-2021 5-year estimates, Table(s) B25070, B25091 & ACS, LEAD tool, 2018; Social Sensitivity Percentile Scores calculated by Rincon Consultants, Inc., 2022.

Safety Element.aprx
Fig X Social Sensitivity Analysis

Parks and Natural Resources

Across the 1,515 square miles of Sonoma County there is a diverse landscape of parks and natural resources varying in biomes and topography. Each combination of microclimate, vegetation, and wildlife presents a different type of sensitivity to climate change (SCRLS 2022). Parks and natural resources within Sonoma County include waterways, regional parks, hillsides, and critical habitats. These various resources provide habitat, ecosystem services, sources of community resilience, recreation, and economic productivity to the County. These resources are spread throughout the County and face various levels of exposure to climate hazards. The dispersal of Parks can be found overlayed with the wildfire, landslide, and flood maps in Figure 8, Figure 11, and Figure 12. Land Cover Types and Federally Designated Critical Habitats are found below in Figure 17.

Primary vulnerabilities for parks and natural resources are typically associated with extreme heat and drought related stressors, increasing wildfire frequency and severity, with impacts such as species mortality and loss of habitat. Compounding climate hazards stresses natural ecosystems past their ability to absorb individual climate hazards, which can cause wildlife to shift towards more favorable habitats, such as parks and open spaces where people recreate (USDA 2020). Parks and recreation areas used by both wildlife and community members may also experience climate hazard stressors creating competing needs for safe habitats for wildlife as well as impacting the ability for community members to recreate.

Critical Facilities, Buildings, Services, and Infrastructure

Climate change is expected to amplify extreme weather and climate hazards in Sonoma County. A jurisdiction's vulnerability increases when buildings and facilities are not designed, operated, and/or maintained to function effectively under more extreme weather conditions or can be damaged by more extreme weather conditions. The functionality of critical facilities, buildings, services, and infrastructure is essential to the County's livelihood and economy. The following County critical facilities, buildings, services, and infrastructure components would be sensitive to climate change: fires stations, police stations, hospital/healthcare facilities, emergency shelters, schools, public libraries buildings, educational facilities, residential and commercial development, roadways and transportation facilities, airfields, and communication facilities.

The sensitivities presented in this asset category are critical to the County's health, quality of life, safety, security, and economy. Sonoma County depends on well-functioning roadways, water supplies, and utility infrastructure systems. Currently, overall funding levels and replacement of aging infrastructure are below what is necessary to keep up with maintenance needs. Climate impacts can increase the costs of keeping these critical elements functioning at necessary levels (Cornwall et.al, 2014). Figure 3 displays the locations of critical facilities, buildings, services, and infrastructure across the County.

Agriculture

Agricultural land cover seen in Figure 16 encompasses the majority of central Sonoma County. As the main source of economic productivity for the County, this asset category is particularly essential to the community when gauging sensitivities to climate change. According to the 2020 Sonoma County Agricultural Report, production of crops and livestock declined slightly in 2020 compared to 2019 to $3,476,093,000, which was primarily attributed to market changes and supply chain challenges associated with the COVID-19 pandemic. The agricultural industry struggles with labor shortages during peak harvest periods, increased production expenses, and climate hazard-related losses. Sonoma County's top 10 commodities by value are found in Figure 15 below.

The agricultural lands of Sonoma County experience sensitivity to climate change from direct exposures to climate hazards. Croplands and rangelands within fire, landslide, or flood zones are exposed and subsequently sensitive to climate change. The entirety of agricultural operations are dependent on outdoor based activities which can be significantly hindered by climate hazards or halted all together. Different hazards may limit agricultural operations in different ways. Based on the location of agricultural lands in relation to hazard zones, different areas of the county may encounter varied issues (Cornawall et.al., 2014). Per the Sonoma County Resilient Lands Strategy much of the County's land use is agriculture with compounding sensitivity as the hottest parts of the county are co-located with intensive agriculture areas (SCRLS 2022).

Nearly 70% of California's existing area of wine production will be vulnerable under future climate change projections by mid-century. As described in the California Fourth Climate Change Assessment regional report, the sensitivities of agriculture are primarily related to extreme temperatures and temperature-related water scarcity (Ackerly et al. 2018). Changes in rainfall and precipitation dynamics create sensitivities for rangeland vegetation, plant production, and wine production (Ackerly et al. 2018).

Figure 15 Sonoma County Agricultural Report, Top Ten Commodities by Economic Value

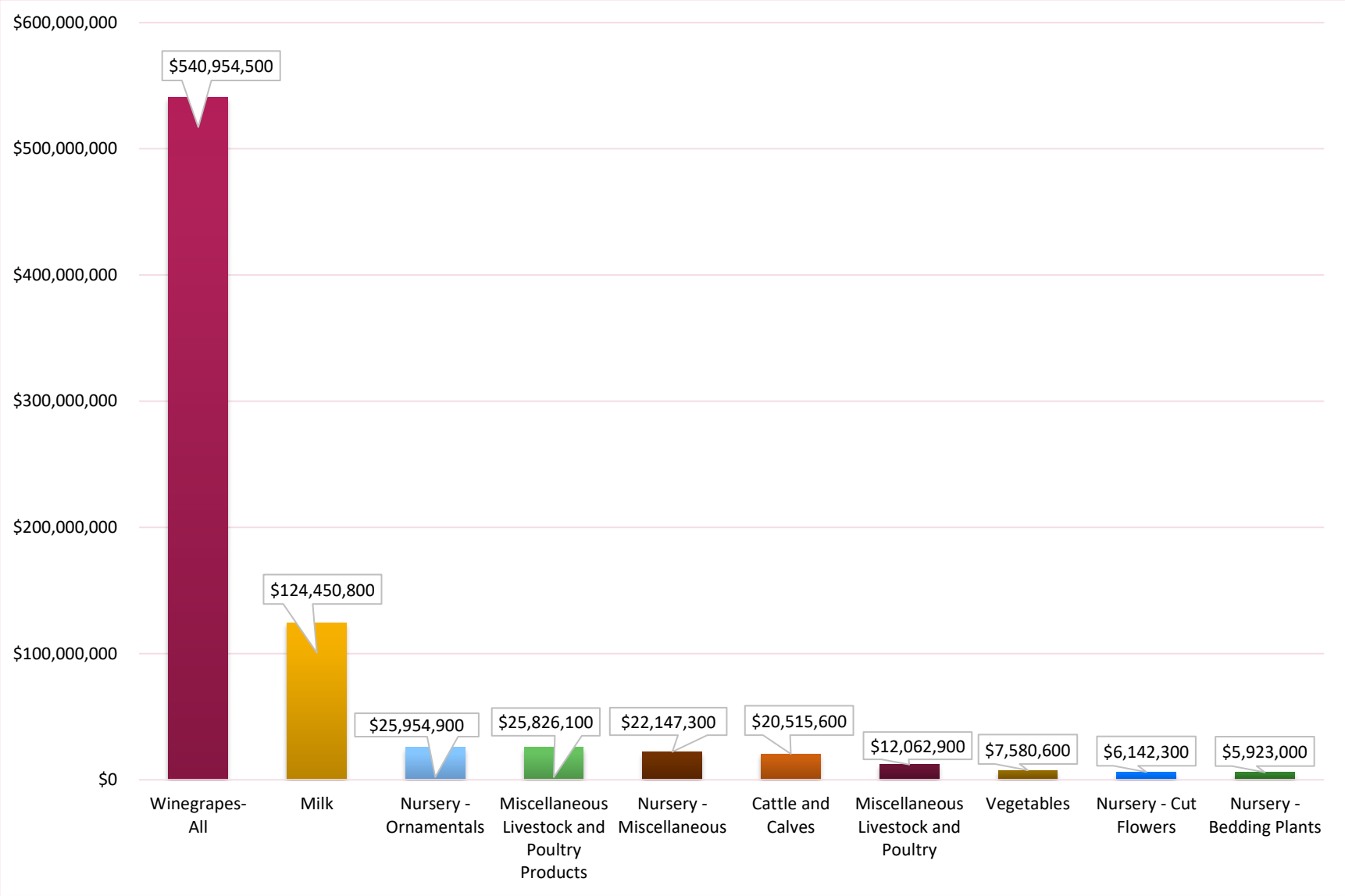


Figure 16 Sonoma County Regional Parks, by Land Cover Type and Total Acreage (Sonoma County Regional Parks 2023)

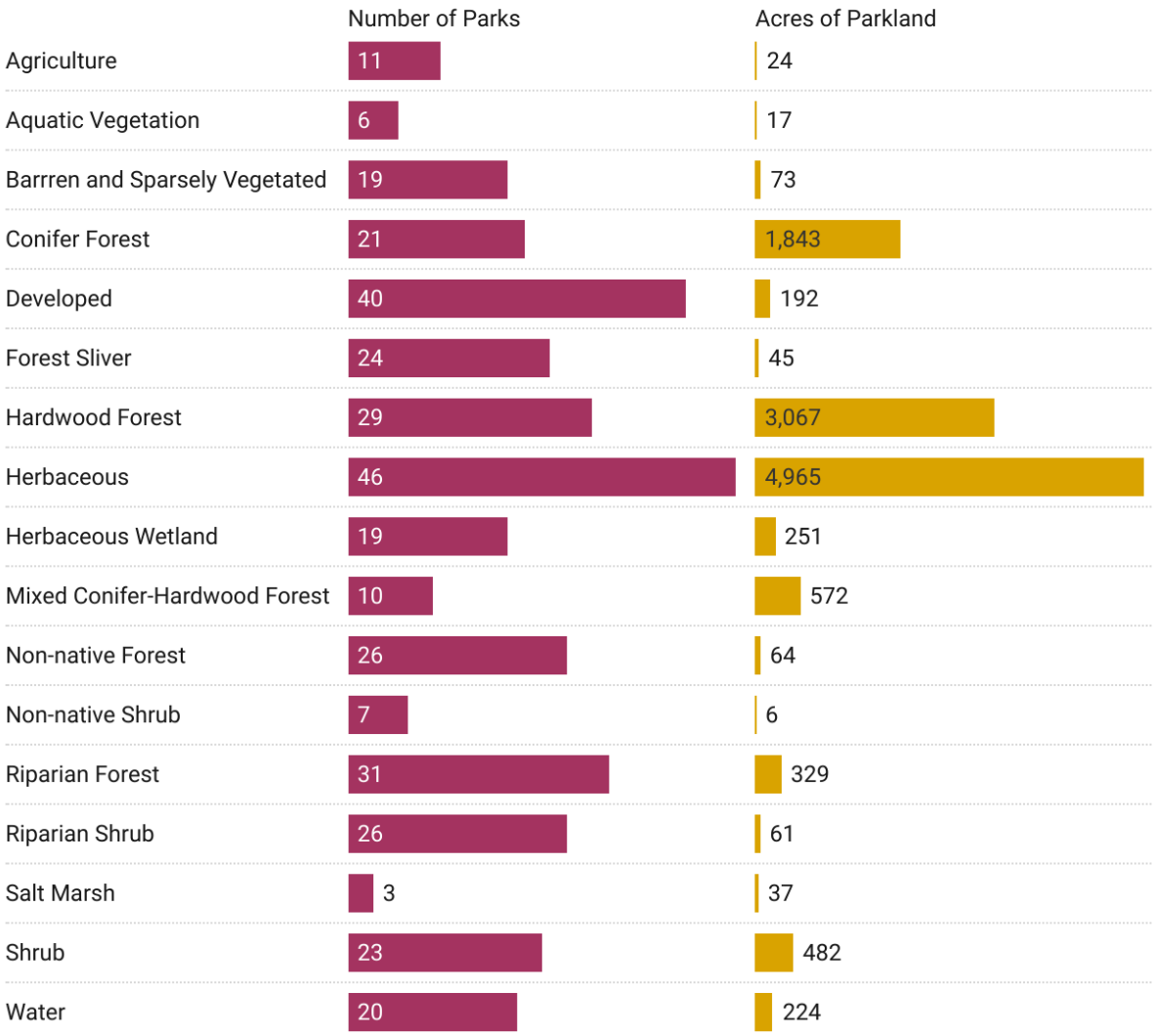
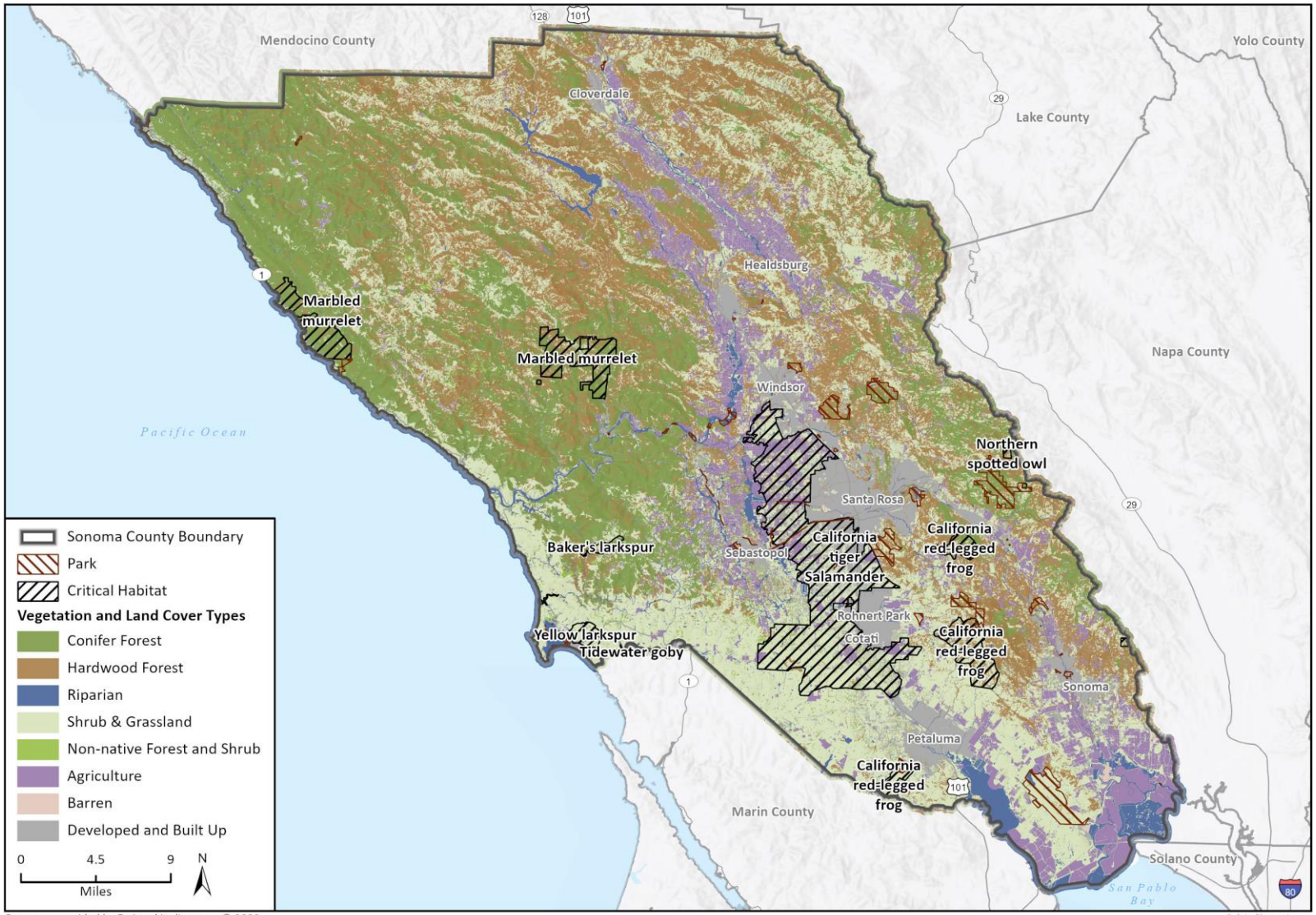


Figure 17 Sonoma County Land Cover Types and Federally Designated Critical Habitats



Basemap provided by Esri and its licensors © 2023.
Additional data provided by Sonoma County, Fine Scale Vegetation and Habitat Map, 2013; USFWS, 2021.

Safety Element.aprx
Fig 10 Natural Resources with Vegetation, Critical Habitats, and Parks

5 Vulnerability Analysis

Vulnerability is the propensity or predisposition of a certain asset or population group to be adversely affected by climate change impacts. In this assessment, it is based on the combination of potential impacts and adaptive capacity. The results of the analysis detail how climate change may impact community members made vulnerable by systemic inequities. It also details how climate change may impact parks and natural resources, critical facilities, buildings, services, and infrastructure, and agriculture in Sonoma County. The vulnerability assessment will inform the development and prioritization of adaptation policies and programs to increase community and ecosystem resilience as part of the Sonoma County General Plan Safety Element update.

The following section outlines the impacts each climate hazard has on populations and assets identified in Section 3, *Sensitivity*. A detailed summary of the County's adaptive capacity organized by climate hazard can be found in Appendix B. An impact score and an adaptive capacity score is identified for each asset by climate hazard, along with an overall vulnerability score consistent with the scoring methodology provided in the Methodology section. Vulnerability scoring helps the County understand which climate effects pose the greatest threats and should be prioritized in adaptation planning and policy.

Adaptive capacity was almost exclusively evaluated based on existing County and utility-led plans and programs. There are other forms of adaptive capacity that are led by institutions (e.g., schools, religious institutions), community-based organizations, non-profits, special districts, and other nongovernmental entities. Communities also form their own informal adaptive capacity efforts to prepare for, weather, and recover from climate hazards. According to the safety element survey, almost 60% of respondents indicated that they would first turn to friends and family, as opposed to community organizations or the County, for resources during an emergency, indicating the importance of interpersonal support systems during hazard events. This assessment focused on County-led programs and policies in alignment with the focus of the Safety Element which is part of the County's General Plan.

Populations

Overview

As climate change impacts occur, virtually all populations in a community will be affected; however, some individuals are more sensitive due to inequitable systems and structures and therefore will be disproportionally impacted by climate hazards, which will vary depending on the hazard type and magnitude of sensitivity. Overlaying population sensitivity, Environmental Justice Communities, and potential climate impacts helps to determine the level of vulnerability.

Figure 10 displays social sensitivity in unincorporated Sonoma County by census tract. As described in Section 3.1, *Populations*, the areas of Sonoma County with the greatest concentration of social sensitivity are in the Cloverdale area, directly southwest of Santa Rosa, and around Fetters Hot Springs-Agua Caliente. Figure 10 also displays Environmental Justice Communities which are located throughout the County but concentrated in west, south, and central County.

Areas near Fetters Hot Springs-Agua Caliente, southwest of Santa Rosa, Forestville, Cloverdale, and south of Windsor have a combination of high temperature exposure by end-of-century, high social sensitivity, and a concentration of Environmental Justice Communities, as displayed on Figure 18.

Areas near the Russian River, around Cloverdale, and in most of northwest County have a combination of high wildfire exposure, high social sensitivity, and a concentration of Environmental Justice Communities including Environmental Justice Tribal Communities, as displayed on Figure 19.

Areas near the Russian River, around Cloverdale, and in most of northwest County have a combination of high landslide susceptibility, high social sensitivity, and a concentration of Environmental Justice Communities, as displayed on Figure 20.

Areas near the Russian River, directly southwest of Santa Rosa, around Cloverdale, and in most of northwest County have a combination of high flood exposure, high social sensitivity, and a concentration of Environmental Justice Communities, as displayed on Figure 21.

Areas of the County south of Petaluma but north of San Pablo Bay are designated as Environmental Justice communities and face exposure to two feet of sea level rise by 2050 and seven feet by 2100. Areas along the Russian River and south of Jenner are designated as Environmental Justice communities, high socially sensitive areas, and face exposure to two feet of sea level rise by 2050 and seven feet by 2100.

Populations made sensitive by systems are grouped below into four categories of social sensitivity:

1. **Individuals with High Outdoor Exposure**
2. **Under-Resourced Individuals**
3. **Individuals Facing Societal Barriers**
4. **Individuals with Chronic Health Conditions or Health Related Sensitivities**

The vulnerability of each population group is assessed based on potential impact and adaptive capacity. According to the safety element survey, responses to the question asking who is most impacted by climate change-related hazards correlate with these four groupings. When asked about which community groups the County should prioritize with assistance, the responses also closely correlated with these four categories of social sensitivity. This assessment acknowledges how the intersectionality of systems compound individuals' sensitivity across multiple factors at once; however, for the purpose of this assessment, analysis was conducted based on the systemic sensitivity that increases an individual's risk to the greatest degree. Compounding sensitivities are further explained for each population group below.

Adaptive Capacity of Populations

There are existing Sonoma County plans, policies, programs, and resources in place to help populations made sensitive by systems to mitigate and adapt to multiple climate hazards; however there remain significant gaps in adequately preparing community members to be able to prepare for, cope and recover from climate impacts. The existing plans, policies, and programs identified in this assessment do not address the systemic issues that render certain populations more vulnerable to climate change. They largely focus on mitigating climate change impacts rather than addressing the root causes of disproportionate sensitivity.

- **Sonoma County Cooling Centers:** provides cooling centers for County residents during periods of extreme heat and/or poor air quality. In recent years, cooling centers have been located in

Cloverdale, Sonoma, Santa Rosa, Petaluma, and Healdsburg (Sonoma County 2022).

- **Sonoma County Climate Change and Health Profile Report**: details climate projections and related climate hazards, climate-health related risks, and populations in the County most vulnerable to climate change impacts including individuals facing societal barriers. The report outlines high-level public health strategies, near-term actions, and long-term actions that County agencies may consider implementing to mitigate climate change impacts on people made vulnerable by systems (CDPH 2017).
- **The Climate Ready Sonoma Report** assesses existing vulnerability and adaptive capacity efforts for populations including individuals facing societal barriers (Sonoma County 2014)
- **The Sonoma County Operational Area Emergency Plan** includes several annexes on topics including community alert & warning, evacuation, and mass care & shelter. There are protocols and resources included specifically for individuals facing societal barriers (Sonoma County 2021)
- **Sonoma County Multi-Jurisdictional Hazard Mitigation Plan** identifies mitigation strategies that reduce or eliminate long-systems including individuals facing societal barriers (Sonoma County 2021)
- **KBBF 89.1 FM** is a bilingual public radio station that serves the north San Francisco Bay Area and Sonoma County. According to the North Bay Organizing Project, the radio station has historically provided critical emergency and evacuation information to Spanish-speaking residents during past hazard and evacuation scenarios.
- **Community Rating System** is a voluntary program within the National Flood Insurance Program (NFIP) that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions. However, under-resources individuals are often uninsured and face disproportionate flood impacts (FEMA 2023).
- **Sonoma County Energy Independence Program (SCEIP)** offers financing for permanent energy, water, wildfire safety, and seismic strengthening improvements through the property tax system. Financing is available for residential, commercial, industrial, agricultural, multi-family and certain non-profit projects (Sonoma County 2022).
- **Sonoma County Home Resilience Guide.** The County of Sonoma, in partnership with the Bay Area Regional Energy Network (BayREN), developed a guidebook to educate homeowners on improvements they can make for a more energy efficient, safe, comfortable, and resilient home, including energy efficient technologies, water saving features, and ways to protect homes from wildfires, earthquakes, and more.
- **PG&E Medical Baseline Program:** provides eligible customers with a medical need for electricity (for oxygen, dialysis, etc.) with extra notifications (i.e., calls, texts, or door-bell rings) in advance of a public safety power shutoff. Public safety power shutoffs may occur during an extreme heat event (PG&E 2021). This program particularly helps individuals with chronic health conditions or health related sensitivities mitigate impacts from public safety power shutoffs.
- **PG&E Self-Generation Incentive Program:** pays for all costs associated with procuring battery storage for eligible customers. Medical Baseline Program customers qualify for full benefits of the program (PG&E 2020). This program particularly

helps individuals with chronic health conditions or health related sensitivities mitigate impacts from power service disruptions.

The Safety Element Survey was conducted to better understand how the community has been impacted by climate change, how they are preparing, and what barriers they have faced to preparing for more extreme weather events as the result of climate change. When asked what precautionary measures respondents had taken to prepare for wildfires, a majority of respondents indicated that they had signed up for emergency alerts, prepared an emergency supply kit and maintained vegetation around their home. Very few respondents felt that they did not need to take any precautionary measures. When asked a similar question about flood readiness, most respondents had signed up for emergency alerts, some had prepared an emergency response kit, and over 30% believed they did not need to take any precautionary measures, a sharp drop from the number of people concerned for wildfire risk. When asked why they had not signed up for emergency alerts, Spanish speaking respondents indicated that they did not know the emergency alert system existed and were unsure if the alerts were available in Spanish. These results are indicative of a language barrier as these concerns were not prevalent for English speaking respondents. Another question targeted renters asking if they had asked their landlords to make improvements to prepare for wildfires and flooding. Most respondents indicated that they had not asked their landlord to make improvements and cited worries that their landlord would get mad or raise rent and not knowing what improvements landlords should make. Respondents were also asked to indicate how important they thought it was to prepare for climate change. Over 60% of respondents believed it was very important to prepare while very few said it was not very important. When surveying about barriers respondents face to preparing for climate change-related hazards, over 40% indicated financial constraints as a concern and 28% cited no barriers and believed themselves to be adequately prepared. Another set of questions asked respondents about which members of the community had been most impacted by climate change hazard events and in what ways, and to which community groups should the County prioritize with assistance. Many responses listed people with low incomes, people experiencing homelessness, seniors, people with disabilities, farm workers, people who speak languages other than English, undocumented people, people with inadequate access to transportation, renters, and people located in hazard zones as the most impacted and most in need of County aid. They cited that people were most impacted by extreme heat, fires, power outages, floods, and being out of work.

1. Individuals with High Outdoor Exposure

- Outdoor workers
- People experiencing houselessness
- Visitors
- People recreating outdoors

Outdoor workers, people experiencing houselessness, visitors, and people recreating outdoors face high outdoor exposure, which increases exposure to potential climate hazards. A significant portion of Sonoma County's local economy is associated with viniculture and agriculture (Sonoma County MJHMP 2021a). The significant number of outdoor workers in these sectors face high risk to climate hazards. This high risk from climate hazards is compounded by the fact that a large percentage of viniculture and agricultural workers are immigrants, speak languages other than English, and/or are undocumented.

Sonoma County has an estimated 2,893 people experiencing houselessness in 2022 (Sonoma County Point-in-Time Count Results

2022). There is a concentrated number of homeless camps along the Russian River near Guerneville (Waterkeeper Alliance 2023). People experiencing houselessness often suffer from high rates of respiratory conditions, mental illness and other chronic health conditions and therefore are more sensitive to climate hazards (CDPH 2020).

Sonoma County is also a popular tourist destination with many people visiting the coast and wineries. Visitors are at risk because they may not receive warning during emergency events and are more likely to be unsure of how or where to receive help, or how to evacuate. Visitor deterrence, which could occur during and following climate hazards, would have a notable negative impact on the local economy (Gamble et al. 2016).

Many residents and visitors engage in various outdoor recreation activities, including biking, hiking, golfing, water sports, equestrian activities, and camping, in Sonoma County. In 2018, outdoor recreation added $731 million a year to Sonoma County's economy (The Press Democrat 2018). People recreating outdoors are more likely to face high exposure during climate hazard events. They may be geographically isolated and face challenges evacuating hazardous areas.

Potential Impacts



Extreme Heat and Warm Nights

Individuals with high outdoor exposure are at risk of health impacts from extreme heat. Outdoor workers are often subject to strenuous work conditions and are vulnerable during extreme heat events. People experiencing houselessness and displaced individuals are exposed to the health-related impacts associated with extreme heat because they have limited access to shelter and air conditioning. The primary health impacts to these populations are heat-related illnesses, such as heat stress, heat stroke, and dehydration, which can be life-threatening (CDPH 2020). Visitors are particularly at risk during extreme heat events because they may not be keyed into local heat warning communications and are less likely to know where to seek refuge. People that recreate outdoors are also susceptible to health impacts from extreme heat.



Drought

Unless there are major water shortages in the county, individuals with high outdoor exposure are most likely not at disproportionate risk to drought.



Wildfire

Some outdoor workers, including fire fighters and emergency personnel, may be exposed to hazardous work conditions during wildfire events and may become injured from smoke inhalation or burns. Outdoor workers in the viniculture and agricultural sectors also risk exposure to hazardous work conditions during wildfire events, which often overlap with harvest season. Workers are impacted by air quality and loss of wages, especially where hazard pay is unavailable. Many agricultural workers in the county live on agricultural operation premises and lack transportation needed during wildfire evacuations. Additionally, undocumented outdoor workers are unable to access Federal reimbursement should their housing or personal belongings get destroyed or damaged by fire. People experiencing houselessness are particularly at-risk during wildfire events as they often suffer from respiratory conditions, mental illness, and chronic health conditions that may be exacerbated from physical contact with wildfire or poor air quality. People experiencing houselessness have limited access to shelter and often do not have access to transportation to evacuate from smoke engulfed areas (CDPH 2017). Visitors and people recreating outdoors may not have access

to emergency public health warnings and may not know of appropriate evacuation routes or where to get emergency evacuation information in the event of a wildfire. Additionally, wildfire risk may deter visitors, impacting Sonoma County's economy (Gamble et. al 2016).



Landslide

Some outdoor workers, including emergency personnel, may be exposed to hazardous work conditions during landslide events and may become injured from debris, rocks, or damaged infrastructure or facilities. Undocumented outdoor workers are unable to access Federal reimbursement should their housing or personal belongings get destroyed or damaged by a landslide. People experiencing houselessness are particularly at-risk during landslides because they have limited access to shelter and often do not have access to transportation to evacuate from hazardous areas (CDPH 2017). According to the focus group interviews, this is a particular risk in areas around the Russian River where there are both high concentrations of people experiencing houselessness and high landslide susceptibility. Visitors and people recreating outdoors may not have access to emergency public health warnings and may not know of appropriate evacuation routes or where to get emergency evacuation information in the event of a wildfire. Additionally, landslide risk may deter visitors, impacting Sonoma County's economy (Gamble et. al 2016).



Riverine and Stormwater Flooding

Outdoor workers may be exposed to hazardous work conditions during flooding events and therefore are vulnerable to health impacts (CDPH 2020). Many agricultural workers in the county live on agricultural operation premises and will also be subjected to flood-related damage to their homes. People experiencing houselessness are disproportionately at risk of health impacts during flood events because they often live in flood hazard areas and do not have access to transportation to evacuate inundated areas. They may also have their personal belongings destroyed or damaged during a flood event (Ramin & Svoboda 2009). Impacts of flooding are likely to result in minimal impact to visitors, although visitors to and people recreating in areas along the Russian River could be impacted (Gamble et. al 2016).

Sea Level Rise



Outdoor workers, particularly those working along the coastline, may be exposed to hazardous work conditions during sea level rise storm surge events and are vulnerable to health impacts (CDPH 2020). Impacts of sea level rise are likely to result in direct impacts to visitors and people recreating outdoors, though disappearing beaches may deter or inhibit these individuals and impact the county's economy (Gamble et. al 2016).

Vulnerability Score – Individuals with High Outdoor Exposure

Climate Hazard			
Extreme Heat	High	Low	**5-High**
Drought	Low	Medium	**2-Low**
Wildfire	High	Medium	**4-High**
Landslide	Medium	Medium	**3-Medium**
Riverine and Stormwater Flooding	Medium	Low	**4-High**
Sea Level Rise	Low	Medium	**2-Low**

2. Under-resourced Individuals

- People experiencing poverty
- Unemployed individuals
- Individuals with no health insurance
- Households without a computer
- Households without a broadband internet
- Households with limited computer skills
- Renters
- Individuals with educational attainment of less than 4 years of high school
- Single female heads of household
- Individuals in overcrowded housing
- Mobile home households
- Households experiencing housing burden
- Households experiencing energy burden

Under-resourced individuals have inequitable access to resources with which to prepare for, cope with, and recover from climate change impacts. Individuals who are unemployed or people experiencing poverty often face financial barriers when preparing for and recovering from climate change hazards. Individuals in these groups often live in homes that are less protected against climate hazards, and/or are renters so they are unable to make needed home improvements. People experiencing poverty may not be able to take time off work to address health concerns either caused by or exacerbated by climate hazards. People experiencing poverty in conjunction with food and housing insecurity are rendered systematically more vulnerable than the general population to many co-morbid health issues.

Single female heads of households, as defined by the U.S. Census as female householders with children under 18-years-old and no spouse/partner present, are often subjected to high levels of work-life conflict and financial hardship, which can make preparing for, coping with, and recovering from climate hazards difficult. They are also more likely to serve as the primary caretaker of children which can make evacuating during a hazard scenario difficult (Flanagan et al. 2011). Additionally, women's wages, on average, are lower than their male counterparts. According to U.S. Census Bureau data, in 2020, women earned 84 percent of what men earned (Pew

Research Center 2021). This disparity is even more extreme for black women who earned on average 64 percent of what white, non-Hispanic men earned in 2020 (Bleiweis et al. 2021).

Individuals with educational attainment of less than four years of high school usually have lower earning potential and are twice as likely to be unemployed than those with a high school degree (Association of Public and Land-Grant Universities n.d.). Individuals with low educational attainment are more likely to work in outdoor and/or labor-intensive environments thus increasing the impact of climate events (CDPH 2017). Under-resourced individuals are less likely to have access to transportation, healthcare, and other basic needs. Under-resourced individuals often lack the financial resources to evacuate from a climate hazard and/or find a safe and affordable place to evacuate to.

Households without a computer or broadband internet, or that lack computer skills may be less likely to receive emergency alerts or governmental guidance before or during a climate hazard event, making them particularly vulnerable in evacuation scenarios. Individuals without health insurance are more likely to have undiagnosed pre-existing health conditions and inadequate access to preventative care and treatment, which may make them more vulnerable to health impacts from climate hazards (Gamble et al. 2016).

Individuals who rent housing have limited ability to weatherize their homes for hazard events. Mobile home households also often do not have adequately weatherized homes. They also may not have temperature control in their housing units and generally experience a higher water and energy utilities cost burden than homeowners (Cooley et al. 2012).

Households experiencing housing cost or energy cost burden are less likely to have financial resources to prepare for, respond to, or recover from impacts. Individuals living in overcrowded housing are more likely to face health and safety concerns. The U.S. Census defines an overcrowded unit as one occupied by 1.01 persons or more persons per room. Individuals in these groups are more likely to face financial barriers when preparing for and recovering from climate hazards (CA Department of Housing and Community Development 2022).

Potential Impacts



Extreme Heat and Warm Nights

Under-resourced individuals may not be able to pay for adequate air conditioning or fans, increasing their exposure to extreme heat. Individuals without vehicles may face challenges traveling to cooling centers or temporary shelters during extreme heat events (Cooley et al. 2012). Households without a computer or broadband internet may not receive heat advisory warnings or governmental guidance, causing them to experience health impacts from extreme heat exposure (CDPH 2017). Under-resourced individuals are less likely to receive medical care for illnesses triggered or exacerbated by extreme heat, or if treatment is received, they are likely to face a significant medical cost burden and related financial stress.



Drought

During periods of prolonged drought, under-resourced individuals are more likely to experience the cost burden associated with increased water rates (Feinstein et al. 2017). These individuals may struggle to access clean and affordable drinking water which may cause financial strain (Gamble et al. 2016). Droughts often trigger cascading economic impacts through the agricultural sector, decreasing job availability and leaving people

experiencing poverty particularly vulnerable to financial hardships (Howitt et al. 2015). According to the stakeholder focus group interviews, Gold Ridge Resource Conservation District noted that rural areas of the community that rely on local water resources have faced significant challenges of water reliability and water quality during recent periods of drought (Jensen 2023). Sonoma County and the North Coast Regional Water Quality Control Board have found that falling groundwater levels due to drought conditions may increase levels of naturally occurring minerals in shallow groundwater that supplies drinking water to private wells. This can pose increased health and safety risks to individuals relying on local groundwater resources (Sonoma County MJHMP 2021a).



Wildfire

Under-resourced individuals may experience injuries or death from smoke inhalation or burns and are likely to experience financial burden associated with medical treatment (CDPH 2017). These individuals may have their belongings and homes damaged by a wildfire. If this occurs, under-resourced individuals are less likely to be covered by insurance and more likely to suffer from the cost burden. Individuals without vehicle access are vulnerable during wildfires because they may have a more difficult time evacuating safely. Renters have limited control over home hardening and improvements that may protect against fire and smoke. Individuals living in mobile homes may also face disproportionate risk if their homes are not adequately hardened and weatherized. Subsequently, they may experience economic and health impacts and a greater loss of belongings than homeowners (Gamble et al. 2016).



Landslide

Under-resourced individuals may experience injuries or death from landslides and are likely to experience financial burden associated with medical treatment (CDPH 2017). These individuals may have their belongings and homes damaged by a landslide. If this occurs, under-resourced individuals are less likely to be covered by insurance and more likely to suffer from the cost burden. Individuals without vehicle access are vulnerable during landslides because they may have a more difficult time evacuating safely. Renters have limited control over home hardening and improvements that may protect against landslides. Individuals living in mobile homes may also face disproportionate risk if their homes are not adequately hardened and weatherized. Subsequently, they may experience economic and health impacts and a greater loss of belongings than homeowners (Gamble et al. 2016).



Riverine and Stormwater Flooding

Under-resourced individuals may experience injuries or death from high velocity flooding and are less likely to receive medical treatment (CDPH 2017). Individuals in these groups may experience cost burdens if their belongings and homes are damaged from floodwater inundation. Individuals without vehicle access are vulnerable during flooding because they may not have access to transportation to evacuate. Households without a computer or internet may not receive communications and emergency alerts to safely evacuate from hazard areas (CDPH 2020). Renters have limited control over home improvements that may protect against flood damage. Individuals living in mobile homes may also face disproportionate risk if their homes are not adequately weatherized. Subsequently, they may experience economic and health impacts and a greater loss of belongings than homeowners (Gamble et al. 2016).



Sea Level Rise

Sea level rise could impact housing needs in Sonoma County due to populations in search of areas to relocate as they move from areas impacted by sea level rise. Populations living in coastal areas may be negatively impacted economically due to loss of property and land because of levee failure, coastal erosion, or inundation due to storm surges. Furthermore, sea level rise can negatively impact individuals living in low-lying areas along the coast and in formerly tidal portions of southern Sonoma County. Saltwater intrusion into aquifers could render water wells unusable which could impact under-resourced individuals relying on wells for potable water.

Vulnerability Score – Under-resourced Individuals

Climate Hazard			
Extreme Heat	High	Medium	**4-High**
Drought	Low	Medium	**2-Low**
Wildfire	High	Medium	**4-High**
Landslide	Low	Medium	**2-Low**
Riverine and Stormwater Flooding	High	Low	**5-High**
Sea Level Rise	Low	Medium	**2-Low**

3. Individuals Facing Societal Barriers

- BIPOC
- Limited or non-English speakers
- Immigrants
- People who are undocumented
- Native Americans

Individuals facing societal barriers are those who are directly impacted by systemic social and economic challenges. These challenges create educational, resource, economic, and health disparities that leave communities extremely vulnerable to climate change impacts (Baird 2008). When looking at the intersectionality and compounding impact of these societal barriers, these communities are more likely to face high outdoor exposure, be systematically under-resourced, be subjected to toxic stress and/or have chronic health conditions, live in high-hazard risk areas, and are less likely to be homeowners. These systemic factors make them disproportionately vulnerable to climate hazards. In the county, many of these individuals face compounding risks associated with linguistic and income barriers. Immigrants and people who are undocumented are often deprived of access to medical services, quality housing, and basic needs, as well as access to social and economic services that would allow them to prepare for, respond to, and cope with climate hazards. If evacuation and/or advisory notices, hazard preparedness material, or governmental guidance are not provided in their preferred language, these individuals may

not be able to prepare for, cope with, or recover from a climate hazard (Gamble et al. 2016). Additionally, historical mistreatment and underserving by government leads to distrust, which compounds the lack of access to resources even when they do exist.

Sonoma County is located on the ancestral lands of the Pomo, Coast Miwok, and Wappo tribes. Most Native Americans experience some degree of the implications of colonial violence, cultural erasure, and social marginalization, and as a result, they are more likely to be under-resourced and experience poverty (Lynn et al. 2011). Not all county residents who identify as Native American have ties to tribal communities or come from tribes that are not federally recognized within Sonoma County, which affects the ways in which climate hazards impact individuals. In 2020, one in three Native Americans across the United States were living in poverty (Northwestern Institute for Policy Research 2020). Native Americans often experience worse health outcomes and lower life expectancies compared to other populations due to a variety of systemic factors including toxic stress due to regularly experiencing racism and other systemic harms, disproportionate poverty, and discrimination in the delivery or accessibility of health services. Native Americans are also less likely to have health insurance, which may limit their ability to seek medical care for injuries or illnesses caused or exacerbated by climate change impacts (Indian Health Services 2019). Native Americans are more likely to live in high-hazard risk areas and less likely to be homeowners, which leaves them vulnerable to climate impacts (Gamble et al. 2016). Within the vulnerability analysis, potential impacts to Native American populations are discussed in the context of BIPOC.

The close relationship some tribal communities have with their surrounding ecosystems and natural resources leaves these populations particularly at risk to climate change impacts because the natural systems their livelihoods may be dependent on are rapidly changing (Baird 2008). Climate change impacts can disrupt traditional ways of life for some tribal communities by threatening the health of local plants, animals, and ecosystems that play a critical role in the maintenance of their cultural traditions, and climate hazards may damage or destroy a tribal community's cultural resources and sacred land (Karuk Tribe Department of Natural Resources 2016). Additionally, tribal communities are often geographically isolated, making accessing healthcare services difficult.

Potential Impacts



Extreme Heat and Warm Nights

BIPOC, immigrants, and people who are undocumented are more likely to live in housing with insufficient protection from extreme heat events and limited or no affordable air conditioning and are less likely to be able to make the home improvements necessary due to financial constraints or because they are renters. Limited or non-English speakers may not be provided heat advisory warnings or governmental guidance in their language, potentially causing them to experience greater exposure to extreme heat (Gamble et al. 2016). The primary health impacts to these populations are heat-related illnesses, such as heat stress, heat stroke, and dehydration, which can be life-threatening (CDPH 2020). Immigrants and people who are undocumented may not have access to medical services to treat heat-related illnesses. Tribal elders may have limited or reduced mobility, making it difficult for them to seek medical treatment or refuge from extreme heat (CDPH 2020).



Drought

Drought conditions and declining stream flows may negatively impact tribal fisheries along the Sonoma County coast which may disrupt tribal cultural traditions and tribal eco-tourism economies (Karuk Tribe Department of Natural Resources 2016).



Wildfire

BIPOC, immigrants, people who are undocumented are generally more likely to live in wildfire hazard zones and in housing with insufficient protection against wildfire. Limited or non-English speakers may not be provided with wildfire or smoke advisory warnings or governmental guidance in their language, potentially causing them to experience greater exposure to smoke and/or wildfire. Individuals in these groups may face systematic and/or cultural barriers to access resources to safely evacuate hazard areas (Gamble et al. 2016). Individuals in these groups may experience injuries or death from smoke inhalation or burns (CDPH 2017). People who are undocumented may not have access to medical services to treat injuries (Mendez et al. 2020). The harm that many community members have experienced when engaging with government systems, including at evacuation centers, may make it harder for them to receive the support and services that they need.

Tribal elders may have limited or reduced mobility, making it difficult for them to seek medical treatment or evacuate from a wildfire. Wildfires may damage or destroy a tribal community's cultural resources and sacred land. Western management practices that have historically centered around fire suppression often generate extremely severe and dangerous fires. Conversely, tribal communities have developed and implemented low-intensity fires to manage eco-cultural resources and reduce the buildup of fuels, decreasing the number of extreme fire events. Tribal communities often rely on local natural resources for economic opportunities. These communities may face economic impacts if natural resources are damaged or destroyed from a wildfire (Karuk Tribe Department of Natural Resources 2016).



Landslide

Limited or non-English speakers may not be provided with landslide advisory warnings or governmental guidance in their language, potentially causing them to experience greater exposure to a landslide. Individuals in these groups may face systematic and/or cultural barriers to access resources to safely evacuate landslide hazard areas (Gamble et al. 2016). Individuals in these groups may experience injuries or death from landslide impacts (CDPH 2017). People who are undocumented may not have access to medical services to treat injuries (Mendez et al. 2020). The harm that many community members have experienced when engaging with systems, including at evacuation centers, may make it harder for them to receive the support and services that they need.

Tribal elders may have limited or reduced mobility, making it difficult for them to seek medical treatment or evacuate from a landslide hazard area (Karuk Tribe Department of Natural Resources 2016).



Riverine and Stormwater Flooding

BIPOC and people who are undocumented are more likely to live in flood hazard areas and in housing with insufficient protection against riverine and stormwater flooding. Limited or non-English speakers may not be offered flood warning or governmental guidance in their language, potentially causing them to experience greater exposure to flooding. Individuals in these groups may face

systemic and/or cultural barriers (including racism and other forms of discrimination) when seeking access to resources needed to safely evacuate hazard areas (Gamble et al. 2016). Individuals in these groups may experience injuries or death from high velocity flooding (CDPH 2017). People who are undocumented may not have access to medical services to treat injuries (Mendez et al. 2020). Tribal communities may face similar impacts from flooding as from wildfire.



Sea Level Rise

Populations in this group are less likely to live in coastal areas due to the high cost of living. Limited or non-English speakers may not have access to hazard-related communication in their language and therefore may not be able to prepare for and cope with sea level rise (Cooley 2012). Individuals in these groups may face systemic and/or cultural barriers in accessing resources needed to safely evacuate or avoid sea level rise hazard areas (Gamble et al. 2016). People who are undocumented may not have access to medical services to treat flood related injuries (Mendez et al. 2020). Tribal communities may face similar impacts from sea level rise as from wildfires.

Vulnerability Score – Individuals Facing Societal Barriers

Climate Hazard			
Extreme Heat	High	Medium	**4-High**
Drought	Low	Medium	**2-Low**
Wildfire	High	Medium	**4-High**
Landslide	Low	Medium	**2-Low**
Riverine and Stormwater Flooding	Medium	Low	**4-High**
Sea Level Rise	Low	Medium	**2-Low**

4. Individuals with Chronic Health Conditions or Health Related Sensitivities

- Seniors
- Young children
- People who are differently abled
- Individuals with asthma
- Individuals with cardiovascular disease
- Military veterans

Individuals with chronic health conditions or health related sensitivities are socially and physiologically vulnerable to climate change impacts and hazards. Seniors and people who are differently abled may have limited or reduced mobility, mental function, or communication abilities, making it difficult to evacuate during or prepare for a climate hazard event. They may also have medical needs for electricity which may be impacted during a public safety power shutoff or climate hazard event. Individuals in these groups are more likely to have pre-existing medical conditions or chronic illnesses that may exacerbate the risk of illnesses and medical problems from climate hazards. In the stakeholder focus group interviews, the Disability Services and Legal Center noted that people who are differently abled often also experience financial hardships as they may be reliant on federal income programs. These resource constraints may decrease the ability of people who are differently abled to mitigate and recover from climate hazard events. Individuals with asthma and individuals with cardiovascular disease are more likely to experience health impacts from climate hazards because of pre-existing conditions or diseases. Seniors often face challenges regulating their temperature due to medications or underlying conditions related to age. Young children are socially and physiologically vulnerable to climate hazards. They often have limited understandings of climate hazards and insufficient resources to independently prepare for and safely respond during a climate hazard event. Young children are reliant on their guardians and/or caregivers to ensure their health, safety, and wellbeing. Young children have not fully physiologically developed and are therefore more vulnerable to health effects of climate change impacts (Kenney et al. 2014). Military veterans may have been exposed to a variety of environmental, physical, and chemical stressors during military service which may have caused physiological or psychological health conditions, illnesses, or different abilities that make them particularly vulnerable to climate hazards (Olenick et al. 2015).

Potential Impacts



Extreme Heat and Warm Nights

Individuals with chronic health conditions or health related sensitivities are particularly at risk of heat related illnesses during extreme heat events. Differently abled folks, seniors, and children may have difficulty affording or accessing air conditioning or traveling to cooling centers during extreme heat events. Extreme heat events can also trigger power outages which are particularly dangerous for individuals who are electricity-dependent, either for their mobility, communication, or medical devices. Extreme heat conditions can exacerbate asthma, cardiovascular disease, certain different abilities, and other respiratory and cardiovascular conditions, potentially causing heat-related illnesses such as heat stress, heat stroke and dehydration, which can be-life threatening (CDPH 2020). Children are still physiologically developing which means that they are less able to regulate their bodies during extreme heat events (Kenney et al. 2014). Young children and seniors are especially at risk of dehydration as their bodies are not able to regulate as well (Kenny

et al. 2014). Dehydration may exacerbate underlying health conditions and illnesses.



Drought

Individuals with chronic health conditions or health related sensitivities are at risk to drought conditions and associated cascading impacts. Prolonged drought conditions can lead to water scarcity and individuals may need to rely on poor quality water supplies.



Wildfire

Individuals with chronic health conditions or health related sensitivities may be more susceptible to injuries or death from smoke inhalation or burns (CDPH 2017). These populations are particularly at risk of respiratory health impacts associated with smoke inhalation of wildfire smoke pollutants. Seniors and military veterans are vulnerable to health impacts from wildfire smoke pollutants because they are more likely to have underlying respiratory and/or cardiovascular conditions and illnesses. Young children may experience respiratory health impacts from wildfire smoke because their respiratory systems are not fully developed and are sensitive to stressors. Individuals with cardiovascular disease may experience severe cardiovascular health impacts if exposed to wildfire smoke pollutants. Individuals with asthma may experience severe respiratory health impacts such as difficulty breathing if exposed to wildfire smoke pollutants. Individuals with disabilities, young children, and seniors may have difficulty evacuating from wildfires, increasing the risk of health impacts from wildfire smoke inhalation or fire burns (EPA 2022).



Landslide

Individuals with chronic health conditions or health related sensitivities may be more susceptible to injuries or death from a landslide (CDPH 2017). Individuals with disabilities, young children, and seniors may have difficulty evacuating from landslides, increasing the risk of health impacts and geographical isolation (EPA 2022).



Riverine and Stormwater Flooding

Seniors and young children are particularly at risk to injury and/or death from high velocity flooding (CDPH 2017). Riverine and stormwater flooding may also limit access to transportation systems, healthcare centers, and emergency response to those that are injured or in need of consistent medical care, such as those with chronic health conditions or illnesses. Young children, older adults, people who are differently abled, and individuals with chronic health conditions or illnesses may not be able to safely evacuate floodwater hazard areas.



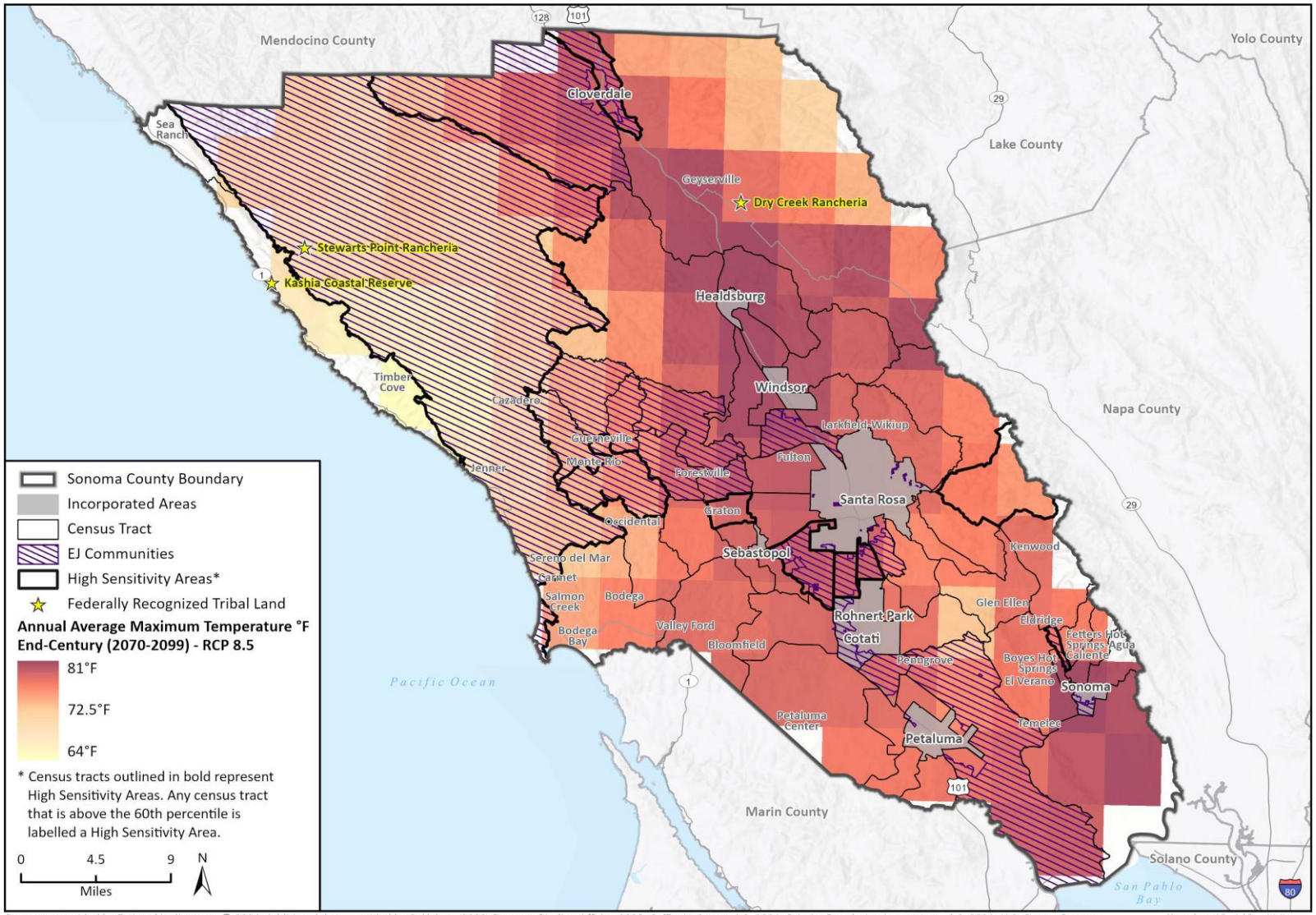
Sea Level Rise

Seniors, people who are differently abled, and individuals with chronic health conditions or illnesses may be less able to safely evacuate hazard areas.

Vulnerability Score – Individuals with Chronic Health Conditions or Health Related Sensitivities

Climate Hazard			
Extreme Heat	High	Medium	**4-High**
Drought	Low	Medium	**2-Low**
Landslide	Medium	Low	**4-High**
Wildfire	High	Medium	**4-High**
Riverine and Stormwater Flooding	Medium	Low	**4-High**
Sea Level Rise	Medium	Low	**3-Medium**

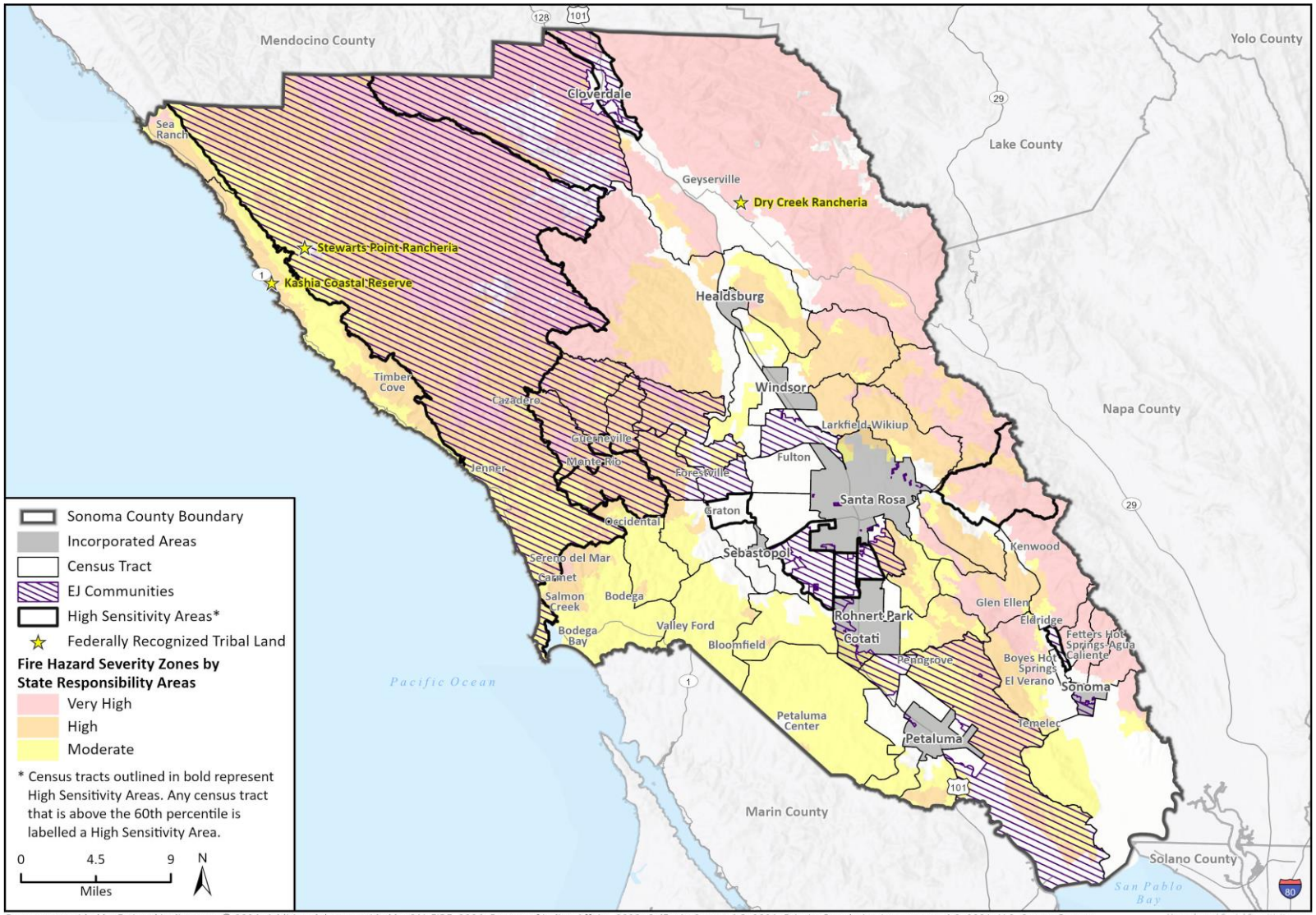
Figure 18 Sonoma County High Social Sensitivity Areas and Annual Average Maximum Temperature, End-Century



Basemap provided by Esri and its licensors © 2024. Additional data provided by CalAdapt, 2022; Bureau of Indian Affairs, 2023; CalEnviroScreen 4.0, 2021; Priority Population Investments 4.0, 2021; U.S. Census Bureau, 2020; CDC, 2010; American Community Survey (ACS) 2017-2021 5-year estimates, Table(s) B25070, B25091 & ACS, LEAD tool, 2018; Social Sensitivity Percentile Scores calculated by Rincon Consultants, Inc., 2022.

Hazards and Social Sensitivity.aprx
Fig X End-Century Average Max Temp and Social Sensitivity

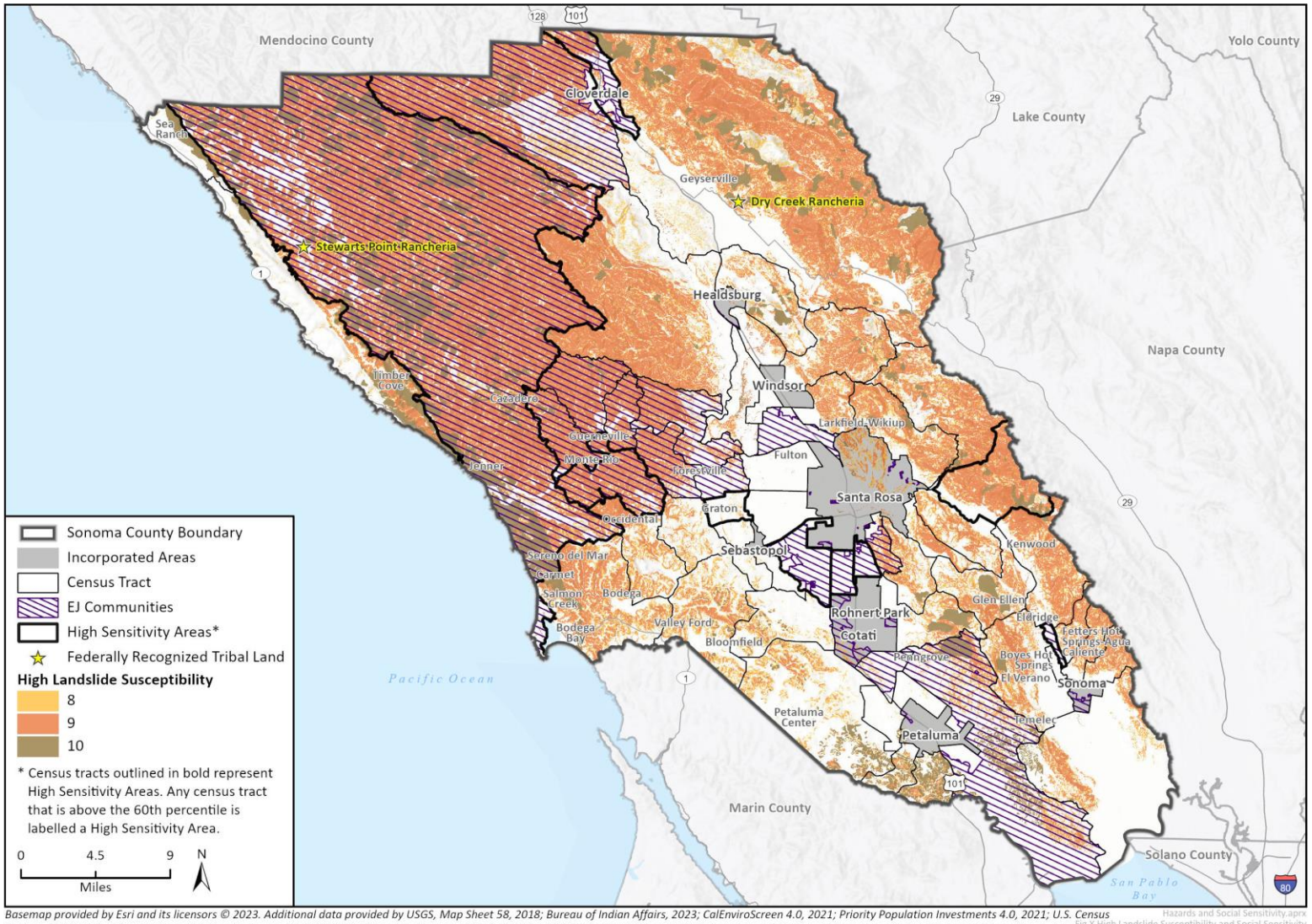
Figure 19 Sonoma County High Social Sensitivity Areas and Wildfire Hazard Severity Zones



Basemap provided by Esri and its licensors © 2024. Additional data provided by CAL FIRE, 2024; Bureau of Indian Affairs, 2023; CalEnviroScreen 4.0, 2021; Priority Population Investments 4.0, 2021; U.S. Census Bureau, 2020; CDC, 2010; American Community Survey (ACS) 2017-2021 5-year estimates, Table(s) B25070, B25091 & ACS, LEAD tool, 2018; Social Sensitivity Percentile Scores calculated by Rincon Consultants, Inc., 2022.

Hazards and Social Sensitivity.aprx
Fig X Fire Hazard Severity Zones and Social Sensitivity

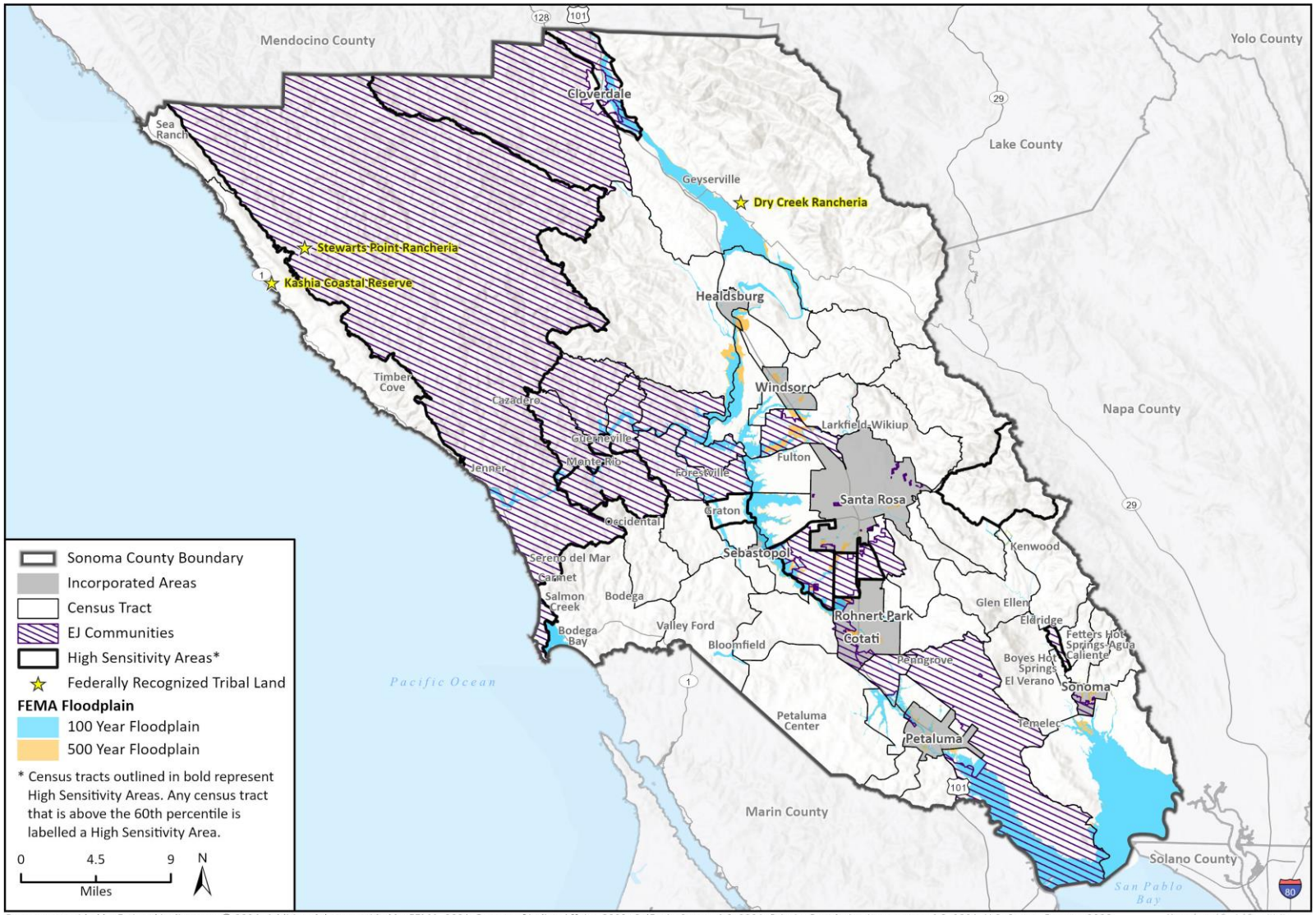
Figure 20 Sonoma County High Social Sensitivity Areas and Landslide Susceptibility Areas



Basemap provided by Esri and its licensors © 2023. Additional data provided by USGS, Map Sheet 58, 2018; Bureau of Indian Affairs, 2023; CalEnviroScreen 4.0, 2021; Priority Population Investments 4.0, 2021; U.S. Census Bureau, 2020; CDC, 2010; American Community Survey (ACS) 2017-2021 5-year estimates, Table(s) B25070, B25091 & ACS, LEAD tool, 2018; Social Sensitivity Percentile Scores calculated by Rincon Consultants, Inc., 2022.

Hazards and Social Sensitivity.aprx
2022 High Landslide Susceptibility and Social Sensitivity

Figure 21 Sonoma County High Social Sensitivity Areas in 100-Year and 500-Year Floodplains



Basemap provided by Esri and its licensors © 2024. Additional data provided by FEMA, 2021; Bureau of Indian Affairs, 2023; CalEnviroScreen 4.0, 2021; Priority Population Investments 4.0, 2021; U.S. Census Bureau, 2020; CDC, 2010; American Community Survey (ACS) 2017-2021 5-year estimates, Table(s) B25070, B25091 & ACS, LEAD tool, 2018; Social Sensitivity Percentile Scores calculated by Rincon Consultants, Inc., 2022.

Hazards and Social Sensitivity.aprx
Fig X FEMA Flood Hazard and Social Sensitivity

Parks and Natural Resources

Parks and natural resources within Sonoma County include County regional parks, open spaces, forested land, critical habitats, vegetation communities, rivers and streams, waterbodies, wetlands, and wildlife (Sonoma County MJHMP, 2021a). Natural resources correspond to varying land cover types found throughout the County, as depicted in Figure 16. Federally designated Critical Habitat for multiple species are displayed in Figure 17.

Sonoma County Regional Parks categorized the park system that they manage by land cover type and acreage which are displayed on Figure 16 . Sonoma County critical habitats, parks, and land cover types are depicted in Figure 17. The information in Figure 17 was used in combination with Figure 7, Figure 8, Figure 12, and Figure 13 to identify affected vegetation communities within each hazard zone and the scope of affected habitats associated with certain vegetation types.

This section provides a general discussion of potential impacts to parks and natural resources. The Sonoma County Climate Resilient Lands Strategy provides further characterization of the impacts of climate hazards on natural and working lands. The Climate Resilient Lands Strategy divides the County into nine ecoregions that have distinctive physical and biological features, and provides detailed information on each ecoregion's unique qualities, land use, demographics, critical assets, impacts from climate change, and resilience indicators. The Napa–Sonoma–Russian River Valleys ecoregion is in the middle of the County and most of the county parks are located in this ecoregion, including Crane Creek and Tolay Lake Regional Parks and part of Spring Lake Regional Park (SCRLS 2022).

Potential Impacts

Extreme Heat and Warm Nights

The impacts from extreme heat and warm nights are similar to impacts experienced by vulnerable populations. Wildlife under these conditions face impacts of heat stress and heat related illness as well as disrupted reproductive cycles, and compounding risks associated with early and extended seasonal temperature increases (Backlund 2008). Because it is seasonally warmer earlier in the year, species can emerge early with no food source and potentially face a delayed cold front which increases mortality rates. Timing of seasonal warmth may not overlap with food sources and extreme heat may stress dependent vegetation communities and wildlife (Dale, 1997, Hamerlynck 1995, Maclean 2011). Plants are more likely to experience heat stress and drying, and species' habitat ranges may shift. Some pests can proliferate more easily with warmer temperatures (Hamerlynck 1995), and some plants and animals ill-suited to the new warmer conditions may suffer increased mortality rates (Ackerly et al. 2018). Parks and natural resources are highly exposed to extreme heat and warm nights. As shown in Figure 7, central Sonoma County may experience significant increases in temperature and subsequently extreme heat events. The natural resources at risk include California Red Legged Frog and California Tiger Salamander Critical Habitat areas, as well as hardwood forest, and shrub and grasslands as shown in Figure 17. Both mid- and end- of century projections depict dramatic increases in extreme heat days (CEC 2021).

Drought

Impacts from drought include water scarcity and availability, particularly for land covers, parks, and natural resources that are dependent on higher amounts of rainfall. Drought will disrupt habitats and the ability for wildlife to survive from dehydration and unreliable food sources. Extended or variable drought conditions affect the amount and duration water is available in ephemeral and permanent waters sources, impacting plants and wildlife dependent on those aquatic resources. Sonoma County is home to several State and Federally listed threatened or endangered species dependent on rivers, streams, lakes, and wetlands for survival per the County's General Plan 2020 Environmental Impact Report (Sonoma County EIR 2023).

Wildfire

The largest direct impacts to parks and natural resources are caused by wildfires. There is direct mortality and loss of resources and wildlife from wildfire as well as indirect mortality due to loss of habitat area and available food sources and seed bank (Backlund 2008). The severity and frequency of wildfires can exacerbate these impacts further through habitat conversions resulting in vegetation communities that no longer support the species using that habitat (Bell et.al 1999, Stephenson et.al 1999, Coop et al. 2020). As discussed within the Exposure to Climate Hazards section, projected annual burned acreage is expected to increase as are the decadal probabilities of wildfire shown in Figure 10. Figure 8 shows the eastern and northern edges of Sonoma County within wildfire zones with Hood Mountain Regional Park & Open Space Preserve completely exposed and several partially exposed parks interspersed along the County jurisdictional edges. Increased wildfire probabilities and expansion of wildfire zones shown in Figure 10 may lead to increased park and natural resource exposure to wildfires (Sonoma County 2022). Wildfire impacts on parks can also cause prolonged closure of park facilities, limiting access to important recreational areas and facilities for the public. Potentially affected land cover types can be seen in Figure 17 and primarily include conifer and hardwood forests along with some shrub and grasslands.

Landslides

Landslide susceptibility directly overlaps with parks and natural resource areas throughout the County affecting nine separate park areas as shown in Figure 11. In the event of a landslide, there is potential for loss of lands, habitat, and disruption of waterbodies in areas of debris flow. The susceptibility of parks and natural resource lands in Sonoma County to landslides is high, therefore, there is risk around loss of topsoil and habitat conversions. Wildlife and plants face a compounding risk to landslide events because it creates both habitat displacement and increased mortality risk. Potentially affected land cover types can be seen in Figure 17 and primarily include conifer and hardwood forests.

Riverine and Stormwater Flooding

There are several major rivers that run through Sonoma County as well as many creeks. FEMA flood zones are identified alongside most of these rivers and creeks (Figure 12). A majority of the flood-prone areas throughout the County are part of the Russian River (Sonoma County MJHMP 2021a). Flooding impacts include erosion and the detrimental effects flooding can have on water quality, especially to aquatic and fish species dependent on water quality for survival (Talbot 2018). Riverine and stormwater flooding will mostly affect sensitive species of plants and wildlife that are not upland. Other impacts include damage from inundation

within storm flooded areas, such as habitats and lands around streams and waterbodies in the County. Floodplains across the County primarily could impact the following land cover types: riparian, shrub, and grasslands as shown in Figure 17.

Sea Level Rise

The direct effects of sea level rise on natural resources are the losses of prime recreational and natural areas. Bodega Bay may be almost completely flooded by 2100. The negative impacts of sea level rise include the risks of squeezing and permanently submerging coastal habitats, which could lead to losses in the biodiversity of habitats and shrinking the area between habitats and human developments. As sea level rises, it can inundate the County's natural land and open spaces, which in certain areas serve as natural protections against flooding, further decreasing coastal habitat values. In addition, saltwater intrusion into freshwater due to sea level rise may alter coastal habitat and ecosystems (Sonoma County MJHMP, 2021a).

Sea level rise will result in increasing shoreline and bluff erosion, which will narrow the beach. impacting tourism resources for Sonoma County. Coastal erosion due to sea level rise could make some beaches inaccessible and it may become much more costly to maintain. It will also negatively impact dune habitats and coastal wetlands areas such as the ones south of the Russian River mouth, where sea level rise will intensify flooding, changing the depositional environment and altering the stability of the natural berm (Sonoma County MJHMP, 2021a). The shifts in coastal processes will affect the management of the freshwater lagoons in the Russian River estuary (Sonoma Water CAP, 2021).

Adaptive Capacity

There are existing plans, policies, and programs in place to help alleviate climate impacts on parks and natural resources particularly related to wildfire and drought. Many of the existing plans, policies, and programs in place are collaborative efforts at the local level. It should be noted that many local entities may not have the staff, resources, or jurisdiction to fully implement strategies.

- **Sonoma County Climate Resilient Lands Strategy** is a non-regulatory framework for how the County and its partners can conserve, manage, and restore natural and working lands to build climate resilience. The Strategy provides an overview of climate hazards, characterizes Sonoma County land types and ecoregions, and offers recommendations and guidance for the planning, design, and implementation of resilience-related projects.
- **Sonoma County Vital Lands Initiative** is a long-range comprehensive plan to prioritize the land conservation activities of Sonoma County Agricultural Preservation and Open Space District. The plan includes goals, priorities, and strategies for conservation, and identifies climate resilience as a co-benefit of conservation.
- **Sonoma County Multi-Jurisdictional Hazard Mitigation Plan** identifies hazard exposures to natural resources and potential actions for mitigating damage.
- **Sonoma County Climate Mobilization Strategy.** Includes strategies to increase the resilience of natural and working lands throughout the county.
- **Sonoma Valley, Petaluma, and Santa Rosa Plain Groundwater Subbasin Groundwater Sustainability Plans.** Describes the County's policies for groundwater management such as protecting groundwater recharge areas, managing land use that

has an impact on groundwater use and quality, and developing alternative mechanisms for integrated groundwater management strategies.

- **Sonoma County Operational Area Contingency Plan: Wildfire Burn Scar Debris Flow Response.** The Plan establishes guidelines for local government and entities within Sonoma County to reduce threats of debris flow in areas in recent wildfires including parks and natural resource areas.
- **Sonoma County Operational Area Emergency Operations Plan Annex: Russian River Flood Plan.** The Plan outlines procedures and responsibilities for emergency response to flood conditions on the Russian River and its tributaries. The Plan outlines flooding and response scenarios on the Russian River.
- **Community Rating System** is a voluntary program within the National Flood Insurance Program (NFIP) that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions.
- **Sonoma County Energy Independence Program (SCEIP)** offers financing for permanent energy, water, wildfire safety, and seismic strengthening improvements through the property tax system. Financing is available for residential, commercial, industrial, agricultural, multi-family and certain non-profit projects.

Vulnerability Score – Parks and Natural Resources

Climate Hazard			
Extreme Heat	High	Low	**High-5**
Drought	High	Medium	**High-4**
Wildfire	High	Medium	**High-4**
Landslides	High	Low	**High-5**
Riverine and Stormwater Flooding	Medium	Medium	**Medium-3**
Sea Level Rise	High	Low	**High-5**

Critical Facilities, Buildings, Services, and Infrastructure



Overview

Within Sonoma County, there is an interdependent network of critical facilities, buildings, services, and infrastructure vulnerable to climate change. The following discussion of this asset category explains the cascading impacts of climate hazards as they affect the ability of the community to receive emergency and essential services. Infrastructure dependencies are also explored in this analysis. Assets within this category and identified in the Figures throughout this assessment include:

- Fires Stations
- Police Stations
- Hospital/Healthcare Facilities
- Emergency Shelters
- Schools
- Public Libraries
- Airports

Additional critical facilities and service infrastructure throughout the County that are not identified in the Figures within this assessment include:

- Public utilities, including water, wastewater, and power
- Public transportation and roadways
- Energy and communications facilities
- Storm drainage and flood protection facilities
- Solid and hazardous waste and recycling facilities

Vulnerabilities to this asset category primarily concern physical exposure and damage to facilities from exposure to various climate hazards subsequently affecting operations of critical services. The Sonoma County Multi-Jurisdictional Hazard Mitigation Plan (Volume 1) includes additional technical detail on the exposure and vulnerability of critical facilities to various hazards. According to the safety element survey, respondents faced many communication and evacuation challenges during hazard events. Many respondents noted losing power and internet access as major communication barriers during previous hazard events. There were also many people who did not know where to find information about what to do in a hazard event or could not properly access the information due to a language barrier. Other evacuation challenges respondents mentioned included heavy traffic on evacuation routes, confusion about which evacuation routes to take and which ones were affected by the hazard, trouble finding and paying for a place to stay while evacuated, and some people with disabilities noted having additional challenges in terms of health exposure during the pandemic and finding accessible lodging.

Potential Impacts



Extreme Heat and Warm Nights

Extreme heat could impact occupants of buildings and facilities that are not adequately weatherized for increased temperatures. Additionally, as temperatures increase, roadways, transportation routes, and railroads are vulnerable to damages through sustained heat such as buckled railroad ties and cracked surfaces (Ackerly et al. 2018). Increased emergency service calls could strain medical services and emergency responders. Electrical infrastructure could be overwhelmed by peaks in demand and result in blackouts or public safety power shutoffs instituted by energy providers to avoid impacts to electrical facilities. Power outages have significant cascading impacts on communication networks, water conveyance, and vulnerable populations. The ability for critical service providers to fully function during power outages could be significantly impaired (Sonoma County MJHMP 2021a). Central and southern Sonoma County may experience the greatest increases in temperature by the end of the century as shown in Figure 7.



Drought

Drought will have minimal direct physical impact on buildings and facilities across Sonoma County. However, drought can impact water reliability and water infrastructure. The recent multi-year drought significantly strained the County's water supply systems, which resulted in water storage levels sinking to

historic lows. This led to mandatory water use restriction impacting day to day activities and local economies. Low water supply also led to new reliability investments by water agencies, putting additional strains on their financial systems, which may influence future water supply rate adjustments. Regionally it has also been found that drought and subsequent overuse of groundwater has exacerbated unsafe drinking water in rural areas (Ackerly et al. 2018). Sonoma County has multiple sources of water including public systems, small water systems, private wells, and surface water. To maintain effectiveness, critical facilities must maintain operations during projected droughts while service providers like Sonoma Water will have to overcome obstacles with supply (Sonoma County MJHMP 2021a). Projected changes in snowpack, temperature, and precipitation rates from climate change across California will result in potentially enhanced water scarcity through the end of the century (Sonoma County MJHMP 2021a).

Drought impacts can create service strain for emergency and medical services. Cracked pavements from drought compounded with extreme heat impacts roadways and transportation routes (Samuel et al. 2019).



Wildfire

Structures and buildings located within wildfire hazard zones are at risk of direct structural damage from wildfires. There are many critical facilities in wildfire hazard zones, including fire stations, evacuation shelters, schools, and airports as displayed in Figure 8. Areas of high exposure include the eastern and northeastern parts of the County with some exposure along the northwestern portions of the county. Wildfire hazard zones may expand by end-of-century which could lead to more critical facilities at risk of structural damage. Per the Sonoma County Community Wildfire Protection Plan, the risk of large wildfires in California is expected to increase up to 50% by the end of the century (Permit Sonoma Fire Prevention Division 2023). Additionally, electricity distribution lines as well as natural gas and oil lines are interdependent systems for the County. Above ground or just below-grade utility lines have the potential to be damaged in wildfire hazard zones, resulting in oil and gas leaks and power outages, which can cause fires or explosions. Utility lines under certain high wind conditions can also trigger wildfires through downed power lines (Ackerly et al. 2018). Additionally, public safety power shut offs in response to wildfire risk can affect power service reliability.

The potential impacts that arise from increased wildfire exposure of buildings and service lines can create cascading risks. Residential and commercial buildings not properly weatherized may experience wildfire smoke more directly as well as heightened risks of building exposure without fuel reduction and best practice building standards (Permit Sonoma Fire Prevention Division 2023). Additional risks include the displacement of communities exposed to wildfires causing service strains and needs for additional community safety services. Areas exposed include communities along the eastern span of the County as well as the northwestern areas of the county. Increased frequency of wildfires in areas shown in Figure 9 can place strain on fire and emergency services. Evacuation routes could be disrupted during a wildfire event limiting emergency responders' access and the ability for people to evacuate. Wildfires can also impact water quality downstream through cascading risks associated with post-fire effects. Soil erosion and slope instability that lead to sedimentation of watersheds negatively impacts drinking water while simultaneously creating flood risks (Permit Sonoma Fire Prevention Division 2023).

In the stakeholder focus group interviews, the Sonoma County Community Development Commission noted that loss of housing

stock, due to wildfire impacts, has led to increased displacement and houselessness in the county.



Landslides

Pipelines for water, electrical distribution lines, and roadways are vulnerable to landslide impacts which could occur in sloped areas that extend into wildfire zones. Because there is high landslide susceptibility along roadways in the western end of the County, shown in Figure 10, and in areas where there are several critical facilities including fire stations, schools, and emergency shelters, there is a risk of emergency service disruption and impacts to evacuation (CDOC 2021).



Riverine and Stormwater Flooding

Impervious surfaces can impede the absorption of water and augment stormwater flooding in areas of Sonoma County. There is risk of damage to critical facilities from increased extreme precipitation events including erosion, washouts, and sinkholes. Storm drainage and flood protection services for the County may be impacted by these events and potential areas of impact can be found in Figure 11.

In the stakeholder focus group interviews, the Sonoma County Community Development Commission noted that flooding damage has led to loss of housing stock, increasing displacement and houselessness in the county. Additionally, it was also noted that there has been increased damage to and flooding of rural roads that have not been adequately maintained or hardened to mitigate impacts. This has previously caused several rural communities in Sonoma County to be temporarily isolated (Carlton 2023).



Sea Level Rise

Storm surges and wave run-up are already threatening coastal infrastructure. Sea level rise will exacerbate this issue and expose over 50 additional critical facilities to inundation. This includes waste facilities that may pose risks to the immediate community and increase public health concerns. Furthermore, rising seas will impact storm drainage systems, which may experience stormwater backups as a result of tidal flooding (Sonoma County MJHMP, 2021a). Saltwater intrusion can affect drinking wells adjacent to the coast and San Pablo Bay. Sea level rise will threaten Sonoma Valley wastewater treatment plants, affecting collection systems, and reclamation systems, as well as, the operation of Hudeman Slough's tide gate, and roads and levees adjacent to the wetlands management units (Sonoma Water CAP, 2021). The combination of sea level rise and storm surges can cause temporary closures to the County's roads and bridges, including Highway 1 and Highway 37, which are at risk of failure due to sea level rise. In addition, sea level rise will increase the likelihood of breaching levees that protect roads and highways adjacent to San Pablo Bay.

Adaptive Capacity

Several plans and programs are in place to adapt Sonoma County critical facilities, buildings, services, and infrastructure, including plans related to utility and emergency services reliability. Most plans and programs address extreme heat and wildfire hazards.

- **Sonoma Water Local Hazard Mitigation Plan.** This plan evaluates the natural hazard risks and vulnerabilities facing Sonoma Water's infrastructure and services. The LHMP describes hazard exposure and potential impacts of coastal erosion, coastal storm, flooding, landslides, severe winter storms, wildfire, and drought.

- **Sonoma Water Urban Water Management Plan.** The Plan details water supply sources, historical, and projected water use, and potential future water supplies during normal, single-dry, and multiple-dry years. The Plan describes climate change impacts on water supplies and endangered and threatened species. Proposed demand management strategies center around metering, water conservation public education and outreach programs, asset management, and wholesale supplier assistance programs.
- **Sonoma County Community Wildfire Protection Plan.** The Plan describes wildfire risk in Sonoma County. Assets, ecosystems, and resources at risk in the County are identified and assessed. The Plan details response entities, mitigation strategies, and potential risk reduction projects
- **Sonoma-Lake-Napa Unit Strategic Fire Plan.** The Plan identifies and prioritizes wildfire mitigation and recovery strategies aimed at reducing risk within the Sonoma-Lake-Napa Unit.
- **Pacific Gas & Electric (PG&E) Climate Change Vulnerability Assessment and Resilience Strategies** Evaluates how climate hazards have the potential to impact PG&E's assets and services, including disadvantaged communities' reliance on the delivery of continuous power, PG&E outlines its approach to engagement, emergency preparedness, and response planning.
- **Pacific Gas & Electric (PG&E) Community Wildfire Safety Program** implements improvements within Sonoma County energy infrastructure to reduce wildfire risk and increase resilience to climate hazards including strong storms and wildfire.
- **Sonoma County Multi-Jurisdictional Hazard Mitigation Plan** includes the broad goal of protecting critical facilities, utilities, and services from hazard impacts.
- **Sonoma County Operational Area Emergency Operations Plan and Annexes.** The Plan provides guidance on all phases of an all-hazards emergency management process including preparedness, response, recovery, and mitigation. It outlines the systems and roles of responsible entities, alert and warning systems, public information communications, mutual aid agreements, and a hazard analysis summary in alignment with the County's current Hazard Mitigation Plan
- **Sonoma County Energy Independence Program (SCEIP)** offers financing for permanent energy, water, wildfire safety, and seismic strengthening improvements through the property tax system. Financing is available for residential, commercial, industrial, agricultural, multi-family and certain non-profit projects.

Vulnerability Score – Critical Facilities, Buildings, Services, and Infrastructure

Climate Hazard			
Extreme Heat	Medium	Low	**High-4**
Drought	Medium	Medium	**Medium-3**
Wildfire	High	Medium	**High-4**
Landslides	High	Medium	**High-4**
Riverine and Stormwater Flooding	Medium	Medium	**Medium-3**
Sea Level Rise	High	Low	**High-4**

Agriculture

Overview

A large portion of Sonoma County's economy is based in agriculture and is valued at nearly $830 million in 2021 (Sonoma County Crop Report 2021). The potential climate change impacts to the County's agricultural sector could be far reaching. The 2021 Sonoma County Agricultural Report states that the largest obstacle faced was drought related losses (Sonoma County Crop Report 2021). Some of the top economically profitable crop or rangeland types in Sonoma County are:

- Winegrapes
- Milk
- Nursery
- Poultry Products
- Cattle and Calves
- Vegetables
- Sheep and Lambs
- Rye and Oat Hay Crops
- Apples

Potential Impacts

Extreme Heat and Warm Nights

A greater number of extreme heat events and warmer nights could cause declines in crop yields due to increased heat stress (Parker et.al. 2020). Lower crop yields associated with extreme heat could increase costs and ultimately decrease agriculture profitability. Livestock operations are potentially less viable during extreme heat events as livestock may suffer from heat related illness. Livestock and poultry are vulnerable to extreme heat conditions, leading to mortality, which, in turn, may impact rendering plant capacity (Sonoma County 2019a). Agricultural workers are particularly vulnerable to health risks from high-outdoor exposure to an increased number of extreme heat days. These individuals typically are under-resourced, face societal barriers, and may have chronic conditions due to on-farm exposure to dust and farm chemicals. As a result, extreme heat may impact agricultural operations by reducing worker availability and productivity.

Drought

Higher temperatures will decrease the statewide snowpack and raise the snowline, decreasing important surface water reserves for agriculture (Ackerly et al. 2018). Like extreme heat and warm nights, drought is linked to declines in crop yields, increasing costs, and decreasing crop profitability. Drought can result in regional losses of crops and can stress the statewide water supply. A majority of the County's agricultural water is drawn from the Russian River watershed, which supplies Lake Sonoma and Lake Mendocino. These lakes have experienced drought related reduction in capacity. In 2009, Lake Sonoma was at 74% capacity and Lake Mendocino was at 38% capacity (Sonoma County MJHMP, 2021a).

Crops reliant on high depths of water and subsequently higher water intensity needs are most impacted by drought (Cooley et al. 2015). In 2022, all of Sonoma County was in a Severe or Extreme Drought (NOAA 2023). According to NOAA, extreme drought conditions result in the following impacts:

- Livestock need expensive supplemental feed; cattle and horses are sold; little pasture remains; fruit trees bud early; and producers begin irrigating in the winter.
- Fire season lasts year-round; fires occur in typically wet parts of state; and burn bans are implemented.
- Water is inadequate for agriculture, wildlife, and urban needs; reservoirs are extremely low; and hydropower is restricted.



Wildfire

Sonoma County has experienced a significant number of severe wildfires in the past 5 years, as shown in Figure 9. Wildfires can destroy crops and disrupt rangeland operations while wildfire smoke may stress the health of crops and livestock. Agricultural land cover overlaps very high fire hazard severity zones mainly at the eastern and northern edges of the County as shown in Figure 22. Moderate fire hazard severity zones overlap agriculture throughout the entire county particularly in the southwestern portion of the County and southeast of Healdsburg. The probability of wildfires across Sonoma County is expected to increase by the end of the century in areas throughout the County with significant new exposures of agriculture lands in the east, north, and west jurisdictional ends of the county.



Landslides

There are high degrees of overlap with landslide susceptible areas and agricultural lands shown in Figure 10. Almost all agricultural lands are located in a deep-seated landslide susceptible area. Landslide impacts on agricultural lands include mainly rangelands at the base of landslide susceptible areas. In the event of a landslide, agricultural operations may be fully halted and the viability of the land for continued use may be limited by the time it takes to restore. Landslides can create vulnerabilities for livestock with risk of mortality as well as habitat displacement.



Riverine and Stormwater Flooding

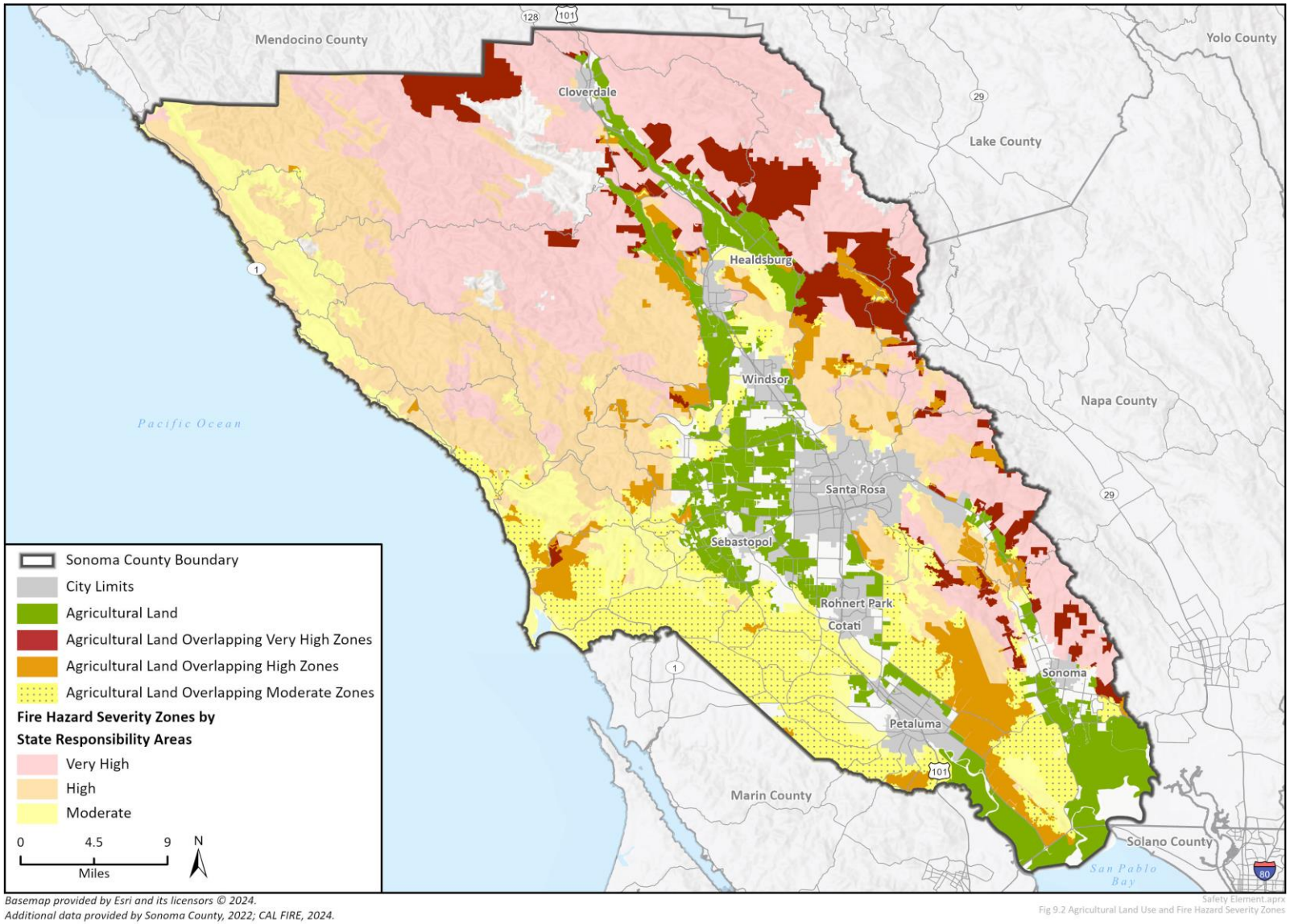
Agricultural Land overlapping flood plains occurs in areas throughout central Sonoma County next to the Russian River and the North Bay Area, as shown in Figure 22. Operations in these areas along the rivers that run through the County have the potential to be disrupted during flood events and could result in reduction in crop yields. Agricultural worker residences could also be inundated.



Sea Level Rise

Sea level rise can impact farmlands located in low-lying areas due to saltwater contamination since rising seas will increase saltwater pollution of the State's delta and levee systems (Sonoma County MJHMP, 2021a). The impacts of saltwater intrusion due to sea level rise is one of the primary climate change concerns for agricultural practices in Sonoma County bordering the San Pablo Bay to the south. Agricultural lands in reclaimed tidal areas in southern Sonoma County will be at risk of inundation due to the risk of levee breaches and failure (Climate Ready Sonoma County, 2014). Additionally, privately maintained pumps and levees that do not meet current construction standards expose the county to greater risk of levee breaches. Antiquated private systems in south county meant to protect those areas from tides can be a source of vulnerability for the county.

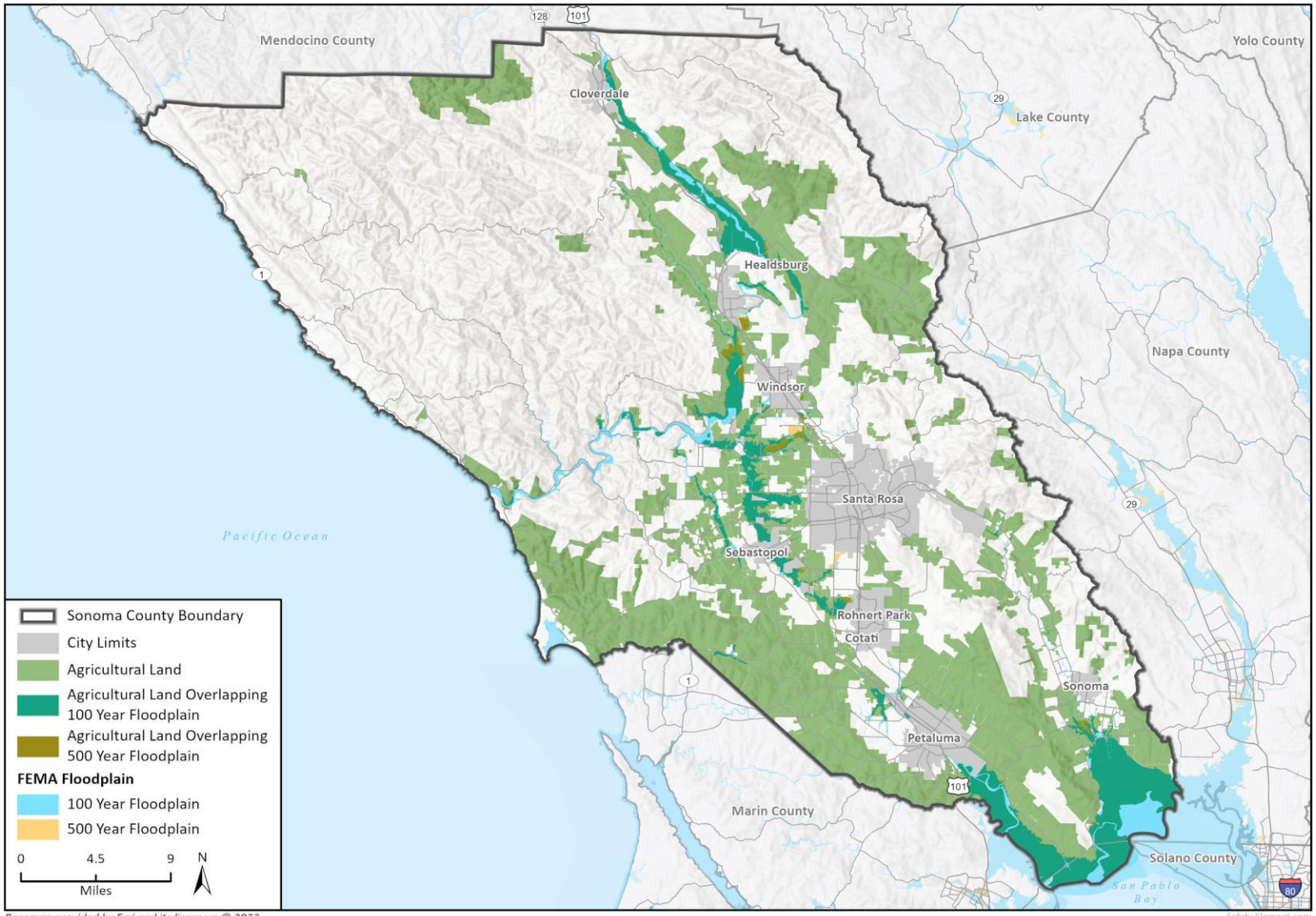
Figure 22 Sonoma County Agricultural Land in Wildfire Hazard Severity Zones



Basemap provided by Esri and its licensors © 2024.
Additional data provided by Sonoma County, 2022; CAL FIRE, 2024.

Safety Element.aprx
Fig 9.2 Agricultural Land Use and Fire Hazard Severity Zones

Figure 23 Sonoma County Agricultural Land in 100- and 500-Year Floodplains



Adaptive Capacity

- **Sonoma County General Plan 2020.** Some agricultural-specific adaptive capacity is present within the County as part of the Sonoma County General Plan Land Use Element and the Agricultural Resources Element. Both elements establish agricultural land protection policies.
- **Sonoma County Climate Resilient Lands Strategy** is a non-regulatory framework for how the County and its partners can conserve, manage, and restore natural and working lands to build climate resilience. The Strategy provides an overview of climate hazards, characterizes Sonoma County land types and eco-regions, and offers recommendations and guidance for the planning, design, and implementation of resilience-related projects. Agricultural lands are identified as important opportunities to adapt to climate change, reduce climate risks, and sequester and store carbon at a meaningful scale.
- **Sonoma County Crop Report.** The annual report summarizes the total value and production of crops and agricultural commodities in Sonoma County. The 2021 Report summarizes the impacts of drought on recent agricultural production.
- **A Roadmap for Climate Resilience in Sonoma County, California.** The Report prepared by the North Bay Climate Adaptation Initiative details climate projections and related climate hazards, climate-related health risks, and the populations in Sonoma County that are most vulnerable to climate change impacts. Goal 6 of the Roadmap specifically addresses the promotion of food system security and agricultural climate preparedness.
- **Sonoma County Multi-Jurisdictional Hazard Mitigation Plan.** The Plan assesses hazards within the County and identifies mitigation strategies that reduce or eliminate long-term risks to people and property from those hazards. Climate hazards planned for include drought, flood, landslide, sea level rise, severe weather (e.g., extreme heat), wildfire. The MJHMP includes specific goals and actions to reduce flood exposure of agricultural lands and increase resources for water conservation among agricultural producers.
- **Sonoma Valley, Petaluma, and Santa Rosa Plain Groundwater Subbasin Groundwater Sustainability Plans** lay out a management process for ensuring a sustainable groundwater supply in the future for each respective subbasin by improving the understanding of groundwater resources, measuring progress through metrics that will be monitored, actively implementing projects, adopting policy and management actions in response to groundwater conditions if they decline unacceptably, and developing the funding needed for long-term implementation.
- **Agricultural Resilience in the Face of Extreme Dry Conditions: A Marin and Sonoma Partnership Response and Recommendations.** This assessment shares the details of the Marin and Sonoma agricultural communities' collaborative and independent efforts to mitigate drought impacts, organized by specific adaptation practices. The report provides background on efforts and progress, and identifies needed advancements for each mitigation practice, with the intent to galvanize the community resilience already achieved and strengthen it into the future.

Vulnerability Score - Agriculture

Extreme Heat	High	Low	**High-5**
Drought	High	Medium	**High-4**
Wildfire	High	Medium	**High-4**
Landslides	High	Low	**High-5**
Riverine and Stormwater Flooding	Medium	Medium	**Medium-3**
Sea Level Rise	Low	Low	**Medium-3**

6 Vulnerability Summary

Key climate change vulnerabilities on community members rendered vulnerable by systemic inequities; parks and natural resources; agriculture; and critical facilities, buildings, services, and infrastructure in unincorporated Sonoma County is provided in this section. Consistent with Phase 3 of the Cal APG, major problem statements are also provided to characterize the overall climate impacts Sonoma County may experience. These problem statements will be utilized to frame and generate climate adaptation policies and programs for the Sonoma County General Plan Safety Element update.

Vulnerability Analysis

Climate change is expected to have far-reaching impacts in Sonoma County on public health, parks, natural resources, infrastructure and critical facilities, emergency response, and agriculture. Understanding local climate risks and impacts allows communities to prepare for the future and increase their resilience.

Vulnerability scores were determined by the overlay of impact scores and adaptive capacity scores assigned within the previous section. Vulnerability scoring helps the County understand which climate change effects pose the greatest threats and should be prioritized in adaptation planning and policy development.

Populations

- **Extreme Heat.** An increased number of extreme heat days will result in increased public health risks through heat-impacted diseases and air quality degradation. Individuals with high outdoor exposure, low education, under-resourced individuals, individuals facing societal barriers (racial segregation, low social support, poverty, and income inequality) and individuals with chronic health conditions are all vulnerable to extreme heat due to system inequities. Areas near Fetters Hot Springs-Agua Caliente, southwest of Santa Rosa, Forestville, Cloverdale, and south of Windsor have a combination of high temperature exposure by end-of-century, high social sensitivity, and a concentration of Environmental Justice Communities.
- **Wildfire.** Populations who live in the more isolated areas of the County may be more likely to live in very high wildfire hazard severity zones and experience complications with evacuations. Additionally, populations with high exposure or sensitivity may experience injuries, illness, or death from prolonged exposure to smoke or direct contact with flames and are less likely to receive medical treatment. Areas near the Russian River, around Cloverdale, and in most of northwest County have a combination of high wildfire exposure, high social sensitivity, and a concentration of Environmental Justice Communities, including Environmental Justice Tribal Communities.
- **Landslides.** Populations susceptible to injuries or death from landslides includes individuals with chronic health conditions or health related sensitivities. Additional vulnerabilities for populations relate to difficulty evacuating and subsequent risks of health impacts and geographic isolation. Individuals with disabilities, young children, and seniors may have difficulty evacuating from landslides. Areas near the Russian River, around Cloverdale, and in most of northwest County have a combination of high landslide susceptibility, high social

sensitivity, and a concentration of Environmental Justice Communities.

- **Riverine and Stormwater Flooding.** Outdoor workers may be exposed to hazardous work conditions during riverine and/or stormwater flooding events and therefore are vulnerable to health impacts. People experiencing houselessness are disproportionately at risk of health impacts during flood events because they often live in flood hazard areas and do not have access to transportation or resources needed to evacuate inundated areas. Areas near the Russian River, directly southwest of Santa Rosa, around Cloverdale, and in most of northwest County have a combination of high flood exposure, high social sensitivity, and a concentration of Environmental Justice Communities

Parks and Natural Resources

- **Extreme Heat.** Wildlife may face increased heat stress and heat related illness as well as disrupted reproductive cycles, and compounding risks associated with early and extended seasonal temperature increases. Because it is seasonally warmer earlier in the year species can emerge early with no food source and potentially face a delayed cold front which increases mortality rates. Timing of seasonal warmth may not overlap with food sources and extreme heat may stress dependent vegetation communities and wildlife. Plants are more likely to experience heat stress and drying, species' habitat ranges may shift. Some pests can proliferate more easily with warmer temperatures, and some plants and animals ill-suited to the new warmer conditions may suffer increased mortality rates. Parks and natural resources are highly exposed to extreme heat and warm nights.
- **Drought.** Impacts from drought involve risks associated with water scarcity and availability for reliant natural resources. Drought will disrupt habitats and wildlife abilities to survive from dehydration and reliable food sources. Extended or variable drought conditions affect the amount and duration water is available in ephemeral and permanent waters sources, impacting plants and wildlife dependent on those aquatic resources. Sonoma County includes several State and federally listed threatened or endangered species dependent on aquatic resources (rivers, streams, lakes, wetlands) for survival. These species have already been identified as vulnerable to extinction due to habitat loss or other disrupters which will be further compounded by drought.
- **Wildfire.** The largest direct impacts to parks and natural resources are caused by wildfires. There is direct mortality and loss of resources and wildlife from wildfire as well as indirect mortality due to loss in habitat area and loss of available food sources and seed bank. The severity and frequency of wildfires can exacerbate these impacts further through habitat conversions resulting in vegetation communities that no longer support the species using that habitat. Projected annual burned acreage are expected to increase along the eastern edge of Sonoma County within existing and new wildfire zones with Hood Mountain Regional Park & Open Space Preserve completely exposed and several partially exposed parks interspersed along the County edges. Increased wildfire probabilities and expansion of wildfire zones may lead to increased park and natural resource exposure to wildfires.
- **Landslides.** Landslide susceptibility directly overlaps with parks and natural resource areas throughout the County including 9 separate park areas with landslide susceptibility. In the event of a landslide there is potential for loss of lands, habitat, and disruption of waterbodies in areas of debris flow. The

susceptibility of parks and natural resource lands in Sonoma County to landslides is high, therefore, there is risk around loss of topsoil and habitat conversions. Wildlife and plants face a compounding risk when presented with landslide events because it creates both habitat displacement and increased mortality risk.

- **Sea Level Rise.** The direct effects of sea level rise on natural resources are the losses of prime recreational and natural areas, Bodega Bay, may be almost completely flooded by 2100. The negative impacts of sea level rise include the risks of squeezing and permanently submerging coastal habitats, which could lead to losses in the biodiversity of habitats and shrinking the area between habitats and developments. As sea level rises, it can inundate the County's natural land and open spaces, which in certain areas serve as natural protections against flooding, further decreasing coastal habitats values. In addition, saltwater intrusion into freshwater due to sea level rise may alter coastal habitat and ecosystems.

Critical Facilities, Buildings, Services, and Infrastructure

- **Extreme Heat.** Extreme heat could impact occupants of buildings and facilities that are not adequately weatherized for increased temperatures. Additionally, as temperatures increase, roadways, transportation routes, and railroads are vulnerable to damages through sustained heat such as buckled railroad ties and cracked surfaces. Additional impacts from extreme heat are associated with increased emergency service calls which could strain health and medical services and emergency responders. Electrical infrastructure could be overwhelmed by peaks in demand and result in blackouts or power safety shutoffs instituted by energy providers to avoid impacts to electrical facilities. Power outages have significant cascading impacts on communication networks, water conveyance, and vulnerable populations. The ability for emergency providers to fully function during power outages could be significantly impaired (Sonoma County 2022). Areas of central and southern County may experience the greatest increases in temperature by the end of the century.
- **Wildfire.** The structures and buildings that occupy wildfire hazard zones are at risk of direct structural damage from wildfires. There are many critical facilities in wildfire hazard zones, including fire stations, evacuation shelters, schools, and an airport. Areas of high facility exposure include the eastern and northeastern parts of the County with some exposure along the northwestern portions of the county as well. Wildfire hazard zones may expand by end-of-century which could lead to more facilities at risk of structural damage. Additionally, electricity distribution lines as well as natural gas and oil lines are interdependent systems for the County that are present throughout the County.
- **Landslides.** Pipelines for water, electrical distribution lines, and roadways are vulnerable to landslide impacts which could occur in sloped areas that extend into wildfire zones. With high landslide susceptibility along roadways in the western end of the County as well as several critical facilities including fire stations, schools, and emergency shelters, there is a risk of emergency service disruption and impacts to evacuation.
- **Sea Level Rise.** Storm surges and wave run-up are already threatening coastal infrastructure. Sea level rise will exacerbate this issue and expose over 50 additional critical facilities to inundation. This includes waste facilities that may pose risks to the immediate community and increase public health concerns. Furthermore, rising seas will impact storm drainage systems,

which may experience stormwater backups as a result of tidal flooding. Saltwater intrusion can affect drinking wells adjacent to the coast and San Pablo Bay. Sea level rise will threaten Sonoma Valley wastewater treatment plants, affecting collection systems, and reclamation systems, as well as the operation of Hudeman Slough's tide gate, and roads and levees adjacent to the wetlands management units. The combination of sea level rise and storm surges can negatively impact County's roads and bridges temporarily closing them during these events, such as Highway 1 and Highway 37, which are at risk of failure due to sea level rise. In addition, sea level rise will increase the likelihood of breaching levees that protect roads and highways adjacent to San Pablo Bay.

Agriculture

- **Extreme Heat.** A greater number of extreme heat events and warmer nights could cause declines in crop yields due to increased heat stress. Lower crop yields associated with extreme heat could increase costs and ultimately decrease agriculture profitability. Livestock operations are potentially less viable during extreme heat events as livestock may suffer from heat related illness. Livestock and poultry are vulnerable to extreme heat conditions, leading to mortality, which, in turn, may impact rendering plant capacity. Agricultural workers are particularly vulnerable to health risks from high-outdoor exposure to increased number of extreme heat days. These individuals typically are under-resourced, face societal barriers, and may have chronic health conditions due to on-farm exposure to dust and farm chemicals. As a result, extreme heat may impact agricultural operations by reducing worker availability and productivity.
- **Drought.** Higher temperatures will decrease the statewide snowpack and raise the snowline, decreasing one of the most important surface water reserves for agriculture. Like extreme heat and warm nights, drought is linked to declines in crop yields, increasing costs, and decreasing crop profitability. Drought can result in regional losses of crops and can stress the statewide water supply. A majority of the County's agricultural water is drawn from the Russian River watershed, which supplies Lake Sonoma and Lake Mendocino. These lakes have experienced drought related reduction in capacity. In 2009, Lake Sonoma was at 74% capacity and Lake Mendocino was at 38% capacity.
- **Wildfire.** Sonoma County has experienced a significant number of severe wildfires in the past 5 years. Wildfires can destroy crops and disrupt rangeland operations while wildfire smoke may stress the health of crops and livestock. Agricultural land cover overlaps fire hazard severity zones mainly at the eastern and northern edges of the County. The probability of wildfires across Sonoma County is expected to increase by the end of the century in areas throughout the County with significant new exposures of agriculture lands in the east, north, and west ends of the county.
- **Landslides.** There are high degrees of overlap with landslide susceptible areas and agricultural lands. Almost all agricultural lands are located in a deep-seated landslide susceptible area. Landslide impacts on agricultural lands include mainly rangelands at the base of landslide susceptible areas.

Problem Statements

The following problem statements are intended to guide the development of adaptation policies and programs for the County's General Plan Safety Element Update.

- **Equitable Community Safety.** As climate change impacts occur, virtually all populations in a community will be affected; however, some individuals will be disproportionally impacted by climate hazards due to inequitable systems and structures. Areas of Sonoma County with the greatest concentration of socially sensitive populations are in the Cloverdale area, directly southwest of Santa Rosa, and around Fetters Hot Springs-Agua Caliente. Inequitable access to, and distribution of resources, critical services, and resilient infrastructure systems decreases the ability for sensitive populations to prepare for, cope and recover from climate impacts. Safety Element Survey respondents identified the following barriers to adequately preparing for climate change: financial constraints, fear of rent increases if requesting home upgrades, physical limitations or disabilities or illness, social isolation, and language barriers.
- **All Hazards Awareness and Capacity Building**. Community climate hazard awareness and capacity building are important ways to increase emergency preparedness and response to all climate hazards. Climate change hazards are increasing the need for emergency response and management throughout Sonoma County and will continue to strain the capacity of government and community-based organization operations to support the community during and after climate hazard events. Barriers to hazards awareness at the neighborhood scale can stem from inequitable access and distribution of educational resources. Several stakeholder focus group interview participants noted that limited awareness and resources prevent residents from adequately preparing for hazard events. This includes needing resources in languages beyond English and Spanish, such as Fijian, Nepalese, and Filipino, and representation of these communities in safety related leadership roles and positions of authority before disasters happen. Several stakeholder focus group interview participants noted limited funding and staff constraints were barriers that limited the ability of the County to prepare for and respond to hazards. Having sufficient County emergency response staffing resources can become difficult when there are multiple concurrent or back-to-back emergencies. During responses, County staff may postpone day-to-day work, including important public education and outreach, preparation, and planning efforts that prepare the county and the community for the next emergency. After responding to an emergency, County staff may also continue to devote time to the incident through various recovery responsibilities, further decreasing staff capacity.
- **Alerts and Evacuation**. Emergency communications and timely evacuations are an essential part of emergency operation planning and community safety. Barriers to evacuation can stem from deficiencies in the electrical grid, transportation system, telecommunication systems, emergency facilities and services, evacuation locations, as well as inequitable access and distribution of resources. Inability to evacuate in a timely fashion during a hazardous event can create direct impacts to health and safety and exacerbate chronic health problems with socially sensitive populations and EJ communities at highest risk. Most Safety Element Survey respondents reported having taken steps to prepare for wildfires; however, over 40% reported financial constraints as one of the largest barriers to adequate preparation. Historically there have been several climate hazard events that prompted evacuations including but not limited to recent fires of Walbridge, Glass, and Kincade. Wildfire evacuations have typically affected northeast and eastern portions of the County.
- **Recovery and Reconstruction**. Recovery and reconstruction efforts following large scale climate change-induced disasters, such as wildfires and floods, can cause substantial economic

strain on communities, especially under-resourced and undocumented communities, as well as operational constraints for County staff. Safety Element Survey respondents identified a need to better connect people and communities with recovery funds available and providing technical support to obtain these funds. Stakeholder focus group interview participants noted that the organizations receiving the majority of emergency-related funding do not have strong relationships with the communities most impacted by disasters, which has resulted in these communities not receiving the support they need to recover and rebuild following disasters. Undocumented workers in particular are unable to access Federal reimbursement should their housing or personal belongings get destroyed or damaged by fire. Stakeholder focus group interview participants expressed concern related to recovery after wildfire due to high effort and long timelines, as well as a lack of integration of lessons learned from past disasters to mitigate impacts of upcoming ones. When in disasters or emergency declarations, contracting and funding moves very quickly, however, when in recovery, or preparation mode, contracting processes include red tape and gatekeeping, which results in funds not getting into impacted communities and harms efforts to build relationships with community-based organizations. The overarching need identified by stakeholder focus group participants is for the County to invest more in preparation before disasters by developing relationships with communities most impacted by systemic inequities within the context of climate change. **Extreme Heat and Air Quality Protection**. All communities in Sonoma County will experience poor air quality from wildfire smoke, with socially sensitive populations and Environmental Justice (EJ) Communities experiencing disproportionate impacts because of the systemic inequities that they face. Changes in annual average maximum temperature by the end of the century will increase across the entire County with more frequent incidences of extreme heat. Impacts from extreme heat events are expected to compound poor health outcomes already being experienced by sensitive populations and EJ communities, particularly for those located near Fetters Hot Springs-Agua Caliente, southwest of Santa Rosa, Forestville, Cloverdale, and south of Windsor. Impacts include heat-related illness, such as heat stress, heat stroke, and dehydration, which can be life threatening. During poor air quality and extreme heat events, cooling centers, hospitals, and emergency personnel are in high demand and these critical resources may be affected by power reliability, staffing, and inequitable community access to emergency facilities.

- **Water Reliability and Consumption**. Water supply infrastructure, such as pipelines and pump stations, can be damaged by climate hazards, impacting water reliability throughout the County which has direct implications on wildfire mitigation, community members, agricultural production, and critical services. Extended drought conditions that impact availability of water supply can increase the cost of water and affect water quality, resulting in disproportionate impacts to socially sensitive populations and EJ communities. Water levels in groundwater basins throughout the County have declined in recent years due to lower-than-average rainfall and in some cases overdraft. This can result in reduced water availability, problems with existing wells, higher concentrations of water pollutants, and in some cases, intrusion of seawater into the aquifer, mainly along the southernmost parts of the County. Groundwater users that are not within a basin subject to the California Sustainable Groundwater Management Act (SGMA) may have fewer options to address diminished groundwater resources.

- **Parks, Natural Resources, and Watershed Protection**. Parks, natural resources, and watersheds in Sonoma County are at high risk due to the effects of climate change. The increase in extreme heat and warm nights can cause heat stress and illnesses in wildlife, disrupting their reproductive cycles, facilitating pest propagation, and increasing mortality rates. Similarly, seasonal warmth occurring earlier and lasting longer than usual can lead to food scarcity for early-emerging species, stress vegetation communities, and potentially cause a shift in species' habitat ranges. In addition, Sonoma County's parks, natural resources, and watersheds are also vulnerable to the impacts of drought, landslides, and flooding. Drought conditions can disrupt habitats and pose survival challenges for wildlife due to dehydration and unreliable food sources. Landslides pose a high risk to parks and natural resource lands, leading to potential loss of lands, habitat disruption, and increased mortality risk for wildlife and plants. Flooding, especially in the FEMA-identified flood zones alongside the major rivers and creeks in the county, can cause erosion, have detrimental effects on water quality, and impact sensitive plant and wildlife species. Sea level rise would also exacerbate coastal erosion potentially impact beach access and recreational areas such as coastal trails along Sonoma County's shoreline. The hazards caused by climate change would threaten critical habitat areas, hardwood forests, shrubs, and grasslands in the County. They also pose a significant threat to aquatic and fish species that are dependent on water quality for survival, including several state and federally listed threatened or endangered species.
- **Flood Protection**. Riverine and stormwater flooding affects a wide range of communities in Sonoma County. FEMA flood zones are identified alongside most of the rivers and creeks that run through Sonoma County. A majority of the flood-prone areas throughout the County are part of the Russian River. Currently, 3.7 percent of the Sonoma County population is exposed to the 100-year and 500-year flooding. Flooding can result in property damage and direct impacts to the health and welfare of individuals, particularly those that are in substandard living conditions, people experiencing houselessness, those who are unable to evacuate quickly or safely, agricultural workers, as well as individuals without vehicle or in households without a computer. About 969 properties in the County have already experienced repetitive losses. The estimated losses due to flooding events that occurred from January 1995 to February 2019 are about $400 million. Moreover, flooding can impact the County's economy, infrastructures, and critical facilities, including fire and police stations, hospital and healthcare facilities, emergency shelters, and airports. The County's agricultural lands within floodplains are also at risk of disruption during flood events and natural resources are expected to experience more frequent and extreme flooding, including erosion, which would have detrimental effects on water quality and sensitive species of plants and wildlife. Impervious surfaces can exacerbate stormwater flooding, posing a risk to critical facilities and storm drainage and flood protection services in Sonoma County. Flooding damage has already led to the loss of housing stock, increasing displacement and houselessness in the county, and has caused damage to rural roads isolating several rural communities. **Sea Level Rise Safety and Resiliency**. Sea level rise is a significant threat to the safety and well-being of various population groups in Sonoma County particularly those situated close to the Pacific Ocean coastline, the Bodega Bay, and the San Pablo Bay shoreline. Certain communities such as the ones living in the Petaluma Airport/Arroyo Park and Jenner/Cazadero neighborhoods (census tracts 1506.12 and

1543.04), would be disproportionately affected by its impacts, particularly socially sensitive populations, and EJ communities. The direct effects of sea level rise, such as the loss of recreational areas and potential flooding of Bodega Bay by 2100, threaten the county's natural resources and habitats. Housing needs could be impacted due to populations relocating from areas affected by sea level rise, potentially leading to economic losses due to property and land damage. Coastal erosion would be exacerbated by sea level rise, which could render some beaches inaccessible, impacting tourism resources and altering coastal habitats and ecosystems. Critical facilities, including Sonoma Valley wastewater treatment plants and storm drainage systems, are at risk of inundation, posing public health concerns. The county's agricultural lands are also threatened due to the risk of saltwater intrusion into farmlands located in low-lying areas. are also threatened due to the risk of saltwater intrusion into farmlands located in low-lying areas.

- **Wildfire Resilient Landscapes**. Parks, natural resources, and agricultural land in Sonoma County are highly vulnerable to wildfire. Since 2015, wildfires have burned over 400,000 acres in Sonoma County. Projected annual burned acreage is expected to increase along the eastern edge of Sonoma County within existing and new wildfire zones. Increasing wildfire frequency and severity will result in species mortality, loss of habitat, and loss of available food sources and seed bank. Habitat loss may not recover depending on the type of land cover that is destroyed in a wildfire and quick succession fires can prevent or delay the recovery of natural systems. Potentially affected land cover types primarily include conifer and hardwood forests along with some shrub and grasslands. Hood Mountain Regional Park & Open Space Preserve is located entirely within a very high fire hazard severity zone and several parks interspersed along the County edges are located within moderate and high fire hazard severity zones. Agricultural land that is most at risk to wildfire is located mainly at the eastern and northern edges of the County. Other agricultural areas at risk to wildfire are located throughout the County and southeast of Healdsburg. Wildfires can destroy crops and disrupt rangeland operations while wildfire smoke may stress the health of crops and livestock. These impacts to crop yield and livestock can impact Sonoma County's economy, and directly negatively impact the livelihoods of agricultural workers and operators.
- **Agricultural Operations.** A large portion of Sonoma County's economy is based in agriculture and the potential climate change impacts from drought, extreme heat, wildfires, and landslides to the County's agricultural sector could be far reaching. Livestock and crop yields can experience stress and declines. Rangelands located at the base of landslide susceptible areas in the county are highly vulnerable to landslides. Impacts to livestock, crops, and agricultural workers can lead to decreased agriculture profitability. Agricultural workers are particularly vulnerable to health risks from high-outdoor exposure to an increased number of extreme heat days and hazardous work conditions during wildfire events, which often overlap with harvest season. These workers are impacted by air quality and loss of wages, especially where hazard pay is unavailable. Agricultural workers are typically under-resourced, face societal barriers and may have chronic health conditions due to on-farm exposure to dust and farm chemicals.
- **Resilient Infrastructure**. Sonoma County's infrastructure resilience will face significant challenges due to climate change, particularly in the context of emergency preparedness response. For example, extreme heat would impact occupants of buildings that are not adequately weatherized. This would lead to increased emergency service calls and put a strain on

medical services and emergency responders. With climate change, the electrical infrastructure could be at risk of being overwhelmed by peaks in demand, resulting in blackouts or public safety power shutoffs. These power outages have significant cascading impacts on communication networks and vulnerable populations and would impair the ability of critical service providers to function effectively. In addition, the County is vulnerable to the impacts of wildfires, landslides, and flooding, which could also impact emergency preparedness response in Sonoma County. Wildfires, for instance, would pose a risk of direct structural damage to buildings located within wildfire hazard zones, including critical facilities such as fire stations and evacuation shelters. Damage to communication infrastructure, such as cell towers, during wildfires or landslides, would hinder emergency communications, potentially impacting the health and safety of emergency personnel and community members. Landslides, flooding, and sea level rise could damage major arterial routes, impacting evacuation routes, and thus, emergency evacuation could be adversely impacted. These climate risks could impact the ability of community members to evacuate during emergency orders and prevent emergency personnel from entering emergency evacuation zones.

- **Resilient Buildings.** Building stock, including commercial, industrial, residential, institutional, and government facilities, is essential to effectively deliver services and resources to the community. In Sonoma County, building stock is highly vulnerable to extreme rain events, wildfires, landslides, and flooding, which could result in direct damages or impacts to building occupants. In addition, the County's building stock may not provide adequate respite during extreme variability in temperatures. For example, extreme heat could impact the occupants of buildings and facilities that are not adequately weatherized for increased temperatures, which could lead to discomfort and potential health risks, especially for socially sensitive populations and EJ communities. Wildfires are another significant threat to the resilience of Sonoma County's buildings since a significant number of buildings are currently situated in very-high fire hazard zones as well as in areas exposed to moderate and high fire hazards. As the risk of large wildfires is expected to increase up to 50 percent by the end of the century, more buildings will potentially be at risk of structural damage. Moreover, an increase in wildfires could also increase exposure to landslides for the numerous buildings currently at risk in the County. Additionally, the projected increase in flooding frequency due to climate change in Sonoma County could intensify the impact on the County's buildings, where some of which have already experienced repetitive losses due to flooding.

7 References

Ackerly, David, Andrew Jones, Mark Stacey, Bruce Riordan. (University of California, Berkeley). 2018. San Francisco Bay Area Summary Report. California's Fourth Climate Change Assessment. Publication number: CCCA4-SUM-2018-005.

Association of Public & Land-Grant Universities. N.d. How does a college degree improve graduates' employment and earnings potential? https://www.aplu.org/our-work/5-archived-projects/college-costs-tuition-and-financial-aid/publicuvalues/publicuvalues-resources/q3/employment-and-earnings.pdf

Baird, Rachel. 2008. The Impact of Climate Change on Minorities and Indigenous People. https://minorityrights.org/wp-content/uploads/old-site-downloads/download-524-The-Impact-of-Climate-Change-on-Minorities-and-Indigenous-Peoples.pdf.

Bleiweis, Robin, Frye, Jocelyn, and Khattar, Rose. 2021. Women of Color and the Wage Gap. https://www.americanprogress.org/article/women-of-color-and-the-wage-gap/

Burkett, V. and J. Kusler. 2000. Climate change: Potential impacts and interactions in wetlands of the United States. Journal of the American Water Resources Association 36(2):313-320

California Department of Conservation (CDOC). 2021. CGS Map Sheet 58: Deep-Seated Landslide Susceptibility. https://www.arcgis.com/home/item.html?id=3cdc744bec6b45c28206e472e8ad0f89#

California Department of Food and Agriculture (CDFA), n.d. California Agricultural Statistics Review, 2019-2020. Available: https://www.cdfa.ca.gov/Statistics/PDFs/2020_Ag_Stats_Review.pdf

California Department of Forestry & Fire Protection (CAL FIRE). 2021. Santa Clara Unit Strategic Fire Plan https://osfm.fire.ca.gov/media/j3jbgupf/2021_scu_fireplan.pdf

California Department of Forestry & Fire Protection (CAL FIRE). 2020. Tuolumne-Calaveras Unit Strategic Fire Plan. https://osfm.fire.ca.gov/media/bdppiaqj/2020-tcu-fire-plan.pdf

California Department of Public Health (CDPH). 2014. Average Daily Maximum Ozone Concentration. https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/CHVIs/BRACE_Ozone_801_Narrative.pdf

California Department Public Health. 2017. Climate Change and Health Profile Report Sonoma County. https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/CHPRs/CHPR099Sonoma_County2-23-17.pdf

California Department of Public Health (CDPH). 2020. Climate Change and Health Vulnerability Indicators for California. https://www.cdph.ca.gov/Programs/OHE/Pages/CC-Health-Vulnerability-Indicators.aspx

California Energy Commission (CEC). Cal-Adapt Local Climate Change Snapshot for Sonoma County. 2021. https://cal-adapt.org/tools/local-climate-change-snapshot/

California Department of Forestry and Fire Protection. CAL FIRE. 2021. Sonoma-Lake-Napa Unit Strategic Fire Plan. https://osfm.fire.ca.gov/media/zvlgib2a/2020-lnu-fire-plan.pdf

California Office of Emergency Services (Cal OES). 2018. California State Hazard Mitigation Plan. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/state-hazard-mitigation-plan

California Office of Environmental Health Hazard Assessment (OEHHA). 2019. Heat-related mortality and morbidity. https://oehha.ca.gov/epic/impacts-biological-systems/heat-related-mortality-and-morbidity

Sonoma County. September 2015. Sonoma County General Plan. https://permitsonoma.org/longrangeplans/adoptedlong-rangeplans/generalplan/organizationandoverview

Collins M., M. Sutherland, L. Bouwer, S.-M. Cheong, T. Frölicher, H. Jacot Des Combes, M. Koll Roxy, I. Losada, K. McInnes, B. Ratter, E. Rivera-Arriaga, R.D. Susanto, D. Swingedouw, and L. Tibig, 2019: Extremes, Abrupt Changes and Managing Risk. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. In press.

Cooley, Heather, Eli Moore, Matthew Heberger, and Lucy Allen. Social Vulnerability to Climate Change in California. 2012. https://pacinst.org/wp-content/uploads/2012/07/social-vulnerability-climate-change-ca.pdf.

Coop, et al. 2020. Wildfire-Driven Forest Conversion in Western North American Landscapes BioScience 70: 659–673. Published by Oxford University Press on behalf of the American Institute of Biological Sciences. doi:10.1093/biosci/biaa061

Dale, Virginia H. First published: 01 August 1997.Photosynthetic and stomatal responses to high temperature and light in two oaks at the western limit of their range ERIK HAMERLYNCK1,2 and ALAN K. KNAPP1 1 Division of Biology, Kansas State University, Ackert Hall, Manhattan, KS 66506-4901, USA 2 Present address: Department of Biological Sciences, University of Nevada Las Vegas, 4505 Maryland Parkway, Box 454004, Las Vegas, NV 89154-4004, USA Received May 25, 1995 https://doi.org/10.1890/10510761(1997)007[0753:TRBLUC]2.0.CO;2

Delta-Mendota Subbasin. 2019. Groundwater Sustainability Plan. Environmental Protection Agency (EPA). 2022. Which Populations Experience Greater Risks of Adverse Health Effects Resulting from Wildfire Smoke Exposure? http://deltamendota.org/wp-content/uploads/2019/11/Final_Draft_GSP_Nov19/RevExecSum_Nov19_Final.pdf

Feinstein Laura, Phurisamban Rapichan, Ford Amanda, Christine Tyler, and Crawford Ayana. 2017. Drought and Equity in California. https://pacinst.org/wp-content/uploads/2017/01/PI_DroughtAndEquityInCA_Jan_2017_Executive_Summary.pdf

FEMA. 2023. Community Rating System. https://www.fema.gov/floodplain-management/community-rating-system#:~:text=The%20Community%20Rating%20System%20(CRS,Over%201%2C500%20communities%20participate%20nationwide.

Fire Safer Sonoma. 2016. Community Wildfire Protection Plan. https://www.firesafesonoma.org/wp-content/uploads/cwpp-final.pdfGamble & Balbuls. 2016. The Impacts of Climate Change on Human Health in the United States. https://health2016.globalchange.gov/low/ClimateHealth2016_09_Populations_small.pdf

Howitt Richard, Medellin-Azuara Josue, MacEwan Duncan, Lund Jay, Sumner Daniel. Economic Analysis of the 2014 Drought for California Agriculture. Available: https://time.com/wp-content/uploads/2014/12/economic_impact_of_the_2014_california_water_drought_1.pdf

IPCC. The Intergovernmental Panel on Climate Change Sixth Assessment Report. 2021. https://www.ipcc.ch/report/ar6/wg1/#FullReport

Intergovernmental Panel on Climate Change. 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, a special report of Working Groups I and II of the IPCC, ed. C. B. <https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf>.

Kenney WL, Craighead DH, Alexander LM. Heat waves, aging, and human cardiovascular health. Med Sci Sports Exerc. 2014 Oct;46(10):1891-9. doi: 10.1249/MSS.0000000000000325. PMID: 24598696; PMCID: PMC4155032.

KBBF 89.1 FM Radio Station. https://kbbf.org/

Maclean, M.D. and R.J. Wilson. 2011. Recent ecological responses to climate change support predictions of high extinction risk. Proceedings of the National Academy of Sciences. Published online before print July 11, 2011. Magness, D.R, and J.M. Morton.

Maizlish N, English D, Chan J, Dervin K, English P. 2017. Climate Change and Health Profile Report: Sonoma County. Sacramento, CA: Office of Health Equity, California Department of Public Health. Available: https://www.cdph.ca.gov/Programs/OHE/CDPH%20Document%20Library/CHPRs/CHPR099Sonoma_County2-23-17.pdf

The National Aeronautics and Space Administration (NASA). 2022. The Effects of Climate Change. Available: https://climate.nasa.gov/effects/.

NOAA National Integrated Drought Information System. 2023 Drought.gov. Available at: https://www.drought.gov/states/california/county/Sonoma

North Bay Climate Adaptation Initiative. 2016. A Roadmap for Resilience in Sonoma County. https://docs.google.com/viewer?a=v&pid=sites&srcid=bm9ydGhiYXljbGltYXRlLm9yZ3x3d3d8Z3g6NGZkMTIyMGNjOGY1ODIwMQ

Northern Sonoma County Community Emergency Response Team. 2023. Northern Sonoma County CERT. https://www.nosococert.org/

Pacific Gas & Electric (PG&E). 2016. Climate Change Vulnerability Assessment and Resilience Strategies. https://www.pgecurrents.com/wp-content/uploads/2016/12/PGE_climate_resilience_report.pdf

_____. 2022. Climate Strategy Report. https://www.pge.com/pge_global/common/pdfs/video-transcripts/Climate-Strategy-Report-2022.pdf

_____. 2022. Outage notification. https://www.pge.com/en/account/manage-my-account/online-account-preferences/outage-alerts.html

_____. 2021. Community Wildfire Safety Program. https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/CWSP-Fact-Sheet.pdf

_____. 2021. Medical Baseline Program. https://www.pge.com/en_US/residential/save-energy-money/help-paying-your-bill/longer-term-assistance/medical-condition-related/medical-baseline-allowance/medical-baseline-allowance.page

_____. 2021. Self Generation Incentive Program. https://www.pge.com/en_US/residential/save-energy-money/savings-solutions-and-rebates/understand-the-solar-process.page

Patterson Irrigation District. 2017. Water Management Plan. https://www.pattersonid.org/images/pdf/2021-12-09%20AWMP%202019%20Update_draft.pdf

Permit Sonoma Fire Prevention Division. Sonoma County Community Wildfire Protection Plan. 2023. https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Long%20Range%20Plans/Proposed%20Plans/Sonoma%20County%20CWPP/Sonoma%20County%20Community%20Wildfire%20Protection%20Plan%202023%20Update_Final%20Draft.pdf

Proceedings of the National Academy of Sciences of the United States of America (PNAS). 2021. Spatial variation in the joint effect of extreme heat events and ozone on respiratory hospitalizations in California. https://doi.org/10.1073/pnas.2023078118

Public Health Alliance of Southern California (PHASoCal). The California Healthy Places Index (HPI). 2022. https://map.healthyplacesindex.org/

Ramin & Svoboda. 2009. Health of the Homeless and Climate Change. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2704276/

Robert Digitale. 2018. The Press Democrat. Outdoor recreation adds $731 million a year to Sonoma County economy. https://www.pressdemocrat.com/article/news/outdoor-recreation-adds-731-million-a-year-to-sonoma-county-economy/

Samuel A. Markolf, Christopher Hoehne, Andrew Fraser, Mikhail V. Chester, B. Shane Underwood, Transportation resilience to climate change and extreme weather events – Beyond risk and robustness, Transport Policy, Volume 74, 2019, Pages 174-186, ISSN 0967-070X, https://doi.org/10.1016/j.tranpol.2018.11.003.

Seneviratne, S.I., Et.al. 2012. “Changes in climate extremes and their impacts on the natural physical environment,” In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation A Special Report of Working

Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 109-230. 2012 https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap3_FINAL-1.pdf

ICF International. 2016. Sonoma County General Plan and Airport Land Use Compatibility Plan Update Draft Program Environmental Impact Report. Draft. April. (ICF 00203.10.) Sacramento, CA. Prepared for Sonoma County, Modesto, CA. https://www.stanCounty.com/planning/pl/gp/current/DraftEIR.pdf

Cornwall, C., S. Moore, D. DiPietro, S. Veloz, L. Micheli, L. Casey, M. Mersich. 2014. Climate Ready Sonoma County: Climate Hazards and Vulnerabilities. Prepared as part of Climate Action 2020 by North Bay Climate Adaptation Initiative for Sonoma County Regional Climate Protection Authority. Santa Rosa, California. Sonoma County. 2023. Significant Environmental Impact Reports. https://permitsonoma.org/divisions/planning/projectreview/significanteirs

_____. August 2022. Sonoma Climate Resilient Lands Strategy (SCRLS). https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/CAO/Documents/Climate%20Action%20and%20Resiliency/FINAL_SonomaClimateResilientLandsStrategy_Full_rem.pdf

Sonoma County. 2023. Point-in-Time Count: Sonoma County saw 22 percent decrease homelessness, annual Point-in-Time count shows. https://sonomacounty.ca.gov/sonoma-county-saw-22-percent-decrease-in-homelessness-annual-point-in-time-count-shows

_____. 2023. Land Cover and Park Acreage Report. https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Performance%20Data/Permit%20Reports/2023/Planning-Applications-2023-02.pdf

_____. 2023. Operational Area Emergency Operations Plan: Extreme Temperature Response Annex https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Plans/Sonoma%20County%20EOP%20Annex%20Extreme%20Temperature%20FINAL.pdf

_____. 2023. Sonoma County. Environmental Justice Technical Report.

_____. 2023. Draft Sonoma Water Local Hazard Mitigation Plan (LHMP). https://www.sonomawater.org/media/PDF/Projects/LHMP/DRAFT%202023%20SW%20LHMP%20for%20public%20comment%20period.pdf

_____. 2022. Water Sanitation Water Efficiency Rebate Program. https://www.sonomawater.org/sanitation-rebates#:~:text=Get%20up%20to%20%24150*%20back,reduces%20wastewater%20without%20sacrificing%20performance.

_____. 2022. Point-in-Time Count Results. https://sonomacounty.ca.gov/Main%20County%20Site/Health%20and%20Human%20Services/Health%20Services/Documents/Homelessness%20Services/Homeless%20Data/Cou

nty%20of%20Sonoma%202022%20Point-in-Time%20Count%20Results.pdf

_____. 2022. Operational Area Emergency Operations Plan: Annex Extreme Heat Event. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/_Documents/Extreme-Heat-Events-Sonoma-County-Operational-Area-Emergency-Operations-Plan-Annex-August-2021.pdf

_____. 2022. The Sonoma County Operational Area Emergency Operations Plan. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Plans/Sonoma-County-Emergency-Operations-Plan-English.pdf

_____. 2022. Operational Area Emergency Operations Plan: Annex Extreme Heat Event. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/_Documents/Extreme-Heat-Events-Sonoma-County-Operational-Area-Emergency-Operations-Plan-Annex-August-2021.pdf

_____. 2022. Sonoma County Operational Area Emergency Operations Plan Annex: Mass Care & Shelter. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/_Documents/FINAL-Sonoma-County-OA-Mass-Care-Shelter-Annex.pdf

_____. 2022. Sonoma County Energy Independence Program. https://sonomacounty.ca.gov/administrative-support-and-fiscal-services/county-administrators-office/climate-action-and-resiliency/financing-incentives-and-grants/financing/sonoma-county-energy-independence-program

_____.2022 County of Sonoma Emergency Readiness, Response, and Recovery Webpage). https://socoemergency.org/

_____.2022. Community Wildfire Protection Plan Update Hub Site. https://permitsonoma.org/sonomacountycwpp#:~:text=Community%20Wildfire%20Protection%20Plan%20HUB,mitigation%20and%20hazard%20reduction%20projects.

_____.2022. Sonoma County. Operational Area Emergency Operations Plan Annex: Public Safety Shutoff. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/Administration/Services/2147553637/Sonoma-County-EOP-Annex-PSPS-July-2021-FINAL.pdf

_____.2021. Sonoma County Climate Mobilization Strategy. https://rcpa.ca.gov/wp-content/uploads/2020/12/Sonoma-Climate-Mobilization-Strategy-Adopted-2021-03-08.pdf#:~:text=The%20Sonoma%20Climate%20Mobilization%20Strategy%20contains%20a%20ten-year,%28GHG%29%20emissions%20and%20increase%20carbon%20sequestration%20by%202030.

_____.2021. Sonoma County Crop Report. https://sonomacounty.ca.gov/Main%20County%20Site/Natural%20Resources/Agricultural%2C%20Weights%20%26%20Measures/Documents/Crop%20Reports/2021-Sonoma-County-Crop-Report.pdf#:~:text=It%20is%20my%20privilege%20to%20present%20the%202021,19.2%25%20increase%20from%20our%202020%20value%20of%20%24680%2C648%2C600.

_____. 2021. Climate Adaptation Plan. https://www.sonomawater.org/media/PDF/Environment/Climate%20Adaptation%20Planning/SW_CAP_Final_October_2021.pdf

_____. 2021. Sonoma County Operational Area Emergency Operations Plan Annex Community Alert & Warning. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/Administration/Services/2147553358/Sonoma-County-Op-Area-EOP-Annex-Alert-Warning-March-2021-FINAL.pdf

_____. 2021. Sonoma County Operational Area Emergency Operations Plan Annex: Evacuation. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/Administration/Services/_Documents/Sonoma-County-Operational-Area-Evacuation-Annex-FINAL-July-2021.pdf

_____. 2021. Sonoma County Agricultural Report. https://sonomacounty.ca.gov/Main%20County%20Site/Natural%20Resources/Agricultural%2C%20Weights%20%26%20Measures/Documents/Crop%20Reports/2021-Sonoma-County-Crop-Report.pdf

_____. 2021. Sonoma County Multi-Jurisdictional Hazard Mitigation Plan. https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Planning/Long%20Range%20Plans/Hazard%20Mitigation%20Plan/Adopted-Sonoma-County-MJHMP-Volume-1-December-2021.pdf

_____. 2021. Sonoma County Strategic Plan 2021-2026. https://socostrategicplan.org/

_____. 2021. Urban Water Management Plan. https://www.sonomawater.org/uwmp

_____. 2020. Operational Area Emergency Operations Plan: Annex Russian River Flood Plan. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/_Documents/Russian-River-Flood-Plan-Sonoma-County-Operational-Area-Emergency-Operations-Plan-Annex-January-2020.pdf

_____.2020. Sonoma County Fire Safety Ordinance. http://sonomacounty-ca.elaws.us/code/coor_ch13

_____.2020. Sonoma County. Operational Area Emergency Operations Plan Annex: Wildfire Burn Scar Debris Flow Response. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/_Documents/Sonoma%20OA%20Burn%20Area%20Contingency%20Plan%20Nov%202020.pdf

_____.2018. Sonoma County Recovery & Resiliency Framework. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Archive/Documents/12-11-2018%20CAO%20Recovery%20Framework%20Adoption_AttA_English_Fully%20Remediated.pdf

_____. 2017. Sonoma County Operational Area Damage Assessment Plan. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Plans/Damage-

Assessment-Sonoma-County-OAreaE-Ops-Plan-Annex-February-2017.pdf#:~:text=This%20plan%2C%20written%20in%20a%20checklist%20format%2C%20establishes,Sonoma%20County%2FOperational%20Area%20-%20Emergency%20Operations%20Plan%20%28EOP%29.

_____. 2015. Sonoma County Operational Area Coastal Incident Response Plan. https://sonomacounty.ca.gov/Main%20County%20Site/Administrative%20Support%20%26%20Fiscal%20Services/Emergency%20Management/Documents/Plans/Coastal%20Incident%20Response%20Plan-Sonoma%20County%20Operation%20Area%20Emergency%20Operations%20Plan%20Annex-January%202015.pdf

_____.2015. Sonoma County General Plan. https://permitsonoma.org/longrangeplans/adoptedlongrangeplans/generalplan/organizationandoverview

_____. 2008. Sonoma County General Plan Safety Element https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/BCCs/Long%20Range%20Plans/General-Plan-Public-Safety-Element.pdf

Sonoma Valley, Petaluma Valley, and Santa Rosa Plain Groundwater Subbasin Groundwater Sustainability Plans. 2021. Subbasin Groundwater Sustainability Plan. https://sonomacounty.ca.gov/sonoma-county-groundwater-sustainability-plans-approved

Talbot, C.J., Bennett, E.M., Cassell, K. et al. The impact of flooding on aquatic ecosystem services. Biogeochemistry 141, 439–461 (2018). https://doi.org/10.1007/s10533-018-0449-7

U.S. Census. 2020. Sonoma County Quick Facts. https://www.census.gov/quickfacts/fact/table/SonomaCountycalifornia/IPE120220

USDA Forest Service RMRS-GTR-375. 2018 Chapter 10: Effects of Climate Change on Outdoor Recreation. Michael S. Hand, Jordan W. Smith, David L. Peterson, Nancy A. Brunswick, and Carol P. Brown

USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II: [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018.

USGS. Our Coast Our Future (OCOF). 2022. Our Coast Our Future (OCOF). https://ourcoastourfuture.org/about/

West Sonoma Irrigation District. 2018. Water Management Plan. https://westSonomaid.org/images/pdf/2017_WSID_Final_Ag_Water_Management_Plan.pdf

WaterKeeper Alliance. 2023. A River Home for the Homeless. https://waterkeeper.org/magazines/be-the-change-volume-16/a-river-home-for-the-homeless/

APPENDIX A: Stakeholder Focus Group Interviews

Sonoma County
Safety Element Update & Environmental Justice Policies
Stakeholder Interview – Hazards and Safety
December 12, 2022

Date: December 12, 2022
Time: 3:00 PM
Location: Microsoft Teams

Attendees

Name	Agency/Dept	Role
Katrina Braehmer	Permit Sonoma	Project Manager
Steve Mosiurchak	Permit Sonoma, Fire Prevention Division	Fire Warden
James Naugle	Sonoma County Sherriff's Office	Assistant Sherriff
Marshall Turbeville	CAL FIRE	Russian River Battalion
Ben Nicholls	CAL FIRE	Division Chief
Shane Vargas	CAL FIRE	Battalion Chief
Nathan Quarles	Permit Sonoma	Deputy Director for Construction and Engineering
Alex Rosas	Permit Sonoma	Division Manager
Brad Cannon	Permit Sonoma	Building and Division Manager
Barbara Lee	Director	County Administrator's Office in Climate Action and Resiliency Division
Ross Markey	Permit Sonoma	Comprehensive Planning Supervisor
Scott Orr	Permit Sonoma	Deputy Director
Anthony Massucco	CAL FIRE	Sacramento Land Use Planning
Christopher Godley	Department of Emergency Management	Director
Heidi Flowers	Sonoma County Fire District	Administrative Assistant
Eric Vaughan	Rincon Consultants	Climate Change Vulnerability Assessment Task Lead
Reema Shakra	Rincon Consultants	Consultant Project Manager

Meeting Summary

- Katrina Braehmer with Permit Sonoma provided a brief description of the project background and purpose of the meeting.
- There was a round of introductions, each member presenting their agency, division, and role.
- Eric Vaughan with Rincon Consultants presented the slide show which identified climate projections for extreme heat, drought, extreme precipitation, sea level rise, landslides, riverine and stormwater reflooding.
- Questions during the presentation included:
  1. What model are we using for the Climate Vulnerability Assessment?

a. Utilize 8.5 RCP scenario (although it does not consider the worst-case scenario)
b. Cal Adapt will be used for projections.

2. We are not at 84 days for extreme fire risk (Per CAL FIRE)
   a. Will double check to see if the data is specific to the County.

Discussion Questions

1. Of the primary hazards associated with climate change in Sonoma County, which one(s) concern you the most (flood, wildfire, extreme heat, poor air quality/smoke, drought, severe storms, power outages, landslides)?
   - The primary hazards of concern for participants were drought, wildfire, and flood.
   - Several participants noted that drought impacts many sectors, assets, and people, and therefore is a significant concern.
   - Several participants voiced concern regarding the oscillation between extreme precipitation to drought periods and the impacts this has on many sectors, assets, and people.
   - One participant noted that drought is a concern because it often exacerbates wildfire risk.
   - One participant noted that wildfire is a concern because recovery efforts and timelines are significantly high, especially compared to other hazards such as extreme heat.

2. Have you experienced any of these major hazard events in the recent past? If so, what were the impacts to your facilities, operations, staff, and/or the constituents you serve?
   - Several participants shared that Sonoma County staff experienced communication challenges during previous wildfire and power outage events due to loss of power and wireless broadband system.
   - One participant noted that daily operations of the County were impacted when staff got pulled into recovery efforts from past hazard events.
   - Several participants noted that overlapping hazard events have led to employee fatigue and burnout.
   - One participant noted that wildfire impacts critical infrastructure and structures which require long-term efforts to recover.

3. What are the primary barriers or constraints (regulatory, institutional, political, funding, technological, staffing capacity) that prevent you from adequately preparing for and/or responding to your hazards of concern?
   - Several participants noted that staff training and staff time were barriers that limited the ability of the County to prepare for and respond to hazards.
   - One participant noted that pursuing and implementing grant funding is time consuming, making acquiring resources to prepare for and respond to hazards challenging.
   - One participant voiced concerns regarding the accuracy of Federal Emergency Management Agency (FEMA) special flood hazard areas as characterized by FEMA. Inconsistencies in flood hazard zones may limit the success of flood mitigation efforts.
   - One participant noted that the CEQA process can slow down project timelines, which may limit preparedness and recovery efforts.
   - One participant noted that uncertainty of future climate hazards projections influences how infrastructure is retrofitted and developed to limit impacts.

4. Are therec existing plans or programs in place to help you minimize the impacts from hazards? If so, what are they? Do you feel that they address the influence of climate change on your hazards of concern?
    - Sonoma County Climate Resilience Land Strategy provides an overview of prioritization of potential projects that can be done to increase climate resilience.
    - Additional existing plans and programs that help minimize impacts include the Sonoma Water Climate Adaptation Plan, Hazard Mitigation Plan, Community Wildfire Protection Plans, County Emergency Operations Plan, and the Sonoma County Building Code.
    - There are several plans/projects currently being developed that seek to minimize the impacts form climate hazards, including: the Regional Climate Protection Agency: Climate Mobilization Strategy, Climate Ready Sonoma County, Carbon Sequestration Study, Draft Climate Resilience Plan
5. Which types of projects, programs, or plans do you think your agency/department needs to put into place to be better adapted to the influence of climate change on your hazards of concern?
    - One participant noted that project and programs around home hardening, fuel breaks, fuel reduction, fire breaks, prescribed burns (Sonoma County Regional Parks managing ag and open spaces) will help the County mitigate wildfire risk.
6. What role can Sonoma County play in facilitating better preparedness for limiting the extent of impacts from climate-affected hazards to the public?
    - One participant noted that Sonoma County should more clearly communicate climate hazard risks to the public.
    - One participant noted that Sonoma County should focus on communicating near term climate change impacts, not too far out, like to 2050.
    - One participant noted that Sonoma County should center messaging around impacts being felt now, not just what is projected. The County should pair this with solutions and grants/incentives.

Project Process and Next Steps

Katrina discussed Next Steps:

1. Distributing the slides
2. Distributing the climate vulnerability for review with some guidance
3. Will send out two more questions and folks can respond via email
4. Please email/call Katrina with any additional questions or comments

Sonoma County
Safety Element Update & Environmental Justice Policies
Stakeholder Interview – Hazards and Safety
December 20, 2022

Date: December 20, 2022
Time: 2:00 PM
Location: Microsoft Teams

Attendees

Name	Agency/Dept	Role
Katrina Braehmer	Permit Sonoma	Project Manager
Tanya Narath	Sonoma County Regional Climate Protection Authority	Director of Climate Programs
Janice Thompson	Sonoma County Public Infrastructure	Deputy Director
Johannes Hoevertsz	Sonoma County Public Infrastructure	Director
Brian Diemer	PG&E	Public Safety Specialist
Steve Ehret	Sonoma County Regional Parks	Planning Manager
Lauren Cartwright	Sonoma County Economic Development Board	Deputy Director
Nora Malonee-Brand	Sonoma County Department of Health Services	Manager of Health, Policy Planning, and Equity Team
Rhonda Coffman	Sonoma County Community Development Commission	Community Development Manager
Martha Cheever	Sonoma County Community Development Commission	Manager of Housing Authority Rental Assistance Programs
Scott Orr	Permit Sonoma	Deputy Director of Planning
Ross Markey	Sonoma County	Comprehensive Planning Manager
Dale Robert	Sonoma Water	Principal Engineer
Eric Vaughan	Rincon Consultants	Climate Change Vulnerability Assessment Task Lead
Lauran Collar	Rincon Consultants	Climate Analyst

Agenda

1. Introductions
2. Project Background
3. Meeting Purpose
4. Presentation on Sonoma County Climate Projections
5. Discussion Questions
6. Project Process and Next Steps

Meeting Summary

- Katrina Braehmer with Permit Sonoma provided a brief description of the project background and purpose of the meeting.
- There was a round of introductions, each member presenting their agency, division and role.
- Eric Vaughan with Rincon Consultants presented the slide show which identified climate projections for extreme heat, drought, extreme precipitation, sea level rise, landslides, riverine and stormwater flooding.
- Questions during the presentation included:
    1. What is the project timeline?
        a. The project is to be completed in the next year
    2. Do you see splitting up other coastal hazards with Sea Level Rise? Is this a copy paste from the local coastal plan?
        a. These hazards will be covered at a high level. We will just be doing a summary of existing exposure and vulnerabilities.

Discussion Questions

1. Of the primary hazards associated with climate change in Sonoma County, which one(s) concern you the most (flood, wildfire, extreme heat, poor air quality/smoke, drought, severe storms, power outages, landslides)?
    - No responses collected.
2. Have you experienced any of these major hazard events in the recent past (flood, wildfire, extreme heat, poor air quality/smoke, drought, severe storms, power outages, landslides)? If so, what were the impacts to your facilities, operations, staff, and/or the constituents you serve?
    - A primary concern of participants is how climate change would further exacerbate major hazards and hazardous conditions.
    - Several participants noted that major hazard events particularly impacted low-income and special needs populations.
    - Several participants expressed concern that loss of housing stock during hazard events drives the cost of housing up.
    - One participant voiced that loss of housing has a direct impact on people's health.
    - One participant voiced concern regarding hazard event impacts to business operations continuity and staff safety.
    - Several participants noted the need for continuous utility (connectivity, water, electricity) provisions during hazard events and efforts to address these concerns.
    - One participant voiced concern about the mental health impacts and trauma of experiencing a hazard event.
    - One participant voiced concern regarding algae blooms in potable water due to climate change.
3. What are the primary barriers or constraints (regulatory, institutional, political, funding, technological, staffing capacity) that prevent you from adequately preparing for and/or responding to your hazards of concern?
    - Several participants noted limited funding and staffing constraints.

- One participant noted that limited ability to collaborate on climate vulnerability and climate adaptation plans.
- One participant noted conflicting solutions to various climate issues being a barrier.
- One participant noted that it can be challenging not to drive costs up for consumers.
- Several participants cited response times to hazards are often longer than hoped for or anticipated.
- One commenter noted that there is difficulty finding contractors to assist as costs for labor and materials continue to rise.
- Several commenters noted sources of potential financing. These sources included the Center for Disease Control and Prevention, Sonoma County Energy Independence Program PACE, Federal Highway Administration, and FEMA.
- One participant noted that climate change is discussed as part of the General Rate Case submitted to California Public Utilities Commission.

4. Which types of projects, programs, or plans do you think your agency/department needs to put into place to be better adapt to the influence of climate change on your hazards of concern?
   - Several participants stated that their organization needs to ensure that homes are weatherized and have air conditioning at low and no cost.
   - One participant noted there is a need for more comprehensive evacuation planning and transportation planning.
   - Several participants noted the need for resilient utility systems (electricity and broadband) during hazard events. One commenter stated that the Economic Development Board works to provide broadband services to residents.
   - One participant noted concerns regarding equity.
   - One participant noted concerns regarding the loss of campgrounds and open space in the County due to sea level rise.
   - One participant stated there is a need for mental health counseling for people after hazard events.
   - One participant noted a need for greater financial assistance programs.
5. What role can Sonoma County play in facilitating better preparedness for limiting the extent of impacts from climate-affected hazards to the public?
   - One participant stated that the County should assist with aligning and coordinating climate efforts between jurisdictions.
   - One commenter asked how the County is applying an equity lens to their safety and hazard planning.
6. Would you be willing to continue engaging in the General Plan Safety Element Update Process?
   - Participants agreed to continue engaging in the General Plan Safety Element Update process.
7. Who else do you recommend should be engaged on these topics who we might have missed?
   - Several participants suggested that County Counsel should be engaged in the process.
   - Several participants mentioned the Office of Equity should be engaged in the process, due to their greater involvement in equity work in the County.

- One participant stated that the Department of Emergency Management is heavily involved in the County's climate efforts.
- One participant noted the Open Space District should be engaged in the process.
- One participant suggested the Sheriff be engaged in the process.

Project Process and Next Steps

Katrina discussed Next Steps

1. Folks can reach out with any questions.
2. The first major deliverable going out is the climate vulnerability assessment.

Sonoma County
Safety Element Update & Environmental Justice Policies
Stakeholder Interview – Hazards and Safety
January 20, 2023

Date: January 20, 2023
Time: 2:00 PM
Location: Microsoft Teams

Attendees

Name	Agency/Dept	Role
Katrina Braehmer	Permit Sonoma	Project Manager
Scott Orr	Sonoma County Permit Sonoma	Deputy Director of Planning
Stephanie Picard Bowen	Generation Housing	Deputy Director
Jeff Carlton	Dutton Ranch	NA
Gabriela Orantes	North Bay Organizing Project	Project Manager
CC Ciraolo	Greenbelt Alliance	NA
Thomas Hammond	Sonoma Resource Conservation District	NA
Brittany Jensen	Gold Ridge Resource Conservation District	Executive Director
Steve Birdlebough	Transportation Land Use Coalition	
Collin Thoma	NA	Disability Advocate
Rue	NA	NA
Eric Vaughan	Rincon Consultants	Climate Change Vulnerability Assessment Task Lead
Lauran Collar	Rincon Consultants	Climate Analyst

Agenda

1. Introductions
2. Project Background & Purpose of Meeting
3. Presentation on Sonoma County Climate Projections
4. Discussion Questions
5. Project Process and Next Steps

Meeting Summary

- Katrina Braehmer with Permit Sonoma provided a brief description of the project background and purpose of the meeting.
- There was a round of introductions, each member presenting their agency, division and role.
- Eric Vaughan with Rincon Consultants presented the slide show which identified climate projections for extreme heat, drought, extreme precipitation, sea level rise, landslides, riverine and stormwater flooding.

Discussion Questions

1. Of the primary hazards associated with climate change in Sonoma County, which one(s) concern you the most (flood, wildfire, extreme heat, poor air quality/smoke, drought, severe storms, power outages, landslides)?
    - One participant noted that epidemics and pandemics have severely impacted the County.
    - Several participants noted that extreme heat is a major concern.
    - Several participants expressed concern regarding drought, wildfire, and flooding and how these events will be worsened by climate change.
    - One participant stated that future developments should not be sited in hazard areas in order to reduce risk.
    - One participant noted that wildfires and evacuations during a wildfire are major concerns. The participant noted limited transportation options for individuals with disabilities.
    - One participant expressed concern regarding utility reliability, particularly water reliability, during and after hazard events.
2. What did you experience during recent regional flooding, wildfires, and other relevant hazard events during the past year? What were the impacts to people and places?
    - One participant noted that there's many people who work, but do not live, in Sonoma County and therefore may face particular challenges during climate hazard scenarios.
    - One participant shared that Greenbelt is developing a social vulnerability index in relation to wildfire. The index will be available in May/June as a part of a project with Agriculture and Open Space.
    - One participant noted that there are challenges with water reliability and that there aren't many water resources beyond what is supplied municipally.
    - One participant noted that Sonoma and Marin Counties Resource Conservation Districts (RCD) put together a write up on the impacts of drought with a focus on agricultural impacts.
    - One participant stated that the well ordinance is currently being updated.
3. What prevents your community from adequately preparing for and/or responding to regional hazards (regulatory, institutional, political, funding, technological, staffing capacity)?
    - One participant noted that maintenance of rivers and creeks is necessary to reduce flooding impacts.
    - One participant noted that a multi-lingual radio (KBBF Radio 89.1) is something that has been relied on by many community members and should be integrated into planning efforts for hazard event communication.

- Several participants noted lapses in communication during past hazard events. One participant noted inadequate access to broadband and Wi-Fi as a barrier. Another participant noted that many people who do not have landline telephones and cell phones often die during emergencies if electricity is not available.
- One participant stated that there needs to be adequate housing to serve as both homelessness prevention and part of the disaster preparedness strategy.
- Several participants noted that residents are exhausted by the number and intensity of hazard events. Several participants noted that limited awareness and limited resources prevent residents from adequately preparing for hazard events.
- One participant noted that the Resource Conservation District (RCD) goes for grants that focus on water quality and road improvement projects. RCD also works on carbon smart/sequestration projects.

4. What plans, programs, or activities are you involved in? What appealed to you most about those plans, programs, or activities? Why did you engage?
    - One participant noted that the Farm Bureau is working on a climate adaptation pilot project with Sonoma County Wine Commission.
    - One participant noted that the Transportation Commission is interested in compact development and developing outside of the wildland interface.
    - One participant noted there is a need for urbanized areas to be better prepared to handle flooding.
    - One participant stated that Fire Hazard Severity Zone maps need to adequately account for hazard areas.
    - One participant stated their organization is working on projects that focus on residents with disabilities and connecting them with necessary resources.
    - One participant noted that KBBF (oldest bilingual radio station in the U.S.) is an asset to the community.
    - One participant stated that Community Alliance with Family Farmers offers occasional training that includes climate change adaptations such as drought tolerant approaches, carbon sequestration, soil stabilization, etc.
5. Moving forward, how can Sonoma County better engage with local organizations to execute programs that facilitate better preparedness in the community for climate-affected hazards to the public?
    - One participant stated that data needs to look at block levels, rather than census tracts, due to extreme differences found between block groups.
    - One participant noted that there needs to be better communication regarding changes to the permitting process.
    - One participant stated that additional input from organizations and residents would be useful, and that participants should be paid for providing their expertise.
    - One participant stated that the County should be in touch with the regional climate protection agency and advocated for the need of sustainability officers in different industries.

Next Steps

Katrina asked folks to reach out with any questions.

Sonoma County
Safety Element Update & Environmental Justice Policies
FINAL Permit Sonoma Safety Element Focus Group Recommendations
August 22, 2023

Date: August 22, 2023
Time: 1:00 PM
Location: Zoom

Attendees

Agency/Dept
Community Organizations Active in Disaster (Prior Staff)
Equity First Consulting
Health Action Together
La Luz Sonoma Valley (Prior Staff)
La Plaza
North Bay Jobs with Justice
Permit Sonoma
Roseland Community Building Initiative
Santa Rosa-Sonoma County NAACP
Sonoma Immigrant Services
Sonoma Valley Community Health Center

When we say 'community' we mean: Immigrants, Non-English and monolingual speakers, Black community members, unsheltered folks, Latinx, Indigenous and communities on the margins.

Overarching Recommendation: Prioritize Advanced Preparation That Is Grounded In The Realities And Needs Of Communities Most Impacted - Shift From Reacting to Disaster To Culturally Responsive Preparation Mode

- Overarching requests to invest more in preparation before disaster by developing relationships with communities most impacted by systemic inequities especially within the context of climate change.
    - Lack of integration of learnings into systems from past disasters so that the government can adequately meet the needs of communities.
    - Community members most impacted are not seeing very much change when it comes to learning from past disasters and preparing for upcoming ones.
    - Emergency Funding Structures remain unchanged
        - Organizations who are not in relationship with communities most impacted continue to receive the majority of the funding, the same people respond, and support doesn't end up getting into the community.

- Two major strategies in advance preparation are:

- Building trust and non-extractive relationships with local CBOs who have trust in the community, understand their communities specific needs and locations, and provide disaster assistance (resources, legal, translation, information sharing, physical locations, ect). Policies need to include feedback loops for bi-directional information sharing and transparency to build trust and accountability.
- Where systems -based constraints exist, invest and develop processes for building organizational capacity so that organizations who are connected to and in trusting relationships with communities most impact my systems inequities and climate change have the necessary components required by law to be funded to respond to pre-during-post disasters. For example, how can organizations who are hubs for communities be funded to become cooling centers, warming centers, etc.

Top Recommendations

TOP 8 THEMES: Documentation, Contracting, Funding, Language Access, Hiring Practices and Representation, Communications - Alerts & Trusted Sources for Information, Workforce, Safe Spaces

- **Documentation**
  - Remove the requirement to provide proof of documentation when providing emergency assistance where possible
  - Establish relationships with local consulates before disasters in order to more effectively provide support with getting documentation if it's been lost in a fire, flood or other disaster.
  - Build on existing pathways to fund undocumented folks who are providing disaster work in community

- **Contracting**
  - When in disasters or emergency declarations, contracting and funding moves very quickly. But when in recovery (or even preparation mode), contracting processes have a lot of red tape and gatekeeping, which results in funds not getting into impacted communities and harms efforts to build relationships with community based organizations. Need to remove barriers to contracting when not in disaster mode, and shift from a "no" culture to a culture of "yes, let's figure out how to make it possible/work to understand why the barriers exist in the first place."
  - Leverage the Federal funding model that allows 5% of Federal/states/local funding to be used for disaster preparedness, with a certain percentage (50%) of funding that needs to go to the community through subgrants, local subcontractors, community programs and/or a compensated advisory council.
  - The County's strict process to become a vendor, get a grant, or even to get on a listserv to get information, as well as delays in payment to vendors and extended invoicing periods, create a lot of barriers. Multiple examples of when a small local organization with subcontractors is facing slow payments from the County, and doesn't have the resources to make payments. Recommendation to make contracting more quick and nimble, remove the financial and administrative burden on small community based organizations who do not have the financial capacity to wait for slow payments or administrative capacity to meet documentation requirements to apply or report.
  - Align information systems about contracting or grant making with the reality that information is shared word of mouth. Invest in and cultivate existing mutual aid networks.
  - Help local, small community based organizations build capacity before the disaster through identification of opportunities to shift from restricted funding to unrestricted funding, providing connections to possible fiscal sponsors (Marin is doing this), mitigating contracting processes that increase CBO liability while supporting CBOs with possible increased liability.

- **Funding**
  - Adapt policies that define organizations who qualify for disaster funding to also include organizations who provide recovery efforts, legal support for immigrants, legal support for renters who face eviction, community health workers and promotores services.
  - Better tracking of which organizations receive disaster funding for interpretation, and accountability systems so that these organizations follow through with providing quality interpretation when needed.
  - Increased funding for food assistance programs.
- **Language Access**
  - County needs faster interpretation and translation processes, for example with 211, and needs to ensure providers understand local context.
  - Languages beyond Spanish need translation such as Fijian, Nepalese, Filipino.
  - The County needs to require PG&E (or partner with) to provide disaster related communications in multiple languages, so the County can more quickly provide time sensitive information to the community. Example, during power shutoffs.
- **Hiring Practices and Representation**
  - Communities with the closest proximity to the impact of disasters must be represented in safety related leadership roles and positions of authority before disasters happen. Hiring and retention policies within safety related departments needs to reflect this goal.
- **Communications - Alerts & Trusted Sources for Information**
  - Investment in relationship building is critical. The best way to get Information out is through word of mouth, which requires having trusting relationships. Neighborhoods are currently siloed, community members feel burned out.
  - Compensation to folks who have trusted relationships and can help get information out, systems to get critical information to the community cannot depend on uncompensated volunteers, it's not sustainable. Create and share with COAD and the community a list of organizations who respond during disaster, whether paid or unpaid (yet).
  - Communications must be provided in preferred languages
  - Procedures to test alert systems before a disaster (like Napa is doing)
  - Lack of a safe, culturally responsive central place where community members can get information they trust
  - Existing resource at COAD that can be built off of is a communications protocol for how to respond to needs, but this is not being met at the County level. Having COAD inside the County's Emergency Operations Center is a huge improvement for information access.
  - Create partnership processes/protocol between County and Cities to streamline information sharing and make sure Cities are passing information along in timely manners. Often people turn to the City to get information, but the City is waiting on information from the County.
- **Workforce**
  - **Transparency, Training and Enforcement of Rights**
    - Training and transparency of community member rights during and after a disaster is needed, especially for farm workers.
    - Resources for improved oversight of employers to ensure rights are being respected, with timely penalties for violations and when retaliation is experienced. This is especially critical for undocumented or H1 (?) workers

  - **Disaster & Hazard Pay**
    - Invest in workforce support, especially for undocumented workers, in the form of Disaster Pay if both directly impacted. For example, if work is lost due to a disaster, if food is lost due to a power outage, if a parent misses work because of a child's asthma from poor air quality.
    - Financial assistance for monthly rental and/or utility payments when unable to work due to disaster or recovery.
    - Provide Hazard Pay for workers doing hazardous waste clean up after a disaster, as well as improve health and safety requirements, enforcement, and communication of workers rights for workers dealing with hazardous materials.
  - **Evacuations**
    - Provide safe places for immigrants to shelter during a disaster where the threat (perceived or otherwise) of Federal/ICE agents is not present
    - Recognize that the Sheriff does not make community members feel safe, look for other administrative methods to ensure safety when employers make workers work beyond evacuation lines

- **Create hyper-local, culturally responsive safety spaces**
  - Provide resources to trusted community based centers to meet eligibility requirements to be a cooling/heating center before the location is needed. Barriers to remove include: criteria regarding number of electrical outlets, number of seats, unsuitable parking.
  - Create hyper-local, culturally responsive assistance centers where folks already trust. Local Assistance Centers were not trusted because impacted community members did not feel safe and also messaging from the County indicated that LACs are for folks who can apply for Federal and State funds, if you are undocumented or you don't qualify, assistance can't be provided.
  - Mandate more geographically disperse safety centers, prepare in advance to have at least one center in each of the 9 cities.

Issue Specific Recommendations

- **Extreme Heat/Cold**
  - Update policies for when to open heating/cooling centers to trigger if only one day of extreme heat/cold. Currently there needs to be at least 3 days in the calendar forecast to trigger opening, but if it's over 100 degrees for just 2 days there are no resources available.

- **Air Quality**
  - Policies (1) to clearly define what air quality triggers the Deputy Health Officer to say air quality is a health concern and how that is informed by the California Department of Public Health (currently gray area) and (2) protocol for how the County acts on that air quality trigger to communicate air quality warnings, and provide assistance, to employees and the public who work outdoors.

- **Housing**
  - This is a constant issue that is amplified by disasters and needs to be a focus as a form of preparation

- **Mental Health**
  - Increased resources for culturally responsive mental health care

Models that Work

- **Bayer Farm**
  - Bayer Farm in Roseland worked really well as a resource hub during the 2017 fires by providing a space to gather, providing food, and a space to cook for folks living out of their cars. This was fully made possible by community organizations, and the government could have greatly amplified the impact. What didn't work about this model was that the governing agency of the park prohibited the use of the kitchen despite the dire need.

- **Equity Metrics**
  - Create and apply equity metrics to internal policies and processes that don't just incentivise, but actually penalize, if certain communities are left behind. Leverage insights from the state's Equity Index applied during covid: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/CaliforniaHealthEquity Metric.aspx

- **ARPA**
  - ARPA model was a good example of policies to look towards in how funding was distributed.

- **Cash Assistance Pilot Program**
  - County of Sonoma Pilot program to provide support for storm-related income loss and unexpected expenses regardless of immigration status. This should be continued and funds should roll over each year. Related policies could also be modeled off of the County of Sonoma's "Disaster Pay Not Worked" existing payroll systems that offer County staff pay if they are unable to work due to a disaster.

APPENDIX B: Sonoma County Adaptive Capacity

Adaptive Capacity

Adaptive capacity is the ability to adjust to the consequences of climate change. This section summarizes the ways in which the County currently manages the negative impacts of climate change. Types of adaptive capacity include adjustments in behavior, resources, and technologies. Sonoma County has actively taken steps to increase the county's adaptive capacity. Existing policies, plans, programs, and institutions that increase the county's resilience to climate change impacts are organized by climate hazard and listed in Table 1, Table 2, Table 3, and Table 4. Input from the stakeholder focus group interviews conducted in December 2022 and January 2023 are reflected in the tables below. See Section 3.1 of the Climate Change Vulnerability Assessment Report for more information.

Adaptive capacity was almost exclusively evaluated based on County and utility-led plans and programs. There are other forms of adaptive capacity that are led by institutions (e.g., schools, religious institutions), community-based organizations, non-profits, special districts, and other nongovernmental entities. Communities also form their own informal adaptive capacity efforts to prepare for, weather, and recover from climate hazards. This assessment focused on County-led programs and policies in alignment with the focus of the Safety Element which is part of the County's General Plan. Additionally, County-led plans and programs typically focus on supporting the individual community members and do not address systemic changes that currently contribute to the vulnerability of community members.

Extreme Heat and Warm Nights

Table 1 lists programs, plans, and policies that help communities become more resilient to an increase in extreme heat and warm nights.

Table 1 Program, Plans, and Policies to Manage Impacts of Extreme Heat and Warm Nights

Existing and Planned Programs, Plans, and Policies	Objectives
Sonoma County Operational Area Emergency Operations Plan: Annex Extreme Heat Events (Sonoma County 2021)	The Annex overviews procedures, roles and responsibilities, cooling center guidelines, and. It also overviews at risk populations, including individuals with disabilities, seniors, children, individuals who live in institutionalized settings, individuals from diverse cultures, individuals with access and function needs, individuals with limited or non-English speaking abilities, and individuals who are transportation disadvantaged, and potential heat-related health impacts to those populations.
Extreme Temperature Response Annex of the County's Emergency Operations Plan (Sonoma County 2023)	The Annex overviews procedures that guide a collaborative response by local governments, special districts, and allied agencies in Sonoma County to extreme temperature incidents. It describes health impacts of extreme heat on sensitive populations including infants, elderly, medically vulnerable, and people experiencing homelessness
Sonoma County Cooling Centers (Sonoma County 2022)	Sonoma County hosts cooling centers for community members to seek shelter during extreme heat events.

Existing and Planned Programs, Plans, and Policies	Objectives
Pacific Gas & Electric (PG&E) Medical Baseline Program (PG&E 2021)	PG&E provides eligible customers with a medical need for electricity (for oxygen, dialysis, etc.) with extra notifications (i.e., calls, texts, or doorbell rings) in advance of a public safety power shutoff. Public safety power shutoffs may occur during an extreme heat event
Pacific Gas & Electric (PG&E) Self-Generation Incentive Program (PG&E 2020)	The PG&E Self-Generation Incentive Program pays for all costs associated with procuring battery storage for eligible customers. Medical Baseline Program customers qualify for full benefits of the Self-Generation Incentive Program.
Pacific Gas & Electric (PG&E) Automated System (PG&E 2022)	PG&E regularly communicates with customers in the county during power outages and notifies customers when power will be restored. PG&E provides translation assistance to non-English speaking individuals and the option to update language preference for PSPS alerts.

Riverine and Stormwater Flooding and Droughts

Table 2 lists programs, plans, and policies that help increase the community's resilience to droughts and riverine and stormwater flooding.

Table 2 Programs, Plans, and Policies to Manage Riverine and Stormwater Flooding, Droughts, and Sea Level Rise

Existing and Planned Programs, Plans, and Policies	Objectives
Sonoma Water Urban Water Management Plan (Sonoma Water 2021)	The Plan details water supply sources, historical, and projected water use, and potential future water supplies during normal, single-dry, and multiple-dry years. The Plan describes climate change impacts on water supplies and endangered and threatened species. Proposed demand management strategies center around metering, water conservation public education and outreach programs, asset management, and wholesale supplier assistance programs.
Agricultural Resilience in the Face of Extreme Dry Conditions: A Marin and Sonoma Partnership Response and Recommendations (Marin and Sonoma Counties 2022).	This report shares the details of the Marin and Sonoma agricultural communities' collaborative and independent efforts to mitigate drought impacts, organized by specific adaptation practices. The report provides background on efforts and progress, and identifies needed advancements for each mitigation practice, with the intent to galvanize the community's resilience already achieved and strengthen it into the future.
Sonoma Water Sanitation Water Efficiency Rebate Program (Sonoma Water 2022)	The Sonoma County Sanitation Water Efficiency Rebate Program provides rebated to community members for high water efficiency equipment (e.g., washer and toilet)
Sonoma Water Climate Adaptation Plan (Sonoma Water 2021)	The Plan assesses the relationship between climate changes and regional water supply, flood management, and sanitation systems. It includes an assessment of vulnerable Sonoma Water infrastructure, systems, and services. The Plan outlines adaptation strategies and projects to increase resilience.
Sonoma County Operational Area Emergency Operations Plan Annex: Russian River Flood Plan (Sonoma County 2020)	The Plan outlines procedures and responsibilities for emergency response to flood conditions on the Russian River and its tributaries. The Plan outlines flooding and response scenarios on the Russian River.

Existing and Planned Programs, Plans, and Policies	Objectives
Sonoma Valley, Petaluma Valley, and Santa Rosa Plain Groundwater Subbasins Groundwater Sustainability Plans (Sonoma Valley Groundwater Sustainability Agency 2021)	The Groundwater Sustainability Plans for Sonoma Valley, Petaluma Valley, and Santa Rosa Plain Groundwater Subbasins (GSP) detail strategies to increase groundwater recharge capacity and drought resilience. The GSPs establish standards for sustainable groundwater management and use and determines strategies for ensuring that groundwater supplies meet standards by a future date. Sustainable groundwater management strategies identified center around water-use efficiency, alternate water sources, recycled water expansion, stormwater capture and recharge, and incorporating climate change into scenario modeling.
Groundwater Sustainability Plan Petaluma Valley Groundwater Basin (Sonoma Water 2021).	
Groundwater Sustainability Plan Santa Rosa Plain Groundwater Subbasin (Sonoma Water 2021).	
Community Rating System (FEMA 2023)	The Federal Emergency Management Agency's (FEMA) Community Rating System is a voluntary program within the National Flood Insurance Program (NFIP) that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions.

Wildfires and Landslides

Table 3 lists programs, plans, and policies that help increase the community's resilience to wildfires and landslides.

Table 3 Programs, Plans, and Policies to Manage Wildfire and Landslide Impacts

Existing and Planned Programs, Plans, and Policies	Objectives
Chapter 13 – Sonoma County Fire Safety Ordinance (Sonoma County 2020)	The Ordinance describes fire safe regulation adopted by Sonoma County. It includes the adopted California Fire Code sections around development, roadway requirements, signage, water flow, permitting, alarm systems, home hardening, construction requirements, wildland urban interface requirements, emergency access, fuel modification, and defensible space.
Chapter 13A – Duty to Maintain Defensible Space and Abate Hazardous Vegetation and Combustible Material (Sonoma County 2020)	The Chapter 3A of the Sonoma County municipal code describes requirements around vegetation management and defensible space.
Sonoma County Community Wildfire Protection Plan (Fire Safe Sonoma 2016)	The Plan describes wildfire risk in Sonoma County. Assets, ecosystems, and resources at risk in the County are identified and assessed. The Plan details response entities, mitigation strategies, and potential risk reduction projects.
Sonoma County Community Wildfire Protection Plan Update Hub Site (Sonoma County 2022)	The Sonoma County Community Wildfire Protection Plan (CWPP) Hub Site provides an opportunity for the public to provide feedback on the efforts to update the CWPP. The site includes a proposed project list, wildfire hazard index, community base map, and evacuation basic map.

Existing and Planned Programs, Plans, and Policies	Objectives
Sonoma County Operational Area Emergency Operations Plan Annex: Public Safety Shutoff (PSPS) Incidents (Sonoma County 2021)	The Annex outlines response guidelines to a public safety power shutoff (PSPS) due to extreme fire danger conditions. The Annex specifically outlines the needs of individuals with disabilities and those with access and/or functional needs. PSPS potential impacts and emergency response actions are summarized.
Sonoma-Lake-Napa Unit Strategic Fire Plan (CAL FIRE et al. 2021)	The Sonoma-Lake-Napa Unit Strategic Fire Plan was collaboratively developed among various federal, state, city, and county stakeholders. The Plan identifies and prioritizes wildfire mitigation and recovery strategies aimed at reducing risk within the Sonoma-Lake-Napa Unit. The Plan has goals and objectives that seek to reduce costs and losses from wildland fires in the Unit.
Pacific Gas & Electric (PG&E) Community Wildfire Safety Program (PG&E 2022)	PG&E's Community Wildfire Safety Program provides customer support during public safety power shutoffs, implements vegetation management strategies, conducts system resilience improvements, and deploys innovative technologies that reduce wildfire risk. The program provides specific support for non-English speaking individuals, individuals with disabilities, low-income individuals, the older adults, and those with chronic illnesses or health conditions.
Sonoma County Operational Area Contingency Plan: Wildfire Burn Scar Debris Flow Response (Sonoma County 2020)	The Plan establishes guidelines for local government and entities within Sonoma County to reduce threats of debris flow in areas in recent wildfires. The Plan describes post fire debris flow and flooding risk in burn scar areas. The Plan outlines roles and responsibilities in the event of an emergency event.

Multiple Climate Hazards

Table 4 lists programs, plans, and policies that help increase the community's resilience to multiple climate hazards including hazards outlined previously and in conjunction with others.

Table 4 Programs, Plans, and Policies to Manage Multiple Climate Hazard Impacts

Existing and Planned Programs, Plans, and Policies	Objectives
Sonoma County General Plan Safety Element (2008)	Sonoma County's General Plan is blueprint for meeting the communities long term vision for the future. The General Plan includes several elements (or sections) that cover different topics. The Safety Element addresses natural and man-made hazards that may result in personal injury, loss of life, property damage, or environmental damage. Hazards addressed include geologic hazards, flood hazards, wildland fire hazards, and hazardous materials.
Climate Change and Health Profile Report Sonoma County (Sonoma County 2017)	The Report details climate projections and related climate hazards, climate-related health risks, and the populations in Sonoma County that are most vulnerable to climate change impacts. The Report identifies vulnerable populations including individuals living in rural areas, children, older adults, non or limited English speakers, low income, outdoor workers, individuals with chronic health conditions, households with no car, adults educated less than high school, households with no air conditioning, and individuals living in nursing facilities, prisons, and college dorms. Climate hazards planned for include extreme heat, poor air quality/air pollution, wildfire,

Existing and Planned Programs, Plans, and Policies	
	severe weather, extreme rainfall, flood, sea level rise, climate changes impacts on agriculture, drought, and climate change impacts mental and physical health.
Sonoma County Climate Resilient Lands Strategy	The Sonoma County Climate Resilient Lands Strategy is a non-regulatory framework for how the County and its partners can conserve, manage, and restore natural and working lands to build climate resilience. The Strategy provides an overview of climate hazards, characterizes Sonoma County land types and eco-regions, and offers recommendations and guidance for the planning, design, and implementation of resilience-related projects.
Sonoma County Vital Lands Initiative	The Sonoma County Vital Lands Initiative is a long-range comprehensive plan to prioritize the land conservation activities of Sonoma County Agricultural Preservation and Open Space District. The plan includes goals, priorities, and strategies for conservation, and identifies climate resilience as a co-benefit of conservation.
Northern Sonoma County Community Emergency Response Team (CERT) (Northern Sonoma County 2022)	The CERT program trains volunteers in basic first aid, light search and rescue, and small fire suppression, and is closely associated with the Northern Sonoma County Fire Protection District and Cloverdale Fire Protection District. CERT volunteers may assist neighbors and other emergency personnel in times of emergency, and support evacuations along with other responsibilities.
Pacific Gas & Electric (PG&E) Climate Change Vulnerability Assessment and Resilience Strategies (Pacific Gas & Electric 2016)	The Climate Change Vulnerability Assessment and Resilience Strategies Report evaluates how key climate hazards (i.e., flooding, severe storms, sea level rise, subsidence, drought, wildfires, and extreme temperatures) have the potential to impact PG&E's assets and services, including disadvantaged communities' reliance on the delivery of continuous power, PG&E outlines its approach to engagement, emergency preparedness, and response planning. The Plan acknowledges the need to support disadvantaged communities and preferentially consider disadvantaged communities for grant funding.
Pacific Gas & Electric (PG&E) Climate Strategy Report (Pacific Gas & Electric 2022)	The Report describes climate exposure and risk in relation to PG&E infrastructure and operations. It outlines existing efforts to mitigate climate risks including PG&E's Community Wildfire Safety Program, PG&E's Climate Vulnerability assessment, and resilience grant programs, which support local climate resilience initiatives.
County of Sonoma Strategic Plan 2021-2026 (Sonoma County 2021)	The Plan outlines the key strategic goals for the County between 2021-2026. The Plan describes specific climate resilience goals around wildfire preparedness, community resilience, and landscape and species resilience. The County's climate adaptation efforts are developed in alignment with the goals and objectives in the Strategic Plan.
Draft Sonoma Water Local Hazard Mitigation Plan (LHMP) (Sonoma Water 2023)	The Sonoma Water LHMP evaluated the natural hazard risks and vulnerabilities facing Sonoma Water's infrastructure and services. The LHMP describes hazard exposure and potential impacts of coastal erosion, coastal storm, flooding, landslide, severe winter storms, wildfire, and drought.

Existing and Planned Programs, Plans, and Policies	
Climate Change and Health Profile Report Sonoma County (CDPH 2017)	The Report details climate projections and related climate hazards, climate-related health risks, and the populations in Sonoma County that are most vulnerable to climate change impacts. The Report identifies vulnerable populations including individuals living in rural areas, children, older adults, non or limited English speakers, low income, outdoor workers, individuals with chronic health conditions, households with no car, adults educated less than high school, households with no air conditioning, and individuals living in nursing facilities, prisons, and college dorms. Climate hazards planned for include extreme heat, poor air quality/air pollution, wildfire, severe weather, extreme rainfall, flood, sea level rise, climate changes impacts on agriculture, drought, and climate change impacts mental and physical health.
Sonoma County Multijurisdictional Hazard Mitigation Plan (County of Sonoma 2021)	The Plan assesses hazards within the County and identifies mitigation strategies that reduce or eliminate long-term risks to people and property from those hazards. Climate hazards planned for include drought, flood, landslide, sea level rise, severe weather (e.g., extreme heat), wildfire. The Plan included vulnerability analysis and adaptive capacity considerations for sensitive populations including those that are low-income, immigrants, non-English speaking, racially and ethnically diverse, young, old, or those that have access and function needs.
Climate Ready Sonoma: Climate Hazards and Vulnerabilities (Sonoma County 2014)	The Report provides an overview of relevant climate hazards, community vulnerabilities, current and future adaptive capacity efforts. Vulnerable populations assessed include children, seniors, people in poor health, isolated and rural populations, people who do not receive emergency warnings or offers because of language barriers, people living in poverty, outdoor laborers, racial/ethnic minorities, people without health insurance or with insufficient health insurance, or with barriers to accessing health services, people without transportation, people without adequate heating or cooling systems at home, or people without housing, people who live with mental or physical disabilities, institutionalized populations.
Sonoma County Climate Mobilization Strategy (Sonoma County 2021)	The Plan outlines a pathway for Sonoma County to reach carbon neutrality by 2030 and to increase climate resilience community wide. Climate adaptation strategies outlined focus on increased energy resilience and overall community resilience to climate hazards of concern.
Sonoma County Recovery & Resiliency Framework (Sonoma County 2018)	The Framework provides a vision on how Sonoma County can recover from recent fire evets and develop a resilient future moving forward. It highlights the need for community awareness and engagement to build recovery and resilience efforts.
A Roadmap for Climate Resilience in Sonoma County, California (North Bay Climate Adaptation Initiative 2016)	The Plan provides a framework and recommendations for how Sonoma County can increase community climate resilience. The Plan outlines climate hazards of concern, vulnerabilities, and potential climate resilience strategies.

Existing and Planned Programs, Plans, and Policies	
Sonoma County Crop Report (Sonoma County 2021)	The Report summarized the total value and production of crops and agricultural commodities in Sonoma County in 2021. The County's top three grossing crops and agricultural commodities are wine grapes, milk, and nursey ornamentals. The Report summarizes the impacts of drought on recent agricultural production.
County of Sonoma Emergency Readiness, Response, and Recovery Webpage (Sonoma County 2022)	The County of Sonoma Emergency Readiness, Response, and Recovery Website includes information and resources for communities to prepare for, evacuate from, and recover from an emergency. Resources center around alert systems, evacuation guidance, specific needs of individuals with access and function needs, education events, and recovery from recent hazard events such as the Glass Fire (2020) and Russian River Flood (2019).
KBBF 89.1 FM Radio Station (KBBF 89.1)	KBBF 89.1 FM is a bilingual public radio station that serves the north San Francisco Bay Area and Sonoma County. According to the North Bay Organizing Project, the radio station has historically provided critical emergency and evacuation information to Spanish-speaking residents during past hazard and evacuation scenarios.
Sonoma County Energy Independence Program (Sonoma County 2022)	The Program offers financing for permanent energy, water, wildfire safety, and seismic strengthening improvements through the property tax system. Financing is available for residential, commercial, industrial, agricultural, multi-family and certain non-profit projects.
Sonoma County Operational Area Emergency Operations Plan Annex Community Alert & Warning (Sonoma County 2021)	The Annex overviews Sonoma County community alert & warning systems, protocols, and roles and responsibilities in the event of a public threat or hazard event. The Annex outlines the importance of equity and ensuring outreach and planning around vulnerable populations.
Sonoma County Operational Area Emergency Operational Plan Annex: Evacuation (Sonoma County 2021)	The Annex describes responsible entities, emergency alert and warnings, evacuation routes and considerations, sheltering and temporary evacuation points, and critical facilities. The Annex outlines equity concerns around evacuation of community members.
Sonoma County Operational Area Emergency Operations Plan Annex: Mass Care & Shelter (Sonoma County 2022)	The Annex describes procedures, roles and responsibilities, and equity considerations for providing mass care and shelter for the Sonoma County communities during an emergency. Vulnerable populations planned for include individuals with disabilities, individuals with access and/or functional needs, people who speak languages other than English, evacuees, and those who rely on in-place shelter in lieu of evacuation.
The Sonoma County Operational Area Emergency Operations Plan (Sonoma County 2022)	The Plan provides guidance on all phases of an all-hazards emergency management process including preparedness, response, recovery, and mitigation. It outlines the systems and roles of responsible entities, alert and warning systems, public information communications, mutual aid agreements, and a hazard analysis summary in alignment with the County's current Hazard Mitigation Plan. The Plan acknowledges specific vulnerabilities to populations including individuals with access and functional needs (AFN), people with disabilities, people with limited or no English proficiency, seniors, children, and people with limited transportation resources.

Existing and Planned Programs, Plans, and Policies	Objectives
Sonoma County Operational Area Coastal Incident Response Plan (Sonoma County 2015)	The Plan provides guidance for Sonoma County agencies that provide emergency services to address coastal emergency and hazard events. It summarizes communication systems, best practices, and county resources.
Sonoma County Operational Area Damage Assessment Plan (Sonoma County 2017)	The Plan establishes procedures and responsibilities for damage assessment following a major disaster in the Sonoma County Operational Area. It includes assessment instructions and checklists.
A Roadmap for Climate Resilience in Sonoma County, California (North Bay Climate Adaptation Initiative 2016)	The Report details climate projections and related climate hazards, climate-related health risks, and the populations in Sonoma County that are most vulnerable to climate change impacts. The Report identifies vulnerable populations including individuals living in rural areas, children, older adults, non or limited English speakers, low income, outdoor workers, individuals with chronic health conditions, households with no car, adults educated less than high school, households with no air conditioning, and individuals living in nursing facilities, prisons, and college dorms. Climate hazards planned for include extreme heat, poor air quality/air pollution, wildfire, severe weather, extreme rainfall, flood, sea level rise, climate changes impacts on agriculture, drought, and climate change impacts mental and physical health.

APPENDIX C:
Safety Element Survey

Sonoma County
Safety Element Update Survey Summary Memo

Safety Element Survey Summary

Introduction

Sonoma County is undertaking a comprehensive update to their General Plan Safety Element to improve community resilience to emergency situations and climate change. The Safety Element Update is a key opportunity for community members to participate and share their experiences. Incorporating input from the community into the development of this Safety Element provides critical context for how recent climate-driven events in Sonoma County have impacted critical infrastructure and services and community members. This updated Safety Element will guide the County's policies and strategies for building resilience for climate-induced emergencies.

This summary memorandum presents the results and key findings from the survey responses. It includes descriptions of the survey marketing, methodology, format, and main findings of the survey questions results, including summaries of comments and figures that graphically depict responses.

Survey Marketing Strategy

A variety of outreach efforts were conducted to encourage survey participation, creating another opportunity for community members to engage in the Safety Element Update process, to contribute their ideas, respond to choices, and help shape the direction of policies and programs. The survey was publicized through the following methods:

Methodology

The survey questions were developed by the County with support from Rincon Consultants. A total of 553 people responded to the survey.

Survey Format

The survey consisted of 12 questions and used various question formats: checkbox, and open-ended questions. The checkbox questions asked respondents to indicate their preference for answer options. Open-ended questions asked respondents to fill in their answer as desired.

Survey Results

The survey was presented in electronic form (online) and it should be noted that responses received may not represent the entire population being queried. Since only a portion of the County population responded, results do not represent the views or preferences of the entire County.

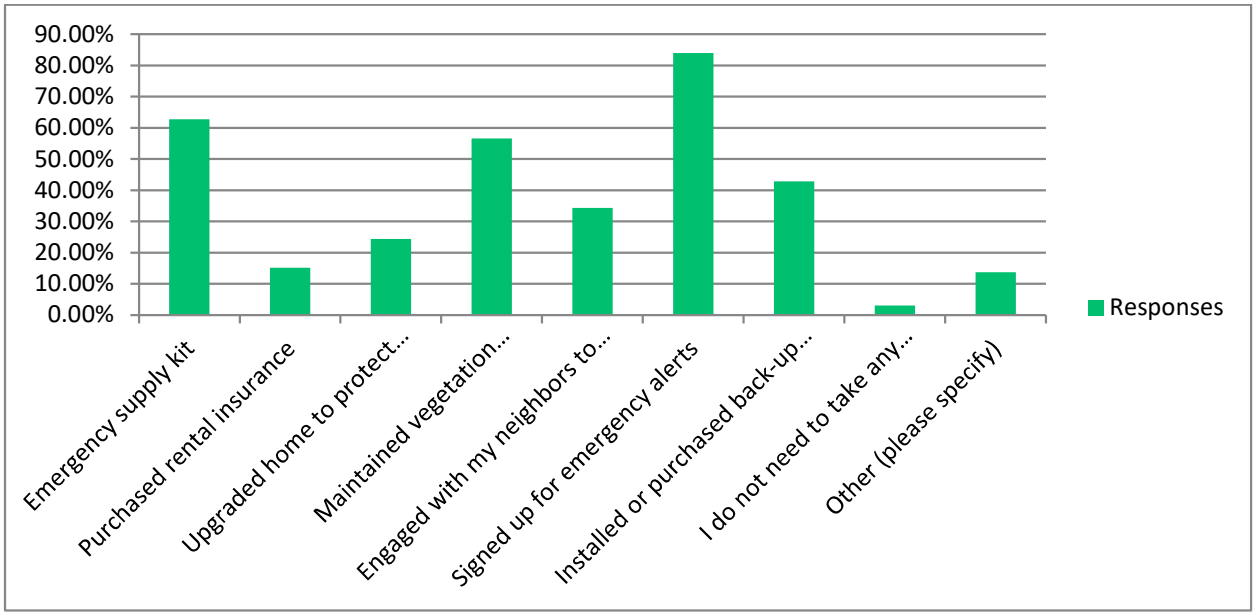
Question 1

Have you taken any of the following precautionary measures related to wildfire readiness (select all that apply)?

Question 1 asked respondents about what precautionary measures they have taken related to wildfire readiness. All 553 participants responded to this question, and none skipped. The question listed nine options:

1. Emergency supply kit
2. Purchased rental insurance
3. Upgraded home to protect against wildfire
4. Maintained vegetation clearance around home
5. Engaged with my neighbors to build a communication or support network
6. Signed up for emergency alerts
7. Installed or purchased back-up power (e.g., generators, solar panels and batteries)
8. I do not need to take any precautionary measures
9. Other (please specify)

The majority of respondents had indicated that they had signed up for emergency alerts, prepared an emergency supply kit and maintained vegetation around their home. Extremely few respondents felt that they did not need to take any precautionary measures.



Approximately 13% of respondents selected option 9 and provided detailed responses, included below. Key themes included:

- Preparing an evacuation plan
- Storing water for fire suppression
- Vehicle maintenance for efficient evacuation

We installed an entire fire suppression system including 3000 gallons tank and fire hose.
I recently moved to a senior community who has done many of these things listed here.
We have done what we can manage and afford. Could be much better. Neighbors not interested.
Keep gas in hand in case I need to evacuate or use my generator.
Started a Firewise group for my neighborhood
Made home kits for smoke filters using plug-in fans and filters taped on.
I believe these are individual choices
No need. Climate change is not a problem
homeowner's insurance
Watch Duty
Downloaded WatchDuty, got a GMRS radio and FCC license
Familiarized myself with possible evacuation routes
already have rental insurance.
I did this not because I feared climate change.
Installed MERV13 air filter on furnace
I have places I can go if we need to evacuate and I have a way out of town.
Avoid leaving on vacation during fire season
Water pump and fire hoses, rain storage tanks
earthquakes and wildfire yes, climate change fears are unfounded per my email
live in central Santa Rosa

Created a “go-bag”, my vegetation work is not clearing land but removing overhanging tree limbs & getting rid of vertical “fire ladders” near house & planting climate friendly plants
I had a long, serious conversation with a friend who owns a wooden home in a fire-prone area. I explained home hardening to her and gave her referrals and resources. I also recommended that she look into what funds are available to assist her in replacing her roof with a metal one. Her whole house, including the roof, is wooden shingles.
None of this has to do with so called climate change. Cal Fire has recommended doing these things for over 50 years.
We moved out of a wildfire prone area to one with less likelihood of wildfire impacts.
Analog phone for use during power outages
Made meeting and comm plan with extended family
Purchased gas generator
Various
Still need to get a generator and battery backup for the solar panels
On the advice of a local fire chief several years ago, I purchased a pump and fire hoses to use pool water to stand and fight the fire
Monthly 2 way radio practice with neighborhood leaders
Review evacuation plan and reunification with family members
I live in a mobile home park; not a lot I can do here; up to the owner
planning to purchase back-up power
I live in an apartment
Most of these I had already in place
Increased homeowners insurance coverage
This is all nonsense
Prepared a go bag with important documents
Basic CERT trained, BHHA Shed Captain, Ag Pass holder, Prepared multiple fire safe areas on my ranch, added additional water storage, water trailer, 3 hydrants with hoses in multiple locations at ranch, in contact with volunteer and sworn/professional First Responders
Increased my homeowner's insurance coverage

Maintaining vehicles for fleeing a wildfire
livestock to eat grass, weeds and brush
Bought an airstream as an escape pod.
A145,000
Considering getting backup generator and battery for solar panel we installed.
This all costs money. You need to help real working people not just rich people.
I can't afford things like back up power. I wish I could.
medical training
My wife has engaged with neighbors and it made an impression for removing vegetation. Just took her one day. She also signed up for emergency alerts.
Moved away from urban wildland interface, installed 3000 gallon water tank.
Build a water trailer with pump and hose
Evacuation routes, go bag
Climate change isn't from California. Climate change happened even before humans were inhabiting the earth
Glass Fire Rebuild - All current building code requirments.
New home has many safety upgrades.
Installed 2,200 gal emergency water supply
keep a to-go bag with important papers and a duffel with clothes etc ready
I've started carrying a go bag in each vehicle, and will be upgrading to a larger vehicle next time we buy so we have more room for the go bag (a week change of clothes, medications, food, water, camping gear and water).
Emergency kit is old, needs updating. Co-located important documents.

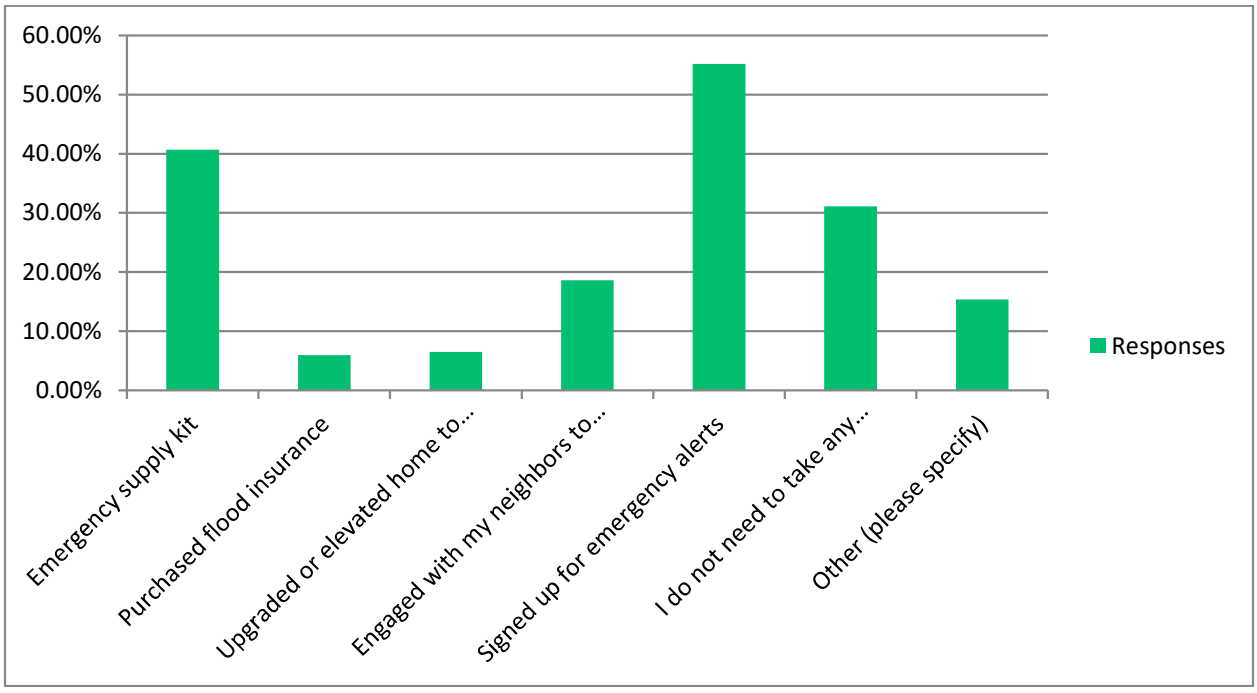
Question 2

Have you taken any of the following precautionary measures related to flood readiness (select all that apply)?

Question 2 asked respondents about what precautionary measures they have taken related to flood readiness. All 553 participants responded to this question, and none skipped. The question listed seven options:

1. Emergency supply kit
2. Purchased flood insurance
3. Upgraded or elevated home to protect against flooding
4. Engaged with my neighbors to build a communication or support network
5. Signed up for emergency alerts
6. I do not need to take any precautionary measures
7. Other (please specify)

Most respondents had signed up for emergency alerts, some had prepared an emergency response kit, and over 30% believed they do not need to take any precautionary measures.



Approximately 15% of respondents selected option 7 and provided detailed responses, included below. Key themes included:

- Updating drainage systems
- And residing outside of flood risk zones

French drain around house.
See above
Put in drainage hose and cleaned existing drains.
I have not taken precautions; I'm unsure if I need to?
Bought a sump pump.
I live in a high elevation spot but I have
We watch the nearby creek in big storms. Got sandbags once that were being freely distributed but luckily didn't need them.
generator for when power goes out, extra supplies on hand
Signed up for Socomonitor .com alerts
Purchased Sump Pumps, Tarps
home doesn't flood but some main roads do
My home on a won't ever flood, but we can get trapped when all roads out are flooded.
I watch the River
I'm not in a flood plane
Bought a home well above 500 year flood level
The basement of my rental house in Shellville regularly floods, but I trust my landlords to deal with the flooding, which they do with a pump. Hasn't impacted me yet.
We are on a hill, no immediate flood danger to home
live on a hilltop
Looked at maps for risk - I'm not in a flood zone
none yet

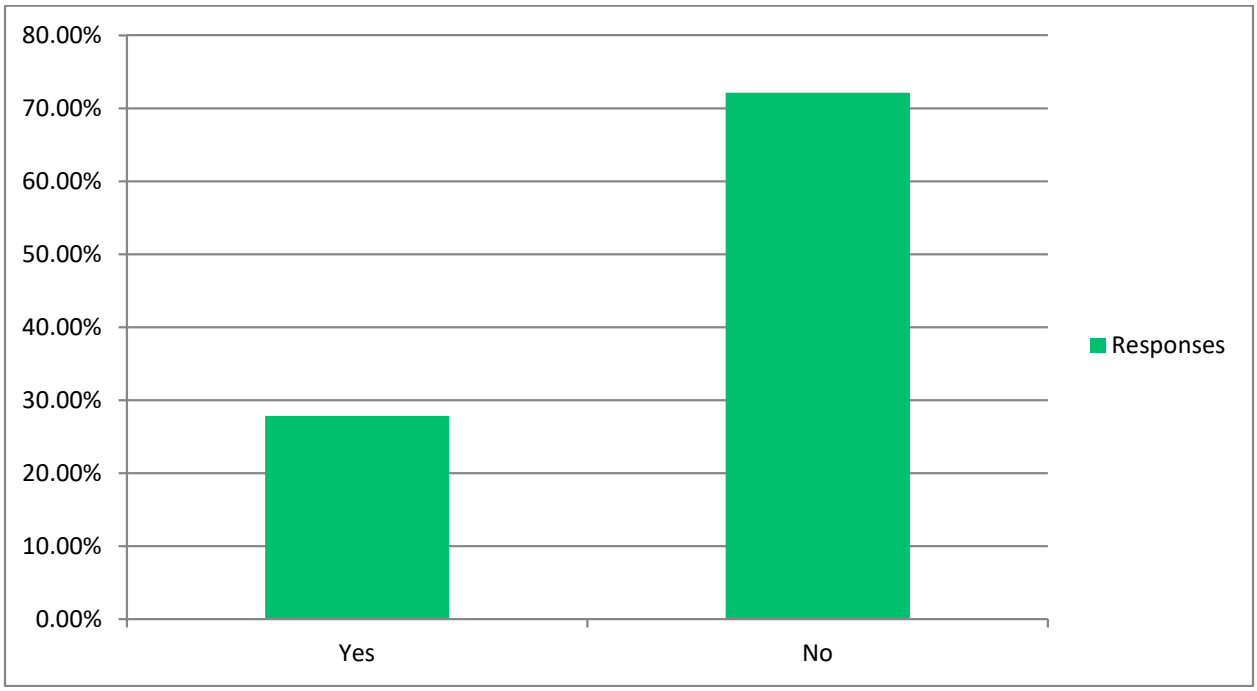
Again, none of this is directly related to so called climate change. If you're not an idiot you've been doing all of these for decades.
Live at higher altitude, analog phone for use during power outages
Purchased flood insurance only because it was required by FEMA
None
While we are at 440 feet elevation and flooding not really a threat. We do have supplies in place incase we are landlocked.
none
Verified current FEMA flood hazard map
live in a non-flood area
I live on top of a big hill
This is all nonsense
My precautionary measures are supportive to my community, my property is not positioned to be effected directly by floods.
Very remote damage from landslides
maintain surface drains on and around the property
Needed to add sand bags for torrential water run off.
This survey is a joke.
I wish flood barriers were affordable. I live in a flood zone and (again), can't afford flood deterrents. Sandbags are great, but not if you are physically unable to get them.
My home is not in low lying area
signed up on website to understand flood level of Mark West Creek
Cleared culverts and ditches on County land adjacent to my property to prevent flooding due to lack of maintenance
Taken other measures to insure our safety
Fingers crossed.
Installed sump pump

Our area doesn't flood
No flood risk at residence.
Don't live in a flood zone
do noy live in flood zone
my creek floods but it onluy gets tio my doorstep, not in my apt
My home is at elevation +335 ft, the City is at ~112 ft.

Question 3

Are you a renter?

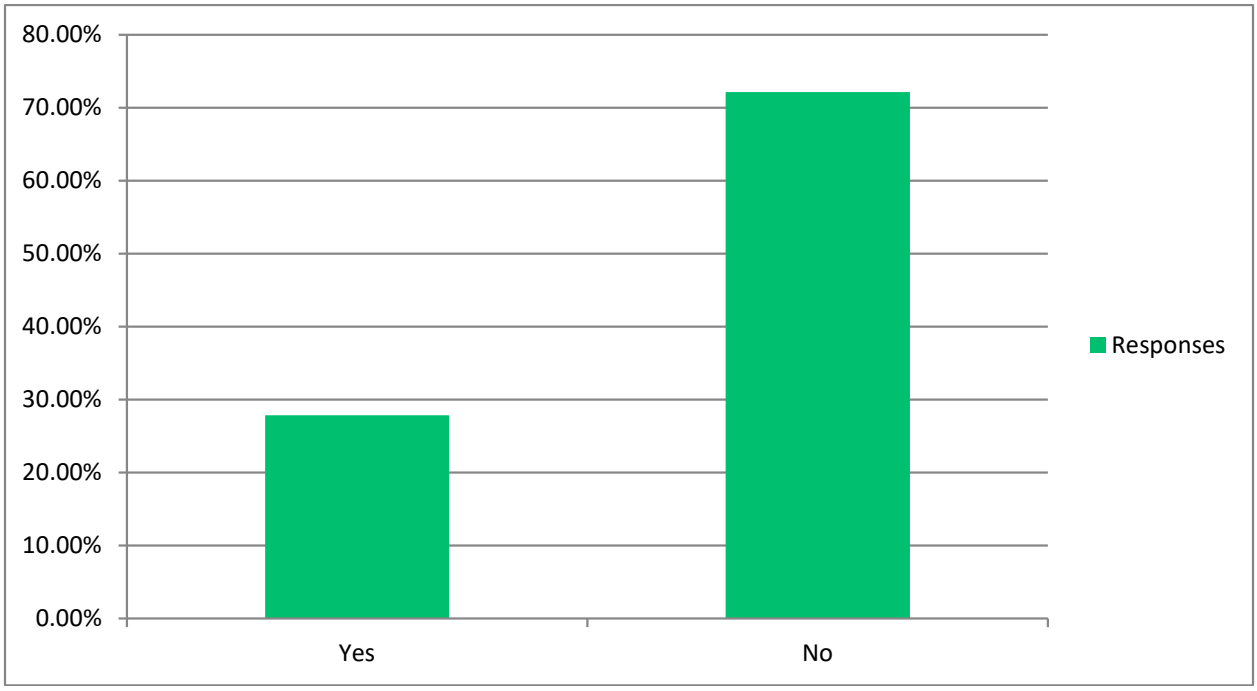
Question 3 asked respondents if they were a renter. All 553 participants responded to this question, and none skipped. Most respondents were not renters.



Question 4

If you are a renter, have you asked your landlord to make improvements for wildfire and flood readiness?

Question 4 continued from question 3 asking respondents if they were renters, had they asked their landlord to make improvements for wildfire and flood readiness. 323 Respondents answered this question and 230 skipped. The previous question indicated that only 154 respondents were renters, so this information may be skewed. The survey showed that most renters had not asked their landlord to make these upgrades.



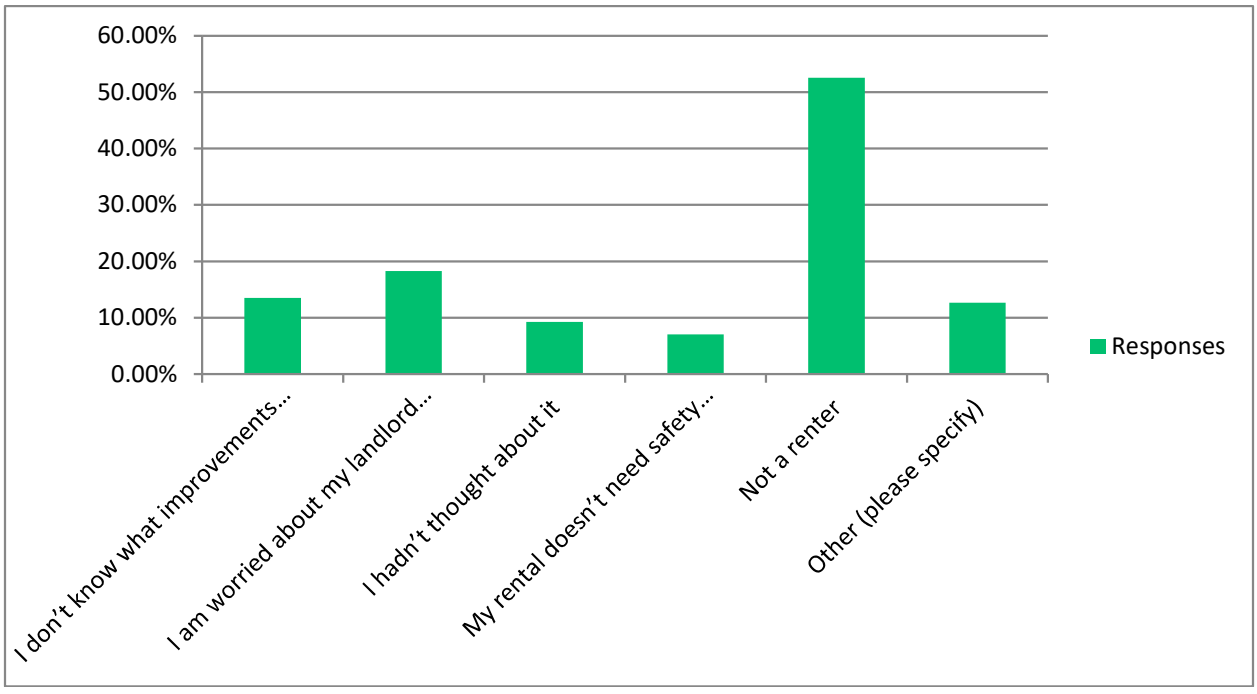
Question 5

If no to the previous question, why not?

Question 5 goes off of the previous question, asking renters why they had not asked their landlords to make improvements for wildfire and flood readiness. 356 people responded and 197 skipped the question. The question gave 6 possible responses:

1. I don't know what improvements the landlord should make
2. I am worried about my landlord getting mad or raising the rent
3. I hadn't thought about it
4. My rental doesn't need safety upgrades
5. Not a renter
6. Other (please specify)

The majority of respondents indicated that they were not renters. Though, amongst renters the most common reasoning was a worry of the landlord getting mad or raising rent, followed by not knowing what improvements landlords should make.



Approximately 12% of respondents selected option 6 and provided detailed responses, included below. Key themes included:

- Not being a renter,
- Landlords not wanting to make improvements, and
- Landlords already making improvements without prompting by residents.

I live in a senior community that addresses these issues.
Might increase rent/ we rent a granny unit, and our neighbors are a young couple with MANY children.
I'm scared to lose my housing as it's below current market rent these days. If my landlord makes too many improvements, it's likely she'll raise my rent.
My unit floor already flooded in the last rain and the complex didn't do anything
Not necessary
I am on 2nd flr. Years ago they had to enter my apartment to fix a leak on my balcony so it would not interfere with neighbors
N/A - not a renter
My apartment needs better safety upgrades, but the landlord doesn't support this for their residents.
They seem on top of things, house has plenty of defensible space
not a renter
Landlord has not been willing to make upgrades for climate change
Landlord handling it
I live in a 55+ MHP, we rent the space only
worried improvement costs will be passed to me
I live at a senior community that addresses the issues.
They won't make modifications or help
You're asking leading questions to arrive at your predetermined results.
I am not a renter so this question is superfluous and has no correct answer
He does/would not pay for anything.
Na
My landlord proactively makes upgrades & improvements for wildfire & flood already, more than I would
I have
Not a renter

Bbb
n/a
I already made them
Climate change is a political talking point. You should be prepared for all these situations because they have always happened .
not a renter
This is all nonsense
As a landlord, I have been diligent about preparing the rental home for emergencies. Defensible Spaces, two fire hydrants, a water trailer, and increased grace it's flow water storage.
Not a Renter, poor form format
Multi tenant corporate building
They can't even fix the current problem within the apartment or the annoyance of neighbors
Not renting.
All costs should be passed on to the renter.
I own!
I am not a renter. why are you asking me more questions?
I'm not a renter.
I am not a renter
n/a
not a renter
I'm the homeowner
NA - not a renter
Not applicable but can't move past this question unless I provide an answer. Needs to be made optional
i own

Question 6

If you haven't signed up for emergency communication alerts, please explain why.

Question 6 is an open answer question asking respondents who had not signed up for emergency communication alerts why they had not done so. 197 people responded while 356 skipped the question. People who responded in Spanish more commonly indicated that they were not aware of the alert system existing, or were unsure if the alerts were available in Spanish. Detailed responses to this question are available below, though some key themes included:

- Respondent had already signed up for the alerts
- They did not know about the alert system
- Language barrier for non-english speakers

n/a	
I fear I'd get too much spam, messages that don't apply to me or that aren't real emergencies.	
Na	
N/A	
I have signed up	
No twniomos servicio de teléfono y electronic	We do not have telephone and electronic service
N/A	
Signed up	
I have!	
I have signed up.	
I have	
El idioma	Language
N/A Have signed up for Nixel.	
n/a	
not applicable	
Have signed up	
na	
Falta de electricidad por 8 días y por lo tanto estuve incomunicada	Lack of electricity for 8 days and therefore I was not able to sign up

Responses	Translations
n/a	
Don't need the government to babysit me	
We've signed up.	
n/a	
No por redode, no porque no se en donde, me puedo registrar	I wasn't able to because I do not know how to sign up.
Si regrestiados en SoCo alertas	Yes, I'm registered with SoCo alerts
No se donde	I don't know where
Tengo mensajes de Sonoma County sheriff "Nixle"	I have messages from Sonoma County Sheriff "Nixle"
Porque no se si sepueden recivir en español	Because I don't know if they can be received in Spanish
Por falta de comunicacion	Due to lack of communication
No sabia que me tenia que registrar	I didn't know I had to register
No por que no tenia conocimento	Not because I didn't know
Por desinformacion	By misinformation
Comunicacion en general. Informacion sobre recursos disponibles. Pero los servicios han mejorado.	Communication in general. Information about available resources. But services have improved.
No sabía que tenía que registrar	I didn't know I had to register
No sabía que me tenia que registrar	I didn't know I had to register
The emergency alert system has never properly alerted wildfire information. To say it best the emergency communication alerts are broken. I have an amazing app downloaded on my phone that knocks it out of the park, Watch Duty	
I am signed up	
No sabia de su existencia	I didn't know of its existence
I get too many alerts	
Intrusive	
Yes I had!	
Na	
I have signed up.	
I have.	

Responses	Translations
Don't need them	
i have	
Climate change is overblown	
I have	
I have.	
I have	
I have signed up	
Salir del peligro y buscar un lugar seguro y seguir las órdenes de las alertas	Get out of danger and find a safe place and follow alert orders
n/a	
N/A	
I am signed up.	
Already have this	
I have other alerts, i.e. earthquake. I have Nixle	
N/a	
I have	
Las alertas que llegaron solo estaban en ingles y eso nos quito mucho tiempo para comprender la situacion y poder salir de la zona de peligro con mas tiempo de anticipacion	The alerts that arrived were only in English and that took a lot of time to understand the situation and be able to get out of the danger zone with more time in advance.
Used to get Nixel and then it changed and I haven't gotten anything since. Did get earthquake alert for the 4.5 in Santa Rosa.	
I did sign up	
n/a	
N/A- I signed up for emergency services.	
I have	
i am signed up	
Na	
have signed up	
n/a	
Don't trust government	

Responses	
N/A	
I have signed up. Survey should filter out questions that are not relevant due to previous answers.	
NA	
n/a	
emergency response on floods, wildfires and earthquakes are being misrepresented as climate change and this is wrong, fear mongering, political agenda wasting our tax dollars, fearing kids and younger generation, anxiety given to them	
N/A	
My husband has	
Signed up already	
New to county but this is a good reminder.	
N/A	
I get them automatically	
I assumed the broadcast alerts of media would inform me	
I have signed up	
N/A	
I was on the county alert. But I don't know the one for Santa Rosa	
I do receive them. I prefer Nixle over the new system though.	
I have	
I get alerts	
I signed up.	
To be aware of at risk/dangerous locations and conditions.	
I have	
N/A	
I have signed up, so why ask me why I have not signed up?	
It would be nice to be alerted incase of an emergency.	
N/A I'm signed up for emergency alerts.	
Na	
Hadn't been aware of the opportunity	
Have	

Responses	
I have	
So I know what's going on around me and can keep my family safe	
Yes to get alerts	
I have. But Sonoma County government is a mess, and saturated with corruption, and only want to look good, and are not genuine or based on reality. The alerts are useless.	
Because fire moves fast & social media sites are more informed than the county. You guys waste all your time & money on homeless population & Covid (I do not agree w the counties covid response in any way.).	
I signed up. Why doesn't this survey work better?	
Have done it	
I am signed up	
Social media	
Not applicable	
I am signed up to multiple county and state alert systems	
I have	
I am signed up	
I did sign up	
N/a	
I have	
m/a	
NA	
Use various local emergency alert provisions, none of which require signing up for alerts	
n/a	
Why...Safer at home than be one of too many on the road	
I have but if power is out, I have no means to get ANY alerts	
I have signed up for emergency alerts with Nixle	
too many irrelevant messages	
NA	
We have.	
I have	
This is all nonsense to take more rights away	

Responses	
n/a	
I have signed up.	
n/a I have communication alerts	
N/a	
I have signed.	
SoCoAlerts are late or never come. Watch Duty is far better as is Napa NOES.	
N/A	
n/a	
The government will never solve my problems, leave me alone	
Am signed up	
I assumed the ones I signed up for fire were the same as flooding	
Signed up	
I have.	
N/A	
Where do you sign up	
I have signed up	
n/a	
n/a, I receive the alerts	
I have signedup	
I did sign up, but honestly all I seem to get are sheriff alerts about stuff I don't care about.	
I have signed up.	
I did	
N/a	
This survey switched to English without warning	
I have signed up. If you read my previous answers, you wouldn't be asking me this.	
N/A	
We are very much signed up!	
You keep changing the service we have to sign up for.	
I have	

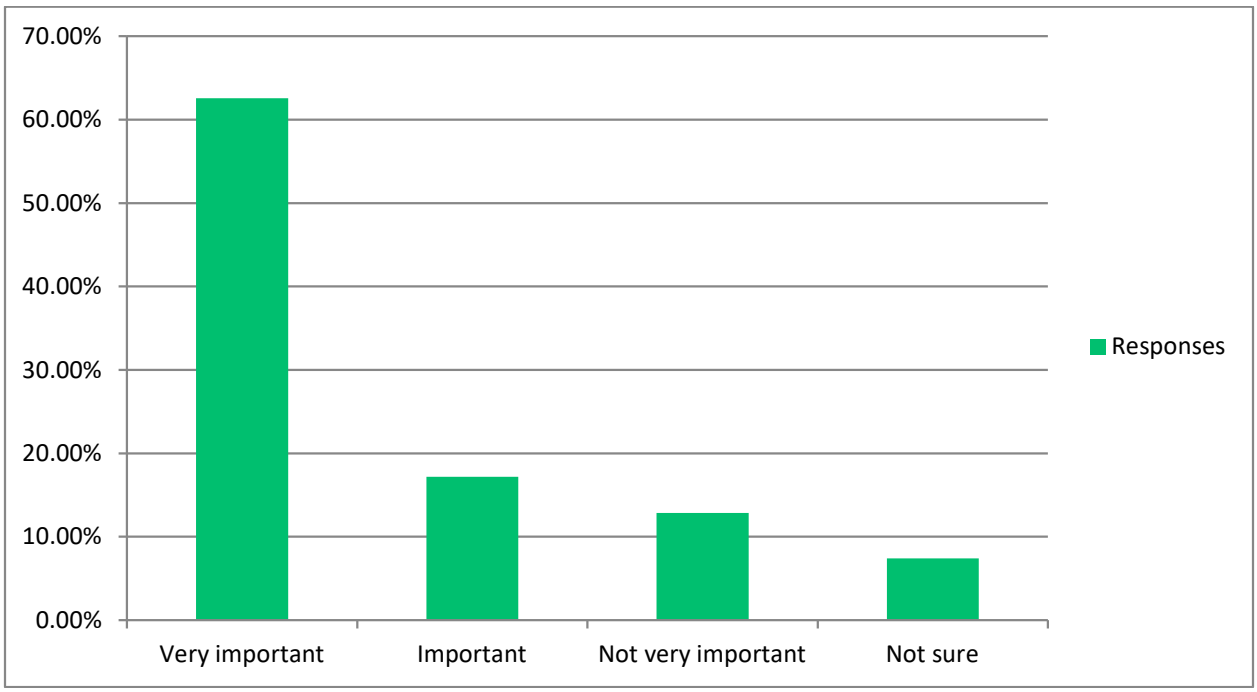
Responses	
I have signed up for emergency alerts. It seems like the system isn't always reliable. I hope more upgrades are on the horizon so citizens can feel confident the alerts will come through consistently. Thanks!	
Yes I had!	
I have	
I have Nixle	
n/a	
I have	
I did	
My work requires me to maintain focus on what I am reading or writing and the alerts completely distract me. If the alerts were only for things that actually might impact me, I might consider signing up, but they were often regarding remote emergencies not related to me at all.	
I have	
N/A	
I have	
We have!	
too many and not relevant most of the time	
N/a	
Not applicable	
I signed up for Nixel, found it was used badly. Signed up for CivicReady, just got a stream of arrest reports unrelated to weather, unsubscribed.	
Maintain a home out of the area as well.	
I have	
I have signed and already submitted that answer!	
Too many texts	
The Government does not help	
N/A	
Already signed up	
Did sign up	
We have.	
why?	
i have	

Responses	
I have.	
I have signed up for emergency alerts.	
n/a	
we have	
NA I have	
live in a area pretty well safe from fire, will not flood, not much can be done about earthquakes and live out in the county where we are able to protect ourselves	
we have signed up	
NA, I said I did sign up for them. See above.	
i signed up	
I have, but I think they changed the system and I may not be signed up to the correct system any longer.	
No real need.	
Same comment as above - not applicable, question should not demand an answer. Cmon, survey monkey isn't that hard	
Not applicable, I have signed up.	
.	
N/A	
I have signed up and appreciate having them. the problem is if electric goes out I loose service	

Question 7

How important do you think preparing for climate change is?

Question 7 asked respondents how important they think it is to prepare for climate change. All 553 respondents answered and none skipped the question. The majority of respondents believe it is very important to prepare for climate change while few did not.



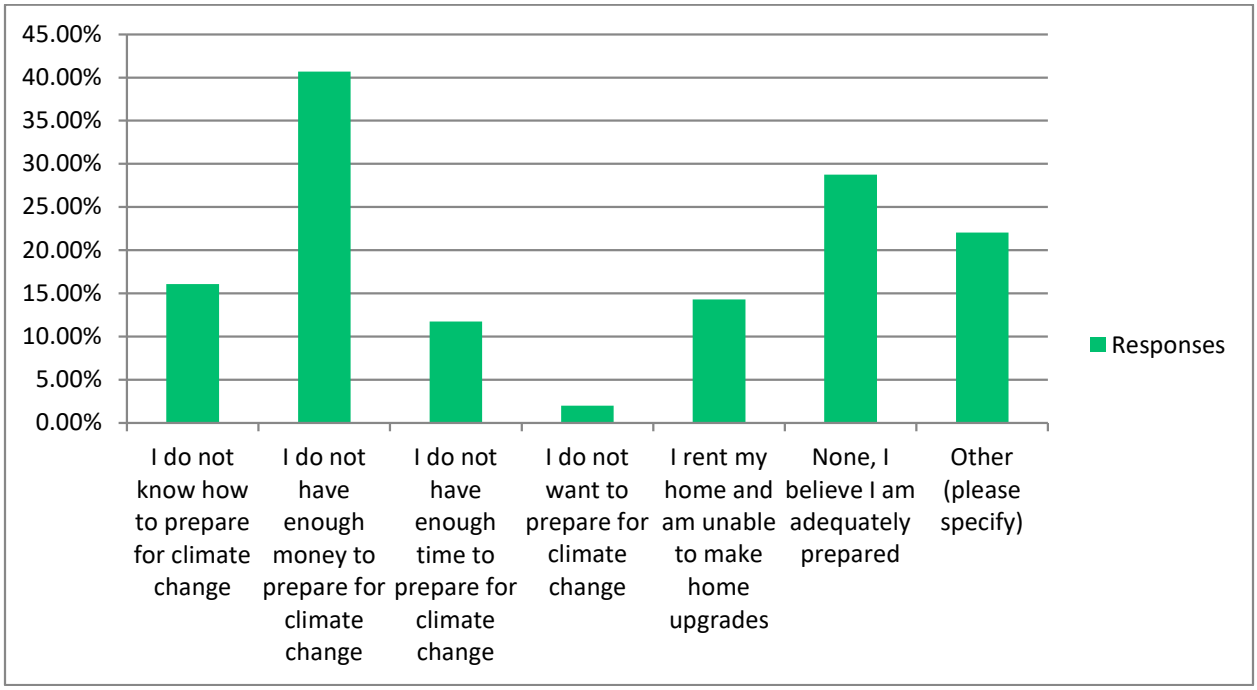
Question 8

What prevents you from preparing for climate change-related hazards? Select all that apply.

Question 8 asks respondents about what prevents them from preparing for climate change-related hazards. All 553 respondents answered this question and none skipped. The question gave seven possible responses:

1. I do not know how to prepare for climate change
2. I do not have enough money to prepare for climate change
3. I do not have enough time to prepare for climate change
4. I do not want to prepare for climate change
5. I rent my home and am unable to make home upgrades
6. None, I believe I am adequately prepared
7. Other (please specify)

Over 40% of respondents cited financial constraints as a concern and 28% cited no barriers and that they were adequately prepared.



Approximately 22% of respondents selected option 7 and provided detailed responses, included below. Key themes included:

- Being in the process of preparing, but not necessarily being prepared yet,
- Needing affordable alternatives,
- And not believing in climate change

We are elderly with limited resources, reduced physical ability and no children.
This is not an issue that should be heavily burdened on civilians, but rather on govenment and corporations
We should call it climate crisis not climate change.
I am NOT seeing an extreme change in climate
These are personal choices
It is difficult to actually predict what is needed to be prepared.
Many suggestions for wildfire home hardening rely on having large parcels and setbacks from neighbors. We need suggestions that work in higher density, low to middle income neighborhoods. We don't all have 100' clearance to work with and need advice. big
It seems the folks who are the most prepared are wealthy and do not work, or are retired or in other ways have a lot of time on their hands.
climate changes is going to happen no matter how much money you throw at it . spend the money on cleaning the environment instead. .
Working to prevent or slow climate change is even more important
The climate has been changing since the beginning of time. Humans adapt.
I adapt based on conditions.
No need. Stop with the fear campaign.
We should work to prevent it! Not just prepare (accept) fot it.
Don’t really know what we can do. Both in our 80s. We have flood and fire insurance.
County doesn't reduce fire fuels along old narrow roads on steep forested hillsides.
Climate change is bull
Avoiding all animal foods, fish, poultry and eggs is the best way to reduce climate change. Please Read Food is Climate if you are serious about this subject.

Climate has always been changing in fact we are 5°c cooler that previously though earths history
Physical limitations
My HOA has control of the common area
I plan to climate migrate out of state. Family keeps me here for now.
cannot seem to complete survey without answering
I believe climate change actions need to happen however, I strongly disagree with converting exclusively to gas. Additionally, tree maintenance by property owners needs to be addressed. Too many trees and wires unmaintained. I spend $800 a yr to have neighbors trees trimmed off the overhang of my property and do no have a single tree on my property. Ordinances related to trees/shrubs height and proximity to property line/fence line and power poles NEED to be addressed. Do not allow trees/shrubs to be planted within XXXX distance to PP and lines. FIX THIS! .
Neighbors have planted 22 redwood trees along property line and close to my house
Our home and property is a work in progress for climate change related hazards.
Out to town landlord neighbor has huge blue gum eucalyptus tree that is fire and windstorm risk to their renter and neighbors.
doing what we can for fire - not in a flood zone
Not climate change but way to be taxed more. There has always been fires and floods. Fires are because we don't allow control burns and we do not clean our Forrest or underbrush. Nothing to do with global tax warning
I am actively and continually trying to improve and prepare
Illness
Climate change is bull
I have prepared.
I have prepared for earthquake, fire and landslide emergencies and earthquakes and fires and floods are caused without "CLIMATE CHANGE", climate change is caused by larger natural forces we do not control
As prepared as I can be, but I'm near the Roger's Creek fault, that could be the more immediate disaster
I've done a lot so far but there should be new building & zoning rules that incorporate climate friendly building standards so that we are not paying monthly bills for poorly built infrastructure. For example - insulation improved standards reduce ongoing energy costs after
Partial prep, many unknowns and cofusion

We are 50 years too late to stop climate change. No amount of preparation for disasters will help me, personally.
I am part of an HOA and cannot control vegetation in the complex or construction materials.
I vote. My preparations will mean nothing if climate is not addressed globally in a much more drastic way.
Climate change is a hoax perpetrated to increase taxes and transfer the wealth of middle class Americans.
I don't follow the politically driven Lysenkoist junk science of anthropogenic climate change.
I am not sure I trust in the information provided by state and county govt agencies. If our climate change is so suddenly in need of drastic change to survive it, then why is this county still pushing for rapid expansion of population and intense building. We have been in a severe drought which we do not know has definitely ended. Where is our future water coming from? Regarding our devastating wildfires: How are we supposed to safely evacuate with even more people added to the existing population. If the situation is so dire and I believe that might be the case, then why is so much of the new building including more hotels and high end housing? I know I will be on my own in an emergency and have prepared. What scares me most is the lack of attention by our elected officials to what is environmentally sustainable. It seems to me in the 34 years I've lived here, it's been all about revenue. This place is rapidly becoming paved & built over. And it's never enough. Look at the counties south of here. Congested, jammed roads, high crime, and extremes between the poor and the wealthy. And the building is never enough. The problems just grow larger… but hey… keep on grabbing that revenue!
Procrastinating
Am prepared, but will continue to do so
Have done some.
I don't believe that climate change will have a perceptible impact when compared with the historical record of weather events.
climate change is inevitable; 800 humans haven't been able to cooperate to stop war; they will not stop climate change. We should learn to live (or die) with the inevitable.
I'm implementing everything I can to prepare.
I don't know exactly what is needed to prepare
I'm trying, but it is a challenge to know what might work
To date the impacts have been minimal. I was more motivated during right after the wildfires to do more but over time, this has become lower priority unfortunately. I do want to be as prepared as possible.
Dont believe in climate change

The government is by far the biggest cause of climat change-related hazards. I have communicated respectfully with the government, but in response, they have threatened me (with "legal action", to quote Tyra Harrington, of Sonoma County Permits, as one of many examples), actively retaliated against me, and ignored me, at times in blatant violation of the law (for example, the Brown Act, and Public Records Act, and various other laws).
Nothing prevents me. Longer growing season helps. Warmer saves on heating bills.
Preventing it is more important than preparing for it
Nothing. I deal with it through my work each day. (bioacoustics)
climate change has been ongoing for millions of yrs..nothing new except for those making like it is something new..
There are certain things I do not control... Lack of Cellphone Coverage on the coast (Jenner). I'd like to see lower cost landline plans The high cost of power backups. These should be subsidized. Jenner evacuation routes go through high population areas increase the threat of being stranded on highway one or River road. The personal financial burdens due to extended evacuation periods. The high cost for home improvements prepared for fires and floods. Many in our communities do not have the funds to make the changes.
We're working on. We both have electric cars and Evergreen from SCP. We have a contract to add MORE solar so we can totally electrify our home. We should be a net zero home within 3 months..
I am PEPARING - a work in progress.
Many preparations require local, state and/or federal preparedness programs to be effective.
There's not much I can do against another fire tornado like the Tubbs
I live in mobile home park
I have prepared quite a bit, but more could be done.
I am preparing for climate change as I can over time.
Who said something is preventing me from preparing?
What could I possibly do to prepare for a 2.5-5.0 degree Celsius increase in temperature? Nothing.
I prepare for obvious hazards and don't attribute them to anything.
More or less
I don’t believe people need to prepare for climate change.
Unnecessary
im prepair for emergencies which happens throughout all of time.

The state and the county need to implement tax breaks for water recycling and solar
Because climate changes everyday
I prepared for natural disasters regardless of the “why”.
Threat of any so-called climate change is exaggerated. In 10 years from now, you will wonder why so much worry has been expended for this unfounded fear
Being uncertain of what actions are priority for home/yard hardening against wildfire
Political BS! Are fires real, yes. Are floods real, yes. Are they getting worse? No, and the data proves it.
I think it’s been blown out of proportion
Mandating all electric furnaces and water heaters is unrealistic. Both from a cost standpoint and a grid capability position. It is way to dictatorship to be called democratic
Really not sure what else can do - except reside house with hardibacker- fire risk frightening but out of my control. Foothills park and areas east should be controlled to reduce risk of fire spreading into Windsor. Also just north of Arata all that area up into limerick lane should be kept mowed and monitored. Perhaps permanent fire breaks in foothills and mountain areas of Santa Rosa and windsor. Maybe they can be made into park features ? Water play area ? For water saving measures can we create additional water reserve storage ?
I feel that I'm doing the best I can here but can't control my neighbors or other land use issues
I nickel and dime it as I can.
Not sure what I can do or what needs to be done.
I have always been preparing for NATURAL disasters. Humans are NOT responsible for nature's cycles. That said the biggest problems in Sonoma County and California have been caused by government regulations!!! 1) blocking free proper land maintaince on both public and private lands. OUR out of controol fires and flooding has been caused by expensive Beuracratic blocking of what people used to be free to do and did do 50 years ago!
I don't believe I'm 100% prepared, but I am somewhat prepared.
I didn't say no to the above question
Age, disability, health issues
I moved in recently, am slowly working on it
I think you need to be a little more specific than saying "climate change" Very generic. Not sure what you're getting out of this survey
change out plants and irrigation for drought tolerance - expensive

I have prepared to some degree, but need to upgrade our emergency kit.
I am adding structure to provide shade to keep house cooler
I am preparing and there Is no level of truly adequate preparing.
Flood seems hard to prepare for and inevitable in the lower river area.
When the ruling class stops flying private jets everywhere and when they stop buying ocean-front property, then I will know they are serious. It is all just a ploy to kill the middle class and make it so only the rich can pollute
County officials must stop approving development in high risk zones
things are changing all the time
As long as the Board of supervisors continues to make unwise decisions, we are all unprepared
Nonetheless, we are doing what we can to prepare.
Man made climate change is a hoax and I refuse to worship at the s as later of doom and gloom .
Climate change is minuscule compared to other issues in the county
Would like batteries for solar
I don't believe anyone needs to prepare for climate change.
I have done some
need affordable energy alternative
I've done what I can but it's impossible to prepare for all known and unknown hazards.
I continually update my home hardening annually
What do you propose we do? Climate change will be gradual, as long as your resentence is above 220 feet your good for now.0
I am an experienced outdoorsman, whatever happens, I will handle it
WE are in the process of buying a home with a sprinkler system and fiber cement siding. We will make fire safety improvements as we can afford.
Climate change is contrary to scientific facts.
I have made outside upgrades but at my own cost

Government should lead by example. Start with free ELECTRIC Smart Train. Then promote Hydrogen as alternative fuel source.
Cost is a major practical problem - esp. homeowner's insurance + the way that home upgrades trigger building code reviews. These are regulatory hurdles that you should focus on clearing. Both are broken.
The obvious fact that the climate change alarmism is a hoax. See https://wattsupwiththat.com/2021/04/25/wheres-the-emergency/ for details.

Question 9

During past hazard events, what (if any) communication challenges did you experience? Please describe.

Question 9 was an open response question asking respondents what communication challenges, if any, they faced during past hazard events. 411 people responded and 142 skipped this question. Detailed responses to this question are available below, though some key themes included:

- Poor cell phone reception
- Loss of power and internet access
- Being on the road and not having immediate access to news
- Not knowing where to find information, or information gaps with language barriers.

Responses	
na	
I only moved here recently so haven't experienced it yet.	
None	
Wi-Fi hotspot needed from satellite internet	
No communication hazards.	
I'm new to the state and didn't know my way around. I now understand the evac zones and get the emergency alerts	
Minor cell phone outage corrected by charging in car.	
Sometimes got notices that were not near me.	
we lose internet when we lose power	
Electric power failure	

Responses	
Agua, Luz y teléfono	Water, electricity and telephone
Cellphone running out of power	
none	
none	
Difficult to get real-time information.	
None	
Fire evacuation for severely disabled; lack of vital communication in west county when power is out, rainfall mitigation to keep water from damaging house	
Cell and cable going down shortly after power outage started	
There is no cell phone reception at my work therefore I do not receive SMS hazard notifications. WiFi connectivity is limited. Brown outs and PSPSs are a common occurrence during red flag warnings.	
No wifi and couldn't charge my phone.	
Cell phone outage	
Confusion over resources.	
Lack of a single easy to follow source for emergency info (wildfire). Cell signals were poor. Watch Duty app has been a game changer.	
No notice from emergency response agencies about fires threatening our home. Phone service disconnected. Cell tower service disconnected.	
Loss of power for a period of 12-24 hours. Loss of wireless communication for a period of 1-2 days	
Poor cell reception at times	
Losing cell service, losing power in general. Slow updates from officials	
Advice about evacuation routes.	
Telephone not working, power put to charge cell phone	
Fire evacuation maps were confusing.	

Évacuation advice was conflicting. We get both Napa and Sonoma county alerts in Sonoma Valley. Sonoma info was sometimes delayed or lacking. Timely, consistent communications are key. Neighborhood or community drills (similar to school emergency preparedness practice) might be a good idea
The 2019 Tubbs and Nuns fires were not communicated well to the general population.
No cable for news updates and no wi fi hard to get news
Knowing whether certain neighbors nearby had already been evacuated or not was challenging in 2017 and 2020. This is better today as we're better connected. During the heat events and smoke days we just hunkered down and didn't really think about reaching out to anyone like with fires or potential flooding.

none	
loss of power	
n/a	
poor cellular coverage at my home	
Sonoma tends to do too little communication.	
Didn't have any major challenges except for charging devices, but we have backup power now for that	
none to speak of.	
Falta de electricidad por más de 8 días por lo tanto estuve con poca batería de mi celular	Lack of electricity for more than 8 days therefore I was low on my cell phone battery
Timely warnings. Understanding zones.	
Didn't get Nixle. Relied on texts from friends	
None	
internet was down, lost power	
None	
did not receive alerts	
None	
When power goes out, internet access goes out. I do keep a landline phone that works when power goes out.	

Responses	
You are on your own. The house - If you leave it, you lose it! Establish hoses - water under eaves continually.	
in 2017 I didn't have a landline so didn't get any official notice - only learned to evacuate from friends texting me. Now having multiple ways of being alerted is very helpful	
La carretera	The road
Internet outage. Overloaded cell towers.	
La falta de energia electrica noteniamos acceso a los medios de comunicacion o incluso - energia para poder cargar nuestros telefonos y poder comonicarnos.	The lack of electrical energy we didn't have access to the means of communication or even energy to be able to charge our phones and be able to communicate.
None	
Lack of information. Local newspaper was worthless for informing us about what was happening in Sonoma Valley. Emergency alerts were no existence in that first 24 hours. Things have improved since 2017.	
Mis papas no podian leer el "Nixle"	My parents couldn't read the "Nixle"
No tengo	I don't have
Apagones de luz sin ceñal de telefono, comida el chada aperder mucho frio	Power outages, without cellular signal, food spoiled, we were cold
Los apagones de luz, comida echada aperder noteniamos, luses para lunbranos mucho frio	Power outages, food spoiled, no light so we couldn't see when it was dark, we were very cold
Perdida de trabajo, debido a la luz se pierde la despensa, Ademas los niños pierden clases y baja su educacion academia, tambien que el estres es mayor dada vez que hay estos climas.	Loss of work, due to the power outage food spoiled, In addition the children lose class time and lower their academic education, also that the stress is greater given every time things like this happen
n/a	
No tenia senal, no tenia una casa segura donde vivir y estar con mis hijos porque en el 2019 me toco perder todo por las inudaciones.	I did not have cellular signal, I did not have a safe house to live in with my children because in 2019 I lost everything due to flooding.
De saloje y trabajos comida	Eviction, food, and jobs
Por que no sabia a donde hir	Why I didn't know where to go
Transportacion	Transportation

Responses	
Se nos fue la luz, no tuvimos internet y pues consecuencia no tuvimos noticias	We lost power, we did not have internet and therefore we had no news
Informacion en español	Information in Spanish
La energia y desalojo, comida y trabajo	Energy and eviction, food and work
N/A	
En carretera	On the road
En la carretera	On the road
La evacuacion y al estar lejos del hogar para seguridad	Evacuation and being away from home for safety
Muchos se va la luz y perdemos todos los servicios	Many of us lose power and lose all services
No tube	I did not have
No sabia donde ir	I didn't know where to go
Habian mucho medios de comunicacion dando la misma informacion. Hubo confusion en algunos casos. Las agencias no estaban trabajando en colaboracion.	There were many media outlets giving the same information. There was confusion in some cases. The agencies were not working collaboratively.
En la carreterce	On the road
Fires cut electricity. So mobile phones were the only means of communication. They should be fully charged at all times. If running out of juice, there must be a "charging staation" announced by public service. Mobile masts will also be disrupted, so your most urgent need will be proper communication!	
En carretera	On the road
Luz/energia	Light/energy
Ninguno por falta de información	None due to lack of information
The county does not communicate in a timely manner	
During the 2017 fires, we got lots of alerts, and minimal power outages. During the 2022 floods, we got lots of alerts, and no power outages	
La falta de informacíon, por falta de la tegnologia	Lack of information, due to lack of technology

Responses	
During the 2017 Fires not much was in place with communications and readiness. There was a lot of conflicting information as well as NO information. Things have improved since then.	
Falta de internet y luz	Lack of internet and electricity
None that I remember	
None	
None	
2017 fires sonoma relied on FB posts from local writers and business owners	
loss of electricity	
No PGE	
Lost landline and internet. No cell service in my area. GMRS radios VERY important	
Traffic	
Cell phone outage	
Had to evacuate to remote parts of the County where cell phone/internet service were limited.	
None	
No cell, landline, internet, TV, etc.	
Cell service data was sluggish. Otherwise, everything was fine.	
None	
Notifications were a bit delayed, sometimes hard to figure out evac zones.	
Sometimes the text messages on my phone don't get through until quite a bit later than my brother's/housemate's text. (I have Verizon.)	
Power outages for numerous days makes running the generator a challenge.	
cell phones stopped working	
Tubbs: couldn't figure out how close the fire was to me or the best route to leave the county. No up-to-date news in the middle of the night. Had to rely on Twitter.	

Responses	
N/A	
Permitting process glacial in response to rebuilding or making changes	
down internet	
Would appreciate visual, from air drones, updates on fires near residence	
Power outages limited our access to internet for updates on evacuations	
Terrible traffic jams trying to exit my neighborhood. Too many autos for our roads to handle.	
Lack of cell phone and internet services. Also loss of land line service separately.	
n/a	
none	
Salir del peligro buscar un lugar seguro seguir órdenes de las alertas	Get out of danger Find a safe place Follow orders from alerts
Power is shut off and cable internet is shut off effectively leaving zero communication for those on fringe of evacuation area. Radio communication is not effective in an emergency for specific coverage. Too many assumptions that those who are in effective areas can simply walk away from their housing and have a place to go. It is IMPOSSIBLE to find hotel housing in evacuation in SoCo that will accept a pet(s). This needs to be addressed. Business (Safeway) buys blocks of rooms during disasters for their employees to use (free) to continue to have them work. Many rooms are used by employees who are not evacuated or need alternate housing they use it bc it's free. Many of the prepurchased rooms go unused - this cannot happen. Stricter guidelines need to be addressed. Too many evacuees without housing options. My family lives in high fire prone areas when one of us are evacuated we all are we live in two counties and in NE/West Co. So/Napa Co. Unrealistic to go to a family member or friends home or believe you can shelter in a car or at an evacuation site is not reasonable. I am an emergency worker I am required to respond - no place to go, no place for my pets.	
our Town (Windsor) lost internet access & info was disbursed randomly (seemingly) on various platforms	
No warning of Tubbs fire	
None	
Prolonged electrical, internet and cell tower outages	
Not knowing what roads were open. Could not get animals out	
The County kept putting out messages via the internet and social media. How do I access those without electricity to power up my cell phone?	
Emergency alert failure.	

Responses	
Lack of warning	
none	
none	
It was difficult to determine my evacuation zone	
My cell phone had no service for several hours	
2017's wildfire was terrible communication for everyone.	
La informacion de que tan grave era el desastre no fue dada con tiempo, se resivio hasta cuando ya era muy tarde	The information of how serious the disaster was was not given in time, it wasn't received until it was too late.
Sonoma County and the city of Santa Rosa was not prepared or had alerts in place. I feel they should have had alerts in place. Any little town in Oklahoma have such alerts.	
Land lines did not work and charging cell phones was a challenge. Gas tank for generator ran out. KSRO was not too good with the information since they moved/changed hands/went Republican.	
none personally, but I was extremely upset at the lack of translation and interpretation into Spanish and indigenous languages	
Very limited cell connectivity during 2017 fires; landline w lots of static interference during heavy rains that needed repair	
In 2017 Our local fire department, which is right in town did not sound the siren alarm. The community was on fire, but it was as if our defenders weren't aware of it, the station was silent.	
I experienced power outages making it difficult to work from, and my apartment complex takes forever to find a solution to a problem that gets brought up.	
Took a while to get my system set up, but have a good one, between alerts, being responsible for notifying my elders, and colleagues I can ask who are in contact with City, County, etc.	
I could not find directions out of Sonoma County during some of the fires in the past. This made a two-hour drive turn into a six-hour drive. No one knew where to direct me or anyone else when the fires jumped the freeway.	
wanted regular updates about fire in our neighborhood during evacuation	
Phone reception was non-existent	
Cell phone	

Responses	
Though I am signed up for Nixle and SoCo Alerts, it seems that both systems are not consistent with alerts for all emergencies. I like that we are trying though!!	
Not sure	
Notifications during the fires were not sufficient	
During the 2017 fires everyone wanted to know what was going on locally vs what they were seeing on the news.	
Lack of warning from you, the good folks at Sonoma County.	
No phone or cable	
N/A	
Prior to 2022, there was confusing information. Last year, in 2022, communications were much more clear, and advance warning was very helpful in both planning and being reassured.	
No county personnel available on the phone	
None	
no cell service in rural area where I live. My landline does not always work during emergencies (noticed during recent fire events in last few years).	
None	
none	
finding a good source for immediate information, twitter seemed to be good, internet, local tv and radio not so much, cell phones and twitter best	
cell phones out, power out, landlines out	
none	
Internet and phone service going out.	
2017 Pocket Fire: loss of cell service. Otherwise, no issues thereafter.	
What is reliable info - there is a lot of noise on the internet	
Cell phone service,	
Since 2017, none	

Responses	Translations
n/a	
N/A	
I live alone and I am completely isolated during an emergency.	
I personally haven't been in a hazard situation, thankfully	
Loss of electricity causes phone batteries to die	
N/A	
During the fires that destroyed parts and threatened all of Santa Rosa, in the past few years, communication was excellent.	
flooding and income loss due to lack of work (wildfires and covid)	
Lack of communication during fires.	
None. Got the high/lo sirens	
Our rental does not have installation, all the windows have failed, and we have been waiting 2 years for a new front door. During the summer our home gets so hot the picture frames melt and fall from the walls. The Last fires all of the smoke got into our home and it was a challenge cleaning it.	
Notice of estimated time for end of power outages.	
Charging my cellphone was challenging	
Twitter was the best communication, which makes me uncomfortable now that I ditched it and it might fail.	
None	
Communications were good.	
I received more information from Napa County than I did from SoCo.	
It was very difficult to get emergency alerts and updates on the fires ; there was a major communication void from the County	
Exactly what roads were open in real time and where to go	
Cable (Xfinity) goes down, the cell service (Verizon) gets overwhelmed. Already substand coverage gets worse	

Responses	
iPhone and iPad battery failures. Getting accurate info. 2017 fires Unable to ahold of any fire county or government resources	
None	
In 2017, I had significant phone connection challenges, but I know a lot of work has been done since then. Personally I dont think I have had any specific communication challenges since.	
We would have had communication problems, but left town before power was cut off and internet was interrupted.	
none	
None	
We frequently lose electricity and in the Kincade Fire AT+T cut off our landline service.	
no phone service	
Cell towers and internet not working	
Overloaded or disabled cell towers and/or loss of internet	
Cell towers getting busy, lack of reliable information.	
power out	
Na	
None	
Cell phone coverage is very poor in our area.	
When power is shut off, phone lines and internet go down, and it is hard to know what is going on.	
Understanding how serious the threat was and which zone my home was located in	
NONE	
All communications worked as expected (cell phone service, emergency alerts, internet service). I live in Central Santa Rosa. We've never lost power or communications capabilities.	
Phone lines being down, competing communication channels (both official and unofficial), having a hard time tracking real-time or as close to real time as possible movements.	

Responses	
Initial information was scare. Over the years, it has gotten better.	
Staying home with windows closed and no a/c dying high heat and dangerous air quality from forest fires	
Downed landlines made it difficult to receive alerts	
Not sure	
NA	
None	
None	
Floods & Fires.	
None. Social media kept me informed of closures/advancements/locations/etc.	
None that I know of.	
In 2019 the evacuation orders were way too broad. Everyone north of hwy 12 and west of 101. People sat in stopped cars on city streets for hours.	
Nine	
when power is out, communication is difficult because cell coverage is spotty & my landline phone is VOIP. Besides, we really need internet for the most up to date emergency information.	
N/A	
None	
Cell phones not working	
Complete loss of power. Difficulty finding ham and gmrs radio repeters.	
None	
-	
During the 2017 Nuns fire, that wiped us out, we lost all phone contact. The cell towers in our Glen Ellen area were compromised and off-line.	
no decent information available at all during Oct 2017 fires. So grateful we now have watchduty app - real time wildfire information is crucial and there was no way to get that information before watchduty.	

Responses	
zero communication from county in 2017 fires	
Cell phone is not an option due to the lack of cell towers in the area. An ATT land line is the only way we can communicate. When electricity goes out, the internet is off. We have NO communication to the outside world.	
No cell coverage in Jenner.	
I was on the edge of an evacuation zone and friends and family used my home to stay, shower, charge electric devices and wash clothes during the wildfires. While I stayed up all night to watch for evacuation warnings and news	
Area specific information	
None	
Power shut offs eliminated internet service	
Where to get fire updates in real time.	
None	
Neighbors wanted help but were away.	
Nixle works very poorly and I don't get all the alerts I should.	
Lack of specific information about fires in Nixle. Watch Duty is much more helpful	
Internet connection	
My phone company's cell tower was down!	
I was well hooked into a communication system that spread the word about the 2017 fire and I got out as quickly as possible. In 2020, I left early avoid the stress of evacuating with everyone else in a chaotic mass exodus.	
2019 - evacuating all of Sebastopol at once with TOTAL gridlock! And I never did get that evacuation notice except forwarded from my family.	
None	
the first fire was a nightmare of non-communication the second evacuation was well DONE!	
none	

Responses	
I rely on wifi calling as cell reception is unreliable in my area. When the power goes out, I can't make or receive calls.	
communication interruptions during significant storms	
Lost service to landline	
Lack of telephone service, cell phone service, no electricity.	
Only challenges have been related to the loss of power	
none	
no power means NO CELL, NO LANDLINE, NO NOTHING	
No cell service or landline service when power is out. Difficult to get ANY communication.	
none	
none	
No form of communication working. No cell, land line, TV, or internet. There was no way to get updates or severity of the situations.	
Fire appeared to be threatening where I live (14th at North) and the roads were blocked with stopped cars. There was not information about ways to exit the city.	
Both the county of Sonoma and the Sheriff's office are awful at communication. Total incompetence. CalFire, on the other hand, was fantastic at communication.	
land line out because someone shut down ATT centers; cell towers down	
Lack of cell service and lack of information relating to wheelchair accessible transportation for those who have no transportation alternatives during a disaster event	
Land line down and we have lousy satellite connections out here	
Road closure updates	
Cell service during power outages and fires	
none	
My landline stopped working likely due to tree falls	
None.	

Responses	
None	
None	
Cell towers going down during first fires (2017). AT and T signal strength isn't as good in my neighborhood anymore.	
None	
Power outages and phone service disruptions.	
No internet. No clear single location with all pertinent info. I always switch between the wildfire cameras, wind speed maps, and soco alert maps	
Only during the 2017 fires, only the city of Sonoma had accurate info at the time. The county fell behind, but is not doing well with alerts and communication.	
None	
I don't have a home phone, so keeping my cell phone charged if the power goes out.	
Landline was useless, so I got rid of it. Cell phone coverage is spotty and internet was completely useless near my home. I am a liceneced HAM and I installed battery powered, line of sight based internet on a hill on my ranch.	
None	
Cell towers go down in fires. I only use cell for my phone.	
Rolling power outages that made internet operated phones useless.	
No cable, electricity	
None	
Lack of emergency notification in the 2017 wildfires	
Very poor internet service here. 1965 copper phone lines only. Old DSL at best. AT&T fiber at end of street but to the homes in the neighborhood. Get with it Sonoma county, Big FED $'s available to get it done.	
None	
Loss of internet when power is out	
Just when the phones were overloaded. Other than that was good. Best updates were social media.	

Responses	Translations
None	
Na	
Internet issues	
None	
None	
Getting timely accurate information from government and authorities.	
Brief interruptions of power affecting some conns, rarely	
2017 Tubbs Fire, zero advanced warning, zero direction on where to go, no general information access published for "How To" or "Where To" do/ go for further direction/ assistance. 2018 Smoke from the Paradise Fire we still didn't have adequate resources for finding info for what/ how to do to deal with it. 2019 Kincade fire, was better, but still not enough accurate information as to all of the above. We need an accurate County Source that acts like KSRO did for the Tubbs Fire. Constant information that people can access on emergency radios during the emergencies is absolutely CRITICAL! We need people trained to keep the airways connected to emergency radios 24/7 during emergency situations. Other than the overwhelmed 911 operators, we need to know by radio where fires or floods are going, and what we need to do about it. When the power is out, only emergency radios can give information. It has been exhausting trying to find information during all of the fires since 2017. My home was destroyed by the Tubbs Fire, and I was under mandatory evacuation orders for the Kincade fire, and the LNU? Complex fires the next year. Each event got better, like having Spanish broadcasting sources and Resources for our Spanish speaking population, etc… but we need a permanent reachable broadcasting entity (that doesn't need to take commercial breaks) that gives clear accurate information, and updates it as new information becomes available.	
Cell towers down	
No e	
Heard by word if mouth from neighbors that we should prepare to evacuate	
None	
Lost WiFi for communications	
Limited cell service. Inadequate updates due to social-media posts. Lack of direction from elected officials.	

Responses	Translations
Alerts regarding Jan 2023 flooding	
I've been fortunate in that my home has not been in an evacuation zone or been affected by PSPS events.	
Sonoma County utterly failed to alter the people of Glen Ellen as the 2017 fire approached. Our neighbors, impaired by drug & alcohol addiction, drove by without altering us to the approaching danger.	
None	
I rely on local radio a lot. They generally have been good but don't repeat current local conditions often enough.	
I got stuck in a loop trying to sign up for so co alerts- it said I was already subscribed and wouldn't let me reset my number.	
Zero communication in '17. Since then it's been pretty good, but for recent flooding it was more or less up to me to watch NOAA.	
Nonr	
Between Nixle alerts and Facebook groups I feel that I have been on top of all communications regarding fires and flooding.	
No electricity because PGE is awful	
None	
none	
Cell phone towers were down, causing no communication	
When a cell phone dies and there's no electricity	
None	
Cell towers going down	
None because we have kept our landline.	
Celular Vivienda temporal Hotel muy caro	
I'm mute.	

Responses	
WEA (Wireless Emergency Alert) communication does not work in the Occidental area. Fire Safe Occidental tested this with Sam Wallis (County Emergency Management) about 2 years ago. Big failure.	
Sometimes the wifi goes out - living in Town of Windsor	
WHEN POWER GOES OFF, MY TELEPHONE GOES OFF. I DON'T HAVE A CELL PHONE BECAUSE SERVICE IS NOT RELIABLE IN THE MOUNTAINS AROUND GUERNEVILLE	
None	
Evacuation routes in East Santa Rosa that will multiply with the new building permits. Unacceptable. Sonoma County owns that. Not the tax payers. Don't push the dialogue from unacceptable decisions based on getting monies from the state to individuals being impacted and spin it as climate change.	
Family in burn zones had a hard time notifying they were coming to stay with us. So my wife got into an amateur radio program to back up phone connection.	
Cell towers down	
I didn't	
Warning alerts have not come through consistently	
cell phone towers being down	
None	
Lack of power & internet; minimal cellular reception & battery	
No cell phone and no internet	
Pge power and Comcast outages	
cell coverage sucks. It used to be good but with companies trying to go to 5g, I find that the coverage is now worse. Power outages play into this issue as well	
None	
getting accurate and up to date information	
lack of notification via landline! I don't like to use my cell phone! it's toxic from the radiation!	
Alerts. Glad my neighbors were around. And luckily had internet & KSRO	
None	
no cell service	

Responses	
We live in Windsor and were evacuated along with the whole town in one of the recent wildfires. My first alert came from 2 friends calling me saying they had heard Windsor might evacuate. I had trouble believing that would actually happen. I logged on to Facebook and watched the Town of Windsor newsfeed and kept checking it until I saw the official post that we would be evacuated and had to leave within two hours. It was hard to believe, but we packed and left and went to our daughter's house in the very south end of SR. If she had been evacuated, we do not know where we would have gone with our dog — probably in search of a motel that took dogs. I stayed glued to Facebook the first night of evacuation trying to see if our home was burning. The best information came from the Town of Windsor newsfeed, which was updated regularly, CalFire, and North Bay News.	
As per usual cell phones don't work well without wifi assist in our area.	
We have fairly good notifications	
Very large pot holes on 50 mph roads that were hard to see, flooding on roads, and power outages (though less for the severity of the storm to props to PG&E it seems.)	
Communication from emergency responders and public agencies during the 2017 wildfires was very poor. I am grateful that the County recognized this deficiency and I believe agencies across the County have improved considerably. This was demonstrated during the 2019 Kincade Fire and the 2020 Glass Fire.	
None	
None	
None	
none	
Poor phone and internet service.	
Cell reception from AT&T sucks, and for 3 days had no cell coverage.	
Road openings/closures were not always clear	
City hadn't adequately communicated likelihood of need to evacuate.	
None	
No power, internet or cell service.	
they took pat kerrigan off air- she was the only one who opened up the phone lines for the community to speak to eachother	
Inconsistent messages from local government.	
Concern that landlines may be discontinued in rural sonoma county - can we rely on cell system only?	

Responses	
None	
Out of electricity for 6 days no wifi. KSRO radio use to be really helpful but no longer broadcast important update and information like they use too. That communication is really missed and necessary in rural areas. The alerts don't work if everything is down.	
None	
We didn't have access to wifi	
internet went down; one time, cell service was overloaded	
the evacuation warning for the Glass Fire came only one hr before fire consumed our homes	
cell towers went down. Relied on land line. We did not receive alerts on the cell anyway. Need sirens.	
During Tubbs, cell reception was all but nonexistent, rendering all attempts to communicate with the community on social media less than useless for us. Thank god for am radio. Also, we have a land line, and that was helpful.	
None	
It was VERY hard helping to get communication to the Spanish speaking community. I use Twitter to share information during disasters/emergencies and so much of the official communications were in English. There was some Spanish but it was always very hit and miss. The social media managers on emergency service accounts need to put out every communication in both languages.	
None	
None	
Promised alerts never came	
power outages, AT&T tower down	
Internet/power failure.	
None	
Cells ssrvicd was spotty and data transfer rates slower. Otherwise, no comms issues.	
Access to gas for my car	
Cell tower losses. Wi-Fi microwave link lost power and access to refuel generator.	
none	

Responses	
none	
no internet, no electricity	
None	
Mobile phone not working when the power is out, unable to receive or get updates. Listen to battery operated radio.	
No e	
None	
I was OK but many of my neighbors couldn't charge their cell phones during the five day power outage in January.	
Loss of PG&E for 8 days, loss of broadband 5 days, loss of phone service 5 days,	
none - lots of communication	
My cell phone service is not good at my house, and neither is radio reception, so if the power goes out we lose cell service, internet, wifi, TV news, and related. Texts are not reliable but sometimes they come thru. We have a land line, and have signed up for telephone alerts.	
I got napa and Marin updates but not much from Sonoma.	
limited cell phone coverage in rural areas	
None...my home was pretty secure so I helped family members get out of harms way.	
Lack of cellphone reception (2017 fires). Thank goodness that 2 local radio stations (KZST & KSRO) stayed on air so we could get updates to figure out where to go, what areas were still burning, where to get food, water, and ice, what roads/freeways were closed, and what areas were under mandatory evacuation and what areas were shelter in place. PLEASE consider funding these and other stations during emergencies - they were a lifeline for us.	
Internet and cell connection out for several days, until Comcast and Verizon could repair their towers	
We just moved to Windsor in November. Thankfully our house and property withstood the rains very well.	
Poor cell reception	
Power out for extended period. No cell service, nor Internet basically cut off except for battery operated radio.	
Wildfire, flooding, heat waves	

Responses	
The count alert system is terrible.	
trying to figure out where to evac to, in 2017 Lawson's Landing let us stay there free, the next not, so we went up to Oregon to get away from the smoke	
loss of internet.	
Burglars	
None	
Cell phones didn't work No internet No way to get info-you could read alert message but no way to use internet as directed by PGE and others. You can't look up evacuation routes with no internet or power	
None - communication was great	
None	
Loss of power and therefore internet. We don't have cable internet up here and power is always dicey -- these are rural problems.	
After 2017 fires, I think county communications have been streamlined and are adequate (English speaking)	
Lengthy power outage eliminated internet communication	
None	
None since the Tubbs Fire.	
If electric goes out I loose all communication	

Question 10

During past hazard events, what (if any) evacuation challenges did you experience? Please describe.

Question 10 was an open response question asking respondents what evacuation challenges, if any, they faced during past hazard events. 414 people responded and 139 skipped this question. Detailed responses to this question are available below, though some key themes included:

- Heavy traffic impeding evacuation
- Fear of exposing oneself to Covid-19 during the pandemic
- Faced impediments from a disability
- Confusion about proper evacuation routes and knowing which routes were safe or affected by the fire
- Finding a place to evacuate to with many hotels being full or expensive

Responses	
We evacuated during the Kincaide fire event. We lived one block away from a zone that was told to evacuate but our zone wasn't, so that was kind of confusing to navigate. I wonder if there should be a specific communication to people who are the "border" of zones to best make the decision to evacuate or not.	
I only moved here recently so haven't experienced it yet.	
None	
Traffic	
The biggest hazard in my view is really that the streets are completely full and no one can move ahead. That scares me. That can me a death trap.	
See previous response on #9	
Traffic jam on South Wright Rd southbound	
When the entire county is asked to evacuate all major roads become parking lots. Where do you evacuate to? I'm glad I no longer live on a dead end street where evacuees & fire trucks both need access at the same time.	
I didn't	
Por carretera	By road
My first choice of evacuation safe place was also scary close to the fire	
none	

Responses	
not applicable	
Traffic	
Nonr	
Unable to evacuate disabled person due to covid. We stayed and took our chances as opposed to being exposed to covid. Disabled person must avoid exposure to people who may be contagious with anything - not just covid	
Lack of information on closed roads	
See above, plus add that HWY 12 is a one-lane road. Additionally, my work is situated at the top of a mountain, at the end of a windy canyon road with only one way in and out. If I had to evacuate at work, we would leave our personal vehicles behind and exit through neighbor's property in Napa or Sonoma.	
None. Stayed with family and friends.	
No power	
Trees down on roadways. Fire across roads	
None, but personal risk was low.	
Evacuating horses when there was really no where for them to go within a 3 hour drive. Fairgrounds and local barns were full and having disease outbreak. Traffic backed up during mass evacuation events.	
Roads clogged with cars on Arnold Drive and Hwy 12. Took 2 hours to evacuate and now up to 1000 more homes and businesses approved at SDC in same corridor in high fire hazard area. No instructions on which roads were open. Fire was burning across Warm Springs Rd. Fire truck led us up Sonoma Mtn. right into flames on Bennett Valley Rd.	
Overcrowded evacuation routes that bottlenecked too early along main routes, failing to utilize smaller streets and accommodating traffic control personnel	
Difficulty getting everything in car because of disabilities	
Confusion and lack of information about proper evacuation routes.	
Power outage removed stop lights	
Uncertainty	
Ninguno	None

Responses	
Knowing which roads were safe routes and which had fire was sometimes challenging.	
Extreme traffic congestion on Hwy 12 from Kenwood to Santa Rosa	
None	
Was part of Tubbs Fire evacuation nightmare. Rights backed up everywhere.	
Seems this has greatly improved since 2017 and the traffic issues.	
gridlocked traffic leaving neighborhood during tubbs fire	
none	
n/a	
n/a	
Finding a place to evacuate to	
Traffic backed up. Road system inadequate for existing population.	
Clogged roads both Arnold drive and 12	
Congested roads and loss of power. We solved the power issue by installing a backup power supply	
None to speak of.	
La talta de tiempo y que las únicas 2 carreteras que hay para salir se saturaron	there wasn't enough time and that the only 2 roads there are to leave were congested
Clogged roadways. NO availability of shelters. Pets. Short notice. Unnecessary areas evacuated.	
Na	
We didn't have to evacuate	
no evacuation was necessary	
None	
None	
Not having a place to go to during an evacuation.	
Family evacuated.	

Responses	
Traffic jams - in 2017 it took me 3 hours to get from Santa Rosa to Rohnert Park. With it being the first real "emergency" around here - it was terrifying to not be moving when you didn't know where the fire was behind you.	
La carretera	The Road
Es los caminos, las rotas de acceso y lo evacuacion son maglimitados.	The roads. The access and evacuation routes were limited
None. We were prepared.	
None	
Cuando se insendio	When there was a fire
No tengo	I don't have
Incendios forestales	Forest fires
No hay lugar para quedabe, los gasolinas estan llenas logares para dejar mascotas.	There is no place to stay, the gas stations are full , there aren't places to leave pets.
n/a	
Por inundacion, por incendios.	By flood, by fires.
Pues no saliamos por otros de sastres de los calles	Well, we did not go out because of the other disasters on the streets
Solo una salida del pueblo y por consiguiente mucho trafico, mucho tiempo para evacuar	Just one exit from the neighborhood and therefore a lot of traffic, a lot of time to evacuate
Que nos que damos sin nada en la inundacion y por los insendios salimas arentan asta San Francisco	We were left with nothing because of the flood and fire so we went to San Francisco to rent a place to live
No habia senal del cel y no podia reribir indicaciones	There was no cellular signal and could not receive alerts or informnation
Inudaciones, caidas de arboles, derrunbes	Floods, falling trees, landslides
Poder encantrar donde quedarnos con nuestras mascotas	Being able to find a place to stay with our pets
Si [[illegible]] evacuation y no tenemos donde ir porque no tenemos familia que has ayuden	wan'ts aboe to evacuate and we have nowhere to go because we have no family to help
Crowded roads to escape the fires	

Responses	
N/A	
Comunicacion y falta de tiempo	Communication and lack of time
El trafico	Traffic
No tube	I didn't have
Miedo	Fear
Las rutas de emergencia no estaban claras.	Emergency routes were unclear.
Roads out of Sonoma will be quickly blocked during a urgent event. People will need to be aware of what direction to take and public service will need to accommodate the numbers of people/vehicles fleeing.	
Bloqueo de salidas	Exit blocking
Cuando se enudo hace 3 años no resevimos ninguna ayudo economica	When it flooded 3 years ago we did not reserve any economic aid
Not knowing when to evacuate or which direction to go	
No need to evacuate	
Not being ready. Not having a prepared list of things to take immediately or a place to go. Not having an in depth to go bag.	
Mas limpieza de corte arboles plantas con peligro de deslaves	More cleaning of cutting trees and plants with danger of landslides
Finding a place to go on short notice	
Sometimes difficult to access information on real time fire spread and evacuation areas and routes	
None	
Delayed notifications	
roads closed	
High traffic	
Road closures, extra large evacuation zone	
I stayed home	

Responses	
Roads	
Traffic. Communications availability	
None	
No place to evacuate to.	
None.	
Traffic	
Traffic, packing in a timely manner, packing up pets, places to bring pets, info on which shelter was full or nearly so.	
A lot of traffic, like everyone else	
too many cars on the road, could not quickly leave area	
Animals	
Tubbs: I knew north-bound 101 was closed but I figured south-bound would have heavy traffic because it was also approaching rush hour. Did not know best route to take, drove past several fires.	
N/A	
Traffic jams, inadequate infrastructure for rapid evacuation.	
Power outage. Not enough gas stations with gas	
gas prices higher	
Where to go, how fast to leave, horrible traffic jam on Hwy 12 in middle of night	
Too much traffic on the small roads to escape.	
Not having adequate information due to lack of communication services. Had to drive into an area being evacuated in order to visually see the wild fire approaching to understand the problem.	
n/a	
Finding a RV park with openings	
Salir del humo que perjudicaba la respiración huir del lugar tomar el 101 hacia el sur hacia el mar u otro lugar más seguro	Get out of the smoke that impaired breathing flee the place take the 101 south towards the sea or another safer place

Responses	
No internet, no way to determine fire evacuation zones, road closures. House didn't burn down however, it took 14 days - living in a house without water, electricity, gas, internet and an actively burning fire around me. Very unreliable communication. Could not recharge alternate energy sources. Very traumatizing.	
none. worked relatively well by leaving early on	
I don't drive and was alone the night of Tubbs fire	
None	
Traffic. But minor compared to some other exit routes	
evacution sites were closed, so we drove and drove ending up staying at a police station in Marin and could not evacuate our animals	
Traffic congestion. Chaos.	
N/A	
Fire at Sonoma Raceway blocked one potential exit route	
2017 my father sent me to Davis to stay at a hotel during the fire.	
none, however my employees had issues.	
Traffic, nowhere close to So co to go.	
None	
Could not evacuate to extended family's home in 2020 because they had COVID	
Los caminos y carreteras estaban llenos de gente que queria huir de la zona de peligro y eso nos hizo vulnerables al peligro	The roads and highways were full of people who wanted to flee the danger zone and that made us vulnerable to danger.
city not having alerts in place which caused evacuation issues via traffic and loss of lives. etc. City and county planners should have been more prepared. After all we live within an earthquake area.	
Pulled off the road to let fire truck by and no one would let me back into the traffic stream. Egress is a REAL problem. If our neighborhood is cut off we all die	
Highway 101 was impossible. Evacuation instructions should suggest that each family have an evacuation plan for every direction, since it's impossible to predict where a fire might come from	
None	

Responses	
No challenges, we stayed in 2017 and helped other locals protect homes.	
Convincing parents to evacuate before their neighborhood was mandatory, families staying behind evacuation lines.	
Same as #9	
Clogged two lane roads	
time away from work and $$ for evacuation	
Fallen trees, blocked roads, dangling electric wires	
None	
None	
Not sure	
We experienced EXTREME traffic along evacuation routes. Hours were spent to go less than a mile. There is currently not enough road capacity for the current population. Unless Sonoma county improves the road infrastructure, we are a ticking time bomb. With the added developments of the SDC, Hanna project and the SSP, there will be deaths during the next major event. Please, improve the infrastructure before you allow these projects to be built. Thank you	
2017 Fires- How to properly and safely get somewhere safe then how to help others.	
As older folks, carrying what we most wanted to save to our vehicle (in the dark, wind, cold) was extremely taxing. Our neighbors drove by, never offered to help.	
None	
N/A	
I did not have to evacuate. However, the smoke from wildfires and extreme heat events caused serious exacerbations of my chronic health issues.	
National guard and other so called authorities were unreasonable	
One evacuation during wildfires; we had to go stay with relatives for about a week	
heavy traffic, possibility of stopped traffic, downed trees or other hazards, brush fire along road	
None	
none	

Responses	
knowing how to get out of a particular area, and getting communications during emercies, where to go safely in real time	
unorganized, some roads closed (hwy 12 & fulton rd construction), congestion	
None, I sheltered evacuees.	
Trees down in rural roads.	
2017 Pocket Fire: limited evacuation locations due to numerous fires.	
N/A	
Over crowded roads, but the staggered evac were well communicated	
Roads blocked due to fire	
n/a	
N/A	
Severe anxiety and fear even though I did not get an evacuation order. It was extremely stressful.	
See response 9	
General difficulties associated with loss of power and being away from home such as expense of relocation, lack of routine, lack of access to clothes, etc.	
N/A	
We voluntarily evacuated when fires were heading our way and no firefighting was engaged, at that point. We have 2 cars, and relatives in the Bay Area, so it was not hard to do.	
road closures and no cell phone service	
did not have to evacuate.	
I only evacuated during the county wide evacuation (Kinkade?), which was pretty chaotic.	
With all the people driving out from the surrounding neighborhood (and from oakmont) it was hard getting out of our dirt driveway because no one would let us out.	
Clogged roads.	
None	

Responses	
Tubbs Fire, evac was a charlie foxtrot. Glass Incident Fire, went smoothly.	
Leaving our home and staying with relatives.	
2017 I sheltered at my horse barn on East Bonness where we took in 20 horses from upvalley. There were fires all around the Sonoma Valley and it ended up being the safest spot. In 2020 I would have died on one of the side roads trying to evacuate if the fires had raced through the middle of the valley. It took hours to get to East Bonness from my house in Fetters.	
Road traffic! It took hours to get out of town	
Long lines of traffic on the road.	
Huge traffic jams leaving Sonoma Valley	
I left early enough to miss the huge traffic jam on Arnold Drive.	
None	
Evacuating large animals and determining where to go. Being out of house for a week plus.	
None	
went to a hotel in Marin county	
None	
Crowded roads. I could not get my horses out.	
traffic at standstill	
We have a farm with over 50 animals. We evacuated all of them to safety, twice, but it was incredibly challenging. After Kincade, our farm took damage, and we had to stay off the property for four months with all the animals.	
Traffic, lack of reliable exits	
power out	
Mainly traffic flows. Too many people in a poorly designed city.	
Not too bad	
Heavy traffic.	

Responses	
I have left the area early for fear our limited exit routes could be cut off.	
Understanding the severity of the threat, which direction was safest to evacuate to (a friend in Petaluma's home vs. a friend in Cloverdale, also which zone my home was in	
NONE	
Only the angst of being in an advisory evacuation zone during wildfires and having to be prepared to evacuate. We've never had to actually evacuate.	
I have not had to evacuate.	
None	
Didn't affect me	
Difficulty getting out of Sonoma County on the freeway	
Road map closures was confusing and hard to find	
Evacuation space and essential supplies are limited due to people being selfish and hoarding essential products unnecessarily	
Where to go during evaluation	
None	
skip	
None.	
Again. If I say no, why can't I skip this question?	
See answer to #9. I stayed home for 3 hours for streets to clear. I live near Stony Point and West Third. I evacuated for 2 days and came home a day before orders were lifted. I hope any future evacuation orders are more targeted.	
Traffic	
the 2 times I evacuated for fire went pretty well. I don't live in a flood prone area.	
Stuck in traffic for 2 1/2 hours during one of the evacuations. What happens when everyone has to drive electric cars & we're stuck & can't move? I understand hybrids, but going all electric doesn't make any sense to me.	
None	

Responses	
None for my location	
Finding safe zones	
Finding hotels not booked	
fast moving wildfire front	
Leveroni was a "parking lot" to get to Arnold and south out of Sonoma County.	
See above (#9) answer.	
911 couldn't tell me where fires were; they told me to wait for officials to tell me to leave. Thankfully I did not rely on them and left when I could see fires on two sides from our home. We burned to the ground but no living beings harmed. Roads were clear for us because we left before most people knew their neighborhood was on fire.	
Arnold Drive impassable backed up for miles..	
Lack of financial compensation for hotels etc. It is very expensive to evacuate.	
Evacuation routes from Jenner have to travel through larger population areas. The potential to be stuck on the road and not be able to get out is high.	
I did not but my son was stuck in traffic to leave Sonoma for 4 hours	
Traffic bottlenecks	
Just getting out with as much as I could in a short period of time and driving 160 miles to my nearest relatives was challenging.	
My brother and his wife evacuated during the Tubbs fire and came to stay with me.	
Traffic to escape and finding a place to stay	
No car	
none	
Rounding up cats to evacuate	
Lack of places to go that are affordable.	
I'm not allowed into an evacuation center because I was abused by my ex husband and he left me unable to have anything obstructing my mouth and nose and have panic attacks when I wear a mask. Despite reaching out to the county they never thought I was important enough to address this.	

Responses	
Conflicting information. We also live in Vacation Beach so the fear is always only having one poorly maintained road in and out much of the year	
Knowing which roads were open	
Transpertation	
None except my food all spoiled in my refrigerator and freezer. I filed a claim with my insurance company and later found out that having filed that claim made me ineligible when I was forced to change my insurance carrier who cancelled my insurance due to my living in a WUI. I had to get insurance through the CA Fair Plan which is less insurance and more money.	
See above re gridlock. Now I do not know where I would go. County should educate about Temporary Evacuation Points.	
Gas lines were long	
none but am worried about permit sonoma's plan to build multi-dwelling units in an already infrastucture-challenged area especially re evacuations.	
Not applicable	
fortunately none so far	
None	
none	
None	
none-safer stayed home. Do not live in a fire prone area, to high elevation to flood	
packing my car by myself. I keep go bag and 4 plastic bins ready to go but hard to load by myself. I am 75	
Not having any form of communication. Mudslides on both exit roads.	
Fire evacuation - hard thing was finding a place to stay with my dog	
None	
Getting myself, my two cats in their carriers + their food, bowls, and litter box, and some of my clothes and valued original paintings, into my car. I've since purchased a used SUV big enough to evacuate more quickly.	
I had no where to go. The shelters in closer proximity were full and motels within 2 hours drive were full (that allowed pets).	

Responses	
During the Kinkade event, most of west county, including west SR was evacuated at the same time creating massive traffic jams. It took me three hours to get from SR to RP.	
Roads blocked with traffic. No evacuation routes.	
None. I packed my car and I left.	
roads too narrow to evacuate a lot of people	
Total lack of available wheelchair accessible transportation and an inability to contact emergency services due to a lack of cell service. Also, there were no wheelchair accessible hotel/motel rooms anywhere in Sonoma County. One person who uses a wheelchair had to drive all the way to the South Bay to find a wheelchair accessible hotel room. No one from the County is doing anything to educate hotel/motel management in Sonoma County that they must hold their wheelchair accessible rooms for those evacuating who use mobility devices for mobility. If they won't do that, then they should sell their wheelchair accessible rooms last	
Where to go, of course. Wound up in Albany with friends	
Traffic	
N/A	
traffic sucked	
Excessive road traffic that did not move. Rumors.	
Trees falling on the road, Road flooding, Landslides blocking the road	
None.	
N/A	
Lost food in fridge and freezer	
None	
None	
Traffic ! Crazy that eve evehicles are being pushed so hard given evacuation snafus.	
Total traffic jam. If we develop more and more and the population of Sonoma Valley increases, we will most likely die the next time around.	
None	

Responses	Translations
I don't evacuate. I have several safe, prepared locations on my ranch and we need to stay onsite to take care of the animals and keep the generators running to help fill up the fire engines.	
None	
Sitting in traffic for what felt like hours.	
None	
None	
We evacuated from our primary residence and also a family members property within 24 hours	
None	
None	
In 2017 the closest hotel was in Benecia, but we felt lucky to have one at all	
Short amount of time to pack. Hard to have a place to go where dog was welcome and could be taken care of while I reported in to work. Should be able to bring our animals.	
Roads were clogged, need more roads	
Gridlock on hwy 12 - and yet you are building more multi unit complexes - entirely irresponsible on the county's part	
None thankfully	
Crowded roads, no traffic direction by law enforcement	
We do not have great vehicles so not comfortable driving far away. We have no relatives close by or a lot of money. We had to go to Petaluma fair grounds and sleep in our car. The fair grounds were clean food was offered - cots offered in dorm type setting - still we choose "privacy" of our own car very uncomfortable and cold. Very scary thinking all can be wiped out . All of windsor evacuated-helpless feeling	
Getting out of town on the same few roads that everyone else was.	
N/A	
Home/farm destroyed by Tubbs Fire 2017. We had no warning. Drove through the flames across Mark West Springs Road, then again through the flames/smoke across Hwy 101 through Santa Rosa.	
Horses	
None	

Responses	
Safe place to go, with dog.	
Traffic! It took 2 hours to go 2 miles during the 2020 fires! We live in the Skyhawks neighborhood.	
Difficult to evacuate from Bennett Valley due to limited roads out.	
Not knowing where to go, when to leave, how insurance could help if needing accommodations.	
Heavy traffic.	
N/A	
I voluntarily evacuated during 2020 fires. no challenges	
Utter, complete lack of emergency notification. Utter, complete lack of defense from our local fire fighters as they were absent. Absent!	
Enormous amount of traffic. Escape route blocked or roads closed. Unless some proactive infrastructure work is done, this will only get worse with the proposed massive housing developments (SSP, SDC, HANNA). How in the hell are the new residents going to get out when the current residents had such a hard time. This is going to be Paradise, all over again, yet worse. Fix the infrastructure, then it's ok to build the housing. Come on, let's use common sense for once!	
Lack of clarity and common sense about which neighborhoods really needed to be evacuated. I'm very concerned about rural roads which were not built for high volumes of traffic and with increased building and ADUs on many of these lots, bottlenecks and stranded people are bound to get worse.	
Roads were crowded. Had to drive pretty far to find a hotel.	
Moscow Road (and now Main Street Bridge) being out really concerns me.	
Yes. Our neighborhood got into huge traffic jam trying to evacuate for fire. Very scary. Not enough hotel vacancies for people seeking refuge.	
Left early to avoid being stuck in evacuation traffic.	
None	
Everyone leaving at once	
none	
Congested traffic	
Being on the road with everyone else at the same time	
None	

Responses	
Dense housing neighborhoods without egress or infrastructure to handle traffic.	
We were stuck in traffic for hours hardly moving.	
Solo una ruta de escape	Just one escape route
Didn't have any hazard events.	
Evacuation during the Kincade Fire: Joy Road was difficult to navigate in the dark due to the terrible road condition.	
We have in-town chickens. We worked with animal services to check on them and fill their food and water. We were fortunate to stay with a sister living in Santa Rosa during the 2019 fires when we had to evacuate.	
WALBRIDGE FIRE EVACUATION - DRIVING EAST ON RIVER ROAD, THERE WAS A MAJOR TRAFFIC JAM AT HACIENDA BRIDGE. TOOK BACK ROADS TO HEALDSBURG. NO SIGNS WARNED THAT THESE ROADS WERE CLOSED	
The longevity of not having gas during the fires in 2019	
See above	
none.	
Evacuating was a huge financial burden. Hundreds of dollars of spoiled groceries, lost sleep, lost time, unknown health impacts, all with zero support or compensation from local government.	
Road blocks	
To much gridlock not enough direction moving traffic	
Health and financial issues make it difficult to easily evacuate.	
Traffic getting in and out of town	
heavy traffic out of Windsor	
Driveway was blocked by downed power line. Evacuation routes in both directions were blocked by power lines and downed trees. Was not sure where to report trees.	
None, just drove out of town.	
None	
none	

Responses	
None	
Could not get home past the sheriff to get needed supplies	
our roads are only 2 way (one lane each way), while multiple new housing developmts are creating traffic hazards. Why won't you widen our roads in these new housing areas: Bellevue Av, Dutton Meadows, Stony Pt (S of Hearn), Corby (by auto dealers)?????? It's a looming evacuation crisis!!!	
4 evacuations. Traffic.	
None	
traffic	
We took the full 2 hours to pack as much as we could (clothes, computer hard drives, photos, etc. plus pet food) and then got on the 101 to head south….and sat on the freeway in crawling traffic. The main slow-down in evacuating was traffic on 101.	
We had to evacuate twice for fires.	
None, i live in Geyserville and we have a huge freeway to evacuate	
During the Tubbs fire my wife and I sheltered in place, but my dad was in a fire zone. He had difficulty getting to our house as traffic was extremely bad. Personally, it was about keeping my legal files from burning at the office and then keeping the air clean in our home.	
None	
None	
None	
Number of vehicles on road slowed evacuation efforts	
none	
Our dairy goats	
Understand the neighborhoods to take actions.	
Not applicable	
Waited for county's evacuation order (about 4:00 a.m.?) — will never do that again. Will leave earlier.	
Finding a place to take dogs!	
None	

lack of info and evacuating when it wasn't needed
Heavy traffic.
Gridlock on roads- getting notice too late
We couldn't find a hotel that would allow our cat, so we ended up at a campground in Monterey. We were lucky that our cat was calm staying in a tent.
None myself
I have severe asthma. I had to relocate. Our car battery went out and we couldn't lift our senior 65# dog I to the car. We were going to my son in Sacramento however the fire had jumped the freeway. We went home and headed north to my daughter's house the next day.
none
Congestion on Highway 12
communication was spotty
We live on a dead end street with the only way out on to Chanate, which is a two lane road and was bumper to bumper. Evacuation was almost impossible. We had to stand in the middle of the street to stop traffic so everyone in our neighborhood could drive out.
Too many people packing evacuation routes , especially through boyes hot springs
Traffic out of areas in Sonoma Valley specifically was very challenging. We have two lane roads and only a couple ways in and out of the valley.
Clogged traffic on our narrow roads. Too many people live in our area.
Not enough fuel at gas stations. Idiot government officials not allowing more stations to be built.
None, left one day early
Traffic from choking the roads down to one lanes and over building on the main arteries.
Salmon Creek in Bodega floods at high tide combined with heavy rain and blocks only road in & out along Salmon Creek Road.
Choosing what to bring/physically loading, coping with pets, finding someplace safe to go, obtaining fuel (major traffic jams and lines at fuel stations, some ran out).
None

Responses	
None.	
Traffic. Not sure where to go that was safe.	
People panicking and causing traffic jams	
Traffic in Rincon Valley was at a stand still.	
Traffic congestion.	
none	
none	
none	
None	
lost of pet do to evacuation, she was found 23 days later. Unable to access property due to a pet escaping carrier at time of evacuation. finally given a number to call so vounteers could get food and water to him. Was less than 2 blocks from road closure.	
None	
Caring for my cats	
I felt that some of the evacuation orders were too broad which caused unnecessary hardships for people with large animals.	
Traffic jam in Bodega Bay on Hwy 1 South	
didn't know about the status of our home. we have a camper so had a place to sleep	
NA	
evacuation was orderly	
Big problem there with this county. Freeways will be gridlocked, areas around gas stations will be gridlocked because people don't keep enough gas in their car, Stony Point road was gridlocked...we were better off staying home and watching the show.	
4 hours of stopped traffic on Arnold Drive trying to leave the town of Sonoma in the 2017 fires.	

Responses
2017 Wildfire - We we told to evacuate and to shelter in place because we were on the dividing line between Fountain Grove and our area. Luckily, our neighborhood set up a citizen watch during the 3 days the fires in Fountain Grove kept burning. We took shifts in different directions as our neighborhood was surrounded on 3 sides by fire, but told to shelter in place. I have never seen a suggestion about setting up watch shifts in any disaster planning, but it allow some of us the rest and sleep knowing others were watching when there was no fire of police help available for 3 days of uncontrolled burning and 1 week of no cellphones, no TV, and whatever the radio stations could cobble together as the disaster unfolded. In addition, our the SRPD came through with updates each day (they knew we were up there and just came to each day to give info) or let us flag them down in the streets below to get an update. Being just 50 feet from the dividing line between evacuate and shelter in place is difficult because the maps did not offer that kind of specific street by street information in 2017 fires.
none yet
Narrow 2 way exit route then difficulty turning onto traffic clogged hwy 116 From Old Monte Rio Rd
too much traffic congestion on Hwy 12 and Arnold Dr
None
Lack of traffic control to allow our neighborhood to enter Main arterial road for evacuation. L O should have been involved.
Lost communication during wildfires, lost connectivity with family
Terrible alert system, no good information on where to go or when.
not sure where to go, fored everywhere, smoke everywhere
Roads became congested and panicked drivers are dangerous
none
Was hard to get everything we needed quickly, had to leave a vehicle and priceless family treasures behind. Didn't know where to go when our 2nd evac location was also ordered to evac, so we sheltered in place due to a family member that couldn't be moved.
None
Not leaving early enough Unclear about evac info no internet Needed assistance loading vehicle
None - we left early
No need to evacuate.

None. We left early.
Lots of confusion during 2017 fires, but have consistently been much clearer with each subsequent fire
None, we were able to get to the Bay Area during a break in the storms, but in the past we have occasionally been unable move north, east or south due to road closures.
N/A
Never had to evacuate
none

Question 11

Which members of your community have been most impacted by recent climate change hazard events (e.g. wildfire, drought, coastal erosion, extreme heat)? In what ways were they or you disproportionately impacted? Please describe.

Question 11 was an open response question asking respondents who in the community they thought were most impacted by recent climate change hazard events and in what ways. 430 people responded and 123 skipped this question. Detailed responses to this question are available below, though some key themes included:

- People with low incomes
- People experiencing homelessness
- Seniors
- People with disabilities
- Farm workers
- People who speak languages other than English
- Undocumented people
- People with inadequate access to transportation
- People located in hazard zones
- People were impacted by extreme heat, fires, power outages, floods, and being out of work

Responses
Low income people who can't afford central air systems, back-up generators or are so busy working all the time just to stay afloat financially that they don't have the time or bandwidth to prepare for emergencies. The farmworker community was really impacted badly during the last few fire events...having to work out in the smoke to pick grapes because they couldn't afford to miss work? That was an inhumane situation and I hope it doesn't happen again -- there should be emergency funds to protect farmworkers. I know the grape growers don't want to lose harvest days, but isn't human health more important? Maybe they and their families should go pick grapes in the scorching heat and smoke and see how it feels.
My friends with kids had to leave their house for a week or more and had trouble finding a place to stay that wasn't really far away or expensive.
Wildfire. Houses were decimated.
Flooding for disabled people was a challenge
We have friends at Fountain grove who lost their home. We have friends whose house was threatened. They stayed and put out the fires with shovels and blankets themselves first. Water pressure was down and not firefighters around. Typical government - reacting when it is too late. Otherwise issues are only dealt with in respect to voting.
People without homes are at increased risk, may not have access to alerts, or transportation, and are more likely to be affected by exposure to severe weather or conditions
Journeys End. The homeless. Southwest Santa Rosa flooded street resulting from poorly maintained street gutters.
Seniors living in senior communities. We are dependent on the organizations to help manage evacuations. Some have done better than others. Farmworkers and other workers whose livelihood is outdoors facing extreme heat, residents who live near the Russian River and other water ways subject to flooding. The homeless.
Everyone is being impacted; every citizen
Incendios, inundation, y calor extremo | Fires, flooding, and extreme heat
My employer's cannabis farm was unprotected and plants were stolen during the evacuation period
low income persons who were barely hanging on to their housing couldn't get housing after the Tubbs fire which seems to have led to a significant increase in homelessness
if you assume wild fires are related to climate change then I'd say the wineries and tourist industry are most impacted. On the other hand if we are assuming warming, that might be also beneficial for grape growers.
Farm workers, undocumented people. Loss of work, unable to get financial aid due to undocumented status, fear of deportation
?
elderly, disabled
Farm workers. The unsheltered. Limited-income households. Immigrant households. They lack money, resources, and time to invest in adequate hazard protection, not to mention they might not get protection from the government/authorities.

Responses	
Loss of home and property damage. Especially hard on low income people with lack of affordable housing.	
High water bills and energy bills.	
What affects one affects all. We are in it together	
Low income, seniors, homeless, people with pets. Very few resources, income disrupted, mobility problems, no place to get away to.	
Elderly, disabled, livestock owners. Difficulty evacuating, mobility issues, nowhere to go.	
People without cars and without good communication avenues.	
Community within areas with limited resources or roadway infrastructure; they were isolated from supplies, utilities, and travel/response	
Those closest to the river	
Our rental did not have appropriate upgrades (double pane windows, insulation, HVAC) to deal with extreme heat. Prices for home energy upgrades are cost prohibitive for many.	
Climate change is a global change, there are no specific local events that are do mostly to climate change. Every fire & flood have stayed within their traditional boundries of where there has been historic fires & floods. We were just dumb enough to put homes & infrastructure there.	
Our whole town will be affected with evacuation problems if they add the County's Housing Development. It will be another "Paradise" inferno should fire strike. 2 lanes in and 2 lanes out and they propose to double the population with the low income housing and in addition an Asphalt Production Plant 1/2 mi from town on 116.	
El tener que evacuar y no poder trabajar	Having to evacuate and not being able to work
Neighbors in lower income housing with poorly insulated building suffer in severe heat. Extreme weather events have slso disproportionately affected communities such as the Springs. Sewer overflows and flooding sre common issues.	
All labor related jobs from farm workers to construction workers	
The people who make the lowest income are impacted the most.	
lower income folks, like our family, who live in older homes that are not sealed well, have no HVAC systems and no filtration for hazardous smoke days. We had to go to a neighboring house with HVAC and at least we had this alternative but many don't. Also all those who feel they have to work, or financially have no choice but to work, especially outside, on days they really should be supported to stay home (like with the pandemic, we were all financially supported to just stay home). There's a big cost to trying to push through and work/take the kids to school/etc like normal during extreme heat/smoke/rain events. I understand that there's cooling centers and things but who feels they can go to that and sit around all day and not go to work if you're living paycheck to paycheck?	
none	
drought, wells went dry	
homeless and farmworkers. many don't have their own transportation to evacuate or a place of safety. Also, they don't have financial resources to provide for their needs in an emergency.	
the unhoused, the elderly, those without family members in the area	

Responses	
Traffic shuts down escape routes.	
You need to have driveable, wide roads so everyone can get out safely. That should be a priority.	
Trinity Oaks - 75 percent of my neighborhood burnt in 2017. One building wall burnt and my garden burnt and septic system destroyed	
Senior citizens	
Sadly it has impacted everyone. The wildfires together with the high cost living here has had the biggest impact on the middle lower and low income members of our community	
Those with disabilities and less money	
In our area, most were affected relatively equally.	
Loas personas mayores por no saber mucho de tecnología	Seniors for not knowing much about technology
Please stop trying to divide people. Spend time and resources on quality of life issues for SC residents. Clean up the homeless and prosecute criminals.	
Too much to tell.	
elderly	
Marginalized communities already facing inequities	
Some neighbors experienced flooding. My home has never flooded.	
poor, often tenants without insurance, lack of resouces	
They weren't	
All the poorest have least protection and are bilingual so do not understand.	
i guess the homeless, because they worse off than me	
Can't speak for others	
Have friends and colleagues who lost houses in one or more of the fires.	
1964 - saved the house, 2007 - lost the house in another County.	
wildfires, drought - hot days are more common then they were say 30 years ago.	
Inindaciones	floods
Elderly.	
La falta de trabajo. La constante, amenaza de catastrofe es muy estresate.	Lack of work. The constant, threat of catastrophe is very stressful.
Depending upon what neighborhood you live in, power outages. Smoke very bad even if the fire was another county.	
La gente que no tiene car par poder salir	People who don't have a car to go out

Responses	
Incendios forestales calles aruinadas por las caidas de arboles	Forest fires streets ruined by falling trees
Inundciones y incendios	Floods and fires
Para los incendios salimos coliundo lomas lejos y paga otel comida y pus cin suficiente ropa para los niños	Because of the fires we went someplace far and had to pay for a hotel and food and we didn't have enough clothes for the children
Incendios, inundaciones arboles caides en las inudaciones de 2019 perdimos todo nos costo mucho recuperar nuestras cosas duramos viviend 6 meses para poder estar en una casa habitable.	Fires, floods trees fell, During the floods in 2019 we lost everything it cost us a lot to recover our things, it took us 6 months to be able to be in a habitable house.
Las personas que per dimos todo en la inundacion de 2019 y luego en los incendios al ser evacuados sin tener a donde ir.	The people, we lost everything in the flood of 2019 and then during the fires we had to evacuate but had nowhere to go.
Individuals in trailers are always displaced during floods because the trailer sites are all in flood zones. My neighbors that are elderly and disabled have a hard time taking care of their vegetation, need extra support during evacuations (don't drive) and have the hardest time accessing updates because they don't have the same comfort level with technology. Homeless people and people who experience power shut offs have a very hard time in extreme heat/cold.	
Desalojos no enejra	Evictions, did not have power
Evacuaciones por incendios, agua mas cara per la sequia, etc.	Evacuations due to fires, more expensive water because of the drought, etc.
Those living on hilly forested areas with crappy roads along the lower Russian River. Not enough financial help for fire clearance. County continues to allow over occupied vacation rentals in these areas, and no one enforces safe road way clearances.	
Los journaleros	The Journalists
Pues todo nos afectado incendios inundaciones falta de trabajo como los hoteles vacios	Well, everything affected us fires floods lack of work like empty hotels
Nos afecto mucho por los evacuaciones y no tener los recursos economicos para poder pagar hoteles y otros mas gastos.	We were very affected by the evacuations and not having the economic resources to be able to pay for hotels and other expenses.
Todos en mi famra emos sido afectados por el cambro climatico	All of us in my family have been affected by the climate change.
Todos de mi comunida, comida, trabajos	All of my community, food, jobs
Had to move out of the county because there was no affordable housing, took me 5 years to get back to Sonoma County	
No one	
Calor extremo	Extreme heat
Calor extremo	Extreme heat
Incandios forestalas	Forest Fires

Responses	
Insendios, inundaciones	Fires, floods
La gente de mayor edad	Older people
Gente sin acceso a technologia. Gente en el area del Rio.	People without access to technology. People in the Rio area.
Calor extremo	Extreme heat
Sonoma was overtaken by wildfires. Some residents nearby in Kenwood were evacuated so many times that they moved out of the State.	
Calor extremo	Extreme heat
[[illegible]]	
Si tengo mi conados tuvieron que salir de sus casas	Yes, my in-laws are with me, they had to leave their houses
WUI	
Familiares mios [[illegible]] evacuados por inundaciones	Relatives of mine evacuated by flooding
For the fires, they affected random people depending on where they lived. It seemed random, except for the people who lived in the mountains. For the floods, I don't know anyone who was affected.	
Las personas de mayor edad	Older people
Ag workers, elder residents, those with access [illegible]]	
The disabled, lower income populations. Not having the means to evacuate or ability to leave and gather belongings.	
Falta de luz, caida de arboles no paso por falta de corte arboles en el camino	Lack of power, falling trees, no access due to lack of cutting trees on the way
I hear many say it is a financial challenge to have to relocate or buy enough supplies to shelter in place.	
No	
Fire, heat. During smoky times most people don't have air conditioning when it's warm and have to keep windows closed	
elders	
Older adults and persons with disabilities or people with pre-existing medical conditions	
Low income	
Relocation costs	
Property/Home Owners. Insurance not covering full expenses. Having long waits and bureaucracy (despite the County's efforts) in the permitting process for rebuilds.	
Low income	
I don't know.	

Responses
Arguably, these were not "Climate change hazard events" but simply events that take place naturally. However, during any form of disaster, the poor are impacted more than any other demographic. This is why it is critical that the County and State STOP implementing policies that increase the cost of living and creating MORE poor.
None Quit pushing BS AGENDAS!
People with disabilities, harder for them to evac, barely [[illegible]] an evacuation.
I would think the homeless or disabled folks were the most impacted. Personally my impacts were relatively minor, smoke during wildfires, lack of AC for heat waves, not the best housing insulation, loss of power or gas in home, stuck in traffic.
People lost their homes in my immediate neighborhood in 2017
Older family were difficult to move safely
Wildfires
unknown
Wildfire, friends lost homes. Drought, cost of water has increased. Extreme heat. Very uncomfortable in my home when it is hot
None
N/A
Farmers drought, planted less
Friends and clients who lived in areas that burned in the Tubbs, Glass and Walbridge fires lost homes and had property damaged.
Their homes burned down.
Wildfire and Drought. Also river erosion. Members of my community have been evacuated three times due to wild fire threats.
houseless
Wild fires caused several evacuations and several planned power outages

Responses	
Salir de casa a chealters y después después salir de ahí a otra ciudad si había oportunidad de salir del peligro . Buscar hospedaje el humo estaba muy bajo penetró ventanas puertas aires de ventilación emtraban la cenizas adentro de la casa mojaba las ventanas puertas con agua y sábanas húmedas para evitar que entrara el humo y cenizas , evacuamos cortaron la electricidad fue un caos al regresar a casa todo lo del refrigerador echado a perder muebles camas llenos de cenizas ropa ect, cosas que tuve que tirar porque estaban llenas de cenizas y toxinas no se quemo el hogar pero se inundo de cenizas tóxicas estuvimos fuer por 6 semanas el incendio crecía a los alrededores y no cesaba .	Leave home to a shelter and then leave there to another city if there was a chance to get out of danger. We had to search for lodging, the smoke was very low, it penetrated windows doors, air ventilation, the ashe entered inside the house, we wet the windows doors with water and wet sheets to prevent the smoke and ashes from entering, they cut the electricity, it was a chaos when returning home as everything from the refrigerator spoiled, furniture, beds were full of ashes even the clothes ect, Things that I had to be thrown away because they were full of ashes and toxins, the house did not burn down but was flooded with toxic ash we were out for 6 weeks the fire grew around and did not stop.
all of the above - read my previous comments. Who is affected IDK I am white, 60, woman, single, employed for gov. agency and it was an impossible struggle. This is on the policy makers. No one would intentionally experience this year after year.	
cost of utilities has skyrocketed. During evacuation, helping less abled neighbors was challenging but doable.	
Heat extremes immobilize me	
Unknown	
Renters without insurance lost everything with meager FEMA recourse, if any. Renters insurance should be required! It's cheap.	
wildfire, drought and extreme heat. No air condioniare and worried redwoods trees catching our home on fire	
Wildfires.	
Wildfire, extreme heat.	
People lost their homes	
not at all	
evacuated, lost their homes, etc	
Low income residents struggle with taking time off during disasters. They are often not given sick/personal days to use and are forced to work in unsafe conditions (like smoke)	
Drought- well water flow and quality issues.	
People woth less money. I was evacuated for a few days, but I had resources to handle it.	
Low income folx and the unhoused.	
Farm workers and renters, low income residents and seniors	
Wineries, vineyard owners, and corporations are allowed much more leeway to waste water and spread pollution than individuals. Drought-resistant, Native trees and plants are not protected enough from property owners or PG&E.	

Responses	
Las comunidades inmigrantes y sobre todo las comunidades que no entienden el idioma ingles y que solo hablan espanol o su lengua materna.	Immigrant communities and especially communities that do not understand the English language and only speak Spanish or their mother tongue.
All people in the path of wild fires or floods are impacted, its not not a race issue.	
Low income families with not access to air conditioning or prolonged heating are really suffering financially. Wood heat is sometimes the only source of heat which polutes. No credit for landlords to install SOLAR!!!! Must be owner occupied? Why?	
poor people, people speaking languages other than English,	
Low-income people and limited English-speaking immigrants. Loss of work(income) during fires and PSPS events. Dangerous working conditions during fires for ag workers, lack of savings for emergency situations and purchases, difficulty getting ER info in their own language, so they can understand what to do and what is happening	
Our entire community was affected by wildfire, if not actual active fire, smoke and poor air quality from fires in our vicinity, especially those who work outdoors. Drought impacts everyone and all things in California, it has been difficult. Extreme heat impacts us all as well. Those with homes that are poorly constructed, or crowded housing, or those that would have difficulty paying for the expensive electricity rates of summer are definitely more at risk of extreme heat. Also when rolling black outs occur, for those who don't have a generator, they are without a way to cool or prepare food and keep their refrigeration.	
Low income families living in or near flood zones.	
People living in WUI. Also, most nonprofits don't have Spanish language or cultural compentency, look to partners like La Luz or other Latinx community leaders instead of building programs that educate and provide services that reach whole community.	
I think people who do not have a lot of resources (including money and support) are those most impacted by these events. They have nothing to fall back on and it can affect the ability to continue to have stable housing, afford food, afford medical care and more.	
Low-income communities who live along the river and are more likely to have their homes flooded; people experiencing homelessness who don't have a way to escape extreme heat, smoke exposure, etc.; farmworkers who are exposed to heat & smoke, seniors who are unable to evacuate safely on their own.	
wildfire/heat - power outages preventing use of cooling, loss of refrigeration for resident and businesses	
No climate change.	
Elderly customers on fixed incomes, who are also less physically able to perform robust work around their homes	
Coffee park and fountain grove friends of mine	
Low income	
I can't say for sure but I would think it would be our non english speaking community.	
Those who lost everything in 2017, those with storm damage from this year's onslaught, those made to work outdoors (farmworkers, laborers) while the air was thick with smoke.	

Responses
People without money or a vehicle
None climate change is nonsense
Old people.
People with chronic health conditions have been severely affected by extreme heat and wildfires, as well as evacuations.
Everyone
Wildfire, drought and flooding have all impacted our community
middle income and low income residents, renters are impacted by all hazards due to lack of financial resources to address needs (if I understand the question....)
Our entire community has been impacted by wildfire threats. Also, remapping our entire area as a high wildfire zone has caused many, many homeowners to have their insurance cancelled.
Tenants. Landlords making them think they don't have rights and making them think they have to leave and find some where else to live rather then taking the appropriate steps to make any repairs to damaged units and letting the tenants back in the unit. Also, there needs to be a better understanding for both tenants and low income home owners about the importance of insurances and the different kinds of insurances that would protect them from any kind of loss.
The people who live in those area's effected by those events are the most impacted. Sounds like the question is fishing for a social justice type answer? Am I right?
Lower income people who are not able to easily afford the extra expense of renting hotels to stay at.
please differentiate climate changes it does wet and dry hot and cold, you need to deal with real issues, wildfire, floods, drought, earthquakes, and not lump them into 'CLIMATE CHANGE'
Tubbs fire, we fled. My daughter's kids were very tramatized
Anyone and all in the WUI.
Community members who live on one-lane rural roads that connect to river road (sometimes with only one route for evacuation) worry me. Additionally, people who are low-income or on a fixed-income face significant challenges when it comes to be able to adapt their homes or lifestyles to the impacts of climate change.
Climate events causes extremes - extreme heat, droughts or deluges of rain. We are impacted because the larger infrastructure isn't built to handle extremes. Roads & flooding don't have good water drainage & infrastructure in general. Lack of linked green space incorporated into new developments create disjointed areas and cause heat islands. Connect green spaces, non-car pathways for walking & biking & plan for weather extremes in developing infrastructure
Fires, elderly neighbors in shelters was sad, drought and heat has affected mental health with fears of fires, water usage
Renters and low to middle income home owners didn't have the resources to recover.
unknown
N/A

Responses
I am impacted and deeply concerned that our forests and local vegetation are being removed out of fear of fire. This makes our environment MORE susceptible to fires. By maintaining a healthy, balanced ecosystem, our natural environment can protect itself. Vegetation management of any type is useless beyond 100' from homes! Put ALL fire prevention resources into home hardening ONLY! No to clearcutting or so-called thinning of our forests, no to vegetation management beyond 100' from homes, and absolutely no to prescribed burns. It was prescribed burns that caused the big wildfire in New Mexico last year. Prescribed burns conducted by the US Forest Service. If THEY can't conduct prescribed burns without burning down millions of acres by mistake, then no one should be considering prescribed burns. The members of my community most impacted by wildfire are the trees and forests, the birds and animals, and the balanced ecosystem that we all rely on for our survival.
Na
Much more difficult for neighbors in apartments to find safe alternative housing during evacuations, also immigrants are challenged due to fear of authorities and lack of trust/security.
N/A
Nature does not discriminate based on ethnicity; it's all about location. People living in WUI zones and near creeks and the Russian River are impacted, regardless of their ethnicity.
low-income bipoc community members and farmworkers who are living paycheck to paycheck and may not be documented/receiving local/state/federal aid
Lower income families lost housing and loss of housing stock caused rise in rents for remaining people.
farmworkers, folks living in high fire areas, folks living on or near Russian River. Homeless, elderly living alone.
Extreme heat. Our neighbor(s) also rent and their house is the same as ours. There is no AC.
Myself and family most impacted by health hazard from smoke. Need clear information about best home heat/AC filters for smoke and adequate supply locally.
Turning off my power and gas wasn't fun..
My friends whose houses burned down.
Nobody
Everyone by the policies forced on us by wealth distribution zealots.
We are elderly, and the elderly are more challenged by evacuating our homes.
I, my folks and neighbors affected by extreme hear and drought Either evacuation or consumption increase/decrease use of energy.
Obviously it's the local less well off people. The many wealthy people who live here, many just part time, didn't and don't care about drought. They still filled their pools and ran their fountains on the Eastside of Sonoma. Our community has really become lopsided thanks to the big push for wine tourism. The people who suffered most during Covid, during fires, and power outages worked in hospitality jobs.
Renters and the poor were much worse off. Nowhere to go and no work
Don't understand the question.
None

Responses
It has been hardest on my grandma who lives alone in Oakmont. We have developed strategies for her to feel safe and evacuate as needed.
I don't have sufficient info to answer this question and I wonder whether any valid conclusions can be derived from the answers to it.
People who lived close to where the wildfires erupted.
None
Undocumented people experienced the worst, low to no translation made access to communication
farmworkers working in smoke
None. It's not about your "climate change." Our world will ALWAYS change because that's what it does.
Renters, Home owners and business owners
I think disproportional impacts have more to do with geography than anything else, and that that lays at the fault of the folks who developed the area 50-75 years ago and put housing in areas known for fire and flood vulnerabilities.
People with disabilities and those reliant on public transportation. They are not able to evacuate unless a vehicle is available or a neighbor provides support.
Drought
Sr Citizen with home ill family.
We are less vulnerable to Fire hazard
Those are not necessarily related to climate change
Older people and those on a fixed income.
The elderly do not have access to good information, often do not have internet access, live with limited means, and cannot afford to evacuate themselves, their medications, and their pets to live in hotels and restaurants during evacuations.
I would say people working jobs that are inflexible and put them in danger if they don't continue working (farmworkers, etc.). Made to continue working in evacuation zones
everyone essentially impacted by fires. We had to evacuate twice for short period of time. Those living by flood plains more impacted by floods.
My son and his family are in northwest Santa Rosa and had to evacuate during the Tubbs Fire. They stayed with us in central Santa Rosa. In subsequent fires, my son has sent his wife and children away (he's a first responder). None of what we experienced was really a disproportionate impact.
Unhoused or insecurely housed for obvious reasons, ie lack of resources such as funds, cars, insurance, ect. Farmworkers for similar reasons.
Low-income folks are always impacted the worst. People that are on a tight budget are significantly affected by changes to the status quo.
My mother lives in Forestville and has been evacuated for flood and fire. She also has frequent electricity outages
Not sure people know what help there is

Responses
The elderly in the community need help and resources. During COVID pandemic, my elderly neighbor was kicked out of her home she's been in for 13 years so that they could renovate her kitchen. They put her in a new unit and her rent was raised by $800 a month. During the most recent fire, she had no assistance and nowhere to go in the case of evacuation.
Seniors
Thise events arent climate change created. They are natural.
The elderly. Something worth noting is that they have a much harder time advocating for themselves and what is best for their lives, because they have not kept up with technology, and have much lower mobility. They can't attend BOS meetings in person, and are much less likely to participate in Zoom meetings. Because of that, they are disproportionately impacted. The government also retaliates and disregards the well-being of certain areas (West County), and groups of people.
Northern California is most disproportionately impacted because the state of California fails in 2 ways, CA has not created any new water storage despite a voter approved tax a decade ago (what ARE you spending that money on??) & CA sends too much water to southern CA, they need to create their own water storage as well. Much like the road improvement gas tax, southern ca gets all the benefits.
Low income people who hold essential jobs and don't have air conditioning. People without cars. People with nowhere to go.
None
I think people with lower income and little or no savings are disproportionally impacted by the effects of climate change.
I had family members who lost homes in the 2017 Wildfires.
No one has been disproportionally effected
Longer growing season benefit unable to be utilizes because of water restriction and prices. Recent rains may ease water restrictions. Prices?
Finding shelter.
Climate change hasn't had much impact in the areas asked.
Us. We lost our home in the Glass Fire
homes burned, lost everything
We lost everything. Still waiting for PG&E resolution.
We lost our home in 2017 with everything in it. Rebuilding during the pandemic with prices skyrocketing and shortages and delivery issues. We're still not back to normal 5 1/2 years later. We lost a lot of money paying for rent after insurance stopped covering that (after two years). Both kids are traumatized and needed therapy.
wildfires have nothing to do with climate change..more recently affected by total lack of forest management by state and county.
Jenner. Wildfire evacuations - twice. Drought in the headlands. Coaster erosion. We are the canary in the coal mine. Fix Jenner and you have a template for anywhere/everywhere else.
Seniors, low income and retirees. No funds to make expensive changes or stay in lodging during evacuation.

Responses
Friends lost everything in the fires.
Elder medically fragile spouse with not enough and money to to help with care in order to keep them at home.
Elderly and non tech savvy. Slow to relieve info
I know three people who lost their homes completely to wildfire. I live in considerable fear each summer/late summer that a wildfire will break out near me (especially as I find a lot of cigarette butts on my country lane). I worry about fire-related outages because I live alone and I'm not strong enough to start my (small) generator by myself. In fact, outages are my main concern almost, especially when my late husband was desperately ill & I needed to bathe him (outage = no water for me) & operate his hospital bed. Also, being on a private well, I am extremely anxious about running out of water (though I use minimal water in my daily activities & yard)...thank goodness for this winter's rains.
Homeless people camping in brushy wooded areas were burned out.
Farm laborers and other BIPOC communities, AS USUAL!!!!!!! You know the reasons and winery owners continue to stall on adequate solutions. Their money and power make it hard for BOS to really really help.
Everyone impacted. Toxic smoke in air, extreme heat, flooding from too much rain in short time or no rain (drought).
Those who lost homes to fires and floods. Renters were ripped off by landlords if they were poor or iminrants
Elderly and disabled affected by heat, smoke and ability to evacuate.
None that I know
Low income (can't do adequate back up energy, get adequate insurance) and homeless
Farmers. Seniors
Wildfire. Thier houses burnt down.
No more than anyone else except I cannot afford a large full home generator which a lot of them have.
People who have had to evacuate repeatedly for wildfires. People whose houses burned. People who have to evacuate when the Russian River rises.
Low income or homeless. We don't have air conditioning installed in our apartment. Relocating during evacuations were difficult. All public areas were full. Hotels and motels were booked. Those living close to the river or low lying areas were flooded out with property damage. Low income is mostly affected because they are most vulnerable with less monetary resources, lack of help or assistance.
the elderly in the extreme heat and they never could go outside taking care of my yard of plants was a real challenge because there was a drought and we weren't supposed to water much or often
power outages
Elderly neighbors who have difficulty evacuating. Family members in Cazadero who were without power for over a week.
The more economically disadvantaged segments of our society are financially unable to adequately prepare or recover from major weather-related events

Responses
Elderly, heat exhaustion
homeless, seniors, overcrowded families, persons/households without reliable transportation to get out
old people that need help and rest homes & hospitals evacuations
wildfire danger
Heavy water flow from Jenner Headlands, rock slides, damaged roads, tree damage on property which is extremely expensive to clear.
wildfire and extreme heat. The wildfires and excessive affected our grape harvest
I imagine that people with less access to transportation or live in areas that flood or burn more easily, or who don't have vehicles that accommodate their entire families would be disproportionately impacted, as would people who are ill or homebound, don't have transportation, or those with fewer funds, resources, and/or friends or relatives who might shelter them outside of the area.
Homeless community.
Lower income residents have more difficulty relocating due to lack of financial resources
The apartment where I live is all old people. Some don't have cars. Two years ago I worried that a fire could sweep down and burn the neighborhood.
My most significant concern involves farm workers having to work in extreme heat.
?
vulnerable seniors and people with disabilities, especially during PGE PSPS/"Fast Trip" events, especially those without their own personal and wheelchair accessible transportation. Many couldn't get to the PGE charging stations. And, there's almost a complete lack of public information available describing services that are available during emergency events. The CPUC has put over $1B into the Self-generation program for vulnerable seniors and people with disabilities that will pay for the purchase and installation of 2 Tesla type residential batteries that when installed, will provide electricity that will keep medical and mobility equipment functioning during power outages. Again, a total lack of information needed to educate vulnerable seniors and people with disabilities about this important program.
renters, lower income, ag workers
Kids education
Homeless persons by flooding
wildfires impacted our community
Wildfire is not climate change.
Flooding in the low lying areas, air quality hazards in particular for folks working outdoors during fire season. Friends and family members being displaced by fires
The poor are always the most impacted by any event. This is why it is so critical the the county stop taking actions that increase the cost of living. You are devastating the poor.
PTSD for many. Also chronic anxiety and depression (not me but several friends)
Equal impact

Responses	
People living near open space that burned.	
I would say the libtards are the most effected by your scare tactics along with the poor because the inflation caused by the new worlds order climate initiative and the war on fossil fules.	
We are all affected.	
None	
Low income community members because many are renters and don't have insurance. Many had to leave the area after the fires because of housing shortages/costs. Disabled and elderly people also face physical challenges when evacuating.	
Heat sucks, always has. This is nothing new. The elderly are the most affected in my community, and all the livestock.	
Seniors, people of color, people with disabilities, indigenous people and people whose first language is not English. They were not aware or didn't have access to the information. When they did her about the hazard sometimes it was to late. Not everyone is online or has access to technology or good quality wifi.	
Elderly father living in East Santa Rosa regularly in very close proximity to wildfire.	
There have been no hazard events connected with so-called climate change.	
Wildfire, house burned down	
Los ancianos en mi comunidad tienen menos recursos para prepararse sobre eventos climáticos.	Elders in my community have fewer resources to prepare for weather events.
All	
Heavy rains flooded roads, my yard and crawlspace	
No one is effected by "climate change". Please stop the fear mongering.	
None	
None, not sure the fires were the result if climate change	
Elderly. They often do not have the money, mean, or contacts to get to better situations when needed, and they can't take their pets and won't leave them. They need to be reached out to as they don't know who or what is available and often need a ride.	
Fools who built in the wrong spot	
The unsheltered.	
Wildfire	
Native American community members have been the most impacted by recent climate change hazard events. The traditional homelands of our local Tribes continues to be impacted by climate change hazard effects that impact the food sovereignty, food security and cultural resources of Tribes. With the land continuously being impacted this can impact the land stewardship and continued shared transmission of knowledge. During climate disasters some Tribal members also feel the they don't have support to turn to beyond their Tribe for assistance. It would be great for the County to provide additional support.	
Pge fires	

Responses
Since entire town of windsor evacuated I'd say no discrimination- equal distress. If you had more money can afford to find a hotel or drive further away and make it a forced "vacation "
Those that are anything but white and poor struggle to survive here. When your simply trying to keep your family fed, clothed, warm with a roof over them, anything else beyond that is too much to ask of them. They need help and support for their families.
Heat exposure for unhoused neighbors; expense of a/c or air purification units for some low/fixed income cmty members
Uncle & Aunt farm burned, cousins homes burned, our 3 generation family of nine with four households homes burned, all of our neighborhood's homes (but 2) burned. Flooding on our hill property and on the valley floor made access impassible. And now after over 5 1/2years since the Tubbs Fire we are still clearing dead and dying trees from our property as well as having an entire hillside abutting the protected riparian corridor of Mark West Creek covered with dead trees and slash that need to be removed for fire safety. And I have no way of clearing them, nor if repairing the hillside flora to protect the steelhead and salmon babies that will die in summers with no shade to keep the creek water cool enough to support the fish.
All of the above
Three friends lost their homes in the Tubbs fire.
Elderly who don't have internet, and inconsistent communication in Sebastopol re cooling centers
Economically Disadvantage community. No money to evacuate or replace food, materials and wages lost
Anyone in the path of Oct 2016 fires
Elderly were very impacted without know where to go, when and how to leave.
Unhoused members of the community. Lack of resources and/or strained resources.
Renters & mobile home residents and those with low-income, who are more likely to be renters/mobile home owners. They have less control over mitigation and disaster prep of their homes and are more likely to already have to live with substandard conditions.
I think anyone who does not have the ability or means to communicate are the most vulnerable. Preparedness has come a long way over the past several years
Many of our surrounding neighborhoods were reduced to ashes, farmworkers lost their ranch housing. We lost our belief that the social & civic systems of Sonoma County are capable of, willing to, provide for the needs of any but the "upper crust."
Probably low income as they do not have the resources to remedy these issues.
Low wage service workers and farm workers are always hardest hit. We rely on those staffing grocery stores, gas stations, drug stores, health services, food service workers and those in the field no matter what the conditions are. "Essential workers" need to be paid more and receive hazard pay when conditions warrant.
People that lost their homes in fires. All homeowners landscaping with drought/price of water.
Vineyard workers impacted by smoke; people who live in hills whose power is regularly shutoff as precaution when winds are high

Responses	
Who do you think! The poor and elderly.	
It is getting hotter. Many people do not have access to swimming pools or air conditioning,	
Seniors seem to be reluctant to leave when evacuation is recommended. A family member waited until the high/low sirens wen down her street and ended up stuck in traffic the took 2 hours to go 2 miles and get on the highway.	
None	
Friends had houses burn down	
Children breathing bad air quality during fires. Young lungs	
It has affected us all	
Farmworkers and immigrants when they lose their livelihoods. They are also doing the most arduous jobs and taking in all the risks of the elements, whether extreme heat, smoke from fires, flooding, etc.	
Nobody!	
West county folks seem to be most impacted most of the time. The inability to manage trees too close to infrastructure, due to environmental regulations seems to be a large problem	
Seniors and others without the financial resources to prepare are most impacted.	
Probably low wage workers and renters.	
Apagones y pérdidas de alimentos congelados	Power outages and losses of frozen food
None that I can see. We will always have hazardous weather events. The world is not a static place, it changes. You expect it to always stay the same, it doesn't and it never will. Deserts become forests and forests become deserts and dinosaurs go extinct and so shall we.	
The Occidental area west of Bohemian Highway is in a Class IV water scarce area. For at least the past 4 summers, many more water deliveries had to be made to our area due to the drought conditions. This is compounded by the fact that a full delivery truck weighs about 48,000 lbs. and ruins many of our rural roads that lack any base rock under the asphalt. This in turn impedes an evacuation.	
Farmworkers and people with low incomes. Farmworkers cannot work or work far less when these disasters occur. They are only paid if they work. Most already live in poor conditions. These disasters only worsen their conditions - housing, food, children, all of it. For similar reasons, people who are poor will lose pay if they cannot get to work, even if their employer is open and cannot work.	
EVERYONE WAS IMPACTED BY ALL RECENT CLIMATE CHANGES. WE'VE HAD WILDFIRE; LANDSLIDES, TREES DOWN, LOCAL BRIDGE DAMAGED DURING FLOODING, POWER OUTAGES DURING ALL THESE EVENTS	
Everyone's the same except those in the fire zone and flood zone.	
Wildfire. So yeah, build more condensed housing in fire escape areas.	
Homeless people camping in the floodplains bore the greatest impact. They need better options.	
Farm workers were forced to continue harvest during wildfires even though it was deemed unsafe for the vineyard ownerw to stay on the property and they were ordered to evacuate.	

Responses
IDK
I live in a mobile home park. We seem to be forgotten during emergency situations. We are not wealthy and many of us are older, often isolated, and many have health issues. We seem to often be somewhat invisible. It is disheartening, to say the least
homeless, low income, and immigrants
Not Sure
Elderly neighbor needed oxygen, but power was out & roads were blocked for days.
Downtown was flooded. Closed all the businesses
the ones that are most affected
During evacuations we have been the safe place for many of our friends to come stay at, as we lived in Cotati and Rohnert Park. Many of my clients in the urban wildlife interface area lost homes in the wildfires. This is a part of living in a wildlife area and having gone through a long period with out a forest fire. Forest fires are natural and necessary for natural forest maintenance. This is not a climate change issue, this is nature being nature and doing what is has for millennia.
flooded driveways keep our whole block out of our homes
the WIND is creating havoc on all, esp farmers and backyard farmers like us!
Seniors. Tech illiterate people.
PG&E has been out way too much for many people in the community. Falling trees are certainly a danger.
low income families, homeless,
Aside from evacuating from wildfires, we have not really been impacted. Low-income folks who work outdoors, mostly in vineyards, have been the most impacted and endangered due to fires and extreme heat, I think.
People who live in the hills have had fire threats and insurance issues like rates tripling or being dropped. Flooding in low areas of our town, Geyserville, are mainly a result of lack of maintenance of drainage ditches and culverts. Environmental restrictions often prevent common sense maintenance like periodically clearing ditches and culverts
people with less income. I am a homeless prevention attorney and I have come across a lot of people who seem to have become homeless as a result of the tubbs or guerneville fires.
1) Seniors and mobility-impaired persons. Evacuation is more difficult for these folks and some have difficulty understanding the situation and actions needed. 2) Non-English speakers have difficulty getting information about the situation, threats and actions needed. 3) Low-income people (including homeless) have fewer resources (may not have transportation) and fewer options for relocating during a hazard event.
Low income does not have the resources to rebuild and/or recover from a loss. If all my money goes to subsistence, there is no money for things like insurance or hotel/high rent after an emergency. This is similarly true for the lower middle and some middle class members as well.

Responses
The middle class and the rich have been disproportionately impacted because of poor vegetation practices by Sonoma County.
Medically compromised and low income residents who do not have adequate air filtration or backup power.
NA
Poor people always suffer most
The latino community and underserved. Need to go deeper with these communities.
Business owners. Trying to keep a small business open while trying to contend with the unexpected has been challenging
Clearly those who have lost their homes (and lives) to wildfire.
None that I know of.
People in the flood zone and path of wildfire had little they/we could do to to prevent it once underway. Those they impacted had huge home damage.
The homeless are most vulnerable to extreme weather, smoke, etc.
Lower income people impacted as fire victim insurance paid high rents - displaced many renters
Farm workers were still out in the fields when the air was so smokey I wouldn't even step outside.
People who have mobility problems depend on electricity for medical support. Those who are new to the area and unaware of hazards.
Elders and the poor
Everyone! The entire county was affected! What are you asking? No one avoided these hazard events. Because we are seniors with severe health issues we were directly affected. Again, everyone was!
not having a/c, or not being able to pay for it. The need to have a great paying job.
we all lost our homes to wildfire
We have the $$ and put in central air. others not so fortunate.
Everyone without adequate resources to adequately prepare. Santa Rosa and Sonoma County doesn't have enough money to adequately prepare, either...no one does. However, the less money you have the greater the impact.
Not sure
The Latinx and Black communities are hit the hardest. The own the fewest homes, are mostly renters, many live in insufficient housing and are afraid to ask landlords to do anything for fear of losing homes.
Our lower-income community has been hit hardest. Housing stock is severely reduced. Rents are astronomical. The availability of housing is lost.
None. Climate change is minimal if not non existent
Wildfire and resulting air quality; drought and loss of food crops
We're all in the same boat. No differences.

Responses
We - (legitimate full-time residents, not vacation/2nd home transient wealthy)- all are impacted in countless ways; fire risks, extreme heat, drought impacts on our vegetation which in turn has collateral impacts on the wellness in general of our landscape- erosion, increased dead vegetation/fuel for fires, terrible impacts on wildlife which we have observed seeking food/water more and more in developed areas, near-constant anxiety living with/witnessing all of the above, social impacts as more bickering and arguing on social media and in person over water restrictions and other climate impact related issues.
People living in high risk areas: forested, river, dry areas
The poor are always disproportionately impacted by any societal events. This is why there cojbty needs to stop taking actions and ensure they take no future actions to increase the cost of living. You hurt the poor more than anyone.
Renters. The cost to rent a home in Sonoma County has gone up so much since the fires. Landlords took advantage of the sudden demand and the market never corrected itself.
Don't understand the question
100% loss of home, shop, barn, guesthouse and all possessions in Glass Fire.
all of us will be affected in some way specific events will dictate who and how extremes of all effects will be hard to specify in advance
we have not been impacted
those whose insurance companies dropped them
Wildfires are mostly due to poor land management not climate change
Uncertain how to respond to this question. No matter what, if anyone needs to leave their house, there is a lot of "unknown" every day life issues that need to be sorted out, i.e. where to sleep, shelter, food.
Elderly relative who could not get out of Oakmont in a timely fashion. Daughter who could not get out of Santa Rosa because all the streets were grid locked. Perhaps planned evacuation routes for the community might have helped.
The unhoused are always at greatest risk. But also people with disabilities and medical issues.
All members of my community of Guerneville have been affected by wildfire. Because the updated fire hazard maps now show Guerneville to be in extreme wildfire danger, many of my neighbors have had their homeowner's insurance canceled. My homeowners insurance has tripled in the last three years.
Seniors, non-ambulatory community members, and those with medical disabilities requiring the use of CPAP, refrigeration for insulin, etc. Back-up batteries supplied by PG&E only provided 2 days max power backup for devices.
unhoused, low income some neighborhoods are particularly vulnerable and the occupants are likely to be the least resourced.
Those in the hazard zones
Too early to tell...but people are leaving this county because of climate change and a crappy political environment. Me...I'm old, I'll deal with it as it presents itself.

Responses
I am disabled and a power wheelchair user with a lift equipped van. In the 2017 and subsequent fires, I have been without power for days and sometimes a week. Electricity is my lifeline. Without power, I had to get somewhere to recharge my chair. Without power, I got sick in the wildfires because I was too hot and there was no AC. There were no hotel rooms in the area (2 had burnt down). A backup battery with a solar charger would have been helpful, but there were none. Recently, flooding has also been an issue as there have been moderate landslides and we didn't know who to call for help.
n/a
Cost of steep forested hillside clearance is much higher than grant allowances. Roads are too narrow for chipper service. County doesn't maintain fire ladders over narrow public roads.
None
Everyone in our community has anxiety over wildfires. Some have moved away.
Family members lost home. Had to evacuate multiple years. PTSD.
We are all impacted in different ways.
seniors, lower income people, they have less resources to evac so are stuck tio have top ride things out here,m and then white property owners get the lions share of the aid
People of color and people with low incomes are disproportionately impacted--they have jobs that put them in harms way; live in housing without AC
fires,
Elderly, disabled, unhoused, impoverished and non-English speakers. Fewer options for evacuation, fewer resources for information and guidance, and typically fewer friends and family to rely upon.
None, events mentioned are naturally occurring events that have been observed and occur throughout history.
Fishermen out of work Too many tourists fleeing covid overloading our town During flooding difficulties getting out of town
Some members of my church lost their homes in 2017. Several evacuated during the various fires.
2017 fire survivors obviously, but also all of the residents who have lost power for days on end due to PSPS events in subsequent years
Unless we , everyone, takes climate change seriously....it's only going to get seriously WORSE. Governmant needs to lead by example and offer substantial rebates/incentives for transition away from fossil fuels.

Responses
Not us, we have resources. The folks I worry about reaching and caring for work everyday and don't have the resources: money, time, educational attainment/plugged-inness....to navigate + understand. This is "happening" to them. I genuinely believe you need to spend money on, and give power to, trained organizers and public communications people so you can reach folks. C.O.P.E. orgs + PIOs try, but they just don't know what they are doing. Public comms + community resilience building are treated as secondary "outreach" or "education" efforts. Until you take this piece of the work seriously, and prioritize it by devoting money and authority to the fields of research + practice of public comms and community organizing, you've got the wrong end of the stick when it comes to reaching impacted communities.
Those without other homes to escape to and those without backup power.
None
They had to evacuate several times, lost power many times
That's WEATHER, not "climate change". Start telling the truth. And the wildfires were from horrible forest management due to insane "green" policies.
All
Those living on the river front. Those whos homes and property burned

Question 12

Which community groups should the County prioritize with assistance? Please describe.

Question 12 was an open response question asking respondents which community groups they thought should be prioritized for assistance. 426 people responded and 127 skipped this question. Detailed responses to this question are available below, though some key themes included:

- People with low incomes
- People experiencing homelessness
- Seniors
- People with disabilities
- Farm workers
- Renters
- People who speak languages other than English
- Undocumented people
- People with inadequate access to transportation
- People located in hazard zones
- People were impacted by extreme heat, fires, power outages, floods, anxiety and being out of work

Responses	
Farmworkers, low-income people of color (Latinos, Indigenous groups, Black, Eritrean, Vietnamese, Cambodian, etc.) who have historically been marginalized by people who have more power and privilege.	
IDK	
Communities with one way in or out with lots of trees.	
Elderly	
Definitely the elderly without family nearby. They are helpless in emergency situations.	
Unsheltered, elderly living alone, those with disabilities	
Lower income residents who cannot afford necessary upkeep. Improved public services response in District 7.	
Low income families, farm workers	

Responses	
Homeowner who live, work and pay taxes into the county and create a stable year-round community. Next community businesses. We need to make sure that the permanent resident community has the tools they need to prepare for climate change so that there will be an ongoing community.	
Personas mayores, escuelas y familias bajos ingresos y personas situation de calle	Seniors, schools and low-income families and homeless people
Bicycle commuters traveling between cities. Residents installing composting toilets and greywater systems. Community garden advocates. Adobe, strawbale, Earthship building contractors	
low income families. There don't seem to be as many services to help re-home families as there are for individuals. Also homeless encampments regardless of the occupants are damaging our natural resources particularly waterways with trash and fecal wastes. This a health and economic issue for all county residents, tourists and business owners	
I think the county's role is to help the entire population not selected preferred groups. The thing that's in your remit is reducing the overhanging trees in the rural road ways so that they don't burn during evacuations. Use resources on things already your responsibility rather than looking for a new mission when current tasks are undone.	
Essential workers, very low income people	
Low income	
elderly and those without the needed resources. And don't make it so difficult	
Sonoma Valley Collaborative.	
Low income renters and the elderly who are often on low fixed incomes.	
The elderly	
Don’t rob people of the opportunity to prepare themselves, to engage in their own strategy and live consequences if they don’t. It is a balance.	
Seniors, low income community, homeless, people with pets.	
Fire mitigation groups supporting prescribed fire, planned burns, large scale fire breaks, roadside shaded fuel breaks, etc. Put the money into establishing and then maintaining fire breaks in key areas.	
Same as above.	
Individuals who are without vehicles, or otherwise need assistance in evacuations (partially or fully immobile who would usually need to rely on private/public transportation to get to a store)	
Close to river and wuie	
Lower-income, elderly, renters	

Responses	
Low income renters, elderly living alone/isolated	
The health and safety of those with threatening proposals like Canyon Rock & increase in population without roads out.	
No lose	
Emergency preparedness education and safety training for lower income families and elders, as well as their neighbors would be key. Having neighborhood level safety committees or teams who could aid and ensure the safety of more vulnerable neighbors (e.g. single parents with young children, elders with mobility challenges, non-native English speakers, etc) would lessen the burden on first responders and reduce potential casualties.	
Those affected most	
Middle class working families who have no extra money left over to make improvements..	
Homeless and those living at or below the poverty line.	
Low income communities and families. Single parent households and households with young children. Outside workers. Renters.	
renters because they get very little help unlike home owners	
no sure	
not sure what this is asking. Seniors?	
Homeless and farmworkers, elderly and homebound.	
the poor and the elderly	
Eldridge for All. The SDC design will be a hazard from every point of view except those making money off of it.	
Those living in a flood way or WUI.	
Trinity Oaks see above. In Glen Ellen	
Senior citizens	
Homeless victims first but also programs that help families, single homeowners, transition to green energy	
Those in danger zones and renters	
Elderly and young children	

Responses	
La gente que no entiende el idioma inglés y que no saben mucho de recursos no como conseguirlos	People who do not understand the English language and who do not know much about resources nor how to find them
All citizens are effected by the homeless problem and the problem of no consequences for criminals.	
Elderly should receive top priority; infirmed people need first care. Children. Water, food and shelter.	
elderly	
Don't understand the question. But I think the county should aid elders, people with disabilities, folks with limited resources, un housed in getting out of harms way	
The poor and homeless.	
tenets, working poor, non-English speakers	
None, fix the roads	
Seniors, non English speaking.	
The biggest action to fight climate change is FREQUENT and inexpensive Mass transit. Not electric buses---MORE Buses, with routes and frequency that make them an actual alternative	
Those who experience the most devastating losses.	
Aging, disabled, poor, undocumented migrants/residents, houseless	
Fire Department needs to evaluate neighborhoods and order changes where needed.	
Elderly. People on the edges of town nearest an active fire,	
The homeless & the lower class	
Elderly.	
Low income	
Seniors, low income that don't have cars to use during evacuations.	
Mas ayoda con la clinica, allodas financieras	More help with the clinic, financial assistance

Responses	
Emergencias climaticas ayuda economica de emergencia informacion acerca de los recursos, vivienda mas economica y que uno pueda ser eligible ademas [[illegible]] que voluntaron para estas emergencicas COAD undocofound fueron unas de las organizaciones que esta vez nos ayudaron por medio de Lupa Catalan.	Climate emergencies, emergency economic aid, information about resources, more economical housing and that one can be eligible also those that volunteered for these emergencies COAD undocofound were one of the organizations that this time helped us through Lupa Catalan.
Grupos que realmente apoyen en las emergencias con ayuda economica como undocufound y COAD y tambien con informacion como cafecitos que fueron voluntarios o do esto atravez de la [[illegible]] Lupe Catalan.	Groups that really support emergencies with economic help such as undocufound and COAD and also with information such as cafecitos that were volunteers or do this through the [[illegible]] Lupe Catalan.
Elderly, disabled, chronically disenfranchised ethnic groups, people experiencing poverty who have paycheck disruptions when they can't go to work (often hourly work) during a disaster.	
Que si van ayudar que se emergencia	That if they are going to help that it is emergency
Sin hogar, sin estatos migratorio que no califican para ayuda Federal, los de bajos recursos	Homeless, non-qualifying immigration status, low-income
Que pongen a lupe de regreso porque hera la que nos ayudava	Put Lupe back because she was the one that helped us
Those on step hillsides with poorly maintained roads, fire ladders and unrepaired landslides.	
Toda la comunidad	The whole community
Informacion con personas	Information with people
Cafecitos	Coffee
[[illegible]] cafecitos recorsos de [[illegible]] y la ayuda de emergencia de estas inundaciones	[[illegible]] Cafecitos, resources, and emergency relief from these floods
Poor people	
Seniors	
Los grupos existentes como cafecitos y almas libras etc. Los que pueden tenar axeso a fondos y que lo entreguan de inmediato	Existing groups like Cafecitos and Almas Libras etc. Those who can have access to funds and who deliver it immediately
Transportacion, parques recreatues club, bolly	Transportation, recreational parks club, bolly
Alluda monetaria	Monetary assistance

Responses	
La gente mayor y la comunidad latina	Seniors and the Latino Community
Personas de avanzada edad, miembros del area del Rio. Grupos latinos que trabajan en el campo.	Elderly people, members of the Rio area. Latino groups working in the field.
Mas alberges para hispanos	More shelters for Hispanics
The homeless, poorest members of our community. Their needs are the greatest and the least met.	
El clima, los incendios	The weather, the fires
Información	Information
Watch Duty	
Low income	
La comunidad latinas	The Latino Community
[[illegible]] transportación	[[illegible]] transportation
Disabled, Homeless and lower income populations that are most vulnerable.	
Low income, elderly, and homeless.	
Seniors, disabled	
Low income, who don't have ability to replace food and or stay a hotels when they need to evacuate. Middle income who would invest in solar if they had the time and downpayment	
renters and elders	
Seniors, veterans, and people with disabilities; specifically homebound individuals.	
Native Americans, low income, disabled	
Low income, elderly	
This question is highly dependent on the impactful event.	
Low income	
Seniors.	
None.	
Elderly with free heat and AC	

Responses	
People with disabilities and the [[illegible]] organizations that provides services to them, [[illegible]].	
I think we all saw that disabled, senior, lower income, and homeless people were very impacted by the fires and floods. They would be my first choice for priority.	
Elderly, assisted living facilities, etc. Also, geographic areas where there is a high percentage of older occupants who do not use technology.	
Sonoma Marin Fair Grounds.	
unknown	
Elderly and working poor. Make resources available that are affordable. Give stipends to help update and repair homes.	
People who don't have adequate funds to find temporary housing.	
Taxpayers	
Vineyard workers and homeless	
Seniors, especially during evacuation. Confusing, emotionally difficult, expensive, difficult physically to gather belongings and oets.	
Folks living in uninsured dwellings in high risk flood and fire (WUI) areas.	
Highest severe fire areas and don’t overbuild our small streets.	
Northern Sonoma County Fire District.	
low income, renters, houseless	
American Red Cross for shelters, Community Colleges, City and county parks departments and private campgrounds for RV camping	
Asistencia de vivienda , medicamentos auxiliares máscaras de oxígeno contra el humo agua alimentos y artículos personales para bebés como pañales , ect,	
I feel this is a leading questions and find it really frustrating. Focus on the areas that are most consistently fire - disaster prone - ironically may not be those with the most diversity from an equity standpoint and may not have the lowest incomes.	
disabled, elderly & economically challenged	
Neighborhood planning	
Low income	

Responses	
Low income renters. Especially seniors.	
Seniors, homes with livestock and narrow roads	
Groups to reduce emissions of greenhouse gas and air particulate. Sonoma should have a program to get every resident into an electric vehicle, and to get every home energy efficient.	
Elderly and/or handicapped. This is the group that has the highest number of deaths during an emergency because they don't have help and are unable to help themselves.	
?	
don't know	
Where there is a lot of dead grass, dry trees, etc. Where the PGE lines get caught in trees. Transformer issues.	
low income communities including financial support for undocumented residents who may not qualify for federal programs.	
Low income	
Low income service providers such as La Luz and Corazón	
Immigrant/undocumented and the unhoused.	
Elderly and poor	
Native plants and trees. Communities that speak other languages than English. Communities with low access to Internet and phones.	
los mas vulnerables, los que no hablan el ingles y los que fueron afectados directamente.	the most vulnerable, those who do not speak English and those who were directly affected.
Plan for the entire community not just a few. Such events knows no boundary. Its not a economical issue or race issue. Its a planning issue	
Disabled, Families with children, those on Medi-cal	
all low-income residents of the County who are affected	
Low-income people, unhoused people, limited-English-speakers	

Responses
Elders without support. Persons without shelter. Persons without means to help themselves. Persons who truly need assistance.
Planning department and city council should stop allowing construction in 500 year flood zones. Army Corp of Engineers should revise 500 year flood zones based on best availblescience instead of ignoring climate change.
Marginalized groups
Monolingual Spanish speakers, undocumented people. Wealthy white folks in the WUI are already organizing themselves, have tons of resources at their disposal, many lots of time and resources to put towards emergency preparedness and organizing their neighborhoods. The system already takes care of them. In SV, think about the dense Springs, also farmworkers being asked to work in hazardous conditions.
I am not aware of many of the community groups within the county.
Everybody
Low-income residents, farmworkers and others who work outside; people experiencing homelessness, seniors.
seniors, people without personal transportation
Elder
Elderly,
Not sure
Low income
I don't think they county should prioritize- I think they need a universal plan for all - Super inclusive so no one feels left out. Maybe create a mentor program for those that may need assistance such as the elderly who don't have family with them. Same for those who can't understand English- find a mentor who speaks English and can translate. You could create a site that connects people- take the time to vet and connect. Lots of other sites connect people.
Older folks. Poor folks. Those who went without last time and will, no doubt, go without next time.
Homeless
Less government.

Responses
Old people and anyone who does not have transportation or the ability to evacuate as necessary.
Those with low income, especially low income renters, and those with chronic health conditions, or who have no access to transport for evacuation.
Everyone
Groups that live in the Laguna area should be helped with flooding problems.
assistance should be income-based
I don't know.
Low income families (tenants and home owners alike)
The groups in at risk area's should prioritize being ready and the County can assist by highlighting the risk and what they should do. People need to be responsible from themselves, the County shouldn't accept being the go to person
Lower income people who are not able to afford lodging during evacuation.
Local fire and police, search and rescue, communications improvements, don't know exact community groups....? I live in Cloverdale, City of at edge of County lands..... your question would be clearer to me with example, i.e. _____
elderly, disabled
Low income living in flood plains and WUI and along the Roger's Creek fault
High fire threat areas with concerns around evacuation, vegetation management (whether private or public properties), and lack of reliable communications. Areas at risk of flooding, especially those that have experienced flood damage more than once.
Elderly, low income and socially isolated people. They may have the hardest time responding to emergency and lack alternate resources for temporary relocation//evacuation.
Non-car community
THe elderly and the disabled
Marginalized, poor, elderly, school childre
Especially farm workers. Low to low-middle class folks.
I think a top priority should be seniors living both independent and in assisted living facilities.

Responses	
Anyone who needs assistance in creating defensible space and hardened homes. No income requirements - just make sure that all homes are safe and protected with home hardening practices. My friend who is very intelligent and well informed had never heard the term home hardening when I spoke with her yesterday. EVERYONE in our county should know that term, what it is, and how to do it. Funds should be used for local education, but everyone in a fire-prone area should be receiving help in making their home safe.	
Maybe Code Enforcement & Fire Prevention to resolve nuisance properties that present a nuisance	
Low income population, kids and immigrants	
Elderly and infirm.	
Those living near creeks, the Russian River, and in WUI zones.	
non-english speaking, low-income BIPOC	
working families.	
Farmworkers, homeless, elderly living alone, non-English speaking.	
Renters who can't afford to do modifications and their landlords won't assist.	
Low-income.	
Everyone during an emergency	
Senior care facilities.	
None	
Stop trying to create division.	
Elderly and handicapped.	
Everyone where is dangerous conditions. Odd question.	
Doesn't it seem obvious? The working class and the infirm and elderly.	
Disabled & Elderly	
Boyes Springs area. La Luz	
All	
None	

Responses	
Low income, POC, elders	
No comment, I know you are looking for equity, diversity etc.	
Everybody, or alternatively, only those whose lives the county decides are worth saving	
The elderly	
Immigrant members, indigenous - languages in addition to English.	
unknown	
None. I want my hard earned tax dollars to go to police, fire and roads etc. Infrastructure!	
Russian River Senior Center and other "help" centers.	
Those in flood or fire prone areas.	
People with disabilities Low income	
black	
Sr citizens and disabled	
Those who need the support	
Senior centers	
Elderly people and others with transportation challenges	
Seniors	
The elderly and less able.	
Farmworkers and people working in jobs that are greatly impacted by the element. Also, people loving in the areas that flood and burn repeatedly	
those living along known flooding areas during rain season. Fire season near high danger forest fire areas.	
Lower income, non- or limited-English speaking people, farmworkers, rural or unincorporated neighborhoods and areas.	
Unhoused or insecurely housed, farmworkers.	

Responses	
People of color, low-income, families	
Elderly, low income and disabled	
Those immediately affected	
Homeless, Elderly and disabled. During the recent rain storms, we were advised to stay indoors and seek shelter. There were limited options for the homeless population and a lot of them were left on the street in the rain.	
Seniors	
Mental health assistance for our homeless is most important.	
The County should treat people impartially and treat everyone with respect and strive not to be biased. But you have Lynda Hopkins' already perfect road getting repaved, and the roads where only 10 rich people live getting repaved when those roads don't need it, while 350 people in other neighborhoods have the shocks on their cars go out in less than 2 years because of potholes, trees go down blocking the roads due to landslides, and the County actively ignoring the people's courteous requests for basic government service in these areas.	
The county needs to create & repair (dredge) existing water supplies. Everyone would benefit from actual maintenance & creation of more storage. PG&E should continue burying power lines & everyone should be conscious of their defensible space.	
Low income people.	
Homeless	
COAD is doing a great job reaching those who need assistance. Let's fortify that network.	
The elderly and disabled.	
All people who live in flood areas	
More air conditions during hot spells. Reduce fire hazards for all.	
Disadvantaged.	
All people have phones so priorities for specific community groups aren't needed	
Prioritize helping people who have lost their homes deal with changes to their property taxes.	
KSVY for announcements & information	
anyone where the wind takes the fire	

Responses	
Any that can help communities mitigate the varied consequences of global heating.	
Local residents, definitely, over those with weekend/vacation homes and air bnbs	
everyone is equal there should be no priority except for Seniors	
Deal directly with home owners. Not community clubs.	
Seniors and low income.	
Lower income.	
Elder and low income	
Elderly and low socioeconomic	
The community that lives here already. More growth = more chance of wildfires + water shortages + less ease of access to evacuation routes.	
Those least able to adapt: poor, homeless, out of work, lost their vehicle, and they are already needing help.	
UndocuFund. Foodbanks. Catholic Charities	
Low & middle income households.	
Homeless, poor, immingrants	
None	
Low income	
Homeless. Seniors. Farmers	
One group would be the homeless the disabled.	
Marginalized communities without the resources to protect them selves.	
Isolate elders died disproportionately in wildfires. Make support EASY and accessible. Non-threatening. They are easily overwhelmed.	
Low income. Not just classified section 8, renters of all sorts are typically low income.	
elderly people who live alone	
those w/o a financial or political agenda	

Responses	
Don't know	
The ones that are most at risk from a particular event and/or are expected to suffer the greatest recovery lag	
Homeless and the elderly and disabled	
medically fragile persons, homeless, seniors	
no clue	
Farm workers with sub standard housing, outlying areas with limited services on the best of days.	
poor people, people who live in flood zones	
Farmers	
Elders, Disabled People, Those who can't easily get transportation, and/or can't afford to pay for temporary housing.	
Multi-faceted answer. Drugs/mental illness being huge contributing factors to the unhoused. I have been advocating for a program like "Homeward Bound" (Marin Co.) be implemented in So. Co. for years. I would assume low income seniors or disabled would benefit greatly from assistance as ell.	
Lower income families, homeless individuals	
None. Assist as necessary	
Poor. Unhoused.	
None. No specific group is affected more than any other. Even this question is divisive.	
focus on the best bang per buck, not specific community groups	
vulnerable seniors and people with disabilities, especially in West Sonoma County	
Ag workers, lower income and renters	
Renters (via homeowner upgrade subsidies), unhoused persons	
Farmworkers, anyone without the means to stop working or be protected in high heat and I smoke events. Community members with unsafe or unsecure housing	
The elderly. People who can't physically fend for themselves.	
Mental health crisis workers! You cannot depend on the current county workers to be both.	

Responses	
Elderly	
Educate renters about renters insurance. Require landlords to be fire safe if near UWI.	
The poor needs help the most from the war on fossil fuels.	
Renters. The county should reach out to all renters and figure out a way to get everyone affordable insurance.	
None	
Low income & disabled	
The elderly regardless of location, race or political affiliation. Cooling and warming options should be available to all that don't live in a home with adequate HVAC units. Busses need to be brought into communities that rely upon public transportation or can't drive any longer, well head of the need to evacuate. Retirement and nursing facilities should have a vetted, well laid out plan on how to evacuate those in their care.	
The populations I have mentioned above, but also don't neglect others. Have a balance. I have seen people focus on on a few groups and the others suffer and become disadvantage while uplifting others.	
elderly and disabled. These are the most vulnerable, least amount of access to transportation for evacuations, often few financial resources.	
None	
Fire department	
Grupos de bajos ingresos, ancianos, indocumentados.	Low-income groups, elderly, undocumented.
Elderly	
Those with limited income/resources who live in areas vulnerable to disasters, those whose employment is negatively impacted by disasters	
Seniors with pets	
Elderly. They often have multiple issues including mobility.	
None, government is not the solution	
All	
The unsheltered, low income renters and low income home owners at risk of losing their homes.	
Seniors - fixed incomes cannot comply with all the mandates	

Responses
Tribes, Native American community members. It feels like the County oftentimes assumes that Native American community members only receive support from their Tribe which is not always the case or can be limited . Local non-Native non-profits also appear to be uninformed about the needs of our Tribal communities. Recently it was voiced to me that they believed that Tribal members only reside on reservations, which shows a complete lack of understanding regarding our Tribal community presence throughout their entire homelands.
Low income residents
I don't think this is the way to go - instead focus on the events to be addressed - fire prevention in the first place , water saving when good tears, upgraded or new inventions in fire prevention , saving all the evacuation and loss of homes
I'm not knowledgeable about community groups. Sorry!
?
Whoever can help clear and replant hillsides along Mark West Creek.
Do not understand the question
Those who live in the most vulnerable areas and low income folks.
Homeless, low income, those most geographically affected by climate change
Assisted living, elderly.
Elderly
Elderly, children/youth, low-income, disabled.
Renters, Srs, mobile home parks, those in geographically isolated areas (rural)
Elderly and those in assisted living who cannot evacuate themselves
The most vulnerable: Elderly, physically & mentally challenged, farmworkers, the struggling worker class.
Low income
See above.
Homeowners
LatinX Seniors who have limited access to transportation
Minorities, elderly, the socially isolated, poor.

Responses	
Landlords so they can make improvements to apartments,	
Definitely Seniors	
The elderly	
I do not support the government taxing citizens for these services	
All	
Those doing manual labor and undocumented folks who don't qualify for federal relief.	
Every American deserves equal service from their government! ALL HUMAN LIFE MATTERS!	
None - the County should treat all citizens equally. Priorities should be based on actual, quantifiable, geographical risk to an area, and focus can then be placed on assisting citizens in that area.	
Seniors, low income. The county also must address infrastructure to handle traffic. In the even of a disaster that requires evacuation, there will be gridlock and life will be lost because of it.	
low wage workers.	
La Luz Comida para todos Cura project	The Light Food for all Cura project
No idea.	
The fire safe councils. I co-founded Fire Safe Occidental. Fire Safe Sonoma should reach out to any new fire safe councils and help them develop local CWPPs so each community has a prioritized customized list of "action items" to help make their community more fire-protected.	
Farmworkers need support from the County, State, Federal, and the farming community - specifically the vintners. The Grape Growers make a big deal about how supportive they are of their farmworkers, but they also say 'no one has come to them for help' - maybe they should OFFER to help!	
LOW INCOME FAMILIES WHO MAY NOT HAVE GOOD MEANS OF COMMUNICATIONS. THESE WOULD INCLUDE ELDERLY, YOUNG FAMILIES, HOMELESS	
Seniors - all the focus has been minorities. Take the dialogue and expand it to encompass non minorities as well.	
Responsible taxpayers.	
Stop goving resources to churches and private businesses and help people who actually live here directly.	

Responses	
Nursing homes	
Everyone should be treated equal.	
See above comments.	
homeless, low income, immigrants	
All	
Rural residents have less supportive infrastructure. Maybe start by maintaining crumbling roads & roadside trees.	
All.	
The ones that are most affected.	
Low income renters impacted by disasters. The owners choose to purchase in high fire or flood areas and should not receive aid.	
rural residents	
low income	
Seniors. Disability. Language barriers.	
No idea	
Spanish speaking low-income residents. They have fewer transportation resources, less connection with English-language news and emergency alerts, and if they are seniors, no younger people in the house connected to social media to spot evacuation alerts. And low-income people in general - they need a safe place to go, and one where they can take any pets.	
We need to fix drainage and fire threats on County and state land first but please be efficient with money	
Homeless and then people in fire and flood zones.	
1) Seniors and mobility-impaired. 2) Low-income and homeless people. 3) Non-English speakers	
Low, Low middle class and in Sonoma County middle class.	
The middle class and the people living in the unban interface.	

Responses
Rural residents
Low income and most vulnerable populations including those in the wildfire corridors and flood zones.
People who don't have other resources
Latino community and underserved.
Elderly and lesser-abled
Those who lose their homes to wildfire.
Elderly and disabled.
Services for unhoused people. Not sure about others.
The homeless and low-income families should be a priority.
Farm workers - homeless and elderly without transportation-
Undocumented individuals, low-income families, homeless individuals
Farm workers
Homeless, seniors, low income families
Elders and the poor
SENIORS!!!
all groups in need
those impacted by wildfires or floods. We have applied 2 years in a row for the county grants to remove dead trees from out shared road, but have not been granted anything
Why are you singling out certain groups? all are vulnerable.
Frankly, everyone needs priority, even if those with less money have a harder time. Reality is that fire, in particular, doesn't care.
Old people and people with large animals
BIPOC communities.
Low income.
Tax payers by lowering property tax and not pissing away money

Responses	
Elders and physically compromised...need AC and electric.	
Everyone	
I find it sad and repugnant that this survey asks this. I'm not even sure what kind of answer "Which community groups..." might be looking for. This is a global, all-hands on deck, all-communities issue. It appears to be searching for a place for proverbial bandaids, triage, instead of addressing the root issues. I was disgusted to see this year the grass was ripped out at Maxwell Park and plastic turf is going in. This is an ecological disaster- it is heat producing, soil-killing, wildlife averse. Even dry grass is preferable-- or better yet, native grasses would be ideal. I have the impression it's all about appearances however-- these kinds of (incredibly expensive) moves are egregious in the face of the struggles our environment is undergoing. I believe it's imperative the general environment/ecology of our respective areas needs to be nurtured with greatest care. Hire more ecologists and environmental people. Plant more native trees. Everyone would benefit, not just certain community groups. I see egregious waste of water by second home owners who come from San Francisco or where ever to visit homes here with lush landscapes with huge lawns and pools who contribute nothing to the community. (Private wells still deplete the water table). I don't know what the answer is to address that but it's having a negative impact on our area and full-time communities.	
None	
None.	
Low income. Single parent households with young children.	
Disable	
The tax payers!!!	
Those of little means and great need.	
Come on... the ones with the least access to resources (money) or who are forced to live in the worst affected zones (except Fountain Grove, for instance)	
those off the grid without communication access	
How about making it even and prioritizing no one group	
Any county area that maybe impacted by fire or storm, no particular group	
Everyone needs help during these times one way or another. No one is better than someone else.	
Elderly	
Unhoused, disabled, undocumented (because they can't always access other resources), poor.	

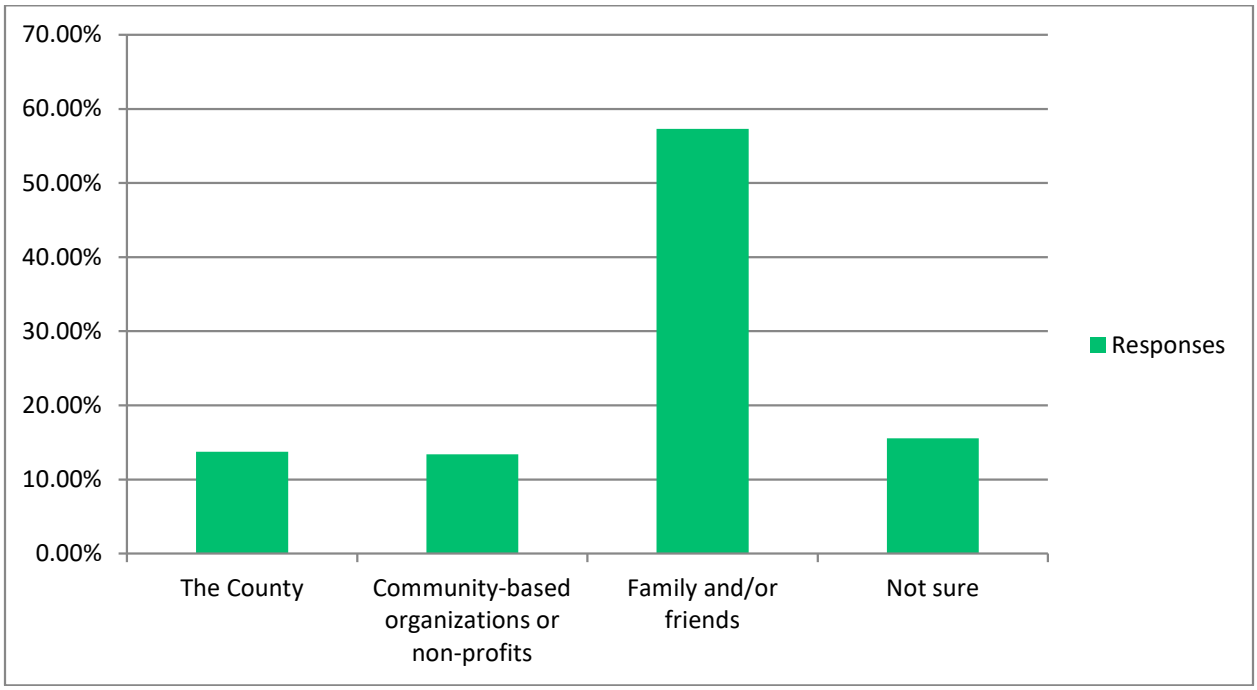
Responses
Probably the fire fighters as they have outreach into the community.
Safer West County, WiConduit, Cazadero Community Club, West County Community Services, Lower Russian River MAC, the Coast MAC
unhoused, low income with kids
I worry about the unhoused population, I think continuing to work to help them find stable environments is a priority.
Those w/o resources to take precautions. Outreach to those who live in the perimeters of fire danger zones.
agricultural workers
The old peoples homes and those that can't help themselves
Elderly people & disabled people - allow citizen to voluntarily add their age and medical issues to the fire and police databases based on their residence so we can flag vulnerable people when they are in a disaster area. I would love to let fire and police know my situation in an emergency event.
Anyone classified as an essential worker. Anyone considered low income in an identified risky area (ie near a creek for flooding, or heavily wooded space for fires).
Very disappointed that the Guernewood Neighborhood Association was able to get a 500K grant to do fire clearance at the ridge line and to the west. This would have been better used in the more populated areas with smaller lots. Making organizations the greater benificiaries of funds isn't fair. We are at greater risk of fires starting between the Russian River up to the ridge line where many visitors are careless with fires and homeless campers are being moved further up the hills, away from easier fire service access near the river. The county should be taking funds to do road clearances and repairs.
Those in hardest hit areas, the low-income and mobility-compromised.
Those communities that are without power or communications. Because there is lack of information.
none
lower income of all stripes, Latinos, Blacks, seniors
Groups that lack financial resources to prepare for climate change hazards
Police and CDF and fire
Elderly, disabled, unhoused, impoverished and non-English speakers.
None
Seniors for one.

Responses	
Medically needy, seniors, homeless	
Corazon, Catholic charities, Food banks...all good. But you should tie assistance to hiring organizers and public comms people (from the private sector, nonprofit comms shops like Fenton) in *leadership* positions. You need to see community organizers on Boards and in the C-suite. Any group that thinks community outreach is a social media/P.R. functionary is not thinking about the work correctly. Give money to groups building power and resilience from the ground up. Full stop.	
Those who cannot afford to retrofit where they live, afford to move, afford internet, or afford heating/cooling	
Elderly	
People living in flood prone areas.	
poor communities and renters	
Me.	
All	
elderly	

Question 13

If you or your family were impacted by a hazard, where would you turn for resources?

Question 13 asked respondents where they would turn to for resources if they were impacted by a hazard. All 553 respondents answered the question, and none skipped. Most people said they would turn to family or friends, and few said they would turn to the County or non-profits. Over 15% of respondents said they were unsure about where to go for resources.



Question 14

What types of resources or programs would you like the County to provide to help people in Sonoma County be better informed and prepared for climate change?

Question 14 was an open response question asking respondents opinion on what resources or programs they would like to see the County provide to help people in Sonoma County better prepare for climate change. 413 respondents answered and 140 skipped the question. Detailed responses to this question are available below, though some key themes included:

- Easier access to information
- More community-building events
- Financial resources such as grants or other assistance
- Updated emergency notification system
- Adjusted land use standards to accommodate the changing climate
- Resources available in multiple languages to eliminate language barrier

Responses	
Funding for lost work days for undocumented farmworkers so they don't have to work during disasters or in dangerous situations (due to fear of losing income)	
IDK	
Don't know	
Assistance with arid adapted plants to replace lawns.	
Skip the info part and go straight to disaster evacuation program where people can opt in, and elderly are automatically enrolled.	
Help and support the US to reduce global overpopulation and big business. I know it will not happen, but it is the only real solution in my view. Half the population half the big greedy cooperation's taking all the resources and we could reverse climate change within 2 generations. The concept of continuous economical growth big government and big business share with finite resources is ridiculous and deadly. It is absolutely mad to believe it that.	
Code enforcement. Code enforcement. Code enforcement. Street maintenance	
Targeted education programs, low or no cost emergency kits, accurate information about evacuation routes a access to emergency shelters	

Responses	
Emergency kits, more landscape & hardscape resource & grants, videos on YouTube reviewing ways to prepare	
Más información y recursos	More information and resources
Nonprofit demonstration sites. Sonoma Clean Power the Grow Biointensive Jeavons Center and Sonoma Ecology Center community garden are examples	
invest in infrastructure that makes recycled water use available to all county facilitates and educational institutions. Where recycled water use isn't possible/available replace medians and ornamental landscape with drought tolerant vegetation. Plant more trees that are drought tolerant natives. plan for hotter climate when replacing trees especially along creeks and paths. Then advertise that the county is enacting its own lawn replacement program. renew/reinvigorate drought programs such as lawn replacement, low flow appurtenances and elevate drought messaging to ensure residents and ag users understand that one season of rain does not end the need for conservation - consider billboards, newspapers, radio messaging to reach the general population as well as disadvantaged persons which may not have time to or even know to receive listserv and other typical alerts, accelerate/require and fund more robust science education at all levels elementary, middle and high school including action based education programs to help creek stewardship, enact water conservation on campuses, consider direct $$ partnerships with NGOs such as Conservation Works, Laguna Foundation, Pepperwood Preserve and others already working with youth towards environmental stewardship, build groundwater infiltration basins - pay for easements to place these wherever needed possibly on existing ag lands, continue and accelerate ag and open space district programs, provide assistance to elderly and low income residents to clear defensible space keep and/expand where possible requirements for riparian buffers to provide fire breaks and corridors of refuge for wildlife. promote carbon sequestration through county ag commission. So many more things.....	
In my lifetime the benefit of any climate change response by the county, if any, is dwarfed by existing work the county could and should be doing in normal course. For example, just speeding up the permit process for rebuilding and improvements would benefit residents more than anything the county might be able to do with regard to climate change.	
Repeated, evidence based information on the facts about climate change, how climate change affects our health and safety, whom it will affect the most, and what specific actions we can/should take.	
internet access	
?	
We have large trees down that are now fire hazards and no means to manage. Some might be neighbors. What does a person do?	
Provide mandatory fire-safety improvements to be made by landlord without cost or retaliation to renter.	
First, make it illegal for residents and businesses to have lawns. Huge waste of water. Stop cutting down so many trees. Within one block of my neighborhood, ten HUGE oak trees and three redwood trees have been completely obliterated. All within one block. Make sure every household has wifi.	

Responses
Improve roads, improve fire response, and consider water use when allowing hundreds of cannabis producer that use millions of gallons of water.
We need to be careful what we ask for, we are our own first responders.
Develop agressive programs that work to reverse climate change. Much more extensive public trancit to reduce automobile use. A much more comprehensive recycling program for all materials, including curbside pickup. Encourage better distribution of resources in housing policy--smaller homes, better building materials and appliances.
Education, financial assistance with home hardening and defensible space.
I would like the County to be proactive in planning for the future to avoid worsening the situation. This means STOP approving high density development in rural, high-fire risk areas such as SDC and Hanna Boys center properties in rural Sonoma Valley.
Stay Kits awareness or funding assistance for shelter-in-place emergencies, or emergency services that could provide a substitute equivalent/evac options
Watch Duty is great! Also, info on home hardening and discounted rates, if any
Fire proofing, fuel reduction, evacuation drills and guidance, community emergency radio stations, emergency preparedness events, guidance for developing neighborhood groups, free emergency kits and weather radios for low income groups and seniors, ham radios, improved fire risk, evacuation, landslide, liquifaction, and flood maps.
The County should stay in their lane and worry about problems they can fix/significantly influence. Fire/med dispatch would fail terribly if there was another major fire or flood. They could not send the reverse ani/ali to evacuate people then, they couldnt do it now. They would have no idea how to think about ordering resources from Counties that are wanting to send resources but arent being contacted.
Attorneys to fight threats to our lives now.
No lose
Community trainings or establishing community emergency safety teams who receive additional training to handle emergencies. Preferred suppliers or subsidized emergency supplies.
Assistance with energy upgrades that don't require being paid back .. assistance with low water landscaping
I don't think handing out money after the floods was the best idea. There have to be better long term solutions but I don't think our local taxes can support such handouts for much longer.

Responses	
I wonder if its possible to have a well-communicated system of "climate hazard days" like snow days elsewhere but more serious. Like a way to communicate ahead to all citizens, hey look the AQI is over X, or the humidity is below Y and the temp is above Z, which means everyone is legally OFF work, OFF school and should either seek services/support at one of these places, or stay home if your home is well-equipped. That would be helpful, promoting a culture of preparedness but also not of fear - that's super important for adoption. If it's doom and gloom hyper-vigilance communication it's a big turn off. Seems it's only aimed at rich old white people somehow. It needs to feel proactive, practical, and made up of community care and solidarity, like we're all in this together.	
quit preaching dome day forecasts.	
outreach events, provide better communication to people in less traditional ways	
More training for the public. Go to work places to train and inform. Some don't have transportation to go to a training.	
focus also on prevention/mitigation of climate change by making it easier and more economical to lessen our individual carbon footprints	
Common sense and realistic evacuation designs.	
Pay Glen Ellen fire department for staff	
Something that does not cost taxpayers taxdollars.	
In question 13, my needs would be different depending on the hazard. The resources provided by the county have improved greatly by lessons learned from our past hazards	
Subsidies for climate smart decisions (solar, electric) and zoning (avoid building in danger zones, consider evacuation routes) and buy-outs when high risk properties are for sale	
I genuinely feel the county is doing its best with the available resources.	
Pues más grupos comunitarios, y mejor información en español	Well, more community groups, and better information in Spanish
Spend time and energy on quality of life issues.	
A clear plan in place would help. Resources to the masses and NOT just the rich who have rebuilt in the hillsides and other fire zones. Plans for mutual aid inplace to enact immediately.	
Community hubs and regional food coordination	
Repair the Monte Rio bridge, repair Moscow Road to enable people to evacuate. Restrict the building of large hotels in our area as roads are inadequate for evacuation, water is limited as is sewer facilities.	
community meetings, billboards, educate students, community events	

Responses	
Roadwork	
Water conservation. Stop watering grass, golf courses, parks. Flood protection. More control on wine and Cannibus industry use of water. Support produce and dairy agriculture	
Better maintenance of storm drains which clog routinely every year and aren't adequately cleared by the Public Works Dept. For fires, ensure property owners, especially those who own large lots are responsible for mowing the high grass that is very common place in the foothills. Also, continue to use sheep to clear county parks in the spring.	
Planning for inevitable changes/crises associated with the climate crisis, including moving us to neighborhood micro-grids with reserve power.	
Fire department inspections and order residents to clear where needed.	
Pick a evac code system and stick to it. More education on those codes - maybe mailings or door hangings alerting to your specific areas 'code'. More evac locations - even if just for people/animals to park. Better resources/support for animals during evac - and then recovery after	
Eliminating potential sources of fire ignition. Insuring that roadsides and county properties are fire safe.	
Platicas o conferencias comunitarias en el area.	Community talks or conferences in the area.
In the rural areas, more help with mitigating vegetation.	
The county has a lot of area that is not rural, yet so much of it's mitigation advice is as if everyone has 100 feet around their property.	
Que hacer para poder paras el cambio climatio	What to do to stop climate change
Alluda para mantener activos a los niños y pos alludas para nuestros higo financieras	Help to keep children active and financial help
Todas las mencionadas arriba es importante como comunidad la fina que haya estos recursos porque esta area es on area de desastres no solo por el rio sino por los arboles y incendios.	All of the above mentioned are important as a community its important that there are these resources because this area is an area of disasters not only for the river but for the trees and fires.
Todas las mencionades arriba es importante estar informados de los recorsos y ayuda que se necesita.	All the above mentioned it is important to be informed of the recorsos and help that is needed.
Small grants for homeowners to take care of vegetation management or buy generators to deal with long power shut offs. I'd like to see a evacuation plan that you can sign up for if you need assistance with transportation and can't get to a bus route because you're elderly or disabled or mentally ill.	

Responses	
Con ayuda de rentas y que se luego	With the help of rents and then …
Recursos para las personas que tienen que evacuar (hoteles) y para energia solar	Resources for people who have to evacuate (hotels) and for solar energy
Just getting a response from county agencies would feel like they cared.	
Estos eventos	These events
Que nos llegaran mensaves en español. Recurso para que los niños y jovenes tumeran gym en las [[illegible]]	That we received mesajes in Spanish. Resource for children and young people to go to the gym in the [[illegible]]
Para las rentas	For rentals
The county did nothing for me after the 2017 wildfire and neither did PGE	
Estar mejor informado	Be better informed
Estar mejor informado sobre todo tipos de peligros	Be better informed about all types of hazards
Talleres para combios climaticos	Workshops for climatic combios
Mas cosas servicios en español un lugar seguro, para poder ir a pedir ayuda	More things and services in Spanish, a safe place, to be able to go to ask for help
Platicas aserca de el cambio climatico	Climate change meetings
Recorsos deayuda	More resources to help us
Ferias de informacion pero la informacion tiene que ser de intercambio.	Information fairs but the information has to be exchanged.
Estar mejor informado	Be better informed
Be honest about the true causes of climate change and the urgency to reduce animal agriculture. Prioritize redistributing the wealth in this country and create a true democracy with active unions, free "factual" education, affordable child care, and most importantly "mental health. In Sonoma County you can begin by renovating the Sonoma Developmental Center and take 750 of the most severely mentally ill people off the streets.	
Estar mejor informados	Be better informed
assemblies, communicate more with the community	Asumbleas comunitances entrenumentos
Que hacer y donde puedo acudir	What to do and where can I go

Responses	
Advertise Watch duty who is already doing this	
Maybe more awareness of the nixel alerts? Maybe billboard and tc advertising	
Talleres con información acerca de los cambios climaticos	Workshops with information about climate change
Warming and Cooling Centers, Places where people can go during an emergency that provides bedding and food and activities for children.	
Dar clases de como protegernos y ayuda para saber que necesitamos	Teach classes on how to protect ourselves and help to know what we need
Solar subsidies and a plan for self-sufficient neighborhood solar grids.	
No	
Manage water table better and plan ahead for years of drought instead of catching up. Down payment assistance for solar.	
Emergency first aid courses, free.	
Alerts/warnings, transportation during emergency events geared for disabled community & homebound persons	
Easy applications for solar, help with PGE, water	
Emergency preparedness programs at the most local levels, GMRS radio distribution and training	
Outreach through community groups such as Rotary	
Unsure	
Sirens	
I don't know.	
There is nothing the County needs to do to prepare for climate change.	
How's about actually publishing real scientific data not government agendas	
Outreach, public engagement on how to prepare for climate change and how to prepare for natural disasters that may be [[illegible]] climate change.	

Responses	
I like the preparation lists and the one website for all the information (socoemergency), although that website should be more accurate and up to date. I'm thinking anything that would fund solar, HVAC, insulation, teams to assist community members who can't evacuate or prepare themselves, classes on prepping for the public (I see some of that already)	
Using the local paper to keep citizens informed.	
Mailers, website, Zoom and in person workshops (including outreach so that people know about what is available).	
Give lower income homeowners help to get solar installed without breaking the bank	
unknown	
Escape routes. Our infrastructure is a mess, roads cannot accommodate all of the cars.	
Better emergency housing.	
Lowering property taxes and allowing more residential permits to lower rents	
More and better community outreach. Use any county based contact an opportunity to inform the public about programs provided by the county.	
Ways to connect vulnerable citizens like disabled and seniors to helpers before actual disasters	
Regular Hazard assessments for homes that are vulnerable to fire and flooding. Assistance for lower income folks to fire harden and flood protect their homes, or assistance to relocate in extreme cases (thinking flood prone areas) More controlled burns to manage fuels on county lands (especially at the WUI but throughout the county as well)	
Responsible growth. Keep single family dwelling zoning intact so our roads are accessible to the residents.	
Better communication and notification programs. More vegetation management. Making fire fighting institutions in unincorporated areas publicly funded and professionally staffed and not reliant on volunteer boards with more paid fire fighters and medical emergency staff in addition to volunteers.	
Emergency preparedness kits, more online resources	
Education, Grants and financial assistance for home resiliency improvements	
Información, alertas , como y donde encontrar ayuda y apoyo en casos extremos	Information, alerts, how and where to find help and support in extreme cases
financial - both to facilitate home upgrades (solar, backup generator, other energy improvements) and assistance with extremely high utility bills	
Alerts and impacts anticipated	

Responses	
Unknown	
Education in high school with homework assignments that demand parental involvement for their education. Info booths with literature at all farmers markets and community events like the County Fair, event venues like Green Center and LBCA	
better laws with regard to where neighbors store their (stuff) that could burn and planting of trees so close to houses.	
We need to actually start doing something. Not just talking about it. People don't prepare for climate change because they can't afford it. The county needs to help everybody go green.	
Reasonable cost programs. Climate change initiatives are not feasible for the poor (electric cars, all electric appliances, etc.). If you want us to drive electric cars instead of gas -- make it affordable for us to buy electric cars. You took away new gas stations, but did not give us a reasonable alternative for transportation.	
Clear policy on alerts	
Everyone should receive notice of what's happening	
mowing their dead grass, etc. Landscape care. Inspections	
financial assistance	
More information on groundwater supply issues and prep for future	
Unknown	
More alternative language resources.	
Use existing communication networks to help communities be prepared. Protect Native trees and plants.	
el condado puede actualizarse en el sistema de emergencias por mensaje telefonico p[ara asegurarse que cada residente resiva las alertas de desastres en su idioma y a tiempo	The county can update on the emergency system by phone message to ensure that each resident receives disaster alerts in their language and on time.
Prepare for the event that most likely will occur. That could be fire or earthquake. Plane for more storage of water. Droughts can occur even if its not a so call climate change. There earth goes through cycles, drought and even excess rain. Plan for it as a county and state.	
Keeping roads in good shape. Finding spots for homeless to park without blocking public streets and highways. MOre Ambulances!! Better emergency services at hospitals	
Better translation and interpretation, archiving of all information in relevant languages, neighborhood meetings and support for connecting neighbors, evacuation routes painted in public places to familiarize people, information publicized on supermarket and cafe newsfeed/crawls beneath TVs	

Responses
Require that all cell phone carriers use the same towers, so coverage is more available to all. Also, require more towers in rural areas. (This may only be something the state can require)
Useful short workshops (zoom) with a specific goal every month. month.
-Alert systems that work for incoming hazards. -Making sure people are aware of the possible hazards that exist in their choices for housing locations i.e. flood plains, wildland interface, unstable soils. -Educating the population regarding with the natural resources at hand so they are not wasted.
Revise 500 year flood zones based on best available science instead of relying on Army Corp of Engineers ignoring climate change.
Providing emergency kits with resources and contact numbers as not everyone can afford the essentials or clearly understand what needs to be done or included inside the kits.
Spanish-language emergency preparedness courses, information, and access to kits. Work with City of Sonoma on Valley-wide strategy, fill gap of resources in Spanish.
I think having informational sessions, sending out pamphlets and any other way we can inform the people in Sonoma County.
Lots of Money
Financial incentives to make changes to homes to adapt to climate change and to reduce emissions.
more help with wildfire vegetation preparedness
Rebates on (or free) battery backup storage
Not to scare the public on need for government
I think Sonoma county is being proactive and doing alot. Keep up the chipper programs, and inspections, and hardening. Get back to repairing roads!!!!!!!!!
Emails, newspaper articles, free resources and supplies
Renters and landlords need rebates/grants whatever, to add solar/batteries to rentals. Landlords need financial incentives to want to upgrade a rental, and renters should have a resource if they want to add an upgrade to a long term rental.
Shelters kept safe. Shelters that aren't closed when still needed, as we experienced in Sonoma.
Emergency kit preparation/recommendations, evacuation procedures, how to sign up for alerts, explanation of what is being done in the county already
Preparation to help make our watersheds more resilient to increased storm flows.

Responses	
Tell the truth and stop wasting our money	
not sure	
Programs for renters to conserve water (more than checking leaks in the toilet!) Programs for low income people with chronic health conditions who need battery back up for medical equipment. Programs for renters to mitigate extreme heat (insulation, UV blocking films for windows, replacement for single pane windows, insulation, attic fans, etc.)	
Nothing the county bureaucracy does really helps , they just don't hear us	
I like the alert system. It may be helpful for the County to set up a system where neighbors can alert each other, especially for people who may not have technological equipment.	
I believe the County is doing an adequate job of informing residents, would like to see additional infrastructure work and financial support for individuals to address climate change needs.	
I'd like to see better information on the role of deforestation in exacerbating wildfires and I'd like to see the county take PG&E to task for outdated equipment (uninsulated wires, etc.) and stop the outrageous, unnecessary PG&E tree removal program.	
There needs to be a better understanding for both tenants and low income/1st time home owners about the importance of insurances and the different kinds of insurances that would protect them from any kind of loss.	
Provide information and maybe inspection services (like the fire dept coming out to assess risks and provide suggestions). Don't get the county into the position of handing out financial assistance	
Inform people that CLIMATE CHANGE is not in our control, it changes as nature changes, we do not control it so better inform the public and don't keep confusing Climate Change with emergencies such as earthquakes, floods, rain, drought, california has a long history of weather/climate extremes for the past 200 years and beyond! Climate change fear is not warranted, but preparation for emergencies is warranted!	
for wildfires: secure communication systems & clear wide evacuation routes	
Energy efficiency upgrades in residential buildings to reduce energy consumption, make homes more resilient, comfortable, improve indoor air quality, safe and cost effective to operate. Resilient Landscape Coalition website for information and help regarding defensible space. Educate to reduce the "fear of vegetation" Water management to keep all storm water onsight: means reducing hardscape and creating permeable surfaces in all aspects of urban life.	

Responses
The county already provides great resources, grants, and recovery funds. I think the hardest challenge is connecting people with the resources that exist and holding their hands through the process. Some people are resistant to making the necessary changes, some can't afford them, and some simply don't have the time to be proactive. Partnering with specific neighborhoods in need might be your best bet for seeing large amounts of change/action.
The resource hubs provided during fire emergencies we're wonderful! As far as planning, I think they are doing a great job of providing recommendations.
Don't build into areas without multiple escape routes, don't allow cheap buildings to be built in low-income areas and cost-shift maintenance to low-income people. Build roads that have designs to capture & filter natural water runoff, only allow high water permeability type concrete to be used in parking lots and sidewalks
They already provide for this.
Education, reducing waste, reducing plastics, gardens, recycling materials
don't know
A booth at community events would be great - especially with a checklist of things we can do to prepare (like farmers markets, craft fairs, festivals)
Educational information sent to every home several times so that everyone knows how to make their home safe. Teach home hardening and safety preparedness in schools. Distribute literature everywhere where people gather including churches, cafes, professional offices... everywhere. Create crews and teams that go to homes and harden homes with attic screens, gutter screens, sweeping debris, and offering advice on how to protect their home during a wildfire. Provide financial assistance to anyone who requests it from a fire-prone area to replace flammable roofs, decks, stairs, fences and porches. Make people's homes safe. Stop all vegetation management beyond 100' from homes. That is useless and doesn't prevent homes from burning. Harden homes and create 30-100' of defensible space around homes in fire prone areas.
I'm not sure
Develop trust/relationship with low-income and immigrant communities during the good times so they can access and trust the County resources in hard times.
Information and outreach.
Transform as many county vehicles as possible to electric or hybrid engines. Put out danger warning signs wherever roads are prone to flooding every time there is an imminent risk of flooding. Require people living in WUI zones to submit their fire prevention measures and disaster evacuation plans in writing to the county.

Responses	
fund community based organizations and non-profits like Latino Service Providers, NBOP, La Luz that community members trust. they are first responding	
Financial resources to adjust energy uses.	
Public messaging: alert systems, go-bag, evacuation routes. Promote neighborhood preparedness. Promote fire-safe roads.	
Insulation services and/or protocols that make landlords accountable for homes that are not equipped to experience extreme heat and cold.	
Don't know	
Natural emergencies require the county to mobilize.. Not sure why you keep calling it climate change	
It would be nice for someone to be answering questions in real time on social media. I always find myself getting the best information from random strangers by following a hashtag. The county could have a much more useful social media presence.	
None	
Tell the truth, not just the politically acceptable orthodoxy.	
Communication with the elderly and handicapped on where to go if evacuated. Help for those groups to get to evacuation centers.	
Shelter for those who need it; expedient exit for traffic; emergency services as needed.	
Quit the incessant expansion of housing. It seems as though the county has sold out to developers and big businesses. You can build and build and you haven't yet solved the affordability problems because wine tourism doesn't have living wage jobs. And you definitely haven't helped with sustainability and the climate. Try to look at the big picture instead of these ridiculous "feel good" knee-jerk responses! Earth to elected gov. officials…. Poor people can't afford Teslas. We don't have and So Co will NOT have the energy grid for all of the electric "everything" that we will be using and poor folks are not going to be riding the "Smart Train" everywhere. Yeah who made the money on that one???!	
Better emergency alert system (Nixle hasn't worked for Sonoma in over a year). Money has to be provided to assist in property vegetation management for residents. The County has to stop approving nonstop development (SDC and Hannah Boys Center massive housing projects) . The bottom line is we do not have the road capacity to accommodate thousands of extra cars/ residents on highway 12 and Arnold drive	
Nixle should operate like Napa County. I use SoCo alerts & Nixle in Sonoma, and Nixle in Napa. Napa sends at least 3x more alerts, and more detail than Sonoma. They aren't annoying andcare often useful Road closures and flooding, especially. Hardly ever get such from Sonoma Co	

Responses	
Better alerts Better updates	
Embrace the variations in weather and quit using “climate change” as an excuse for every natural event———-fewer people living in fire/prone areas would help	
No comment	
A nice large bank account of, say, $5 million.	
None, stop wasting our tax paying dollars.	
Language access, disaster services and fire mitigation teams to do brush clean up and forest understory clearing.	
unknown	
None!	
If you want us to harden or homes, better divert floodwaters or take other actions on our properties, you should provide both instructional and fiscal assistance. Either have teams you employ that will come in and do it for us, or have grants and recommendations to help us get it done. Very few people don't know what they should, and very few don't want to do it, but most of us lack the time, money and knowledge.	
Awareness and energy preparation	
all resources allocated to black folks	
Na	
Not sure	
I believe in emergency preparedness but stop with the claims about climate change. I will never vote for funding that scam.	
Improve voice/internet coverage	
Better communication tools for times when power is out and access is limited. For example, our water agency emailed us during the last power outage to tell us to conserve water, but it was almost too late, and people didn't have power for internet so I'm not sure people even knew about it. That approach makes no sense. Are we supposed to boil water? We need clear directions.	
Programs that bring neighborhoods together so people can lean on each other during disasters	
continue to publish information. perhaps additional online resources lists would be good	

Responses	
Clear, understandable, language-appropriate, timely information and how to/where to go to get resources. This information must be delivered through multiple channels in multiple languages. Invite people with lived experience of being disproportionately impacted to participate in County planning and preparation for future emergencies and disasters and compensate them for their participation.	
More information on packing go backs, even workshops or events where folks can buy a ticket then fill their own. Maps with alternative evacuation routes (understand this would be difficult give dynamic situations, but give people a sense of other options beside 101/main thoroughfares to travel the county).	
Incentives for electrification upgrades. Barriers to entry are there even if you are informed.	
Help for those who can't afford or live in rentals to withstand extreme temperatures.	
Not sure	
Better, more accurate, alert systems. I received an earthquake alert 5 minutes after it already happened. Also, improved evacuation zones with readily available supplies.	
Idk	
County should stop spending so much money on 'climate change'	
There are already resources and programs in place - but the resources and programs in place are run by apathetic and/or corrupt people. The government keeps throwing money at problems but in reality the money just goes into the pockets of corrupt people who actively refuse to do anything or participate with the community. This is corruption. This survey probably isn't even read at all. You don't even have an option for 0 children in the household. You are illegally demanding personal information in order to complete this survey.	
First I would like you to stop spending all of our money on the only people not paying into the system. 2nd I would like to see the county pay the people who lost their homes the PG&E settlement funds instead of embezzling it. 3rd stop wasting time reporting on individual illness & get back to over all community news. 4th stop hiring alcoholics & trusting our fate to their poor decision making. I could go on but you get the point.	
More money for people to upgrade/ improve homes.	
Bilingual events in neighborhoods and parks.	
programs to help people transition to electric powered appliances, solar & battery backup, home hardening (for fire & flood), education for broad community awareness for the need to prepare / adapt (as well as continue to mitigate)	

Responses
Calling it climate change is divisive. Some people do not believe in it. Stick with extreme weather events. You will have more buy in.
Increased electricity usage?more stable electric grid. More charging stations.
Longer cell tower batterie capacity to keep the network up in a power outage.
Climate change is a long way from impacting the community. Science changes all the time and will continue to evolve. In the 80s we were told of an ice age, now its warming so
Help people make their homes more efficient through incentives for upgrading insulation, water heaters, solar panels.
Charging stations at Veterans' Bldg. were good. We need more & more ice. Lower prices for going solar. Lower cost to put in EV charging stations to run home power off vehicles.
informative webinars and resources to help those not able to prepare for disasters
Make sure that the citizens are inundated with the necessary information and media access.
Free, convenient assistance with creating defensible space! We need small herds of woolly weeders, weed whacking assistance for those who can't manage it by themselves and pick up of large wood trimmings from the property. Your shredding program has so many conditions and requirements almost no one can use it. Get a few smaller trucks to access people's properties - we are a quarter mile down from the road and there's no way we can make your chipping service work for us.
zero, none
Subsidize home owners who are making changes to their property. And make those subsidies retroactive. I
Change brush clearance rules to include land parcels next to homes. Provide cell coverage, power generators, and affordable land line plans.
Grants, rental assistance, relocation assistance, mental health services for anxiety
Teach me how I can prepare and not leave the education up to the for profit industry, ie solar
The best program would be education for county officials so that they realized that approving expansion plans for wineries, and more housing of any type (make second homes illegal & use the stock we have for workers' housing). Growth is no longer tenable! Oh, and stop pandering to rich people who continue to have sprinklers going throughout the day on their lush green lawns (prime example: the housing at 5th St.E/Patten/E.Napa in Sonoma).
Make the County those things.
POLICIES! Make it easy to do the right thing and hard to the wrong. But BOS doesn't have the political will.

Responses	
Lets build a spounge county designed to absorb and store water. Use stored water to generate clean power.	
Housing	
Don't care as long as you don't discriminate against someone who is unable to wear a mask	
Fix our roads so we can get out quickly, more specific information, financial help for emergency back up systems	
Shelter, internet, greenhouses	
Reading matireale.	
not sure	
Education on evacuation resources. I do not have family in the area.	
Prevention resources for educating our youth. Involving young people in action plans. Provide more accessibility to charging stations for EV cars. Incentives for switching to EV cars.	
just a great communication system warnings of upcoming hazardous weather suggestions on what to do having a cooling center	
those that are actually beneficial to the people who live here and encourage community involvement rather than regulations and tax increases we have no voice in re implementation.	
not sure	
Housing. Sustainable power grid with buried transmission lines	
Help with removing vegetation and trees. Help with home upgrades to prepare for earthquakes and wildfires.	
free grants to make upgrades	
Climate change will be a slow evolving process, we will probably get warmer and wetter and more people migrating from southern regions (to hot, lack of water). People will migrate north...prepare for it. That is the big concern I believe.	
no clue	

Responses
Networked communications so that people can receive alerts in North Coastal areas. Emergency services 'spell out" areas evacuated, because no one has the map with the numbered areas with no internet, cell service. We can barely get a radio station... Need a broadcast with info people first can receive and then second can act.
Prepared emergency kits
I appreciate the cell phone alerts. More information on things WE can do to slow climate change.
Not sure.
Climate change is inevitable. Only a major reorganization of society will save us. Explore Re-indigenation. Set up large community gardens.
A decent communication program.
?
Demand/response wheelchair accessible transportation services and "check-in" phone calls by County to vulnerable seniors and people with disabilities to assure they are OK and receive needed services before, during, and after an emergency event
I don't know
Accurate communications
Not sure
None
Alerts and evacuation routes
Not necessary
Education about fire and heat events.
More access to guns to protect themselves and their family from a tyrannical government.
Public forums, engagement with CEI at SSU, and faculty at SRJC. Open honest discussions with scientists and workers in the field of climate change.
Subsidies for gray water in our homes. This does not need to be centralized. We are wasting water. The county has a limited permitting process for gray water systems. The county needs to require in in all new builds and provide property tax breaks for homeowners and land lords. Simplify and expand the permitting process for installing gray water systems. Check out Hydro Loop, as it is used in Europe.

Responses	
To not be part of this nonsense	
A). MOST IMPORTANT….proactively take care of our evacuation routes well before the emergency occurs. The current practice of waiting for the bridge to wash out, the tree to fall, or the power lines to fall across the road is killing people.	
I would love for the county to provide funding to community groups that are not nonprofits, that have been doing the work to uplift the populations that have been disadvantaged in our community because they know how to it best. Sometimes, government miss the mark and don't know how to fully engage the public.	
Community engagement with neighborhood people. Nobody is going to the county website to find stuff out. It needs to just be out there in the communities.	
None. Stop perpetrating fear-based reactions. "Climate change" is nothing to be fearful of.	
Fondos para viviendas, temporales o de largo plazo.	Funds for housing, temporary or long-term.
Not sure	
I appreciate the Energy and Sustainability workshops being offered - I just need time to review the recordings/presentations. Continue to offer education and rebates for energy-wise home improvements.	
None	
Community information about what is available for hot days, cold days, where to go for fire and floods. Repeat in general at multiple venues so the info is out there.	
None	
Public education, resource list on the website.	
Reduction in major building occurring - it is reckless	
Presentations across different communities in the County in person and virtual options, especially underserved communities. Actual disaster preparedness kits and resources available to community members, to be shared in an easily accessible manner for those that have issues picking up. For example, if can't pick up can the County mail them? A resource guide for community members so they know where to turn to for specific aid or help during climate change disasters. Available in multiple languages and in culturally relevant formatting.	
N/a	
Evacuation options including save places to park multiple vehicles when have to evacuate - perhaps even in people go elsewhere together in one vehicle	

Responses
Education at convenient times for families & free resources.
?
Our County needs to have 24/7 radio air waves sending information (updated as often as new info arrives) from trained County Civil Defense sources during fires and floods and earthquakes and windstorms, etc.. When the power is out, and we are locked down wherever we are, our only source of information is through the emergency radios. We need accurate, commercial free, information about what is going on and where it is happening, and what emergency resources are available and where they are. We need to know if we should leave our homes/ businesses/ activities, etc… or stay where we are. From weathering so many fires/ floods/ earthquakes/ civil defense crises/ etc… my vote for the biggest need is a trained radio wave information center that is 24/7 and manned by calm, clear, broadcasters who only tell accurate information (as opposed to just speculation about what could happen) and with ZERO commercial breaks. National/ local emergencies NEED to be reported on so people have directions on how to deal with the current challenges.
Drought resistant plants etc
Communication. Public service announcements. Public workshops that provide guidance on how to prepare.
Clear public communication of resources in heat, flood, fire, earthquake emergencies including for people not on social media platforms
Education in basic living skills, emergency skills, and hazard avoidance (safety).
More outreach
Policy and limiting input from outside agitators (lobbying groups not associated with Sonoma County).
the alert systems are a good start, but I think they need to be refined
Why not look to the research? Why not actually do something. Talk? I'm weary of it.
More information and planning shared with the public
The County needs to do more to stop putting people in harms way by allowing building in flood zones and wildfire areas. The RCDs and groups like Sonoma Ecology Center are doing great work with their programming but much more needs to be done to reduce GHG emissions. Eg. more public transit, pedestrian and bike paths, reducing waste streams, planting and protecting trees in urban areas, eliminating most lawns. etc.
Rebates for drought resistant landscaping.

Responses	
More resiliency seminars; more rebate and discount programs for home safety improvements	
Audit people's properties like CalFire does. Provide finance options to promote updates. List tax incentives.	
Install more misters in parks and recreation areas.	
Demonstrations of landscaping and hard scape to help lessen fire spreading to your home. Water conservation, drought isn't going away just because we had a wet year.	
Keep Henry 1, fully staff all police and sheriff personnel	
I support the emergency alert system to warn community members so they can take precautionary actions on their own	
Tax rebates for home improvements	
Information in multiple languages and in multiple modes (print, radio, community forums, etc). Getting rid of things that contribute to climate change and/or are dangerous to health. For example, one-use plastics, pesticides. Hold large companies accountable for waste they produce. Have better public transportation. For example, I drive myself because it would be too complicated to get to work by bus.	
Cut taxes and let us take care of ourselves	
Provide resources, safety kits, financial help for improvements, and better planning for infrastructure.	
Let us know what programs & services are available.	
Intérpretes, talleres, kits de emergencia, ayuda para comprar seguro de incendio/inundacion para inquilinos	Interpreters, emergency kits, help to get flood anf fire insurance for renters
Stop with the war on our wells. It's unfair to put such an additional high cost on those of us who rely on our wells for water. If you hate them so much, put us on county water. Don't fee and tax us into bankruptcy.	
Assistance to upgrade septic systems or tap available sewer to prevent failure during to excessive rain and high water tables	
Devote the resources needed to enforce state PRC codes relating to defensible space and structural hardening. In my experience, too many people have a recalcitrant attitude about disaster preparation. Don't waste precious funds on wildfire prevention. Focus on wildfire protection instead. Also: PRMD should not issue any building permits in flood plain areas or on unstable soils.	
In their language. Outreach to different communities.	

Responses	
THERE SHOULD BE PROGRAMS IN THE SCHOOLS FROM ELEMENTARY THROUGH HIGH SCHOOL TO TEACH PREPAREDNESS AND WHERE TO FIND HELP	
Keeping us informed for example when to leave when to come back, when power/gas will be turned on	
Quit explosive building. Acknowledge that seniors and people on fixed incomes cannot possibly assume the costs of mandated all electric appliances. It is unrealistic and it is not possible for us to financially do	
Encourage people to have multiple avenues of communication from land-lines to cell phones to radio communication.	
Emergency communication	
IDK	
More reliable notifications and more resources for people who may be above the poverty line, but do not have enough financial resources to easily respond to safety measures during an emergency. I feel forgotten and insignificant. I have always worked (until becoming disabled), have always paid my taxes and been an active and honest member of society (including being a county social worker). Now, I find it is extremely difficult to get support. Not everyone can come to preparedness fairs to get emergency supplies and information. Perhaps it would help to have a way for home bound citizens to have access to these resources.	
work with non profits or community members like service coordinators trusted messengers	
Fire extinguisher training	
Permit Sonoma website & processes are a nightmare to navigate. Disincentive for making property updates (or for doing them with permits)	
I have signed up for all the alerts. If the Cell Towers work I will be informed.	
be the clearinghouse for the best information. Be smart with communications during an emergency	
Maximum amount of wastewater sent to geysers to create green energy, larger use of natural gas (extremely clean burning), elimination of battery storage due to extremally hazardous mining and disposal practices.	
Alerts on phone, emails from Co Supervisors, Sheriff, etc	
like I said, widen the roads around SW santa rosa! ie Bellevue Av, Dutton Meadows, Stony Pt (S of Hearn) and Corby. Not cool or safe to add thousands of people in new housing without widening the roads!!!	
Financial incentives for people to do the right thing.	
Communication to low income and Spanish language folks who may be much less connected to social media, making them deprived of the most immediate news updates.	

Responses
Accurate use of science data for predictions.
Maps of hazards and how to correct them.
Community education
1) Information about making your home more resilient, like elevating homes in the floodplain and fire-hardening homes in wildfire hazard areas. 2) Programs to financially support preparedness and resiliency.
Self-sufficiency programs - anything that will help the county be self-sufficient during a climate disaster. If we as a county are removing gas then help the lowest income folks get off the grid with solar and battery storage projects. Ensure the county has sufficient energy supplies. I don't know that you need to punish those with gas - they will naturally have to pay more and more to retain that feature.
The County should maintain their properties to help prevent the spread of a future wildfire. A good example is Wikiup Dr. The County owns 15 feet on each side of the road and refuses to maintain or clear the existing vegetation as needed. Calls to the County go into a black hole.
Grant programs for low income or partial grants to help offset costs of improvements that would help with climate change
Climate Resilience Centers/Cooling Centers identified around the county for displaced persons. Back up energy sources should be renewable resource microgrids funded by jurisdiction's governments and County General Funds.
Better education on what they can do to lower their carbon emissions
Would like the county to better serve the Latino community and underserved as well. To understand on how to go deeper into these communities.
More evacuation centers/programs at the ready
I like the idea of providing portable or window A/C units to seniors who have no means to purchase their own.
Publicly published guidelines.
Water management. To harness excess water when there are high waters to combat drought later. Process to use that water to refill the aquifers.
first off to prioritize stopping pollution and stopping with the CO2 is a pollutant crap
Free or low cost emergency preparedness supplies for those unable to afford them.
Actions that support County climate commitments - time to protect watersheds and groundwater resources

Responses
A decent alert system that actually alerts people to hazards in their area, and is not used as a general news letter.
Supervisors make better decisions on where to build housing. Where there are jobs, public transportation, support. We can no longer afford to house people in high fire areas and flood plains.
Anything with regard to rising seas in low lying areas
That's your job. How do I know?
community bill boards to get the information out
help with veg management in terms of grants, especially after wildfires
County is basically dysfunctional
Stop allowing development in high and very high fire danger areas. Period. Neither residential or commercial.
Better communication
Lower taxes
videos are great because they are easily shared. Build them as a series of short videos on specific topics.
A department of government reduction.
Cooling center with electric back up or microgrid
Better alerts
Food blankets
None.
Ways to access funding opportunities. Education on how to prepare for climate change.
Mortgage payments, food money shelter
You're already doing a great job.
Limit new development in High Fire prone areas. Provide assistance for vegetation/fuels management, fund local CWPP identified fire risk reduction projects. Improve evacuation options.
good question

Responses
zoom meetings
written materials that are mailed to each household
Programs to allow private property owners to remove hazardous vegetation
I believe social media has strived to get information out. Also, I have seen mailers. Red Cross was a god send to us, we were living in dirt field, we thought we couldn't stay at a hotel due to having pets, but we were wrong. They really helped, my friend has breathing issues and being in the dirt didn't help
City planned routes. County planned evacuation routes. Perhaps the alerts could suggest routes based on the area? ie: these streets go east, these streets go west. Rebates for fire hardening improvements. Or grants or tax incentives.
Robust and well-funded government and community programs for firefighting, rescue, emergency housing, housing upgrades, communication, etc. Don't be short-sighted with things like allowing development on flood catchment soil.
Now that the pandemic has sort of faded, maybe some town halls would be welcome.
Assist in funding for additional GMRS radios and repeaters for community communication during extended outages, earthquakes, fires, etc.
better alternatives for relocation; better planning for evacuation routes. we are rural, and generally only have one way out which might easily be compromised. what are the contingencies?
I personally would welcome the County doing vegetation clearing on vacant properties adjacent to occupied properties to reduce wildfire potentional. Or provide resources for landowners to do so.
Less bureaucracy in getting info out and what to do. Get a better alert system for City of Sonoma (like Napa & Marin)
enforce vegetation clearance and support tree removal from burned over areas.
What can you do? The mainstream news outlets cover this pretty good, everything is blamed on climate change now anyway. Most people are aware of environmental conditions and the ones that are not will learn quickly enough.

Responses
Hold free public forums on specific subjects around climate change with the agencies tasks with various aspects of climate change tabling at the event. Please DO NOT sponsor broad general knowledge events as they do not help . . . people need specifics and knowledge of what agencies to contact. EXAMPLES: Where to call for flooded street or overflowing stream/creek? Up-to-date list of local warming or colling centers. Where to call when 911 is down or not answering. Where to obtain free first aid training so you can help others in an emergency, especially trainings in evenings or weekends for those who have to work 8-5 jobs (low income). Web based sites should have a click option to translate the material into a number of other languages (Spanish, Mandarin, Cantonese, Thai).
Would like the county to stop allowing new huge hotel projects with inadequate parking and no regard for evacuation needs of fulltime residents. Make new public safety rules retroactive to all current VR permit holders. Enforce fire safe property clearance laws, especially to VR permit holders. A property bordering on ours just got permitted for 8 overnight guests and have at least 1/4 acre of dead trees and fire fuel.
The county should be doing everything it can to mitigate climate change, investing in zero-emissions technologies and carbon sequestration. County officials should speak on these issues at every opportunity, encouraging residents to get on board and explaining the importance of allocating our resources to these ends.
The county cannot control the weather. However, with services do exist, should be exploited to give everyone a sense of security. The first couple fires hear that County was ill, prepared, communication, wise, and infrastructure wise.
Good alert systems and communication.
Stop with smoke and mirrors and actually effect change, instead of just doing things for optics
public awareness campaigns, rebates and incentives for making improvements to homes and buildings
evac locations, help with payments while evacuated, air purifiers, masks
Housing for the unhoused. Improvements to public transportation and plans for public transportation to assist in evacuation. Property tax incentives for making fire safe improvements to private property.
Clearing of fuel like we use too
Please stop wasting our tax dollars on your ridiculous bull lies.
There are enough resources and programs, but insufficient staffing.
SLR maps

Responses
Ban Fossil Fuels and Invest in Hydrogen production with Solar Arrays.
Deep community organizing + smart, research-driven public communications. "Outreach" and "Public education" are key phrases, but dig deeper to see if a group knows what that actually means in the the literature, on the issue in question. Do they have trained practitioners in leadership positions? Also: just know and be humbled by the fact that first responders are culturally built to think about public comms in an 'incident command'/top-down way -- and it's appropriate to a degree, but when it comes to building community resilience, it's a key cultural failure point. You're wasting public money until you figure out that this has to be addressed.
Commitment to adequately raise minimum wage based on actual cost of living in Sonoma County and commitment to build (quickly) more and different types of housing (micro units, multi family, etc.) so that more people can afford to 1) own a home, 2) retrofit that home and 3) save for emergency situations such as those linked to climate change
Scientific advisories
Fix roads for easier evacuation, have PGE place power lines underground.
Outreach programs
STOP WITH THE CLIMATE CHANGE NONSENSE. You sound like Chicken Little screaming "The Sky Is Falling!". Sane people are pointing at you and laughing.
??

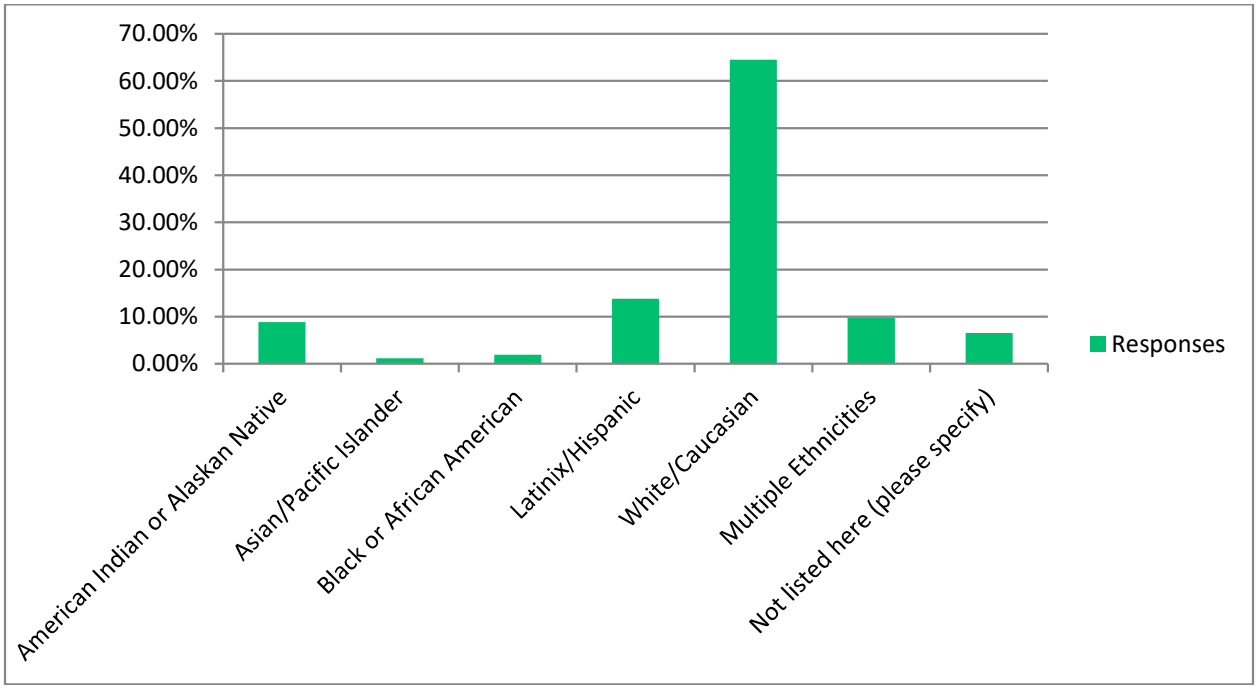
Question 15

Respondents were asked to provide their emails which is not included here.

Question 16

How would you best describe your race/ethnicity? Select all that apply.

Question 16 asks respondents to describe their race/ethnicity. 521 respondents answered this question and 32 skipped. Over 60% of respondents reported being White/Caucasian followed by almost 14% of respondents being Latinx/Hispanic.



Approximately 6% of respondents indicated not listed here and provided detailed responses, included below.

has no basis for climate conditions, weather or health.
European American
Asian/American
None of your business. Stop dividing people.
Why does this matter
no

None of your business
It doesn't matter, I am a human
other
this question promotes racism
None of your business
Celti-Slavic
Italian
Totally biased question
Refuse to answer
European
American
undisclosed
Decline to state
English/german. Theres not ‘white’ race
American
All American
Jewish
Alien
Not important
Na
None of your business
HUMAN AMERICAN
No thank you
Not applicable.
None of your business

Middle Eastern - please give us our own box, we are not "white"
Bad Ass
None of your damn business.

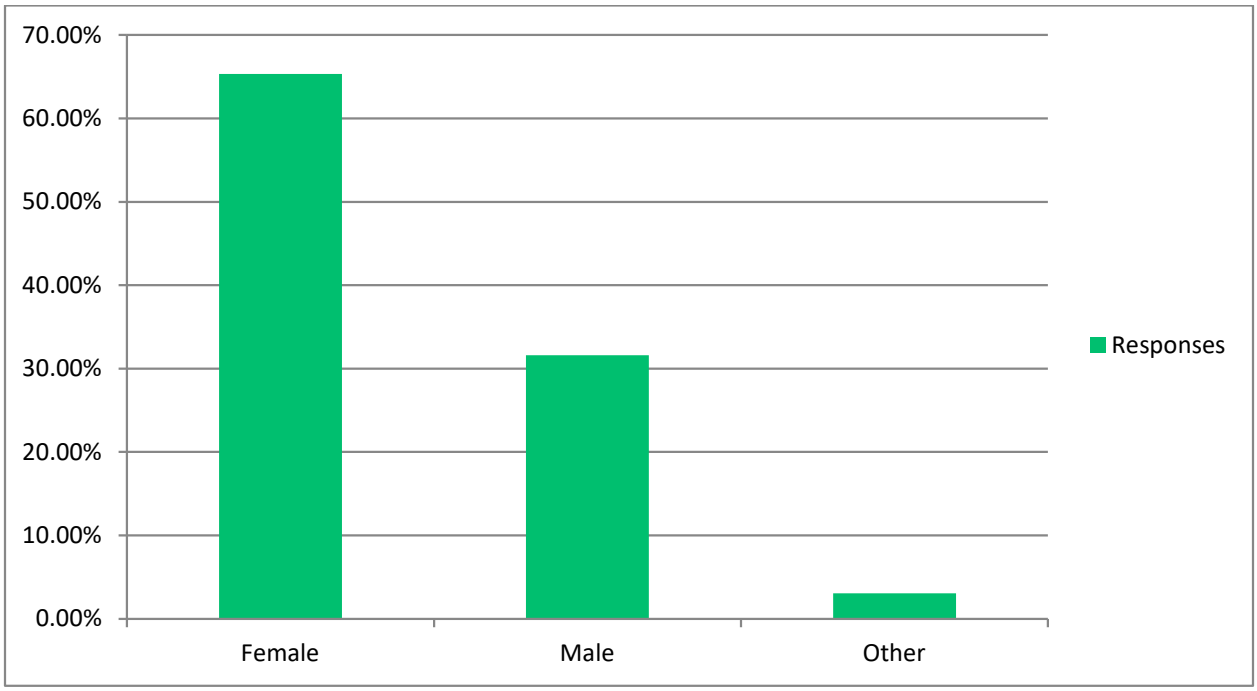
Question 17

Respondents provided their zipcodes which is not included here.

Question 18

What is your gender?

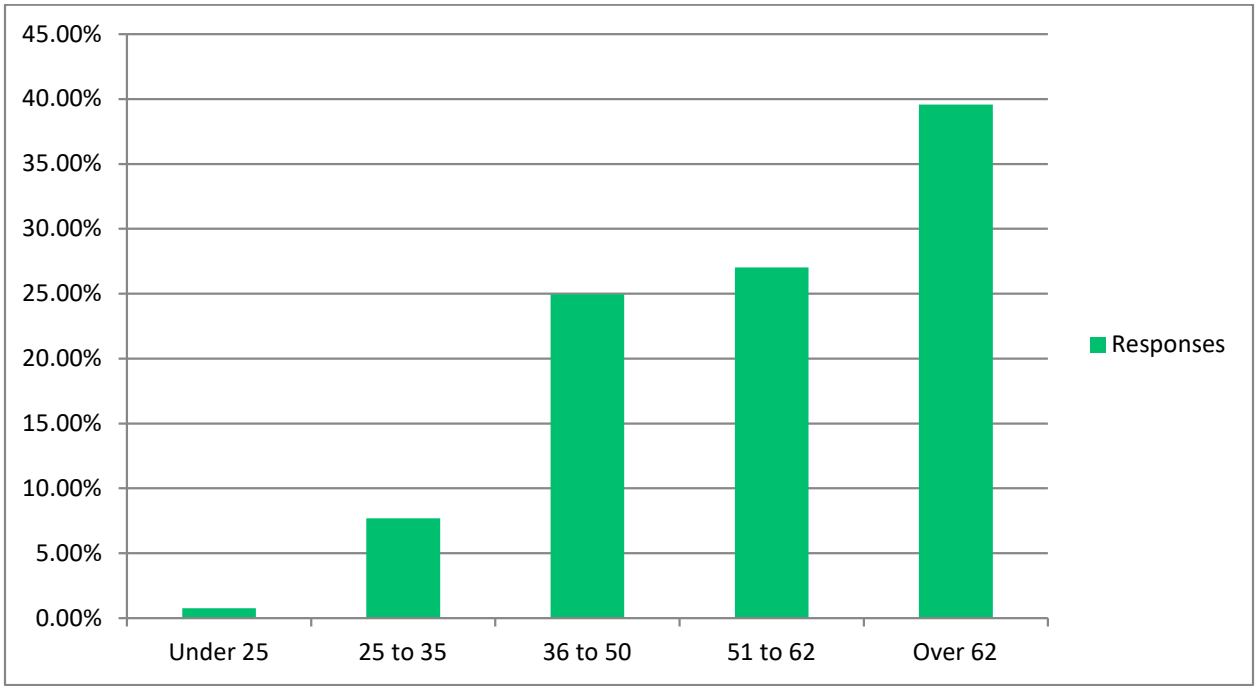
Question 18 asked respondents to indicate their gender identity. 525 respondents answered this question and 28 skipped. Approximately 65% of participants selected Female, 31% selected male, and 3% selected other.



Question 19

How old are you?

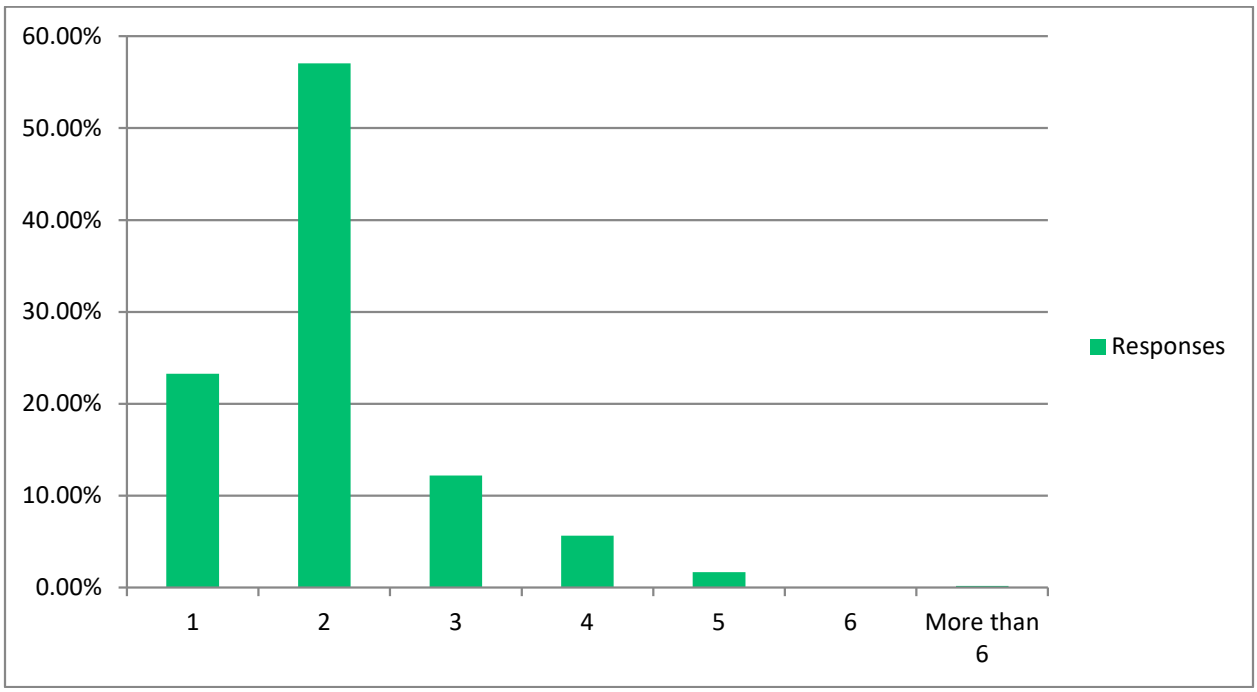
Question 19 surveyed respondents age group. 533 respondents answered this question and 20 skipped. A majority of respondents were in the over 62 age group, and less than 50 respondents were under the age of 35.



Question 20

How many adults live in your house?

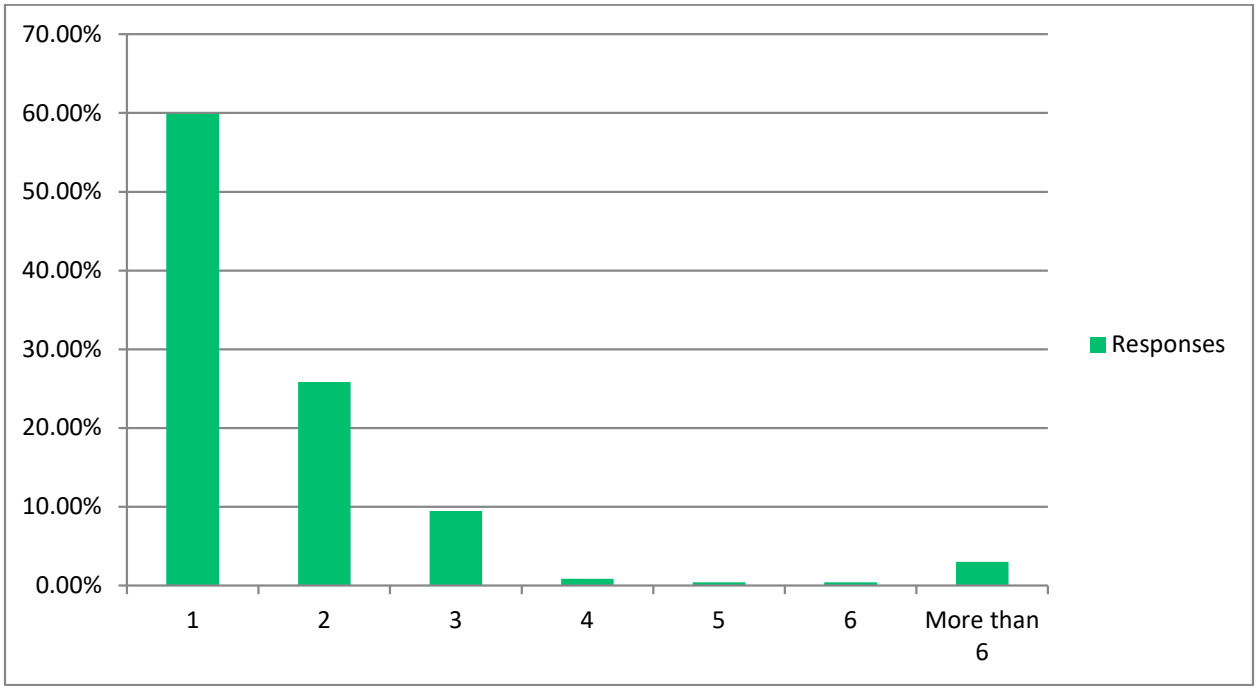
Question 20 asked respondents how many adults live in their house. 533 respondents answered this question and 20 skipped. Over 50% of respondents reported having two adults in their home and over 20% only had one adult.



Question 21

How many children live in your house?

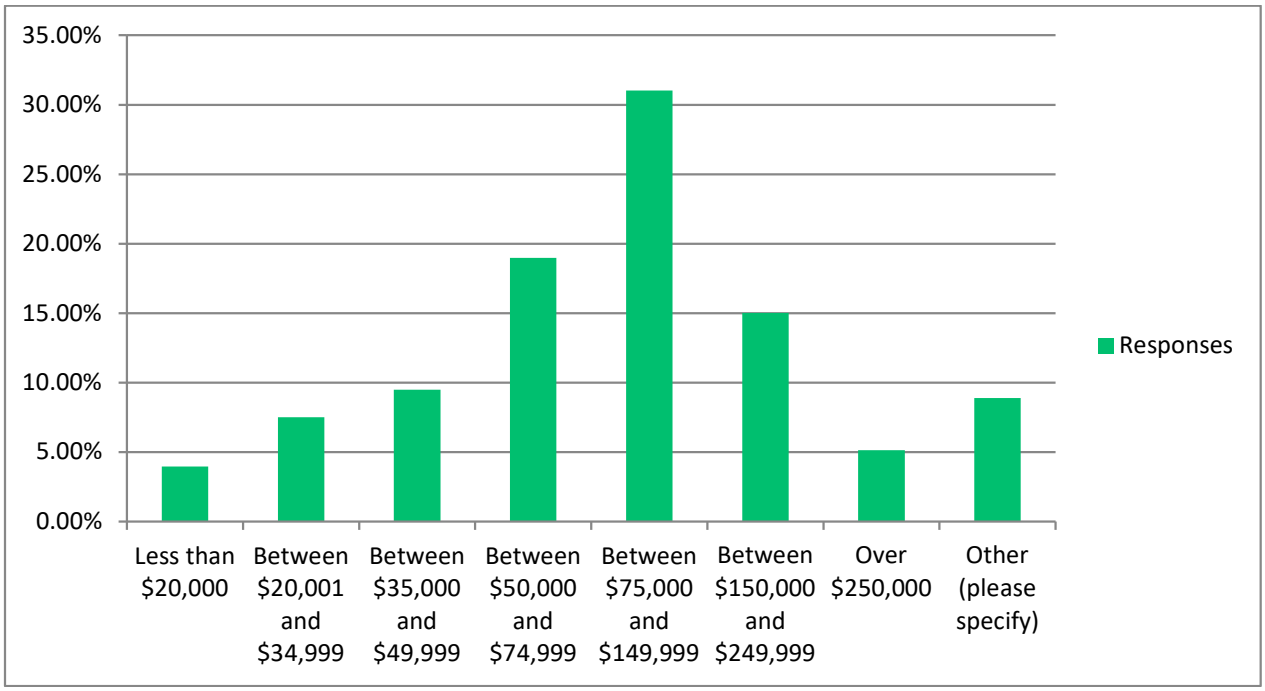
Question 21 asked respondents how many children live in their household. 232 respondents answered this question and 321 skipped. Nearly 60% of respondents said they had one child in their home. Approximately 25% had two children, and few respondents had more than three.



Question 22

What was your total household income last year?

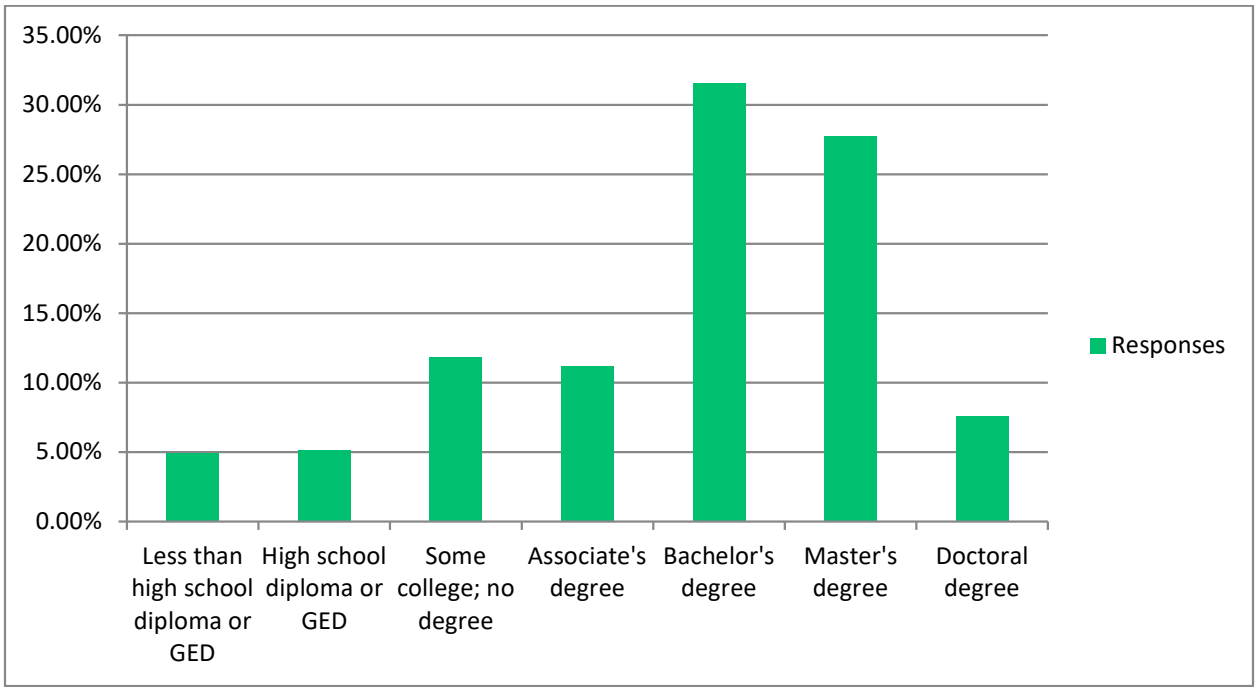
Question 22 asked respondents what their total household income was for the last year. 506 respondents answered this question and 47 skipped.



Question 23

What is the highest level of education you have completed?

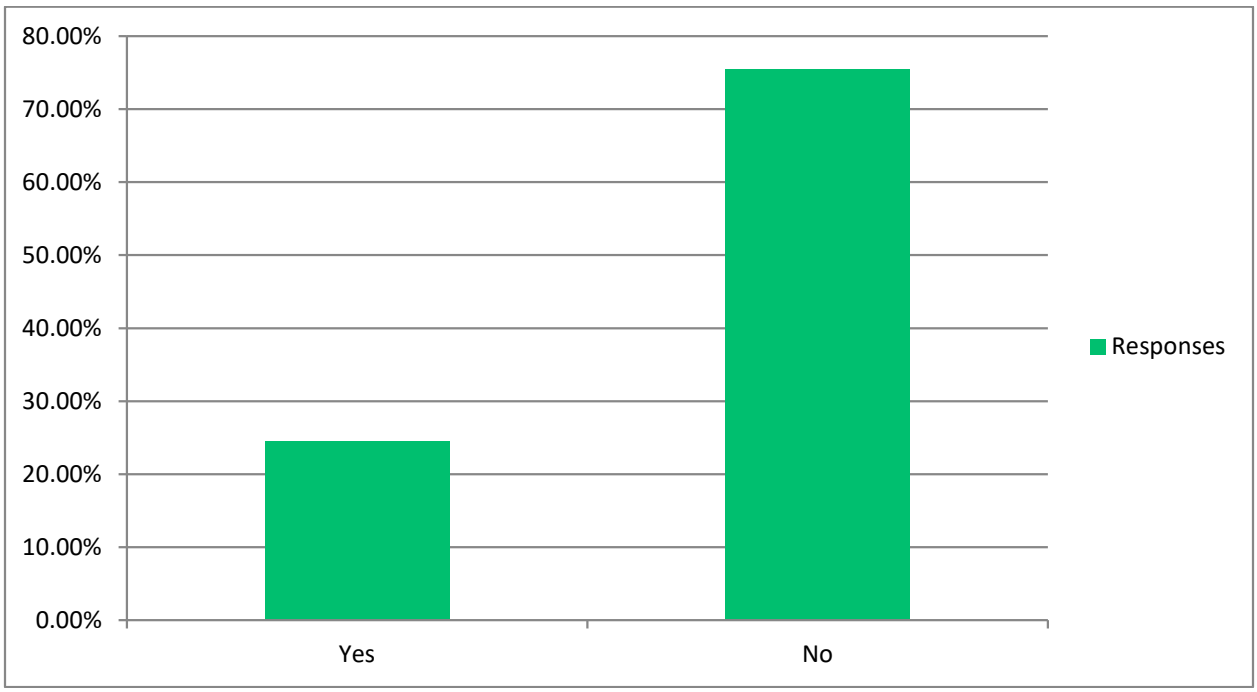
Question 23 asked respondents what the highest level of education was that they completed. 447 respondents answered this question and 106 skipped.



Question 24

Do you identify as having a disability?

Question 24 asked respondents if they identified as having a disability. 448 respondents answered the question and 105 skipped. Approximately 25% of respondents identified as having a disability, and approximately 75% did not.



Appendix B
Residential Egress Assessment (SB 99)

FEHR PEERS

Final Memorandum

Date: March 26, 2025

To: Reema Shakra and Lauren Collar, Rincon Consultants

From: Ian Barnes, PE, Terence Zhao, and Grace Chen, Fehr & Peers

Subject: Sonoma County Safety Element Update – SB 99 Assessment

WC23-3966

Fehr & Peers is conducting a general, programmatic assessment of emergency evacuation routes for the Safety Element Update of the Sonoma County General Plan. This assessment is consistent with Senate Bill 99 (SB 99) requirements.

This document describes the methodology for an assessment of roadway capacity and time needed to evacuate a designated study area under described evacuation scenarios. Please note that emergency evacuations can occur due to any number of events. Additionally, any emergency movement is unpredictable because it has an element of individual behavior related to personal risk assessment for each hazard event. As such, this assessment is intended to provide the jurisdiction with a broad understanding of the transportation system capacity during an evacuation scenario; it does not provide a guarantee that evacuations will follow the same modeling used for analysis purposes, nor does it guarantee that the findings are applicable to any or all situations.

Moreover, as emergency evacuation assessment is an emerging field, there is no established standard methodology. Fehr & Peers has adopted existing methodologies in transportation planning that, in our knowledge and experience, we believe are the most appropriate within the limits of the tools and data available and the budgetary and time constraints in the scope of work, and by current knowledge and state of the practice.

While this assessment should help the jurisdiction better prepare for hazard related events and associated evacuations, the jurisdiction should take care in planning and implementing any potential evacuation scenario. Fehr & Peers cannot and does not guarantee the efficacy of any of the information garnered from this assessment, as doing so would be beyond our professional duty and capability.

Legislative Requirements

SB 99 requires a review and update of the safety element to include information identifying residential developments in hazard areas identified in the safety element that do not have at least two emergency evacuation routes.

SB 99 Approach

The first part of this work consists of identifying residential areas with only a single access route. A threshold of 30 or more parcels was used as a threshold for this analysis. This approach is similar to CAL FIRE's Subdivision Review Program (required by Public Resources Code Section 4290.5), which requires CAL Fire to identify existing subdivisions with 30 dwelling units located in the State Responsibility Area or a Very High Fire Hazard Severity Zone in Local Responsibility Areas, without a secondary means of egress route that are at significant fire risk. While the SB 99 assessment required for safety elements is not required to incorporate CAL FIRE Subdivision Review Program findings, it is noted that the Subdivision Review Program is another source of information about egress in fire hazard areas and explains the differences in methodologies. We have also focused on locations where the single access roadway is at least a quarter mile long in order to exclude cul-de-sacs in urban and suburban areas with substantial street grids. With consideration for the variety of hazards faced throughout the County, it is noted that this analysis also considers single access route areas that are in flood hazard areas, not just fire hazard areas. Twelve such clusters of residential parcels were identified and numbered:

1. In Jenner, parcels along Balboa Avenue, a dead-end roadway
2. In Duncan's Mills, parcels along Freezeout Road, a dead-end roadway
3. In Duncan's Mills, parcels along Conifer Drive in Duncan's Mills
4. In Guernewood Park, parcels north and west of the northern intersection between Old Cazadero Road and Cherry Street, as well as those along Hidden Valley Road, all of which are dead-end roadways
5. In Rio Nido, parcels along Eagle Nest Lane and Canyon Two Road, both of which are dead-end roadways
6. The Odd Fellows Recreation Club and Summerhome Park – although their roadway networks are not contiguous, they are treated as a single cluster due to geographic contiguity; each only has one point of access, the former from the west and the latter from the east
7. In Mirabel Park, parcels along Vila Road west of its intersection with Champs De Elysees
8. In Alexander Valley, a cluster of parcels near Vineyard Lake and Gill Creek, where the sole paved access road is River Road from the south
9. The west side of Bodega Bay, whose only access is Bay Flat Road
10. The Bodega Harbour subdivision in Bodega Bay, whose only access is Harbour Way

11. Near Rohnert Park and Crane Canyon, the parcels along Inverness Avenue, a dead-end roadway
12. Parcels in Eastern Sonoma Mountain, where there are technically two routes of access, one via Grove Street from the south and another via Alta Sonoma Road from the north, but the latter is long, narrow, and winds through mountainous terrain with high fire risks, and is thus not likely to be a viable egress in emergency situations

Also as part of this work, evacuation access was assessed by reviewing the distance evacuees must travel during an evacuation event. This assessment is a proxy for accessibility and can assist in identifying potentially vulnerable communities during an evacuation event by identifying areas of the County that need to travel the furthest and thus are potentially the most vulnerable in an evacuation event. We approached this assessment by measuring distances from each point along the County roadway network to three evacuation locations within the County: the Petaluma Fairgrounds, the Santa Rosa Fairgrounds / Veterans Center, and Sonoma County Airport; as well as the following external gateways into and out of Sonoma County:

- SR 1 north at the Sonoma County line near Gualala
- SR 128 west at the Sonoma County line north of Cloverdale
- US 101 north at the Sonoma County line north of Cloverdale
- SR 128 east at the Sonoma County line near Kellogg
- Petrified Forest Road at the Sonoma County line west of Calistoga
- St. Helena Road at the Sonoma County line west of St. Helena
- Trinity Road at the Sonoma County line east of Glen Ellen
- SR 12 east at the Sonoma County line east of the City of Sonoma
- Ramal Road at the Sonoma County line east of the City of Sonoma
- SR 37 east at the Sonoma County line west of Vallejo
- SR 37 west at the Sonoma County line east of Novato
- US 101 south at the Sonoma County line south of Petaluma
- San Antonio Road at the Sonoma County line south of Petaluma
- D Street at the Sonoma County line south of Petaluma
- Point Reyes-Petaluma Road at the Sonoma County line south of Petaluma
- Chileno Valley Road at the Sonoma County line south of Petaluma
- Tomales Road at the Sonoma County line west of Two Rock
- Fallon Road at the Sonoma County line west of Two Rock
- SR 1 south at the Sonoma County line near Valley Ford

SB 99 Mapping Overview

Figure 1: SB 99 Parcels with One Access/Egress Route and Fire Hazard Severity Zones

Fire Hazard Severity Zones (FHSZs) are designated by the California Department of Forestry and Fire Protection (CAL FIRE) as moderate, high, and very high hazard. This figure shows high- and very high-severity fire hazard zones shown in relation to the twelve clusters identified previously. All clusters except 9 and 10 are located in or immediately adjacent to one of these zones.

Figure 2: SB 99 Parcels with One Access/Egress Route and Flood Hazard Zones

Flood hazard zones, identified by the Federal Emergency Management Agency (FEMA), are separated into two categories for Sonoma County. The 1% annual chance flood is referred to as the base flood or 100-year flood. The moderate flood hazard areas are identified as 0.2% annual chance (or 500-year) flood. This figure shows these flood hazard zones in relation to the twelve clusters identified previously. All clusters except 11 and 12 are located in or immediately adjacent to one of these zones.

Figure 3: Distance to Closest Evacuation Point

This figure maps the distance between each point along the County roadway network to the closest evacuation point listed previously, whether an in-county evacuation or external gateway.

Figure 4: SR 99 Inset Maps

These figure maps outline the SB 99 parcels at a zoomed-in level.

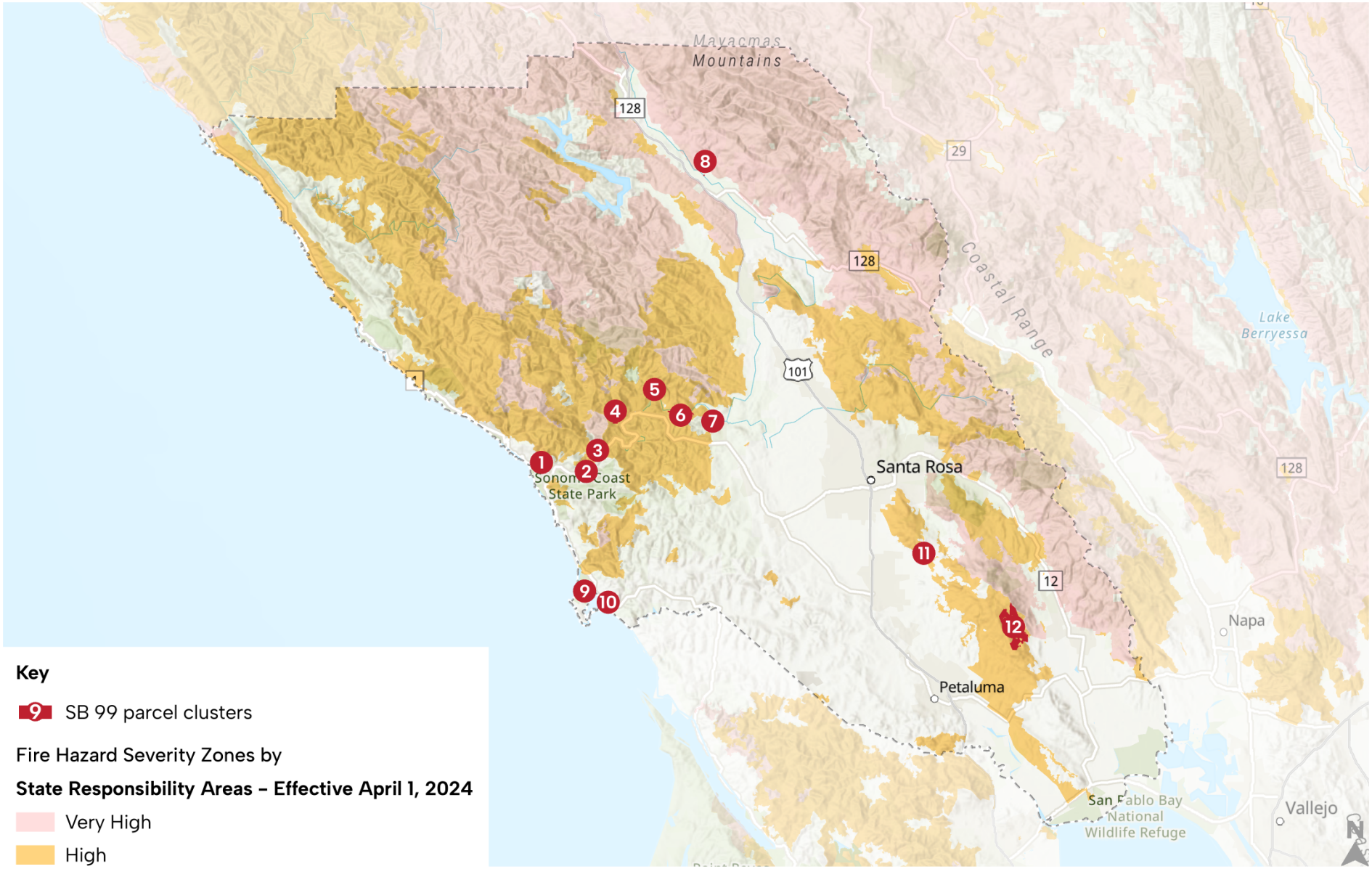


Figure 1

SB 99 Parcels with One Access/Egress Route and Fire Hazard Severity Zones

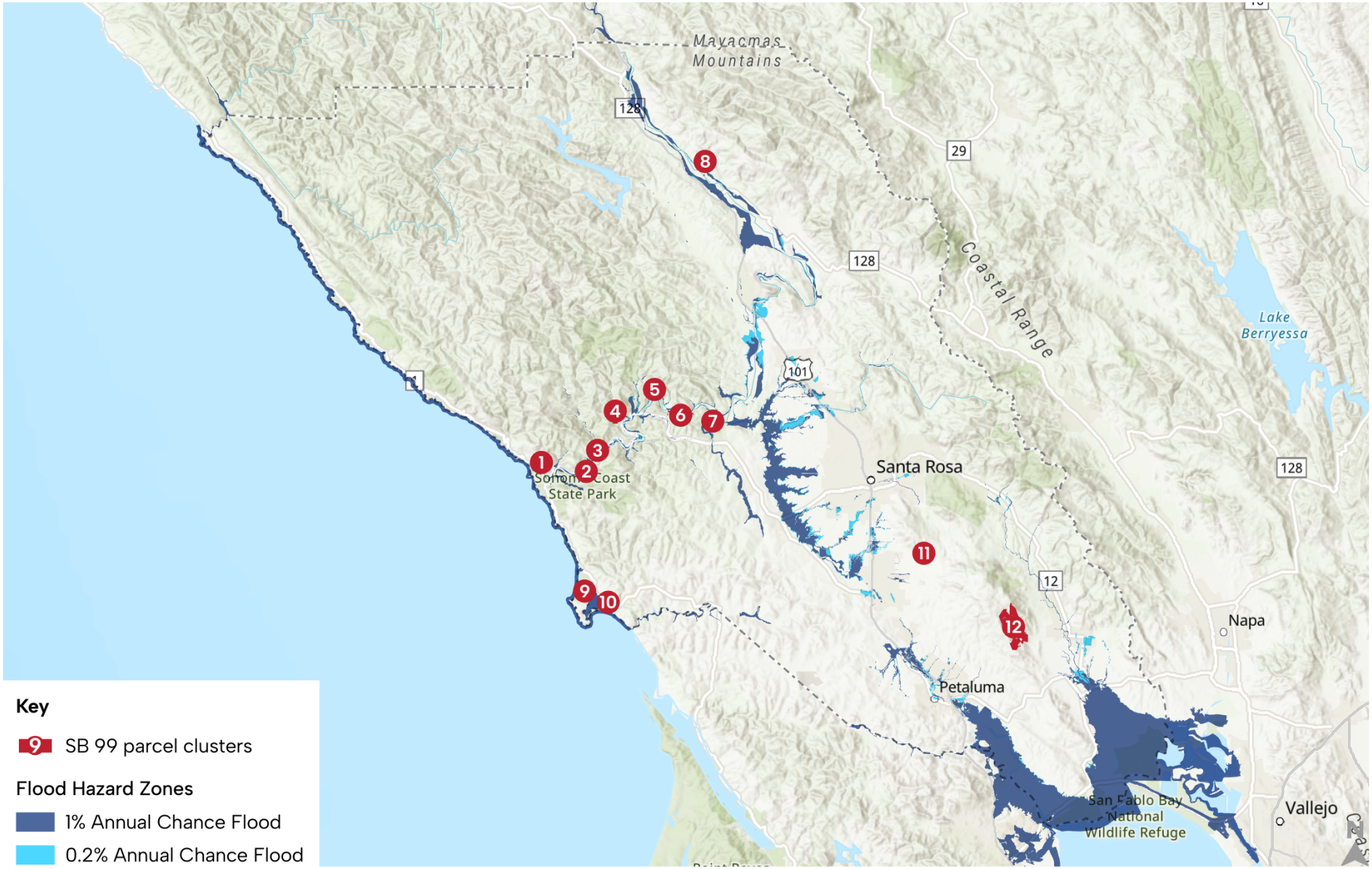


Figure 2

SB 99 Parcels with One Access/Egress Route and Flood Hazard Zones

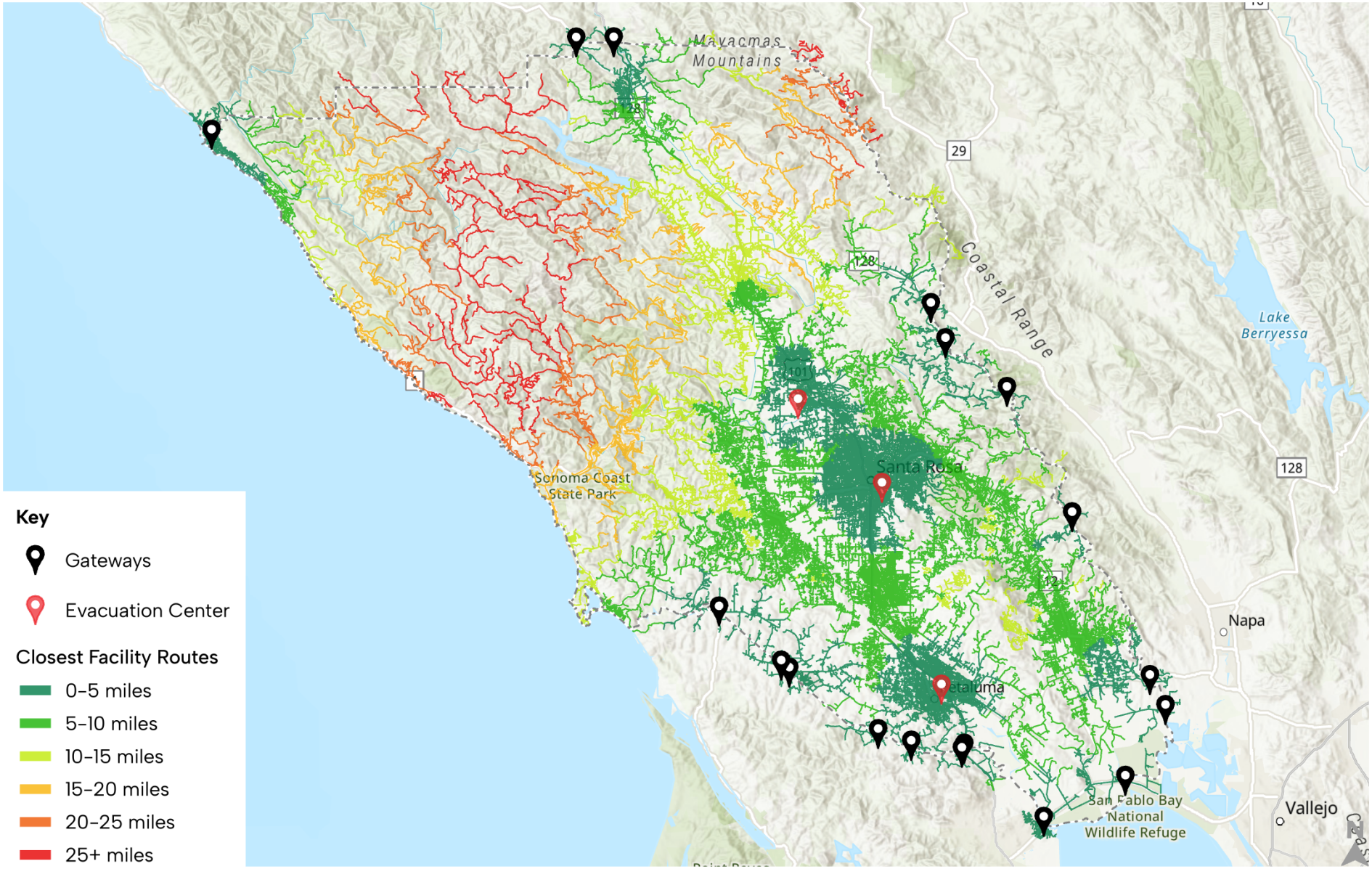


Figure 3

Distance to Evacuation Gateways

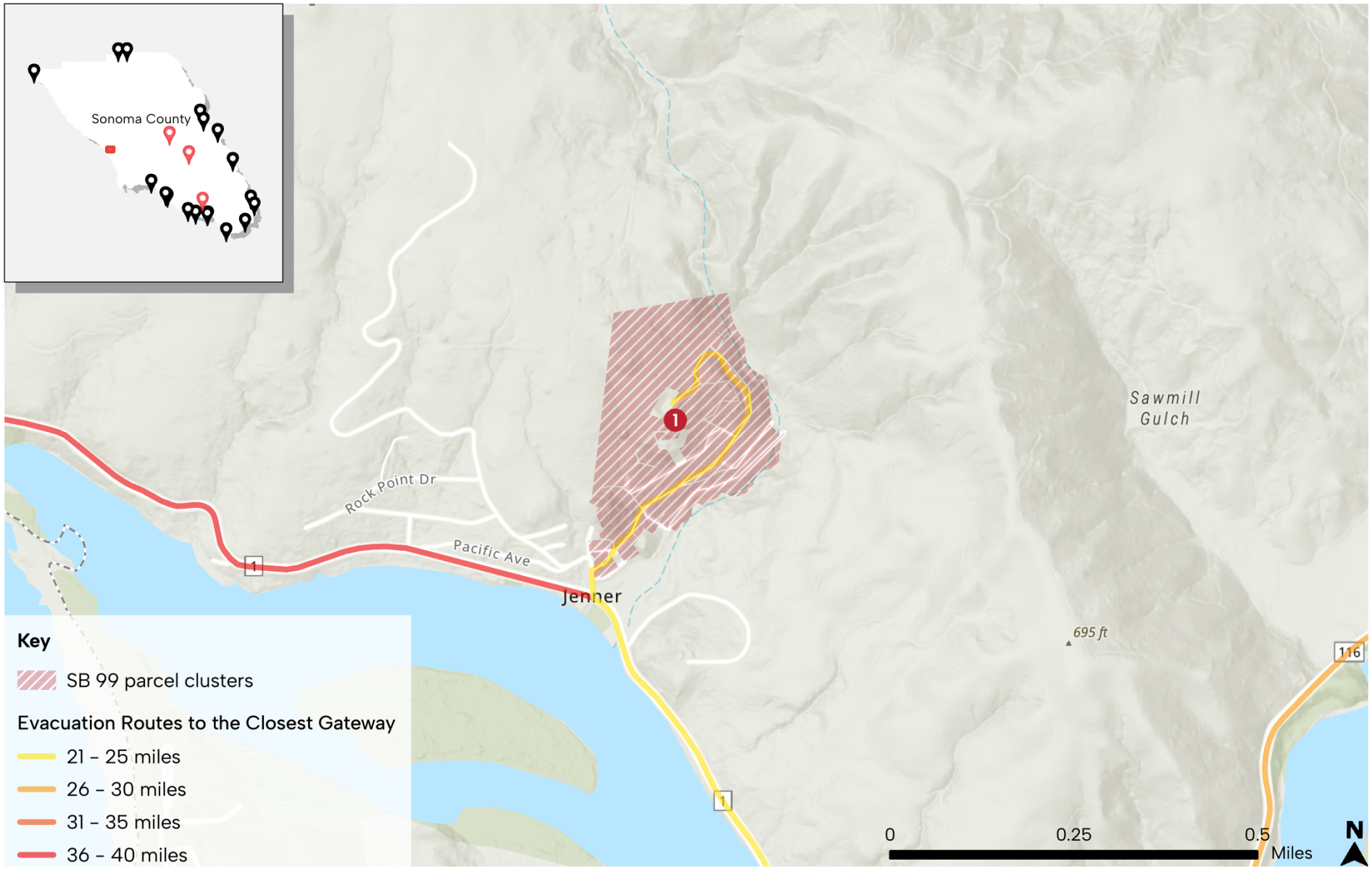


Figure 4-1

SB 99 Parcels with One Access/Egress Route
In Jenner, parcels along Balboa Avenue, a dead-end roadway



Figure 4-2

SB 99 Parcels with One Access/Egress Route
In Duncan's Mills, parcels along Freezeout Road, a dead-end roadway



Figure 4-3

SB 99 Parcels with One Access/Egress Route
In Duncan's Mills, parcels along Conifer Drive in Duncan's Mills

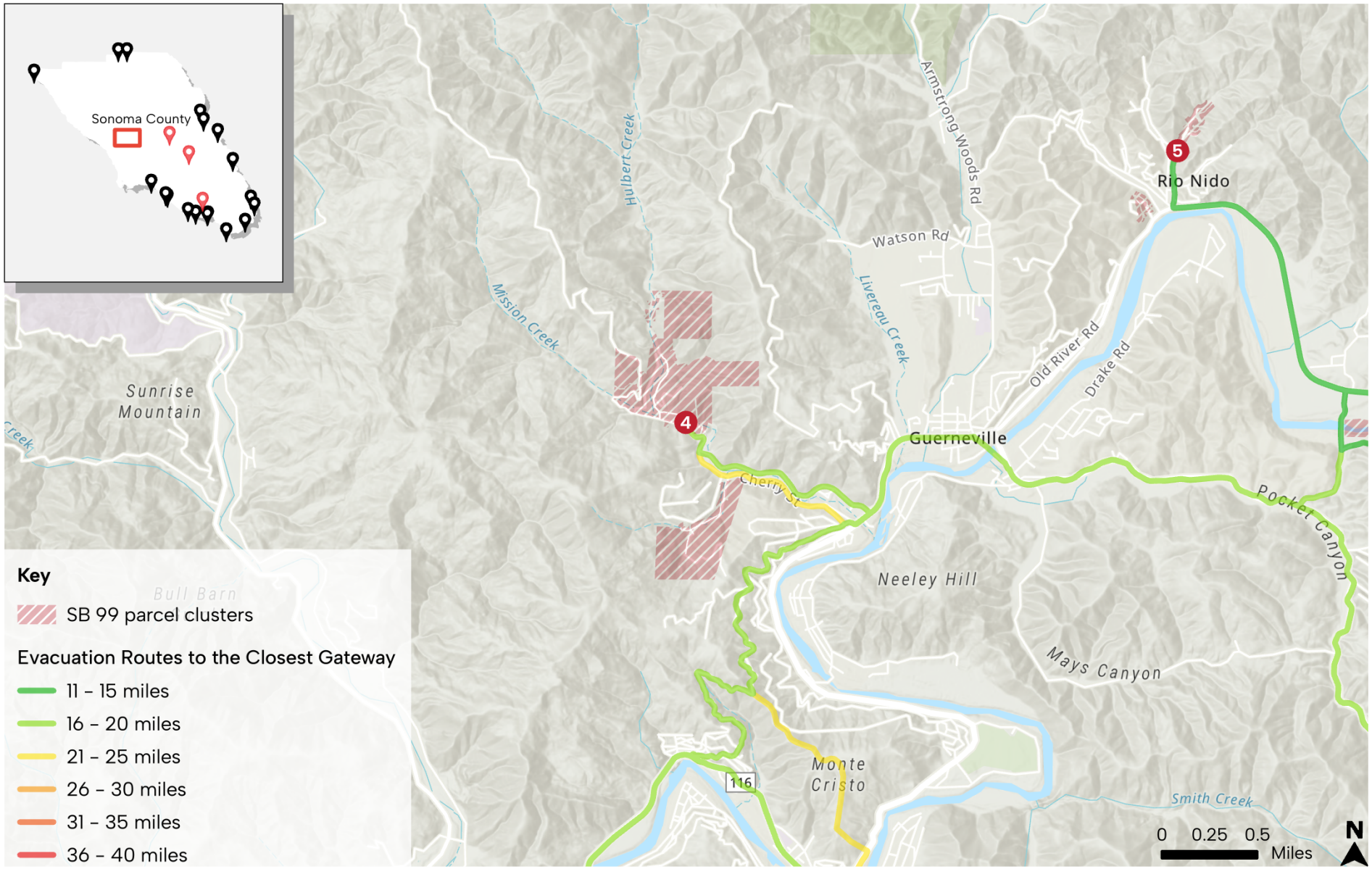


Figure 4-4

SB 99 Parcels with One Access/Egress Route
In Guernewood Park, parcels near Cherry Street and Old Cazadero Road/aking Hidden Valley Road

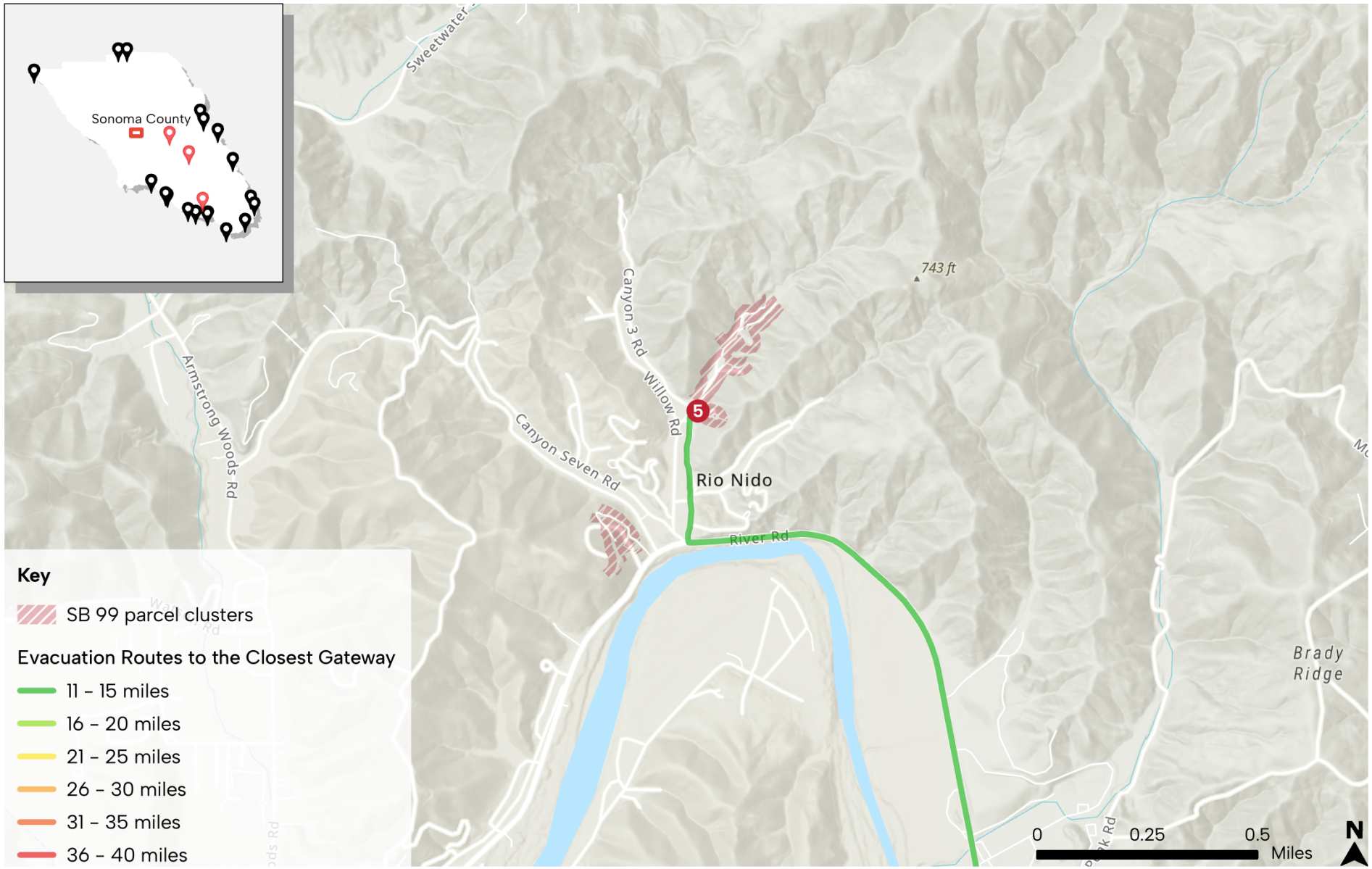


Figure 4-5

SB 99 Parcels with One Access/Egress Route
In Rio Nido, parcels along Eagle Nest Lane and Canyon Two Road

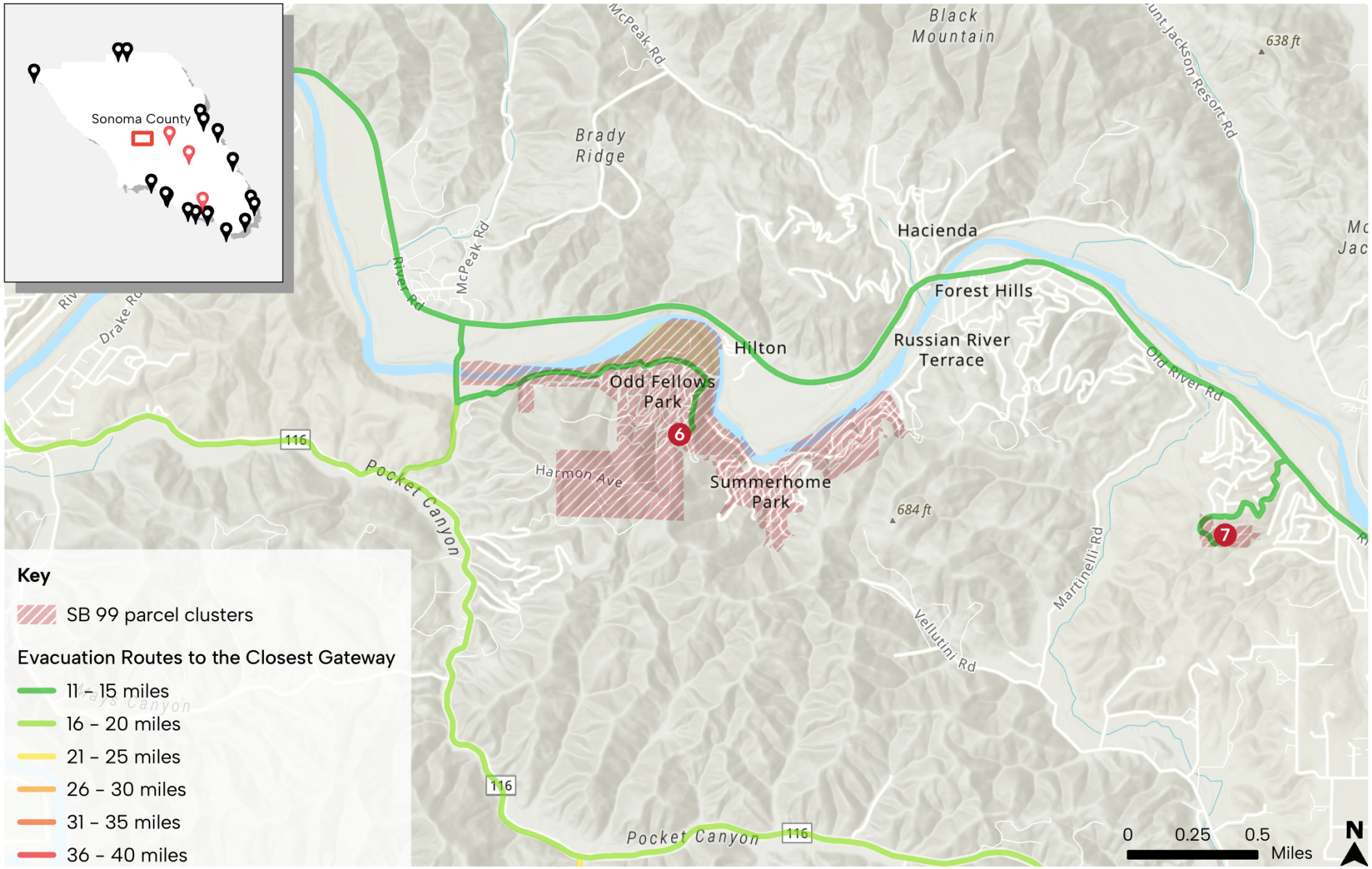


Figure 4-6

SB 99 Parcels with One Access/Egress Route
The Odd Fellows Recreation Club and Summerhome Park

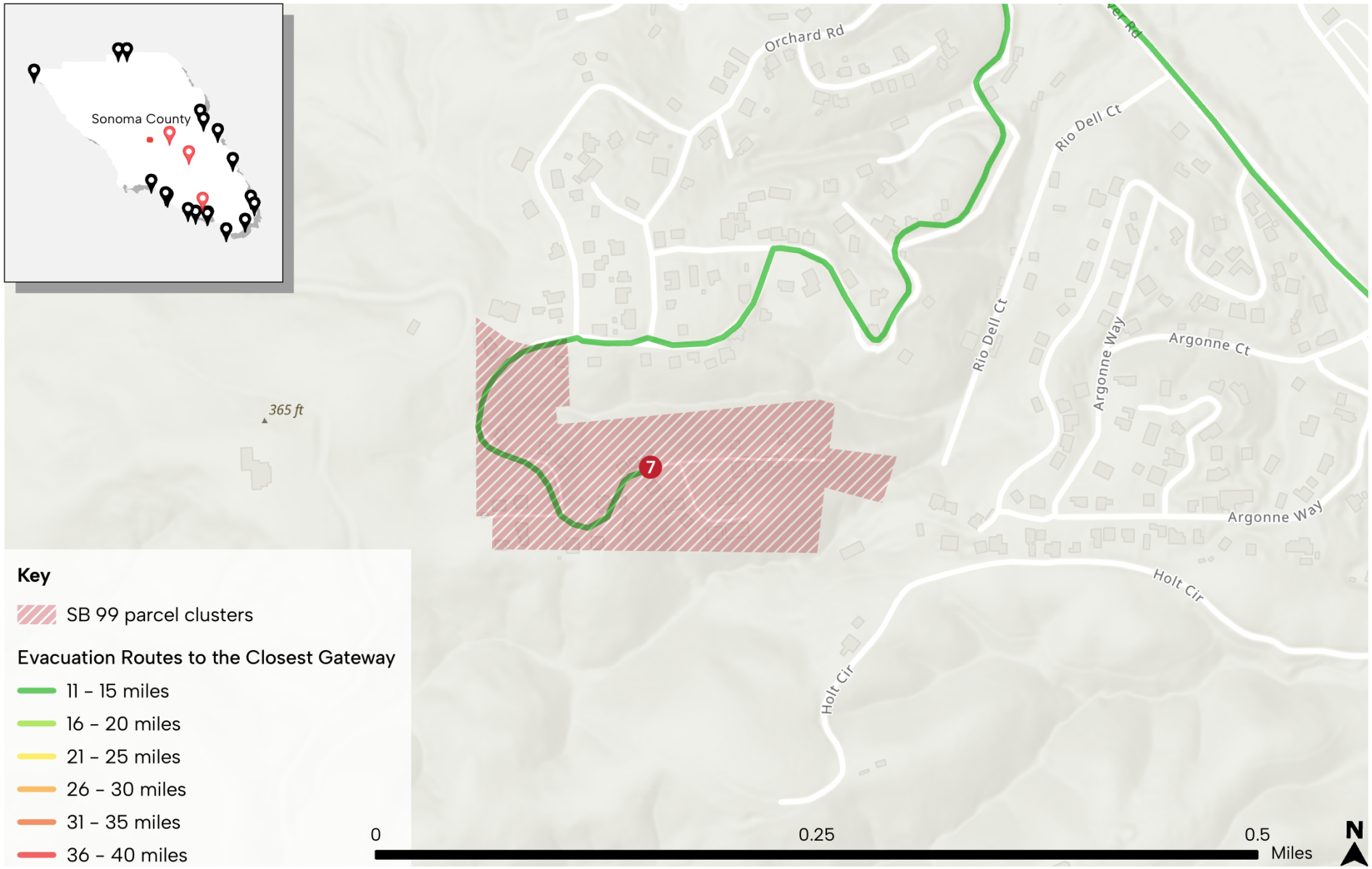


Figure 4-7

SB 99 Parcels with One Access/Egress Route
In Mirabel Park, parcels along Vila Road west of its intersection with Champs De Elysses

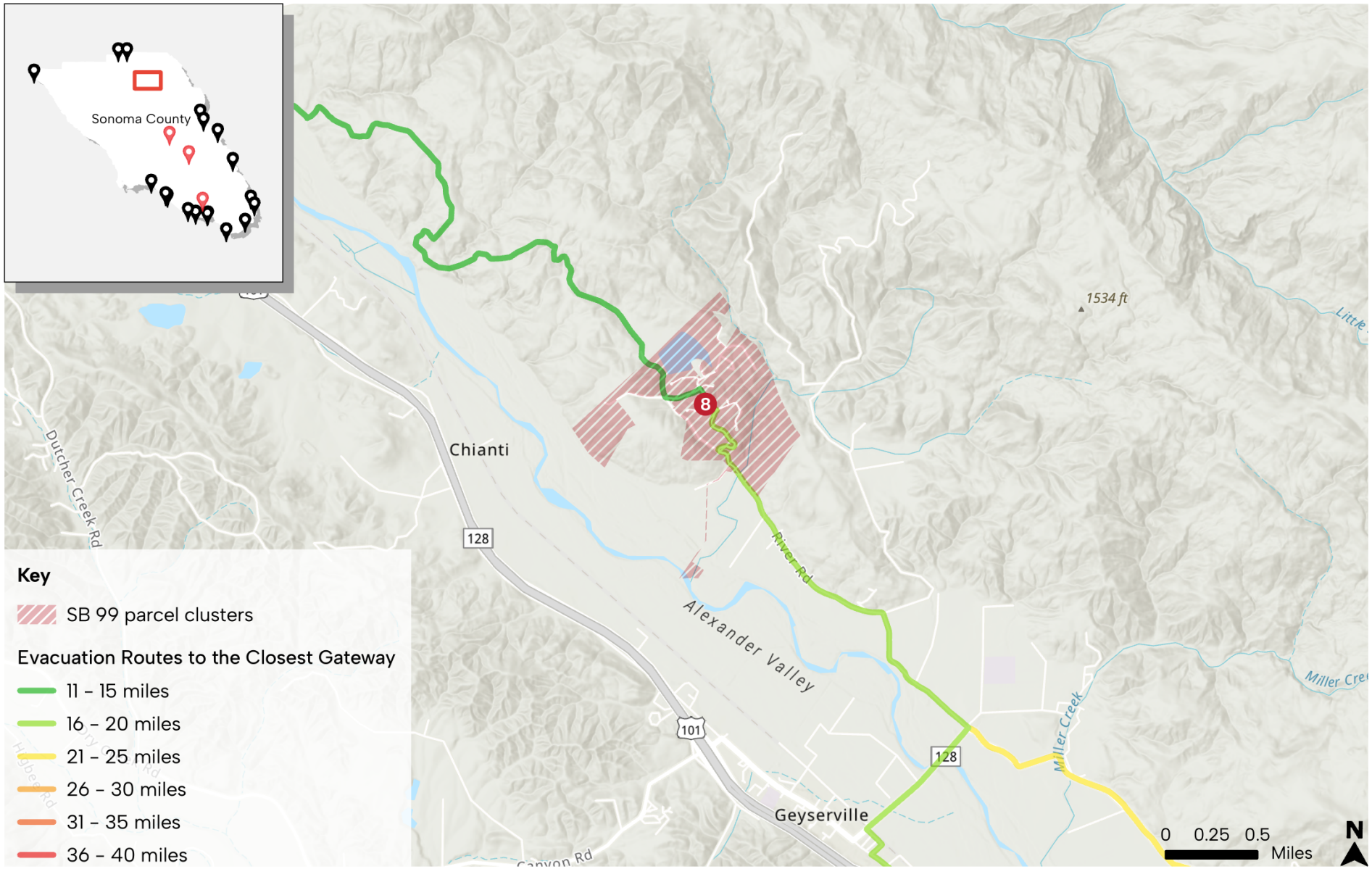


Figure 4-8

SB 99 Parcels with One Access/Egress Route
In Alexander Valley, a cluster of parcels near Vineyard Lake and Gill Creek

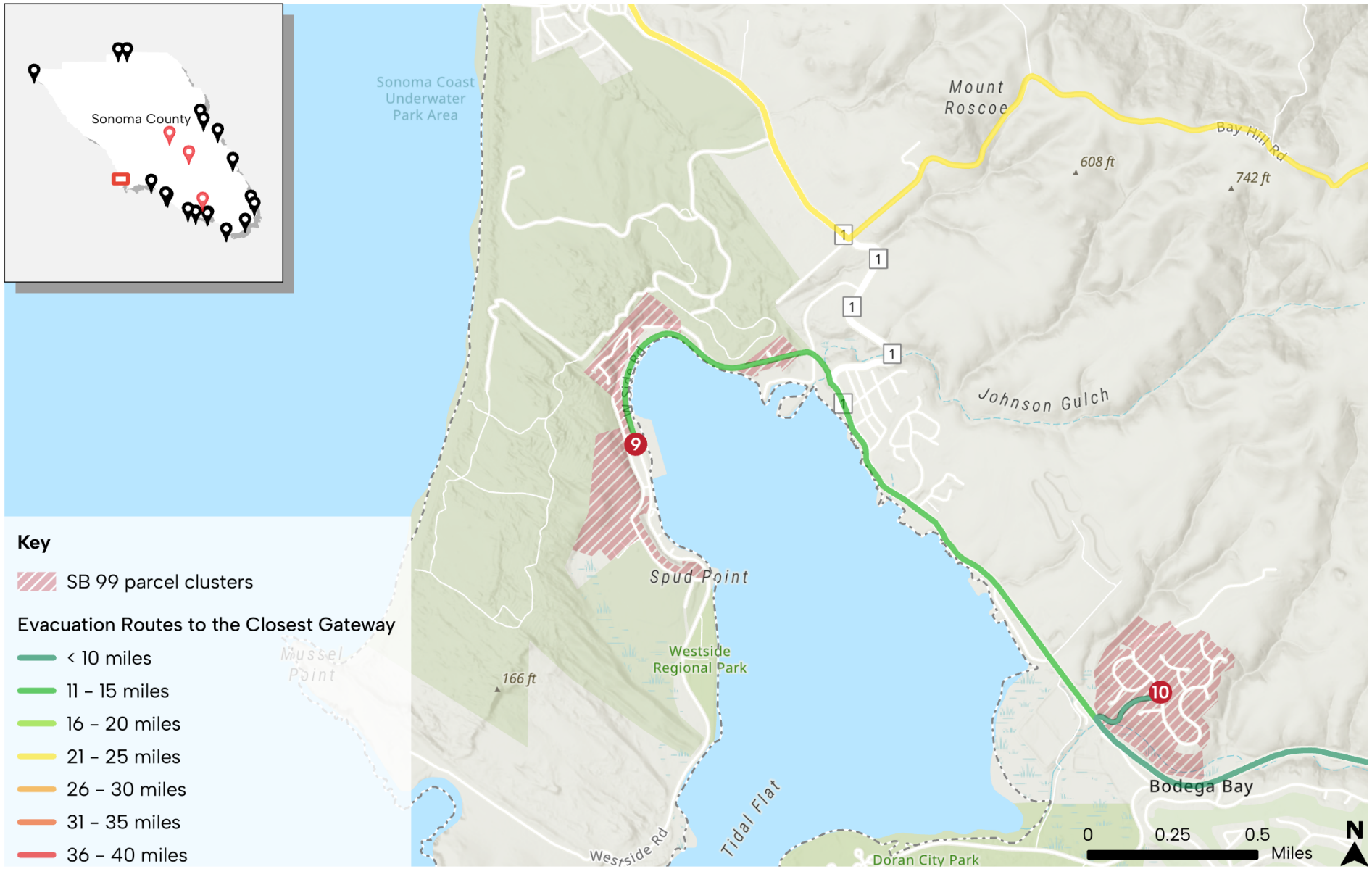


Figure 4-9

SB 99 Parcels with One Access/Egress Route
The west side of Bodega Bay

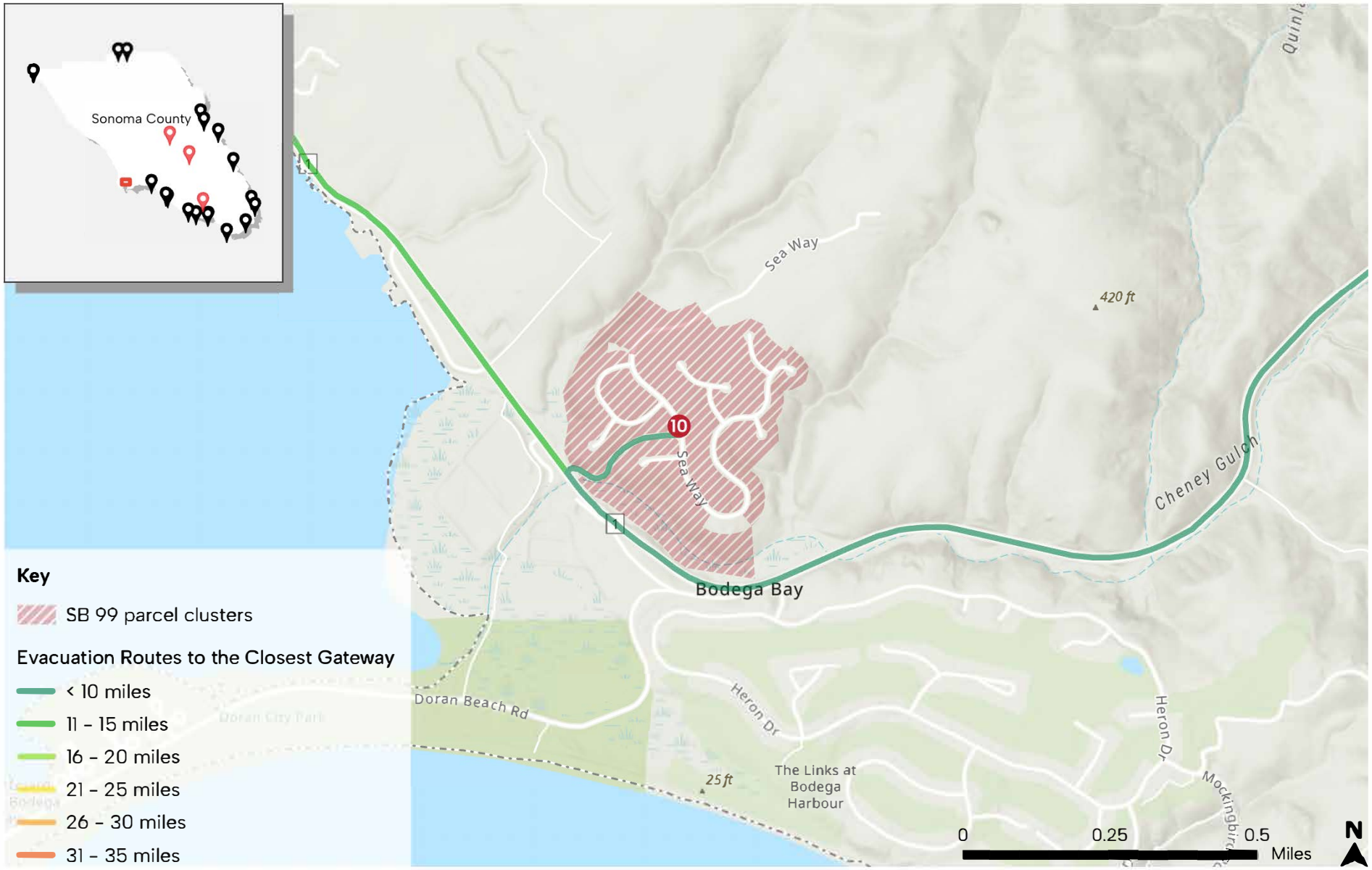


Figure 4-10

SB 99 Parcels with One Access/Egress Route The Bodega Harbour subdivision in Bodega Bay

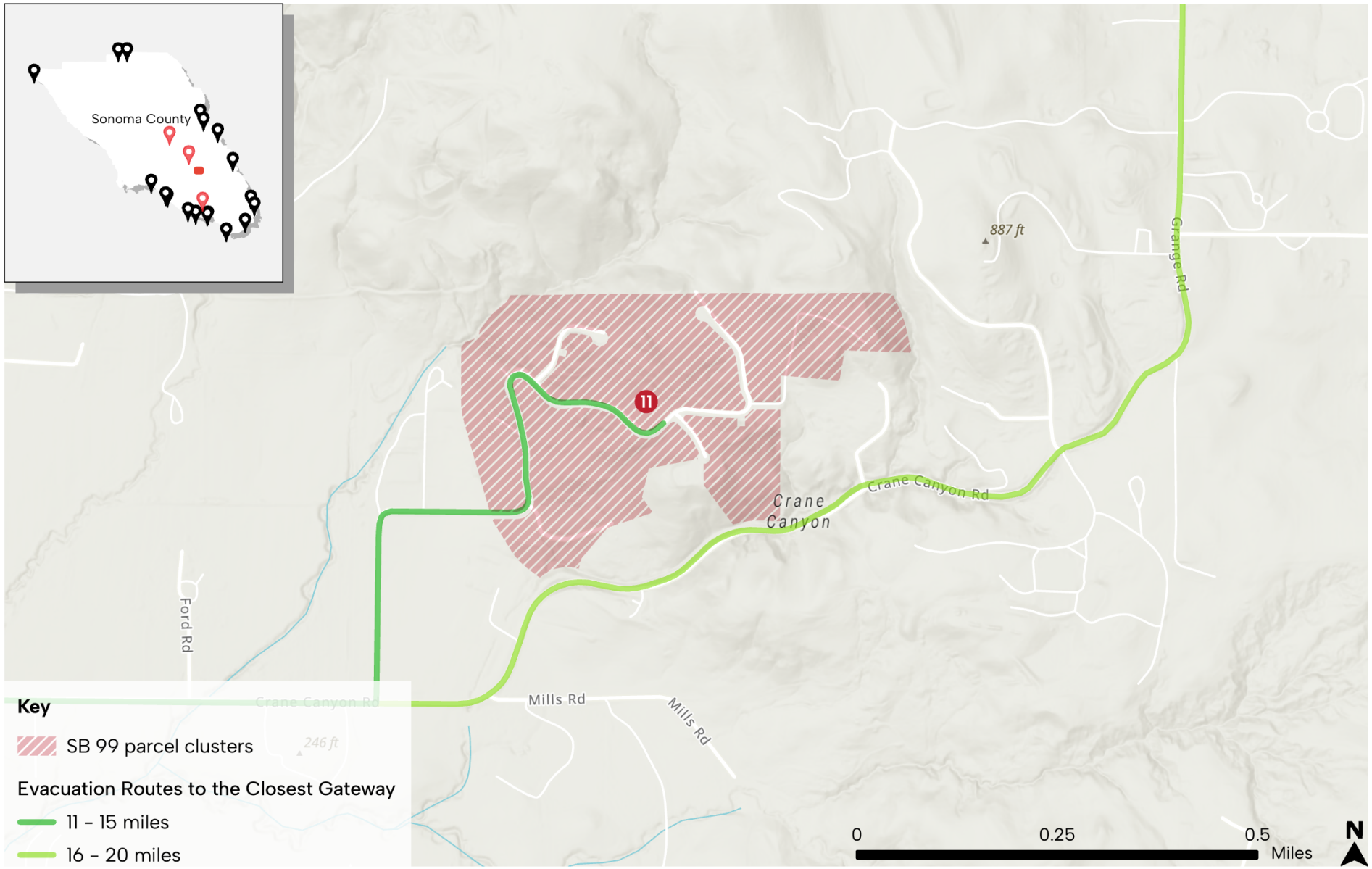


Figure 4-11

SB 99 Parcels with One Access/Egress Route
Near Rohnert Park and Crane Canyon, the parcels along Inverness Avenue

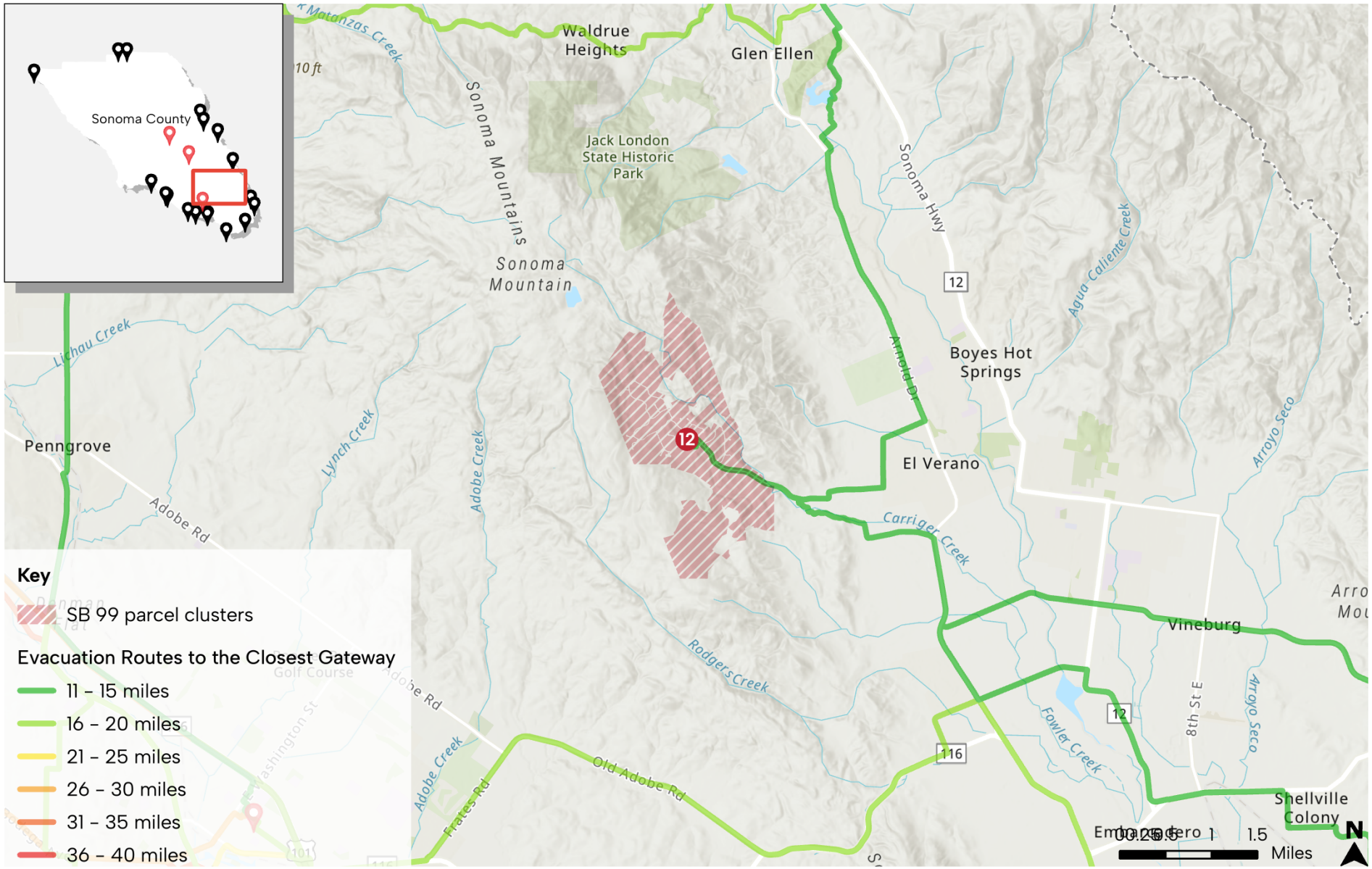


Figure 4-12

SB 99 Parcels with One Access/Egress Route
Parcels in Eastern Sonoma Mountain

Appendix C
Evacuation Routes and Locations Assessment (AB 747)

FEHR PEERS

Memorandum

Date: September 30, 2024 *(Revised June 17, 2025)*

To: Reema Shakra and Lauren Collar, Rincon Consultants

From: Ian Barnes, PE, Terence Zhao, and Grace Chen, Fehr & Peers

Subject: Sonoma County Safety Element Update – AB 747 Assessment

WC23-3966

Fehr & Peers is conducting a general, programmatic assessment of emergency evacuation routes for the Safety Element Update of the Sonoma County General Plan. This assessment is consistent with requirements under section 65302.15 of the Government Code, as legislated by Assembly Bill (AB) 747 and AB 1409.

This document describes the methodology for an assessment of roadway capacity and time needed to evacuate a designated study area under described evacuation scenarios. Please note that emergency evacuations can occur due to any number of events. Additionally, any emergency movement is unpredictable because it has an element of individual behavior related to personal risk assessment for each hazard event. As such, this assessment is intended to provide the jurisdiction with a broad understanding of the transportation system capacity during an evacuation scenario; it does not provide a guarantee that evacuations will follow the same modeling used for analysis purposes, nor does it guarantee that the findings are applicable to any or all situations.

Moreover, as emergency evacuation assessment is an emerging field, there is no established standard methodology. Fehr & Peers has adopted existing methodologies in transportation planning that, in our knowledge and experience, we believe are the most appropriate within the limits of the tools and data available and the budgetary and time constraints in the scope of work, and by current knowledge and state of the practice.

While this assessment should help the jurisdiction better prepare for hazard related events and associated evacuations, the jurisdiction should take care in planning and implementing any potential evacuation scenario. Fehr & Peers cannot and does not guarantee the efficacy of any of the information garnered from this assessment, as doing so would be beyond our professional duty and capability.

Legislative Requirements

Section 65302.15 of the Government Code requires that the safety element be reviewed and updated to identify evacuation locations and routes, as well as their capacity, safety, and viability under a range of emergency scenarios. This is a requirement for all safety elements and updates to a Local Hazard Mitigation Plan (LMHP) completed after January 2022.

It should be noted that the relevant statute requires a general, programmatic assessment of emergency evacuation locations and routes. This is a lower standard of granularity than analysis that is required by CEQA, where quantitative evacuation travel time assessments to study a project's effect on evacuation times for the surrounding area was required. this effort is a general, programmatic assessment of emergency evacuation routes to inform potential policies and strategies for the updated Safety Element, rather than a deeper, more granular CEQA level analysis where the purpose is to quantify project specific impacts.

AB 747 Approach

For this AB 747 Capacity Assessment, Fehr & Peers consulted with Sonoma County staff to identify an analysis approach and three evacuation scenarios to analyze. The analysis approach illustrated below in **Exhibit 1** was developed to study evacuation traffic conditions and identify improvements. There are an infinite amount of emergency events and evacuation scenarios that can occur in the County. Given the geography and topology of the County, three scenarios based on historic wildfire events and key considerations to address for those events were developed in coordination with County staff and first responders. The following section explains each of the three steps in the emergency evacuation analysis process in greater detail.

Exhibit 1. Emergency Evacuation Analysis Process



Scenario Development

We began the scenario development process by first creating a sector system that identifies all areas of Sonoma County that are most likely to evacuate under an emergency scenario, and then groups these areas into large sectors considering historic fire patterns as well as cohesion from a geographic and transportation system perspective. The locations of the sectors are presented in **Figure 1**.

After reviewing the County's evacuation, LHMP, and previous work around identifying evacuation zones, we worked with the County to identify three evacuation scenarios based on direction from County and Fire Department staff. Each of these scenarios would be general and assumed to be caused by an unspecified emergency (although it is accepted that wildfires are the events most likely to cause such a large-scale evacuation), which has necessitated evacuation in a set of affected sectors, requiring everyone to leave (i.e., not shelter-in-place). The three scenarios are:

- **Scenario 1** – An emergency in which sectors 1, 2, and 3, consisting of the mountainous western portions of the County from the coast to the valley floor, must evacuate. The evacuation destinations (or evacuation destinations, as they are referred to in statute) are presumed to be along State Route 1 northwards towards Mendocino County and southwards towards Marin County, eastwards along Skaggs Springs Road towards Cloverdale, and eastwards along River Road and State Route 116 towards Santa Rosa.
- **Scenario 2** – An emergency in which sectors 4, 5, and 6, consisting of the mountainous areas in the northeastern portion of the County, consisting of Alexander Valley and the Sonoma Mountains north of Mark West Springs, must evacuate. The evacuation destinations are presumed to be northwards along US-101 towards Mendocino County and southwards towards Santa Rosa.
- **Scenario 3** – An emergency in which sectors 7, 8, and 9, consisting of the southeastern portions of the County, including Sonoma Valley, parts of Santa Rosa east of Farmers Lane, and the Sonoma Mountains south of Mark West Springs, must evacuate. The evacuation destinations are presumed to be the urban cores of the cities of Petaluma, Rohnert Park, and Santa Rosa, as well as gateways near the shoreline in the south of Sonoma County towards Marin and Napa Counties.

Each of the scenarios was selected with geography and likelihood of evacuation events in mind. The affected area is purposefully established with a large footprint to use the analysis to stress test the roadway network during an evacuation event.

For all three scenarios, we will be modeling the evacuations based on the assumptions that evacuation orders are to be issued at 4:30PM on a Friday preceding a holiday weekend. This timing would take advantage of two stress tests for the roadway network: first, the presence of a

significant number of visitors and tourists in Sonoma County; and second, the presence of peak hour traffic on a weekday.

For all three scenarios, we are assuming that background traffic (i.e., through trips without an origin or destination in the study area) continues to use evacuation routes from 4:30 PM to 6:00 PM. It is noted that background traffic demand could stop shortly after 4:30 PM as it is unlawful to enter an area under an Evacuation Order. However, it is uncertain that police resources would be available for traffic control as the early priorities after an evacuation order are giving area notification to residents and assisting in the evacuation of residents who are unable to evacuate on their own. As such, the evacuation assessment conservatively assumes that background through traffic would not end at the time of the 4:30 pm evacuation order. Thus, the analysis includes background traffic on evacuation routes beyond what might be expected. The evacuation demand loading by time period, which represents the time at which individual evacuation trips begin, is as follows:

- 20% from 4:30 PM to 4:45 PM
- 40% from 4:45 PM to 5:00 PM
- 25% from 5:00 PM to 5:15 PM
- 15% from 5:15 PM to 5:30 PM

For all three scenarios, the evacuation assessment is based on roadway capacities from the Sonoma County Transportation Authority (SCTA) Travel Demand Model ("SCTA model") with a 10% reduction in capacity to account for the various incidents that may occur during an emergency scenario that might limit or reduce the capacities of these roadways (i.e. presence of debris or other hazards). Evacuation trips will not be assigned to any unpaved roads other than unpaved driveways that are the only point of egress to evacuation routes. The free-flow speeds of roadways will be set as their speed limits. Evacuation elapsed time ends when the network returns to an uncongested state (all links with 15-minute volume-to-capacity ratio of 0.75 or less).

Table 1 presents assumptions for evacuation destination patterns for each sector, where specific percentages of traffic will be assigned from each sector towards the evacuation destinations named in each evacuation scenario. These percentages will be used to define the destinations of evacuating traffic in the analysis model. Evacuation destinations, as discussed and identified in this analysis, are not assumed to be the final destination of evacuees. Instead, evacuation destinations are external gateways, or roadways that lead to outside of the boundaries of the study area. As such, they are not destinations themselves but serve as a proxy for trips leaving the study area. They should be interpreted as the gateways to safe shelter. Assumptions of evacuation destinations and percentages were based on County Department staff qualitative experience and understanding of local traffic patterns. Quantitative data to inform these assumptions was not available for this analysis.

Table 1: List of Destinations and Percentage Distributions for Evacuation Sectors

Scenario	Sector		
1	1	Coastal	Mendocino County – 20% Marin County or Petaluma – 50% Santa Rosa– 30%
	3	Russian River	Mendocino County – 5% Marin County or Petaluma – 10% Santa Rosa – 85%
	5	Geysers	Mendocino County – 30% Santa Rosa – 50% Lake County – 20%
3	7	Santa Rosa - Valley of the Moon	Cloverdale – 5% Santa Rosa – 85% Napa County – 5% Marin County – 5%
	9	Sonoma Valley	Santa Rosa – 10% Rohnert Park – 5% Petaluma – 40% Napa County – 30% Marin County – 15%

Evacuation Operations Analysis

The emergency evacuation operations analysis will be conducted using the Fehr & Peers EVAC+ tool, which is a modeling workflow that extracts the study area from the Sonoma County Transportation Authority (SCTA) travel demand model to estimate vehicle demand and levels of congestion in 15-minute intervals during an evacuation window. The EVAC+ workflow can be broken down into three modules:

1. Subarea module: Preparing the sub-area network representing the study area and the associated background trip tables.
2. Evacuation module: Estimating evacuation trips during the evacuation scenarios.
3. Dynamic traffic assignment (DTA) module: Assigning trips (dynamically) to the sub-area network.

The following sub-sections discuss each of these modules.

Subarea Module: Preparing the Sub-Area Network and Associated Trip Tables

Supply and demand are two major aspects of any travel demand modeling exercise. In a travel demand model, the demand is usually derived from people having to perform some activity, for example going to work or evacuating during an emergency. The resulting travel demand can be estimated from socio-economic data of the individuals whose travel constitutes such demand. The supply is based on roadway capacity and travel speeds that determine how many vehicles can travel through a certain section of the roadway per unit of time. The total travel taking place during an evacuation period can be conceptualized as a sum of background travel, the kind that will happen irrespective of an evacuation, and the evacuation traffic that will enter the roads only because there has been an evacuation order creating the need to travel. This subsection discusses the development of the sub-area network and background trips for the purpose of our analysis.

SCTA Model and Sub-Area Network

In order to obtain the background travel demand, we will run the SCTA model with the most up-to-date socio-economic data for Sonoma County. Since the evacuation areas for the three evacuation scenarios are a subset of the entire SCTA model area, we will extract a subset of the model area that represents the area that needs to evacuate as defined in each scenario, as well as the area that would be largely impacted by the evacuation. With this sub-area, we will obtain the trip tables associated with the network that contain all the vehicle trips between each traffic analysis zone (TAZ) and the external gateways (which are the evacuation destinations). The external gateways are roadways that lead outside of the boundaries of the study area. As such, they are not destinations themselves, but serve as a proxy for trips leaving the study area.

Trip tables are a series of matrices that store trips between origin and destination pairs. A conventional travel demand model looks at travel aggregated in time periods. In the case of the SCTA model these time periods are for daily, AM peak 1 hour, and PM peak 1 hour. Since this analysis is based on the assumptions that evacuation orders are to be issued at 4:30PM on a Friday preceding a holiday weekend, PM peak 1 hour trip table will be used as our initial background trip table.

Big Data Adjustments

Since travel models estimate trips during a normal weekday, further adjustments are required to accurately reflect traffic on a Friday before a holiday weekend. To achieve this, location-based services (LBS) "Big Data"[1] traffic counts from August 30, 2019 (which was the last Friday before a Labor Day that was not affected by the COVID-19 pandemic) as well as 2019 weekday average traffic counts were pulled to understand how the traffic volumes differ on a Friday before a holiday weekend compared to a normal weekday.

In addition, a background trip table will be used to represent the traffic conditions before and during the evacuation. The background trip table will be expanded to 2:30PM until midnight based on the traffic volumes on August 30, 2019, according to LBS big data traffic counts.

Finally, from an evacuation standpoint, more disaggregated time intervals than what travel models typically estimate are desired to develop a better understanding of travel during an evacuation order lasting just a few hours with a large number of trips evacuating swiftly. Therefore, a 15-minute disaggregation of the trip tables was completed based on LBS big data to allow for greater granularity enabling traffic assignment in 15-minute intervals.

Background Trip Tables

Based on the SCTA travel model outputs and the big data adjustments, background trip tables for every 15-minute from 2:30PM to midnight were developed to feed into the dynamic traffic assignment model. When evacuation starts, trips that do not end in evacuation zones are assumed to continue their normal activity regardless of if the evacuation order has been given. Trips that end in the evacuation zone after the evacuation order is given do not travel and stay in the original zone, but will travel to a gateway of the evacuation study area.

[1] LBS data is provided from devices, primarily smart phones, which run applications and connect to cellular, WiFi, and/or GPS networks. LBS data is carrier-neutral and uses multiple location technologies, providing few gaps in coverage and high spatial precision.

Evacuation Module: Estimate Resident and Work Trips During an Evacuation Event

The traffic generated due to an evacuation by residents and employees of an evacuation area is the other portion of the total travel. This subsection discusses how the evacuation trips will be estimated.

Evacuation Traffic

To estimate the trips originating in each scenario study area that will result due to an evacuation, we need to know how many vehicles will be evacuated for each scenario. Traffic Analysis Zone (TAZ) geographies from the SCTA model are used to represent neighborhoods in each sub-area. The number of vehicle trips generated by each household was informed by the land use and socio-economic data (SED) in each TAZ. The SED includes a variety of information based on the SCTA land use data and U.S. census data, including persons per household, number of employees, and auto ownership per household. The SED information is used to determine the number of vehicles per household that would be evacuating during an evacuation event.

It should be noted that the dynamic traffic assignment model only reflects personal vehicle traffic. Due to the nature of this model, travel made by walking or biking are not considered. However, based on the characteristics of Sonoma County and especially each of the evacuation areas, these trips will be negligible during an evacuation, and the evacuation model assumes that all households will evacuate using their personal vehicle (that is, assuming the largest possible number of vehicle trips).

We forecasted trips evacuating from households based on household demographic data for household size and vehicle ownership for each evacuation study area, and estimated the number of evacuating vehicle trips generated by each household accordingly. Each household is assumed to be evacuating together, and the evacuation trip is made directly to the evacuation destination (i.e., shelter or external gateway). We also presumed that households with more than one vehicle per person likely would not be able to utilize all vehicles during an evacuation event: for example, households with three or four vehicles but only two household members will be able to take at most two vehicles (this calculation approach results in vehicles per household values that are generally in line with data from past incidents: for example, a post evacuation survey of Santa Rosa residents that evacuated during the 2017 Tubbs Fire indicated that a weighted average of 1.75 vehicles evacuated per household). We are conservatively assuming that 100% households will be at home and evacuating.

In addition to this demand generated from the residential population, we take another conservative assumption that all workers within the evacuation areas drive to work alone, will be present at their workplace in the evacuation area at the time of evacuation, and will also evacuate with each worker taking one personal vehicle.

The estimated evacuation demand for each scenario, quantified in number of vehicles, are documented in **Appendix A**.

Evacuation Departure Time

The departure timing for people leaving the evacuated areas, after the evacuation notice is issued, varies by the timing and nature of the event. For events where ample notice is given, less time is needed to prepare for the evacuation. On the other hand, when little notice of an event is given, the time required to prepare for an evacuation is typically longer as residents need to pack belongings, collect their animals, and other activities that require coordination before beginning their evacuation trip. The evacuation time for a trip in this analysis is based on the time *after* the evacuation trip is loaded on the road network.

Evacuation Demand Loading Window

The evacuation time window is the time between when the evacuation begins (assumed to be at 4:30 PM as previously noted) and how many hours the evacuation zones require to be fully evacuated, based upon the evacuation order (with the assumption that the evacuation zones are fully evacuated when the roadway network within the evacuation area returns to an uncongested state). The distribution across the evacuation time windows for the three evacuation scenarios are stated in the Scenario Development section. Although this is the assumed distribution for the EVAC+ model, it should be noted that emergency scenarios are often unpredictable, and driver behavior can be disorderly.

The capacity assessment of the network also changes the time needed for an evacuation. For example, scenarios where a 2-hour time window is assumed for evacuation (generally representing the time from evacuation order to the time most people begin their trip to leave the area), the total time needed for evacuation can be longer due to congestion and total distance traveled into/out of the area. The evacuation analysis applies roadway capacities from the SCTA model, but with a 10% reduction in capacity to account for the various incidents that may occur during an emergency scenario that might limit or reduce the capacities of these roadways (i.e. presence of debris or other hazards). Any unpaved roads are not included in the evacuation network. The free-flow speeds of roadways are set as their speed limits.

Evacuation Destinations

Trips departing evacuation zones are allocated to model gateways representing the destinations outside of the model area. The capacity of each use within the model area and the shelter opportunities represented at the gateways are used to determine the destination of evacuation trips. The share of trips assumed to end in each evacuation destination are shown in **Table 1**.

DTA Module: Dynamically Assign Trips to the Sub-Area Transportation Network

The sub-area extracted network, the background trips tables, and the evacuation trip tables are inputs of the Dynamic Traffic Assignment (DTA) model. A DTA model estimates traffic and levels of congestion in 15-minute intervals and, as link congestion builds (i.e., roads fill with cars), it dynamically reassigns traffic to less congested routes. This process helps identify congested locations on the network that should be considered during an evacuation event and alternative routes people may use due to congested conditions. In this analysis, we assume the evacuation elapsed time ends when the roadway network within the evacuation area returns to an uncongested state (all links with 15-minute volume-to-capacity ratio of 0.75 or less).

Additional Considerations

Facilitating evacuation of people with access and functional needs (AFNs), such as those who do not have access to or cannot operate a vehicle, is not analyzed as part of this study. The evacuation analysis does not include a detailed assessment of people in the study areas that have AFNs and how this may impact evacuation. However, this is a critical consideration for emergency personnel to ensure that complete evacuation is carried out. Further research into possible means of evacuating people with AFNs is recommended. As noted in the County's existing Emergency Operations Plan Evacuation Annex and Mass Care and Shelter Plan, options for assisting with evacuation in such situations could include, but not be limited to, the following:

- Promotion of County registry to ensure emergency responders know where to look for people who cannot self-evacuate
- Neighborhood "buddy" program to link people needing assistance with people willing to assist
- Coordination with local school districts to provide school bus access
- Partnership with transportation network companies (TNCs, like Uber and Lyft) to provide reduced-rate access
- Increased coordination with emergency services personnel to assist with accessibility

AB 747 Modeling Results

The EVAC+ tool, as described in the Approach and Methodology section, was used to estimate traffic conditions and operations during each of the three evacuation scenarios. The assignment results for each scenario in 15-minute interval are summarized below.

The resulting plots are color-coded by volume-to-capacity ratio, which measures the amount of traffic on a given roadway relative to the amount of traffic the roadway was designed to accommodate, from green to red (green being free-flow traffic and red being heavily congested), while the width of the lines represents traffic volume. For the purposes of this analysis, return to a volume-to-capacity ratio of 0.75 or lower indicates that the evacuation facilities have returned to free flow conditions and have served the vast majority of evacuation demand, with the remaining vehicles in the system representing evacuees who evacuated late.

The results of each scenario are described in the following sections.

Scenario 1

Scenario 1 is an emergency in which sectors 1, 2, and 3, consisting of the mountainous western portions of the County from the coast to the valley floor, must evacuate.

The modeling results for Scenario 1 for the Base Year 2019 and Future Year 2040 scenarios are presented in **Figure 2A** and **2B**. This scenario includes the coastal and mountainous west of Sonoma County, which has a limited number of roadways, and most of the evacuation traffic uses SR-1 to head north or south (and exiting via Valley Ford Road, as indicated by the model. Skaggs Spring Road and SR-116, which connects the coast with points east, sees some evacuation traffic from the coast, but most of the traffic uses SR-1. In the Green Valley area on the southeast portion of the evacuation area, every east-west oriented roadway in the area experiences heavy eastbound flows out of the evacuation area. However, the number of such roadways (in contrast to the mountainous and coastal areas in the west) and the relative proximity of the exit gateways of the study area means there is no single bottleneck for eastbound evacuation traffic.

The Year 2019 analysis indicates that evacuation area roadways would return to uncongested operations about 3.00 to 3.25 hours after the evacuation begins. The Year 2040 analysis indicates that study area roadways would return to uncongested operations about 3.00 to 3.25 hours after commencement of the evacuation. However, with the exception of the eastern exit gateways, the rest of the evacuation area's congestion clears significantly earlier. For reference, the model predicts an 51.4% growth in residential population and a 23% growth in employment population over the same period.

Scenario 2

Scenario 2 is an emergency in which sectors 4, 5, and 6, consisting of the mountainous areas in the northeastern portion of the County, consisting of Alexander Valley and the Sonoma Mountains north of Mark West Springs, must evacuate.

The modeling results for Scenario 2 for the Base Year 2019 and Future Year 2040 scenarios are presented in **Figure 3A** and **3B**. The area analyzed for Scenario 2 includes US-101 between Geyserville and just north of Santa Rosa (although the evacuation area does not), as background traffic along US-101 at the time of evacuation is expected to contribute to the challenges of this evacuation scenario, especially since US-101 is expected to be a primary evacuation route.

The model indicates that at the time of evacuation, there will already be significant traffic on the network, especially on US-101 near Windsor and Santa Rosa, and there is extremely heavy flows of traffic (both evacuation and background traffic) in both directions of US-101 through much of the evacuation period, with southbound traffic towards Santa Rosa being heavier than northbound traffic. The relatively high capacity of US-101 allows this traffic to clear relatively quickly compared to secondary flows of traffic along several other non-controlled access roadways, including Chalk Hill Road, SR-128, Porter Creek Road, Franz Valley Road, Petrified Forest Road, and St. Helena Road towards Napa County, and Calistoga Road towards Santa Rosa, all of which see traffic flows take longer to clear.

The Year 2019 analysis indicates that evacuation area roadways would return to uncongested operations about 2.75 to 3.00 hours after the evacuation begins. The Year 2040 analysis indicates that evacuation area roadways would return to uncongested operations about 4.00 to 4.25 hours after commencement of the evacuation. For reference, the model predicts an 18.2% growth in residential population and a 57.5% growth in employment population over the same period.

Scenario 3

Scenario 3 is an emergency in which sectors 7, 8, and 9, consisting of the southeastern portions of the County, including Sonoma Valley, parts of Santa Rosa east of Farmers Lane, and the Sonoma Mountains south of Mark West Springs, must evacuate.

The modeling results for Scenario 3 for the Base Year 2019 and Future Year 2040 scenarios are presented in **Figure 4A** and **4B**. This scenario represents, by far, the largest population of residents and employees in the evacuation zone amongst the three scenarios, with significant populations in Valley of the Moon, Kenwood, and Sonoma Valley. The model indicates expected heavy traffic along both of the major arterials through Sonoma Valley, SR-12 and Arnold Drive, as evacuation traffic moves towards evacuation destinations at the northern and southern ends of the evacuation area. In the north, SR-12 and, to a lesser degree, Bennett Valley Road, carry

significant traffic. In the south, significant traffic flows occur on SR-12 towards Napa and on SR-121 towards SR-37. However, the heaviest flows are observed along SR-116 / Stage Gulch Road. As Petaluma is the closest population center to much of the evacuation area, it is expected to be a major evacuation destination. SR-116 between Old Adobe Road in the west and Watmaugh Road in the east is the sole route between Petaluma and the Sonoma Valley with many roadways feeding into it on either end, making this stretch the largest capacity bottleneck.

The Year 2019 analysis indicates that evacuation area roadways would return to uncongested operations about 4.00 to 4.25 hours after the evacuation begins. The Year 2040 analysis indicates that evacuation area roadways would return to uncongested operations about 4.50 to 4.75 hours after commencement of the evacuation. For reference, the model predicts an 8% growth in both residential and employment populations over the same period.

Recommendations

Given topographic and roadway network constraints, Sonoma County has limited options to manage evacuation demand during an emergency scenario. The three emergency evacuation scenarios analyzed as part of this emergency evacuation assessment highlight the significance of US 101, SR 116, SR 12, SR 128, SR 121, and SR 1 as key evacuation routes, along with key local and regional roadways under maintenance by the County and surrounding jurisdictions.

Despite these constraints and challenges, the County can build upon previously completed local and regional evacuation planning efforts and incorporate additional strategies that may improve the efficiency of evacuation operations. Based on the modeling results, we developed recommendations to facilitate evacuation traffic operations. These recommendations consider a combination of permanent improvements, such as installing signage, changes to traffic control devices, or modifying roadway widths on key routes, and temporary improvements that can be quickly implemented during an evacuation event, such as traffic control officers, triggered evacuation warnings, or diversion of through traffic to maximize capacity for evacuation vehicles.

Broadly, these strategies can be organized into three categories, and are detailed further in this section below.

- **Demand**: when, how, and where people evacuate in an emergency.
- **Supply**: the physical and operational infrastructure that facilitates an emergency evacuation.
- **Policy**: how information is shared and received in an emergency.

Demand

- Develop a traffic control plan that identifies how signal backup will commence or key locations that traffic control officers will disperse to.
- Work with fire districts and departments to strategically stage emergency response vehicles in coordination with the evacuation warnings/orders.
- Encourage residents to take only one or two vehicles (based on household size) to reduce the number of evacuating vehicles. Offer off-site parking facilities to safely store secondary vehicles in advance of an emergency event.
- Encourage residents to evacuate in a timely manner, or in a phased evacuation, to reduce last-minute evacuations and concentrated demand on the roadway network. Coordinate with school districts to build awareness regarding school evacuation protocols which include sheltering in place or evacuating off-site using school buses or local transit.
- Require new developments or residential construction projects to consider worker evacuation needs as part of their construction permits.
- Underground utilities to prevent downed wires on main evacuation routes.

Supply

- Identify routes where reversible lanes could be considered during an evacuation based on the existing right-of-way and infrastructure.
- Develop a catalog of sample cross-sections for temporary conversion and best practice treatments to enable two-lane egress as well as safe pedestrian egress and emergency response ingress.
- Pursue redundancy of critical transportation infrastructure to allow for continued access and movement in the event of an emergency, including vulnerabilities of traffic signals/traffic control centers, to reduce impact and response time for outages that may occur during emergency events (e.g., signals losing power due to high winds or active fire).
    - Prioritize traffic signals in vulnerable areas for improvements and connect signals to the Traffic Management Center, with contingency plans for loss of power and communications grids.
    - Investigate adaptive signal control (ASC) systems that can adjust traffic signal timing to account for high volumes that occur during hazard events. Provide redundancy in the form of a static evacuation coordination plan in case of ASC system disruption.
- Ensure that Fire departments have complete access to all locations in the County, including gated communities and critical infrastructure that is within the County's jurisdiction.

- Require new developments and redevelopments to provide adequate access (ingress, egress) and a minimum of two roadways with widths and lengths. Inventory and assess existing development that is within the County's jurisdiction to understand whether changes to access (ingress/egress), circulation, or vehicle storage patterns could provide additional community benefit during evacuation events.
- Require new developments and redevelopments to incorporate resilience amenities (e.g., community cooling center, emergency supplies, and backup power) to be used by residents and businesses within a quarter-mile distance.
- Continue to develop and maintain evacuation options for populations with Access and Functional Needs (AFNs) as well as other vulnerable populations (such as those without sufficient access to a vehicle to evacuate all people in their household), as the County has done in its existing Emergency Operations Plan, Emergency Operations Plan Evacuation Annex, and Mass Care and Shelter Plan.
- Provide one-tenth mile markers for assisting travelers and emergency responders with location, mainly when communications grids are down.
- Designate safety zones (points of last refuge) or shelter-in-place locations as potential places of refuge when evacuation routes become blocked.

Policy

- Establish a redundant and resilient public communications system that builds on existing communications tools and systems (such as the Wireless Emergency Alert, Nixle, and Everbridge) to ensure uninterrupted emergency communications such as through solar photovoltaic systems and battery storage, phone/text alerts, radio, sirens/loudspeaker, and signage.
- Consider countywide evacuation drills for residents so that they are aware of what to expect during an evacuation event and are prepared in such a scenario. Conduct regular evacuation training with single-access community HOAs and residents; encourage residents in single-access communities to maintain emergency supplies for 3-10 days.
- Create a registry to accurately document where "Access & Functional Needs" populations are located, along with the location of other potentially vulnerable populations throughout the unincorporated County, such as senior housing facilities and schools, and others without access to a personal vehicle (such as tourists), particularly in very high wildfire risk zones.
- Maintain and regularly update the County's Local Hazard Mitigation Plan (LHMP) and the Sonoma County Operational Area Emergency Operations Plan (EOP) to maintain eligibility for grant funding.

- Adopt an Urban Forestry Plan that includes proper landscaping, planning, and management guidance for County staff and first responders in maintaining clear routes for evacuation.
- Provide Community Emergency Response Training (CERT) to increase disaster preparedness training to the community at the neighborhood level.
- Provide multi-lingual (English and Spanish at a minimum) public health, emergency preparedness, and evacuation information and signage to citizens through libraries, the County website, radio, schools, and other social media platforms.
- Promote a culture of preparedness for residents and businesses to increase resilience to hazard events.
- Improve coordination between frontline emergency personnel, media sources, and school districts to ensure accurate and clear information is being disseminated.
- Coordinate with agencies operating or managing dam facilities on operations, maintenance, and training activities, and provide Emergency Action Plans annually.
- Provide evacuees with guidance on evacuation route conditions along with dynamic rerouting information to decrease travel times and reduce congestion on highly traveled roads (for example, GPS routing systems).
- Monitor traffic using intelligent transportation system (ITS) technology to identify accidents and problem areas, determine the effectiveness of responses, and change responses as needed.

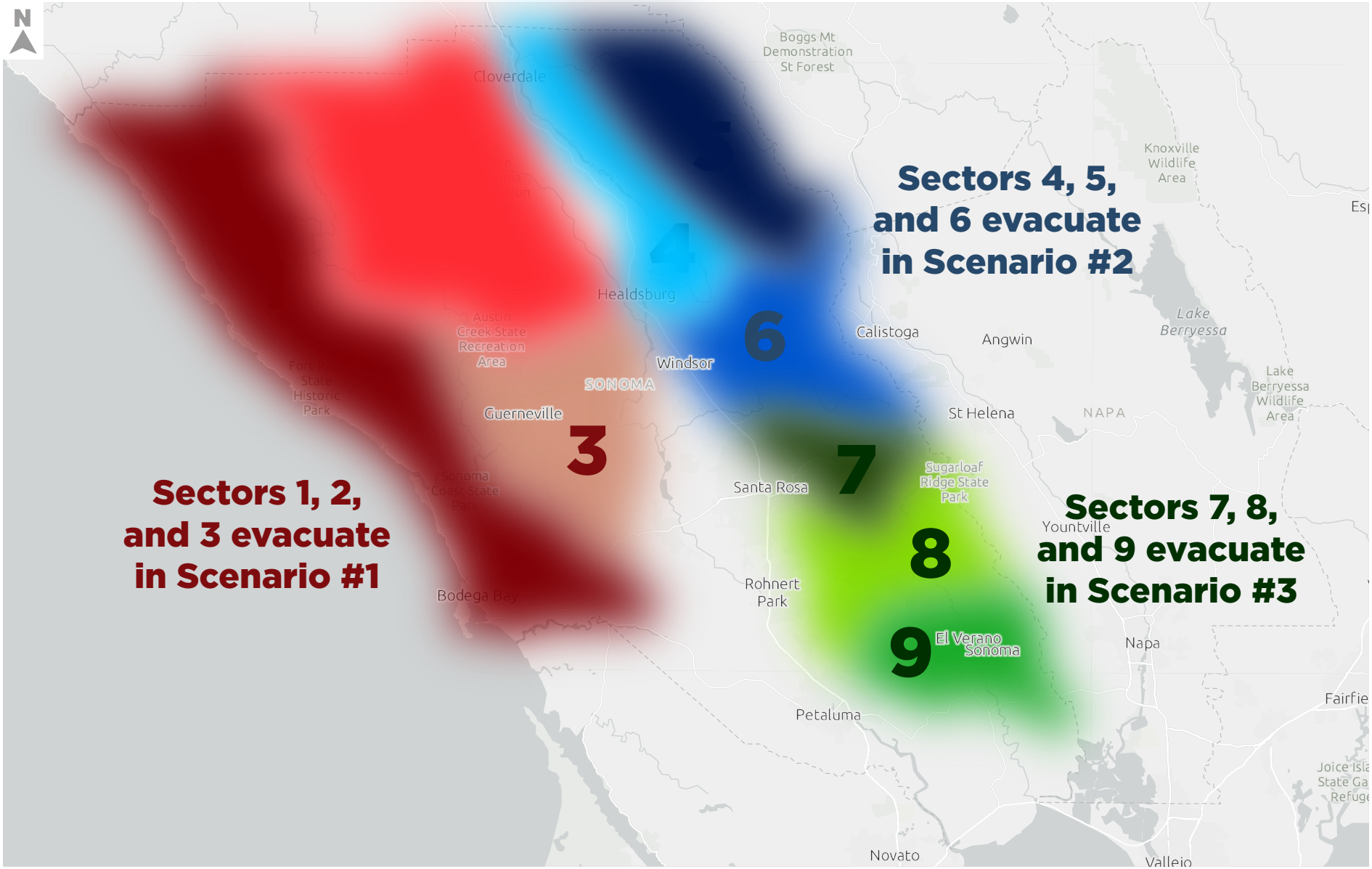


Figure 1

Evacuation Sectors



Figure 2.1

Scenario 1 Base Year Model Run - 2:30 PM



Figure 2.2

Scenario 1 Base Year Model Run - 2:45 PM

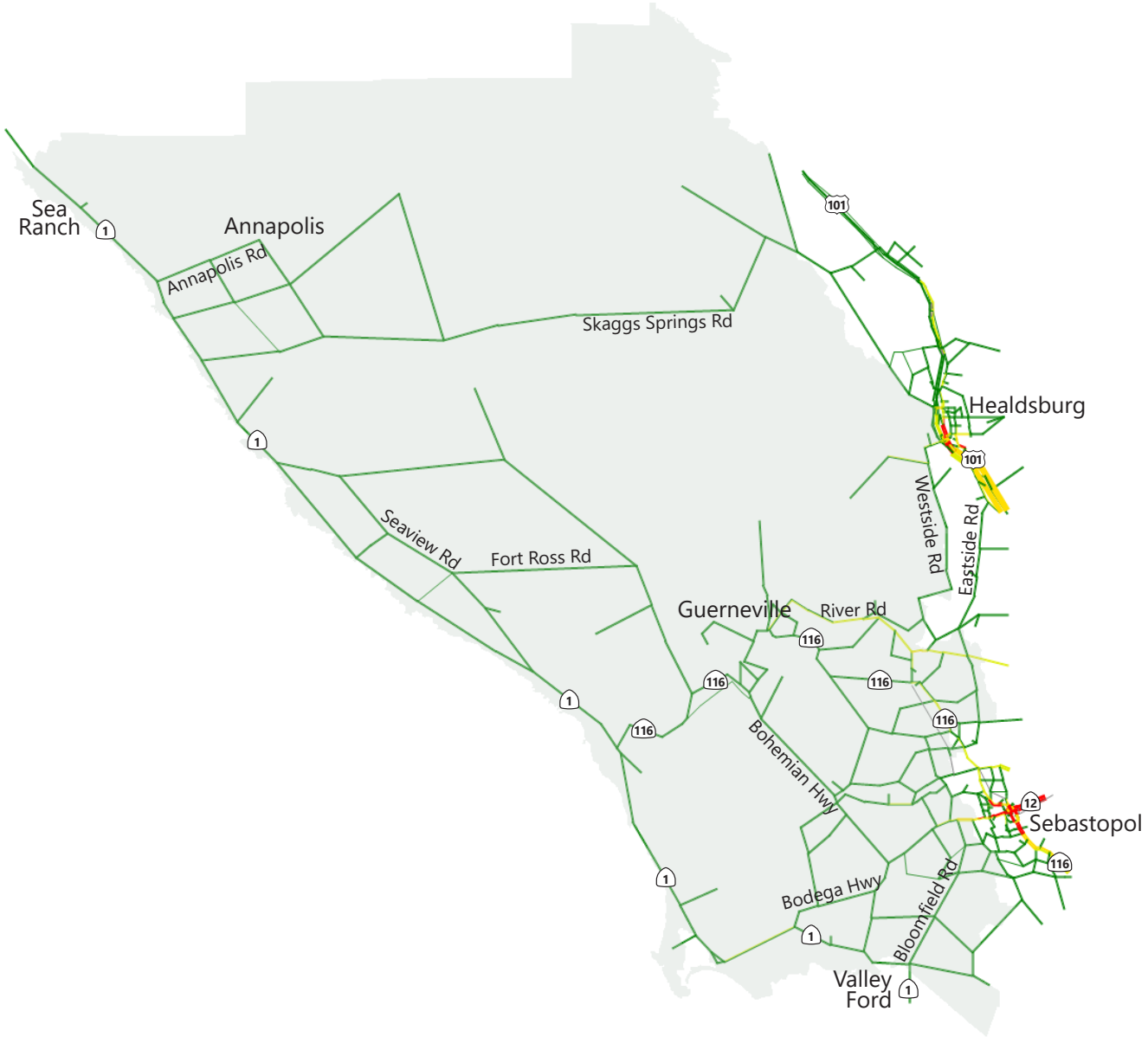


Figure 2.3

Scenario 1 Base Year Model Run - 3:00 PM



Figure 2.4

Scenario 1 Base Year Model Run - 3:15 PM



Figure 2.5

Scenario 1 Base Year Model Run - 3:30 PM



Figure 2.6

Scenario 1 Base Year Model Run - 3:45 PM



Figure 2.7

Scenario 1 Base Year Model Run - 4:00 PM

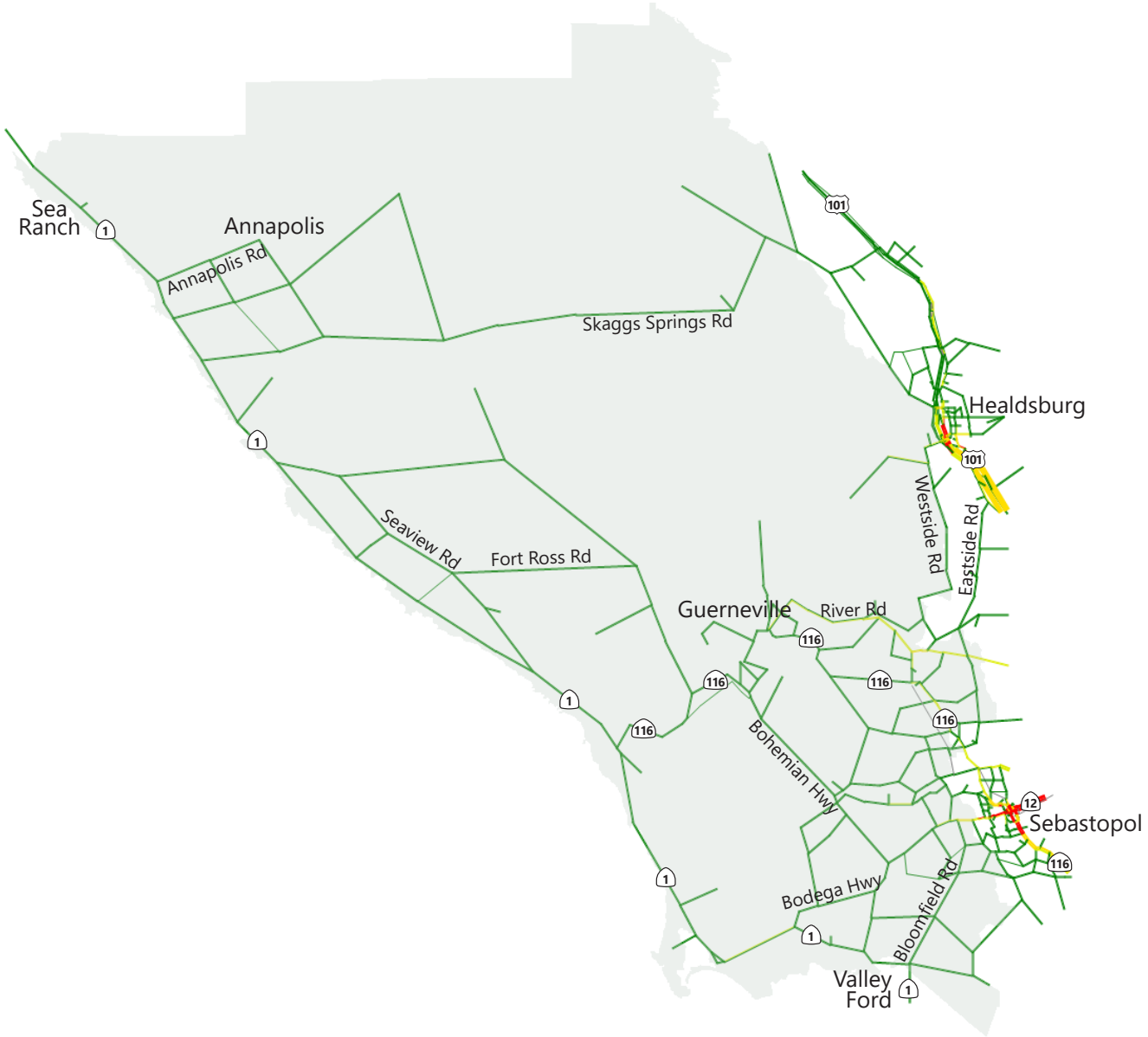


Figure 2.8

Scenario 1 Base Year Model Run - 4:15 PM



Figure 2.9

Scenario 1 Base Year Model Run - 4:30 PM (start of evacuation)



Figure 2.10

Scenario 1 Base Year Model Run - 4:45 PM



Figure 2.11

Scenario 1 Base Year Model Run - 5:00 PM



Figure 2.12

Scenario 1 Base Year Model Run - 5:15 PM



Figure 2.13

Scenario 1 Base Year Model Run - 5:30 PM



Figure 2.14

Scenario 1 Base Year Model Run - 5:45 PM



Figure 2.15

Scenario 1 Base Year Model Run - 6:00 PM



Figure 2.16

Scenario 1 Base Year Model Run - 6:15 PM

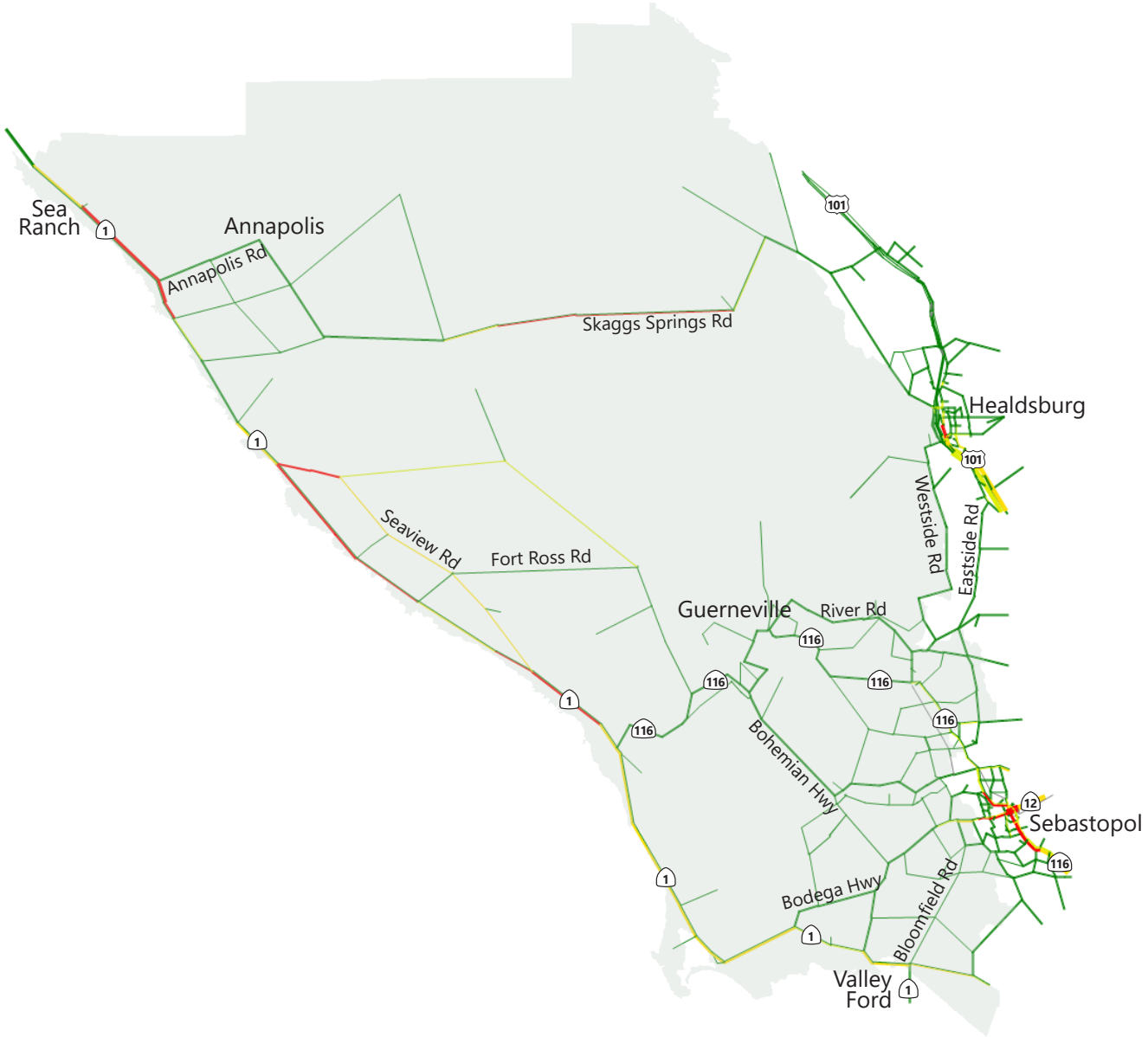


Figure 2.17

Scenario 1 Base Year Model Run - 6:30 PM



Figure 2.18

Scenario 1 Base Year Model Run - 6:45 PM



Figure 2.19

Scenario 1 Base Year Model Run - 7:00 PM

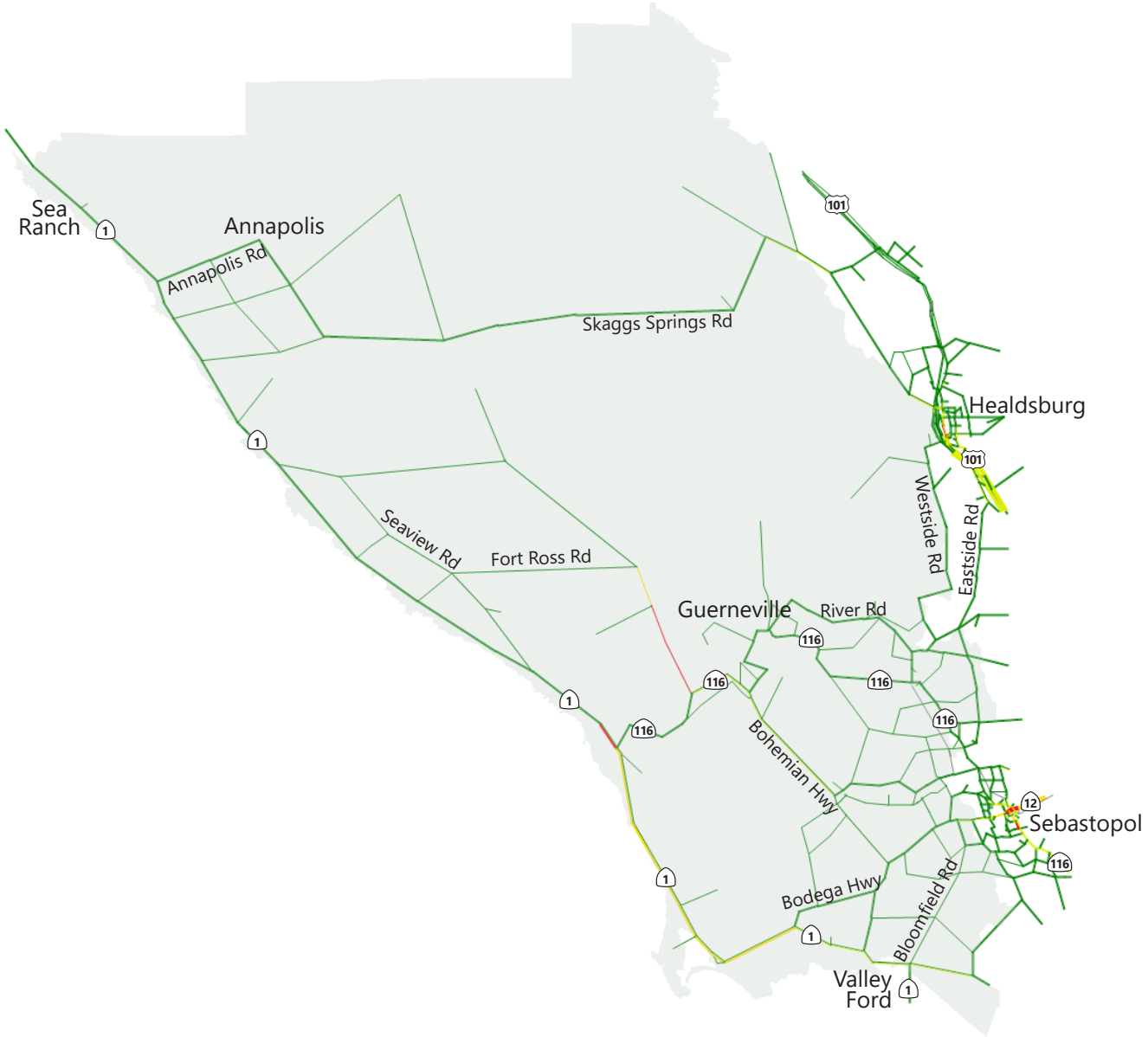


Figure 2.20

Scenario 1 Base Year Model Run - 7:15 PM



Figure 2.21

Scenario 1 Base Year Model Run - 7:30 PM

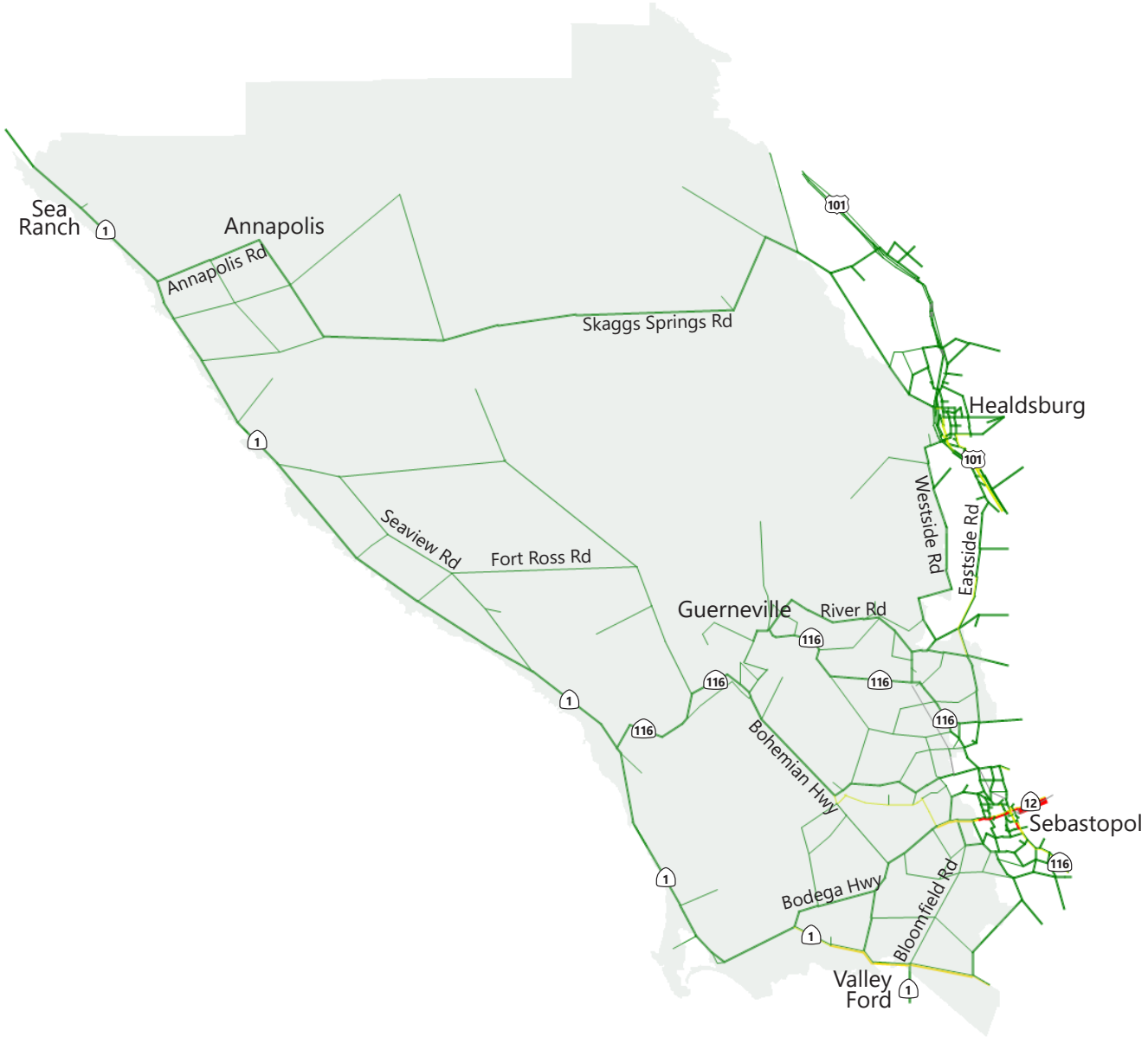


Figure 2.22

Scenario 1 Base Year Model Run - 7:45 PM



Figure 2.23

Scenario 1 Base Year Model Run Results



Figure 3.1

Scenario 1 Future Year Model Run - 2:30 PM



Figure 3.2

Scenario 1 Future Year Model Run - 2:45 PM



Figure 3.3

Scenario 1 Future Year Model Run - 3:00 PM



Figure 3.4

Scenario 1 Future Year Model Run - 3:15 PM



Figure 3.5

Scenario 1 Future Year Model Run - 3:30 PM



Figure 3.6

Scenario 1 Future Year Model Run - 3:45 PM



Figure 3.7

Scenario 1 Future Year Model Run - 4:00 PM



Figure 3.8

Scenario 1 Future Year Model Run - 4:15 PM



Figure 3.9

Scenario 1 Future Year Model Run - 4:30 PM (start of evacuation)



Figure 3.10

Scenario 1 Future Year Model Run - 4:45 PM



Figure 3.11

Scenario 1 Future Year Model Run - 5:00 PM



Figure 3.12

Scenario 1 Future Year Model Run - 5:15 PM



Figure 3.13

Scenario 1 Future Year Model Run - 5:30 PM

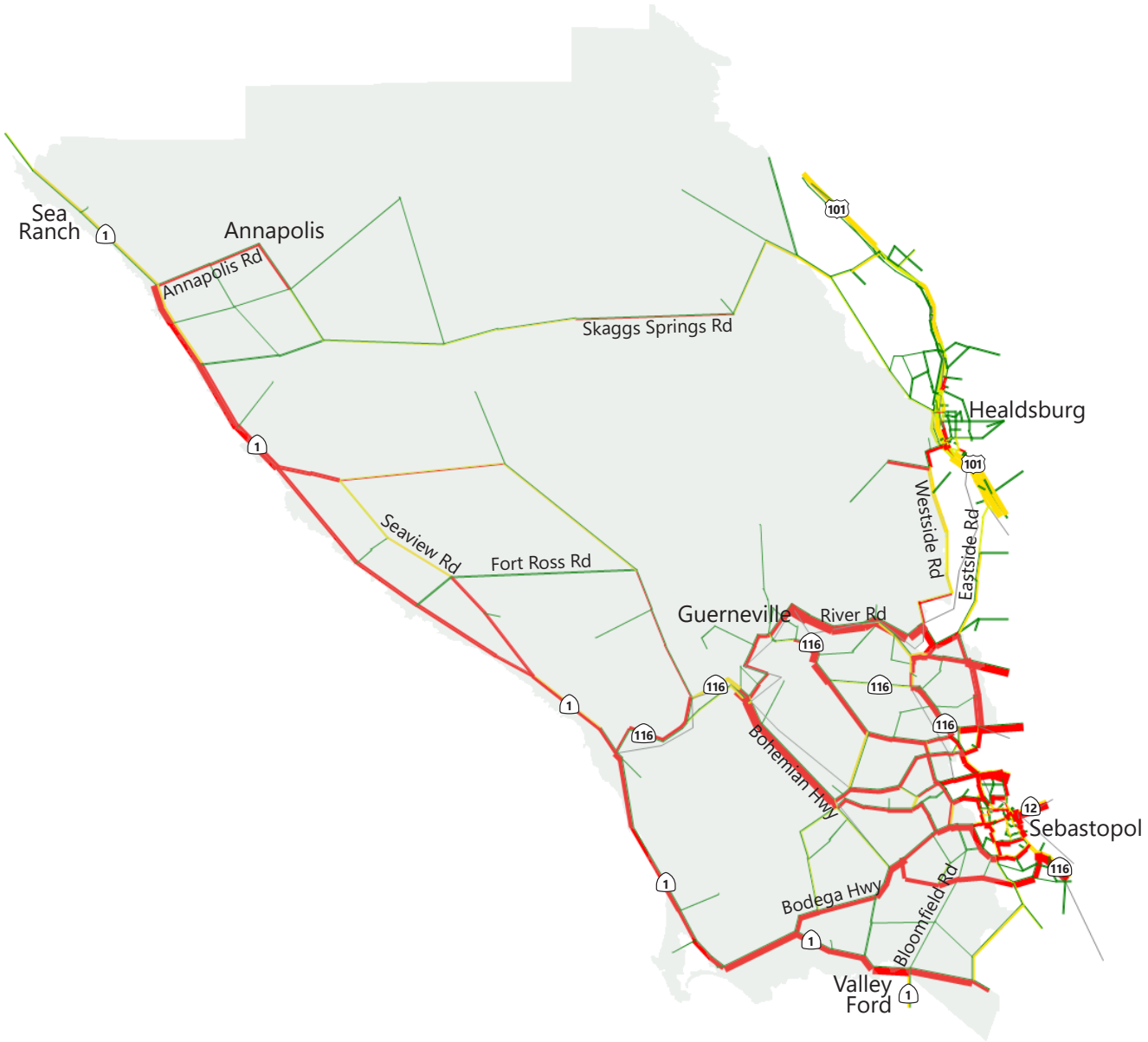


Figure 3.14

Scenario 1 Future Year Model Run - 5:45 PM



Figure 3.15

Scenario 1 Future Year Model Run - 6:00 PM

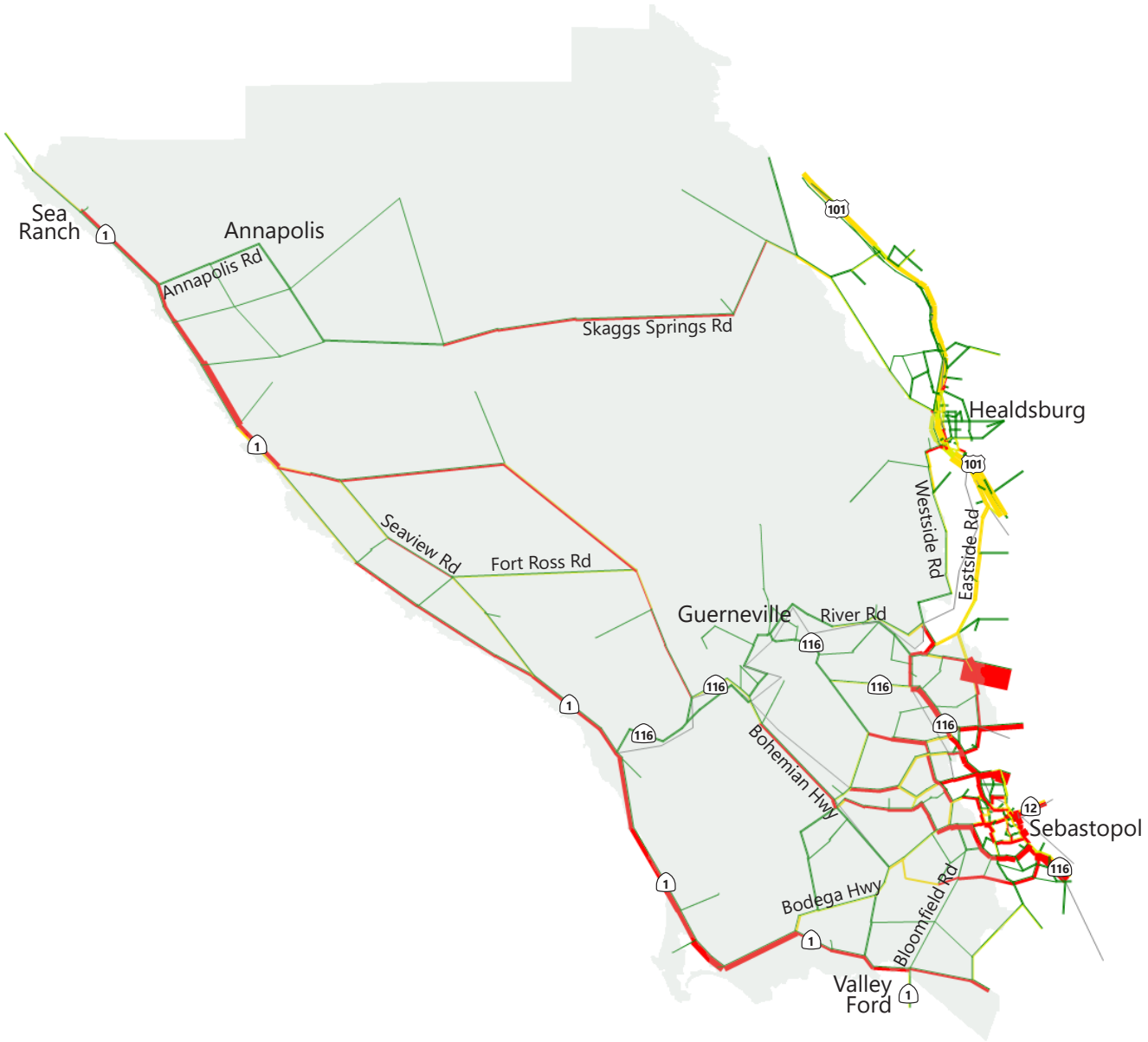


Figure 3.16

Scenario 1 Future Year Model Run - 6:15 PM



Figure 3.17

Scenario 1 Future Year Model Run - 6:30 PM



Figure 3.18

Scenario 1 Future Year Model Run - 6:45 PM



Figure 3.19

Scenario 1 Future Year Model Run - 7:00 PM



Figure 3.20

Scenario 1 Future Year Model Run - 7:15 PM



Figure 3.21

Scenario 1 Future Year Model Run - 7:30 PM



Figure 3.22

Scenario 1 Future Year Model Run - 7:45 PM



Figure 3.23

Scenario 1 Future Year Model Run Results



Figure 4.1

Scenario 2 Base Year Model Run - 2:30 PM



Figure 4.2

Scenario 2 Base Year Model Run - 2:45 PM



Figure 4.3

Scenario 2 Base Year Model Run - 3:00 PM



Figure 4.4

Scenario 2 Base Year Model Run - 3:15 PM



Figure 4.5

Scenario 2 Base Year Model Run - 3:30 PM



Figure 4.6

Scenario 2 Base Year Model Run - 3:45 PM



Figure 4.7

Scenario 2 Base Year Model Run - 4:00 PM



Figure 4.8

Scenario 2 Base Year Model Run - 4:15 PM



Figure 4.9

Scenario 2 Base Year Model Run - 4:30 PM (start of evacuation)



Figure 4.10

Scenario 2 Base Year Model Run - 4:45 PM



Figure 4.11

Scenario 2 Base Year Model Run - 5:00 PM



Figure 4.12

Scenario 2 Base Year Model Run - 5:15 PM



Figure 4.13

Scenario 2 Base Year Model Run - 5:30 PM



Figure 4.14

Scenario 2 Base Year Model Run - 5:45 PM



Figure 4.15

Scenario 2 Base Year Model Run - 6:00 PM



Figure 4.16

Scenario 2 Base Year Model Run - 6:15 PM



Figure 4.17

Scenario 2 Base Year Model Run - 6:30 PM



Figure 4.18

Scenario 2 Base Year Model Run - 6:45 PM



Figure 4.19

Scenario 2 Base Year Model Run - 7:00 PM



Figure 4.20

Scenario 2 Base Year Model Run - 7:15 PM



Figure 4.21

Scenario 2 Base Year Model Run - 7:30 PM



Figure 4.22

Scenario 2 Base Year Model Run - 7:45 PM

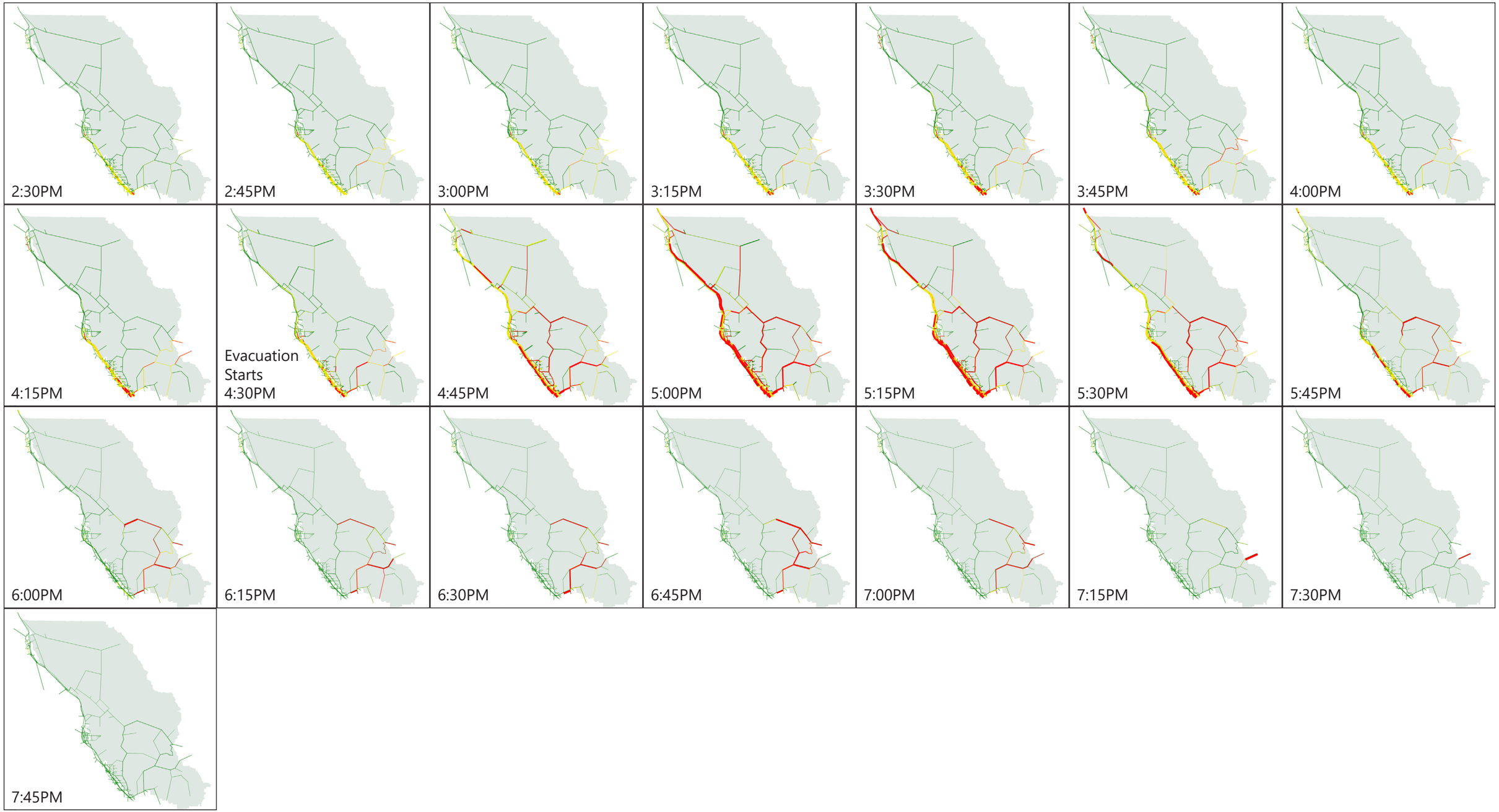


Figure 4.23

Scenario 2 Base Year Model Run Results



Figure 5.1

Scenario 2 Future Year Model Run - 2:30 PM



Figure 5.2

Scenario 2 Future Year Model Run - 2:45 PM



Figure 5.3

Scenario 2 Future Year Model Run - 3:00 PM



Figure 5.4

Scenario 2 Future Year Model Run - 3:15 PM



Figure 5.5

Scenario 2 Future Year Model Run - 3:30 PM



Figure 5.6

Scenario 2 Future Year Model Run - 3:45 PM



Figure 5.7

Scenario 2 Future Year Model Run - 4:00 PM

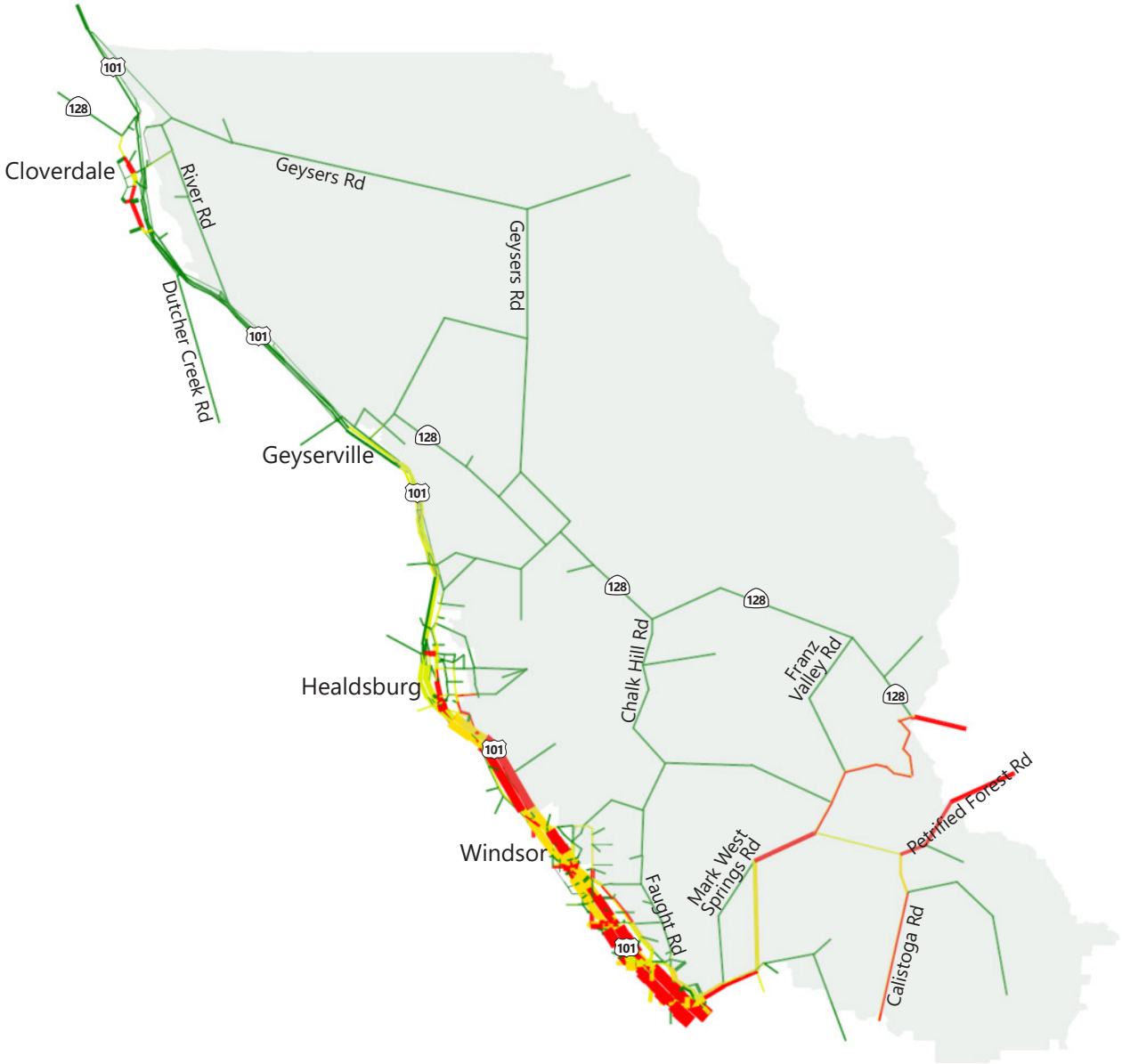


Figure 5.8

Scenario 2 Future Year Model Run - 4:15 PM



Figure 5.9

Scenario 2 Future Year Model Run - 4:30 PM (start of evacuation)



Figure 5.10

Scenario 2 Future Year Model Run - 4:45 PM



Figure 5.11

Scenario 2 Future Year Model Run - 5:00 PM



Figure 5.12

Scenario 2 Future Year Model Run - 5:15 PM

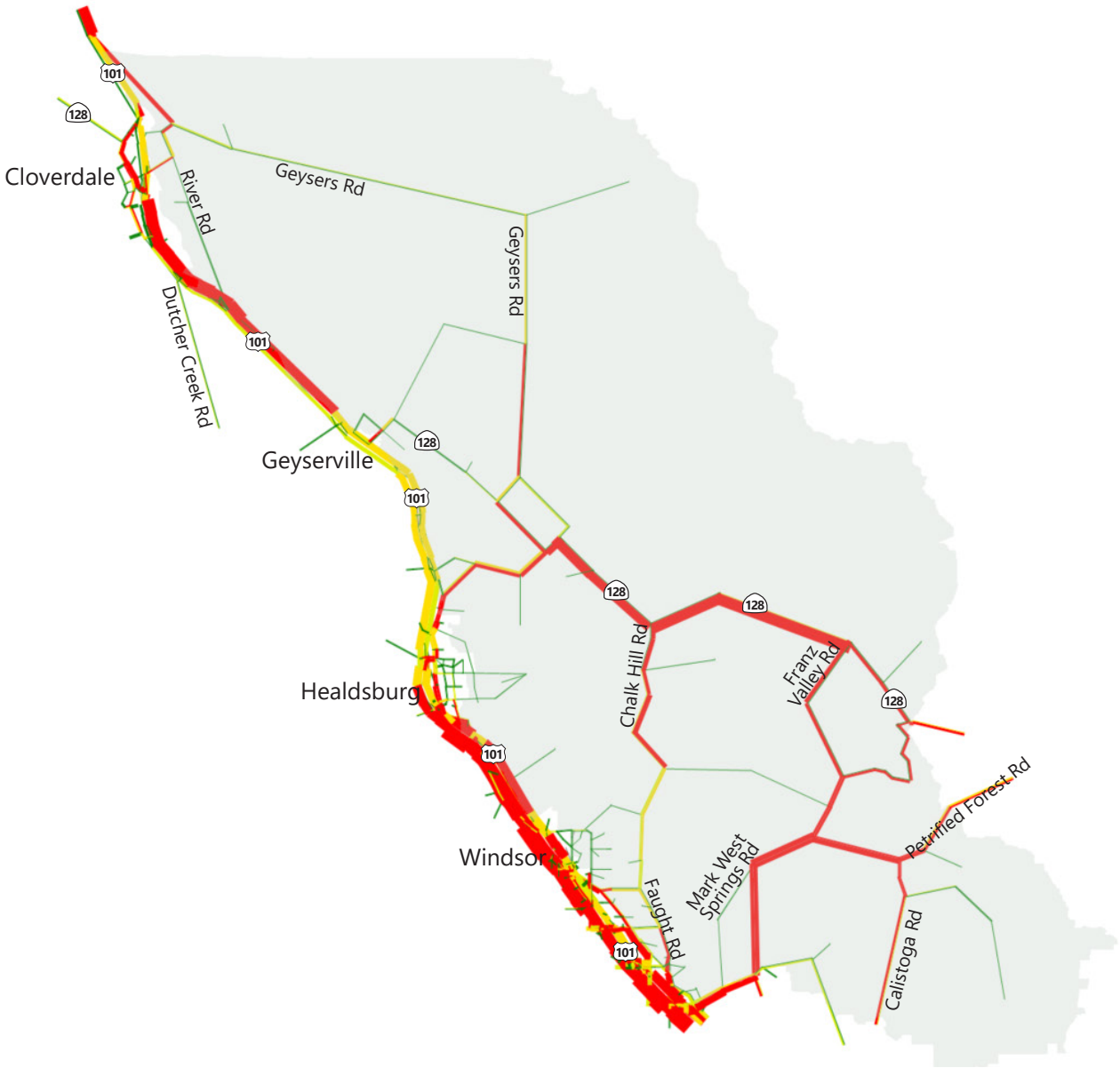


Figure 5.13

Scenario 2 Future Year Model Run - 5:30 PM



Figure 5.14

Scenario 2 Future Year Model Run - 5:45 PM



Figure 5.15

Scenario 2 Future Year Model Run - 6:00 PM



Figure 5.16

Scenario 2 Future Year Model Run - 6:15 PM



Figure 5.17

Scenario 2 Future Year Model Run - 6:30 PM



Figure 5.18

Scenario 2 Future Year Model Run - 6:45 PM



Figure 5.19

Scenario 2 Future Year Model Run - 7:00 PM



Figure 5.20

Scenario 2 Future Year Model Run - 7:15 PM



Figure 5.21

Scenario 2 Future Year Model Run - 7:30 PM

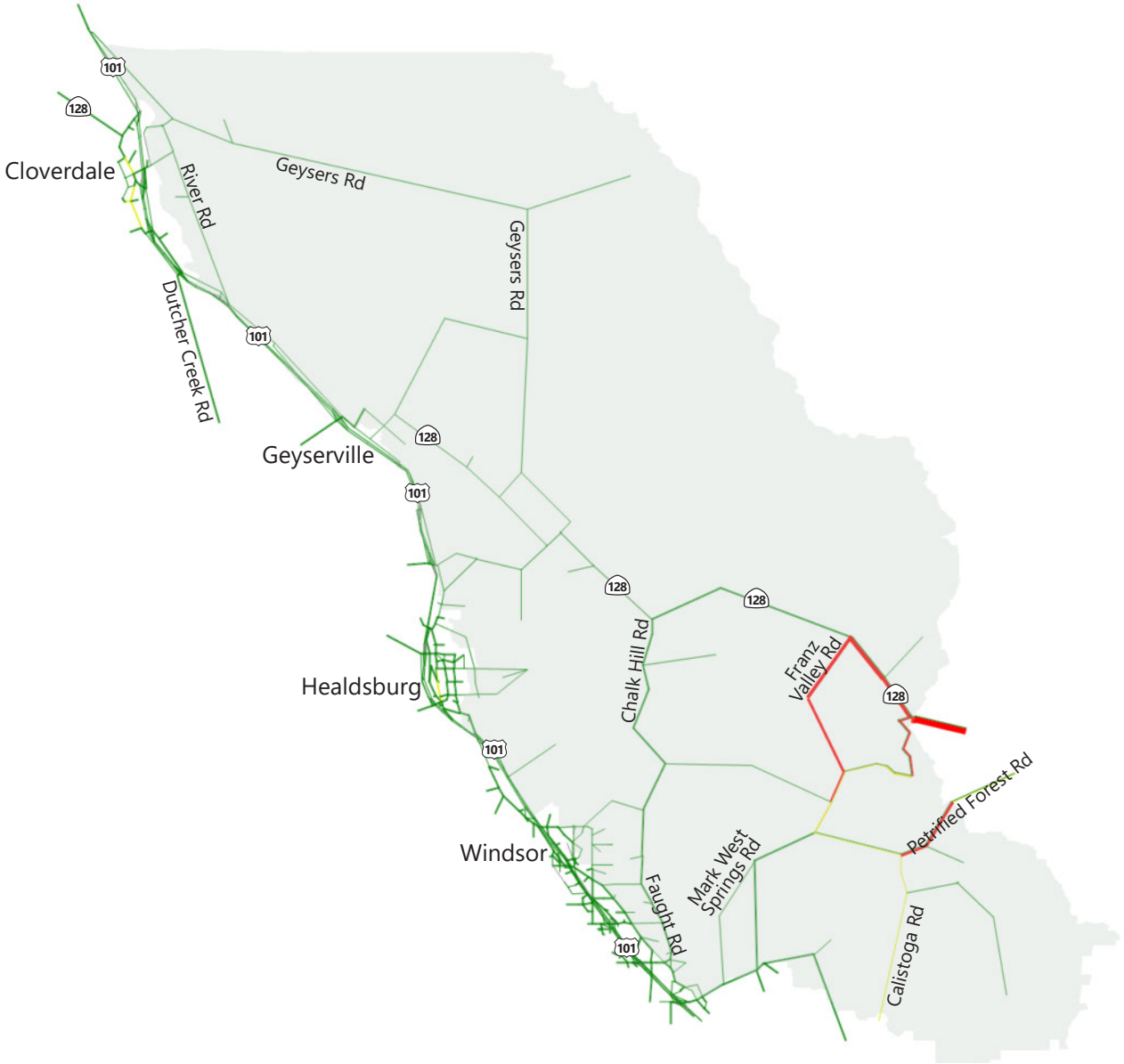


Figure 5.22

Scenario 2 Future Year Model Run - 7:45 PM



Figure 5.23

Scenario 2 Future Year Model Run - 8:00 PM

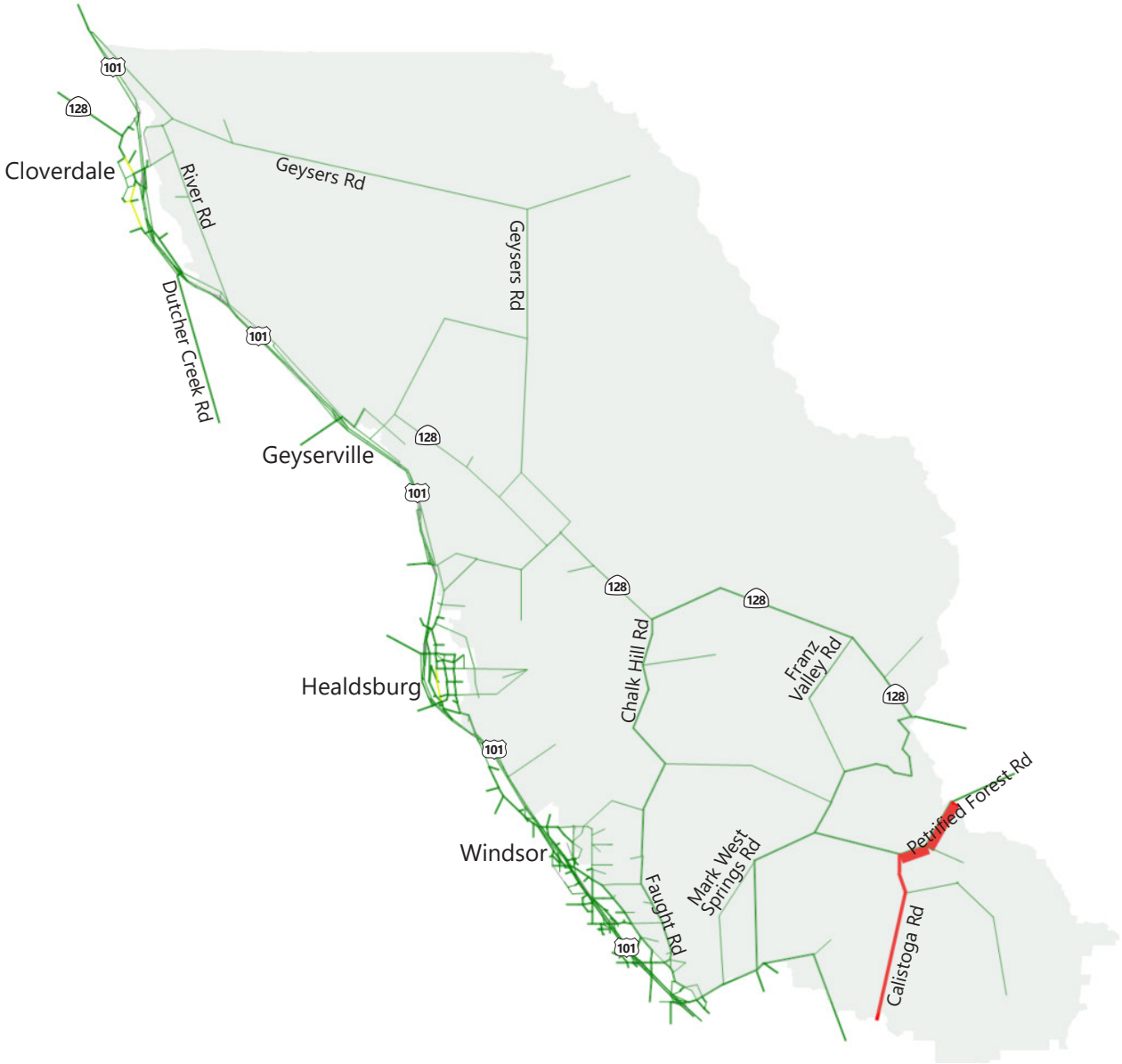


Figure 5.24

Scenario 2 Future Year Model Run - 8:15 PM



Figure 5.25

Scenario 2 Future Year Model Run - 8:30 PM

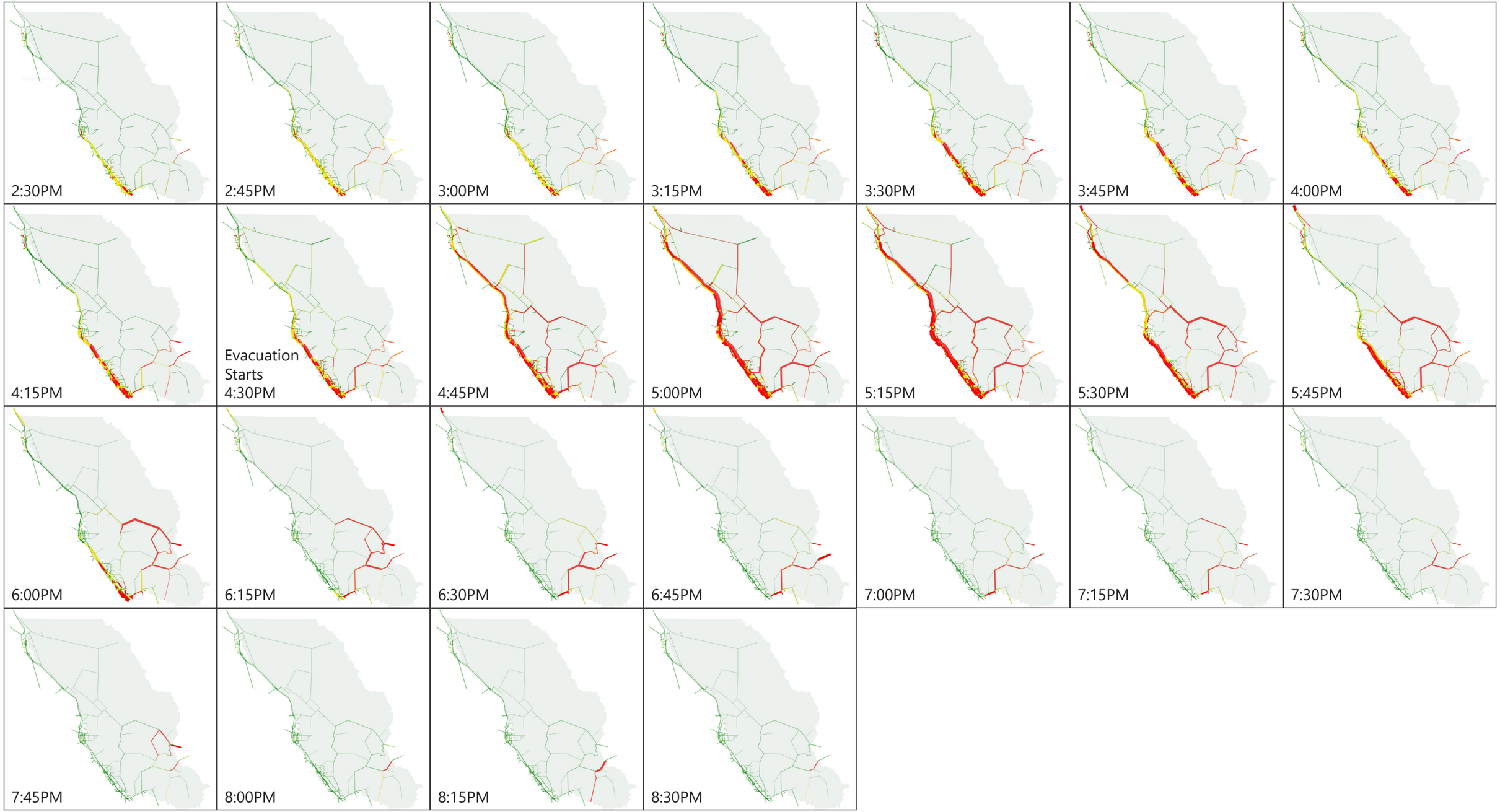


Figure 5.26

Scenario 2 Future Year Model Run Results

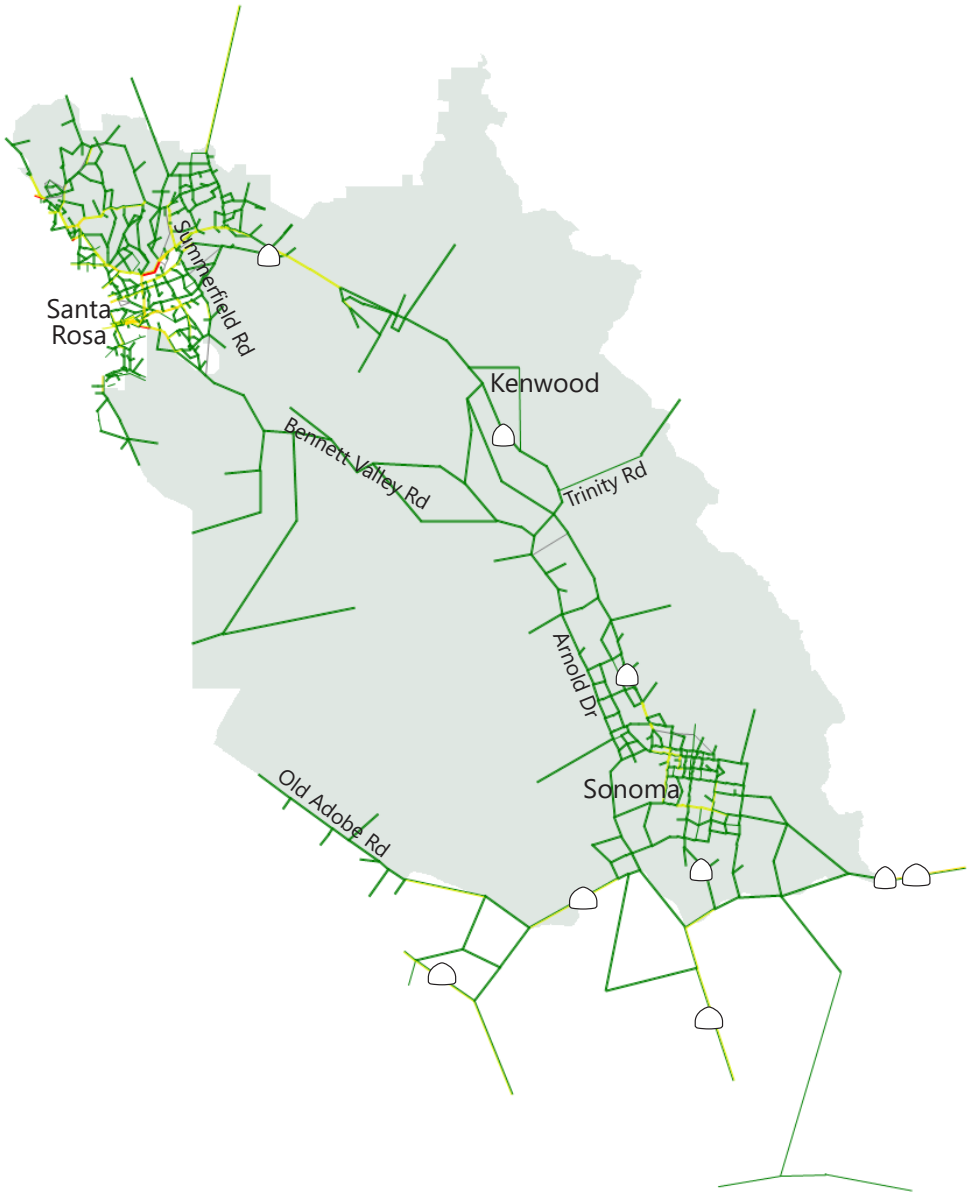


Figure 6.1

Scenario 3 Base Year Model Run - 2:30 PM

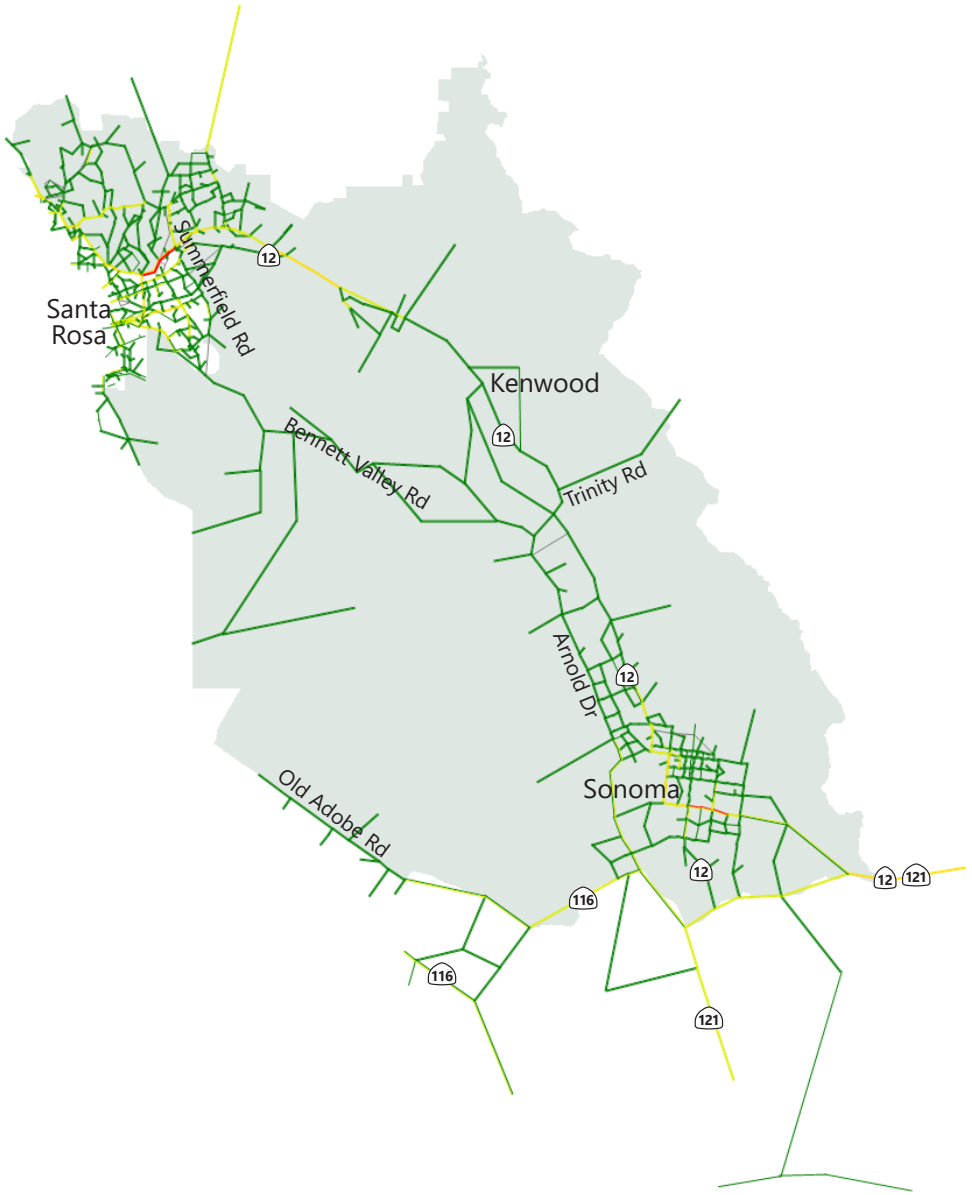


Figure 6.2

Scenario 3 Base Year Model Run - 2:45 PM

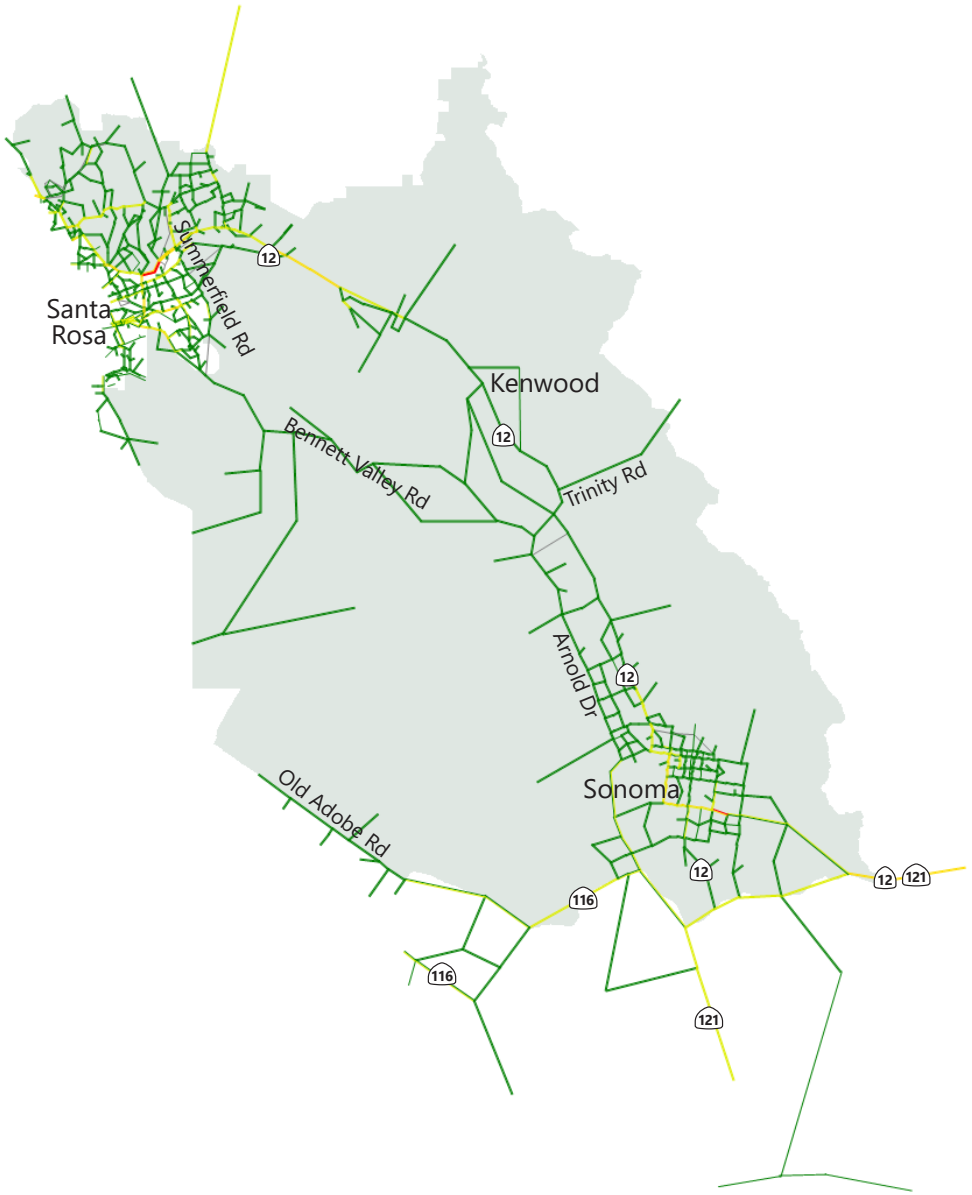


Figure 6.3

Scenario 3 Base Year Model Run - 3:00 PM

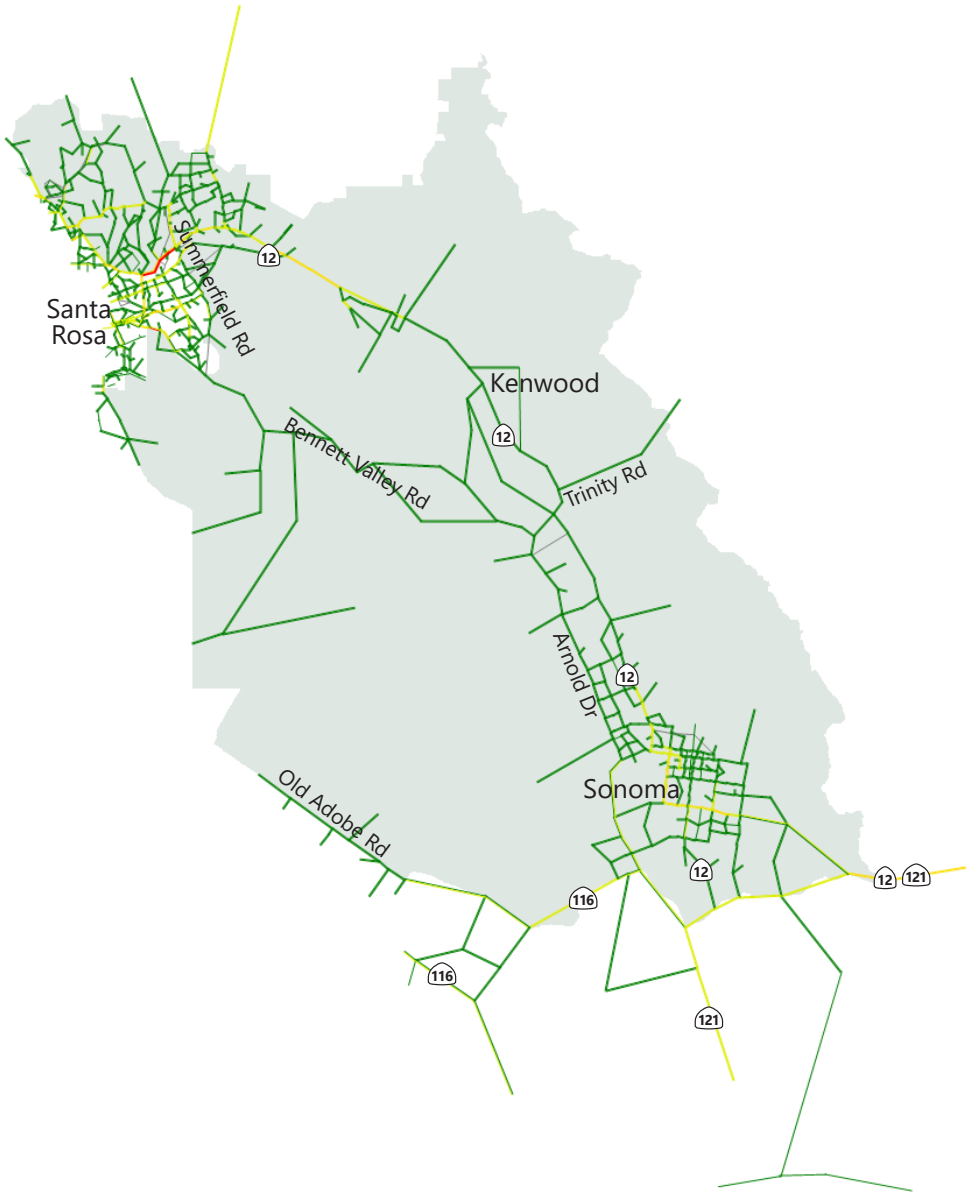


Figure 6.4

Scenario 3 Base Year Model Run - 3:15 PM

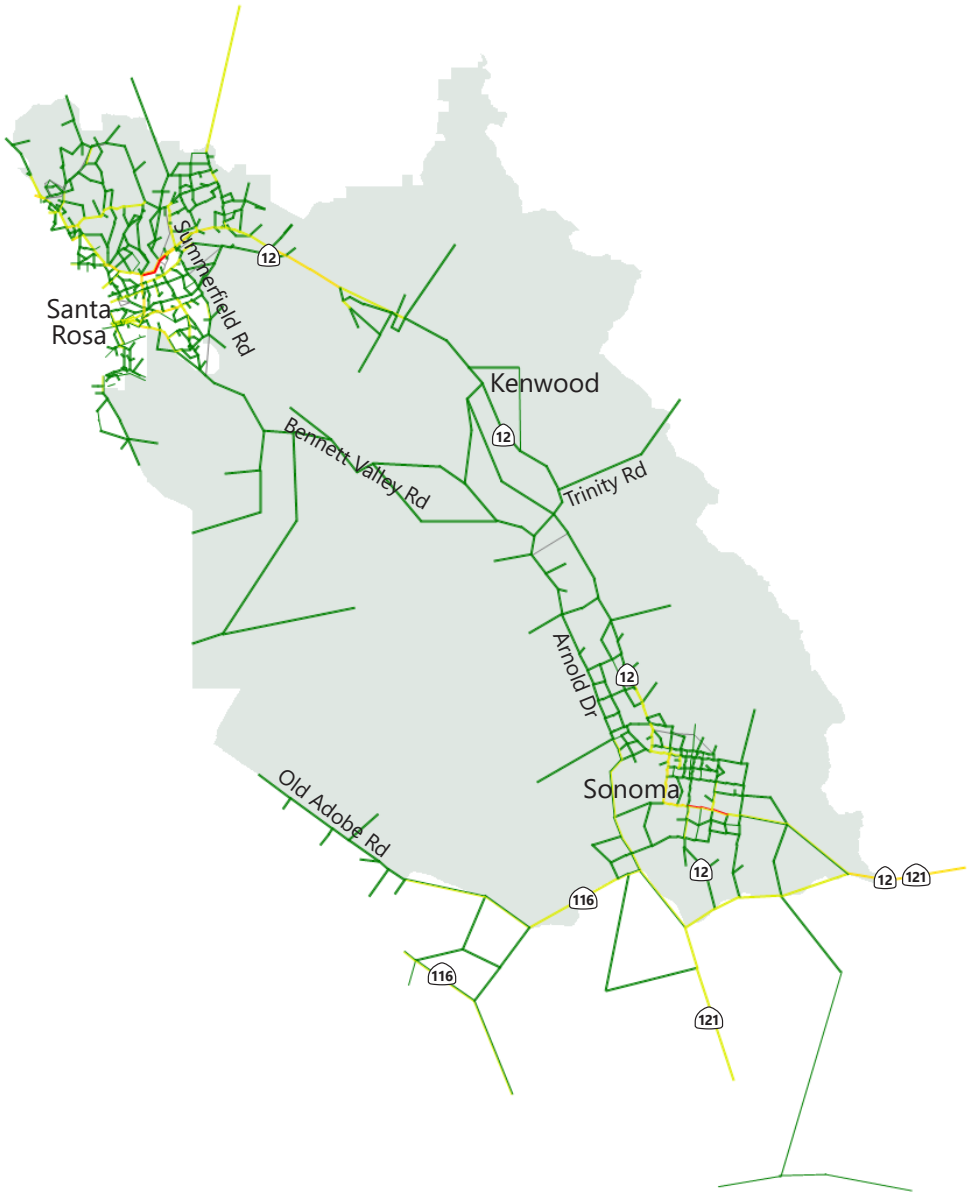


Figure 6.5

Scenario 3 Base Year Model Run - 3:30 PM

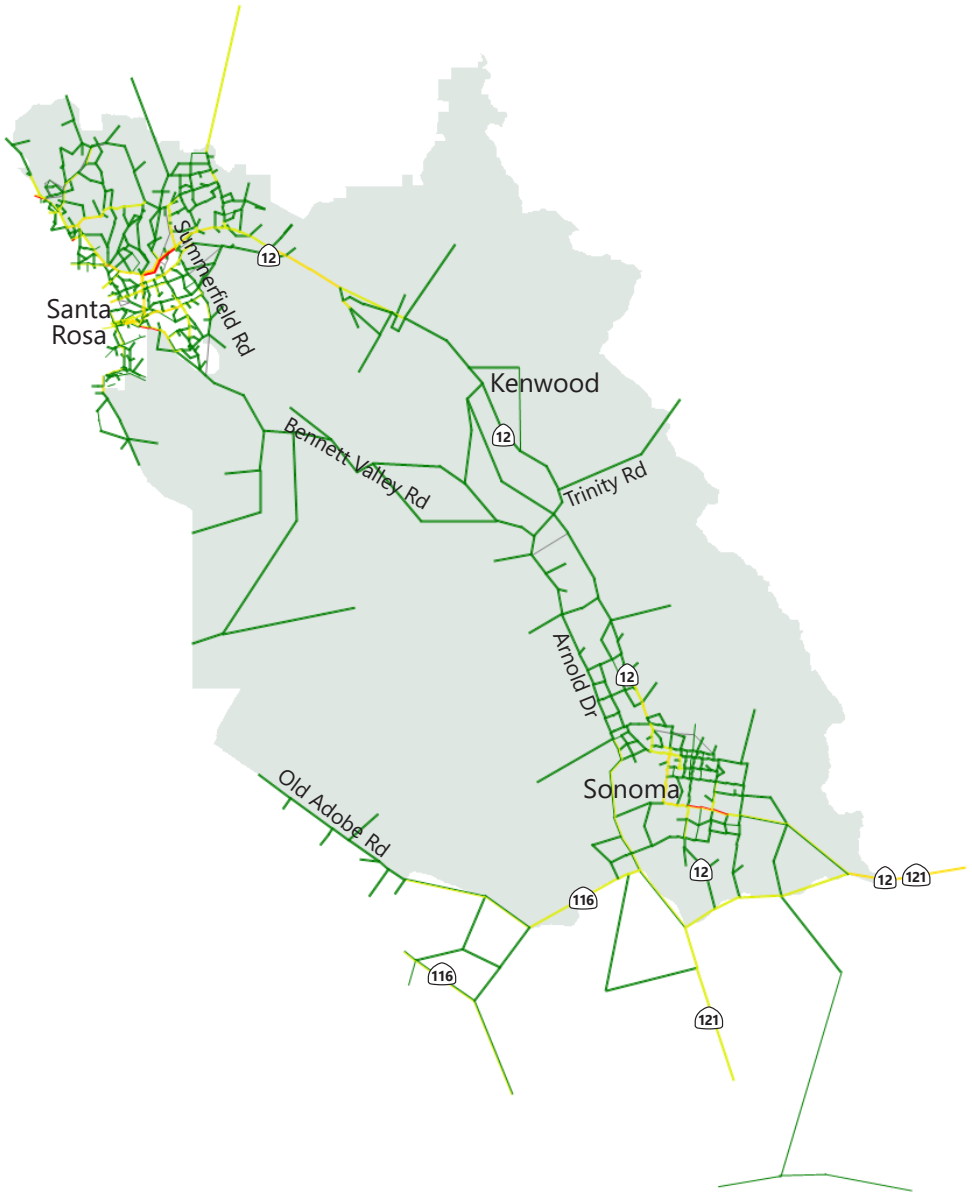


Figure 6.6

Scenario 3 Base Year Model Run - 3:45 PM

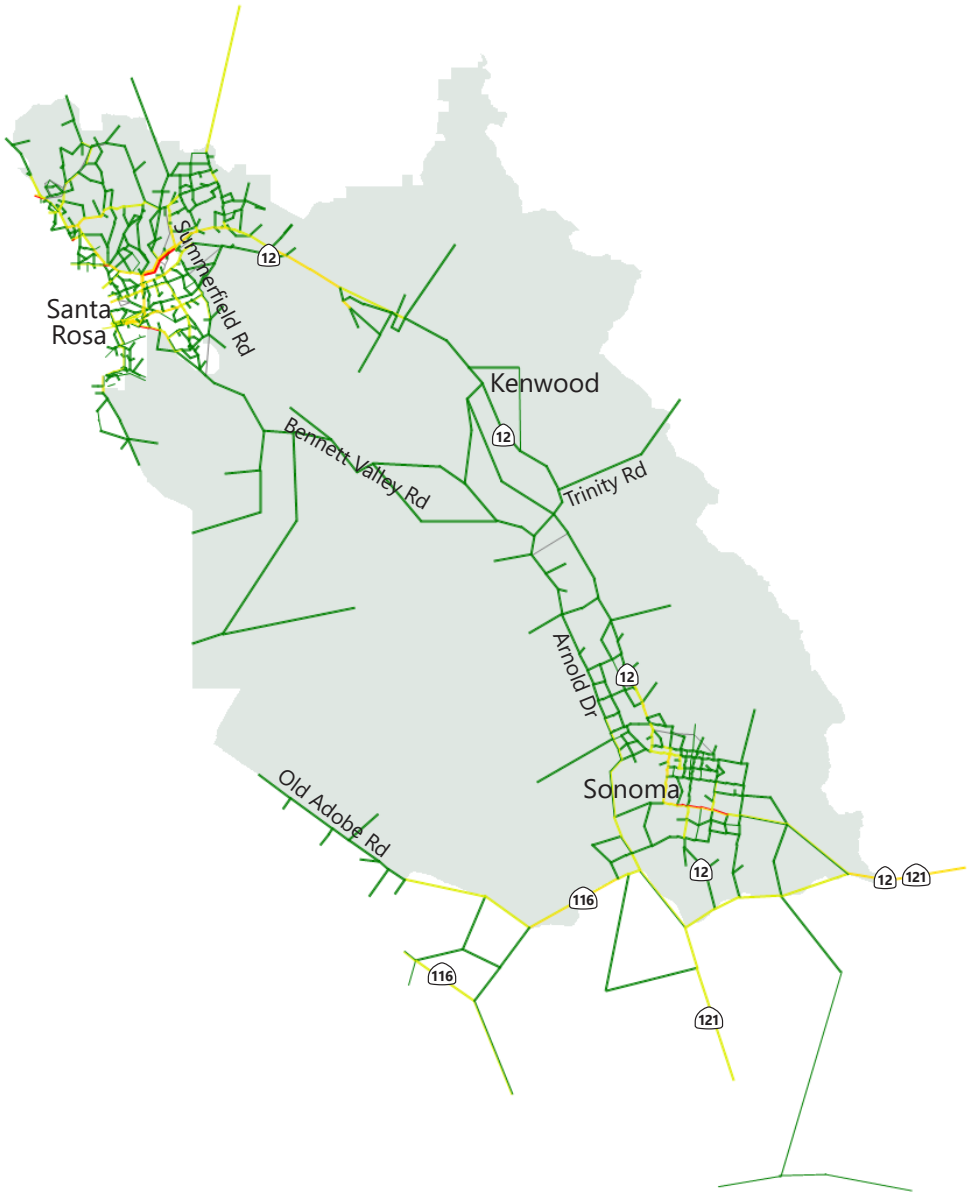


Figure 6.7

Scenario 3 Base Year Model Run - 4:00 PM

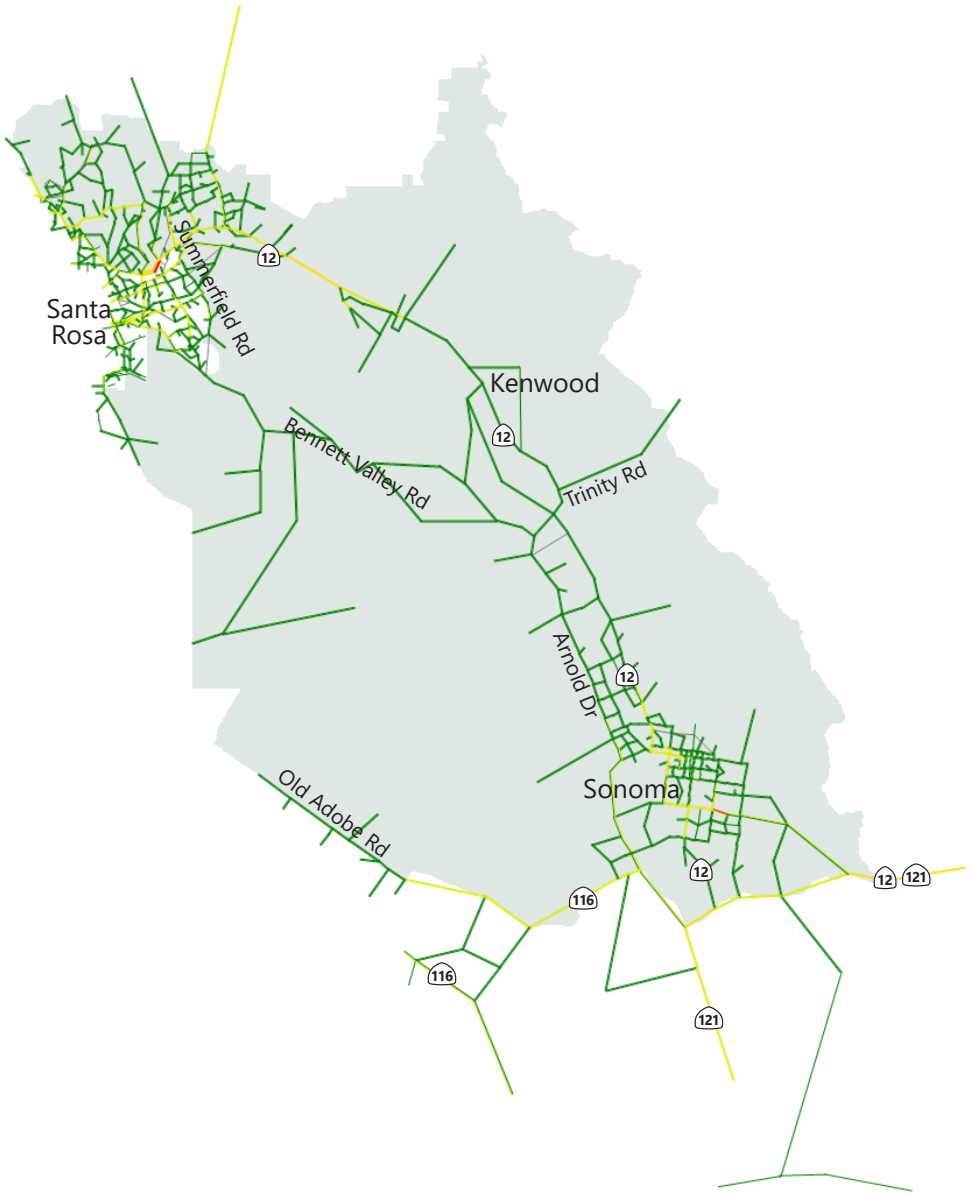


Figure 6.8

Scenario 3 Base Year Model Run - 4:15 PM

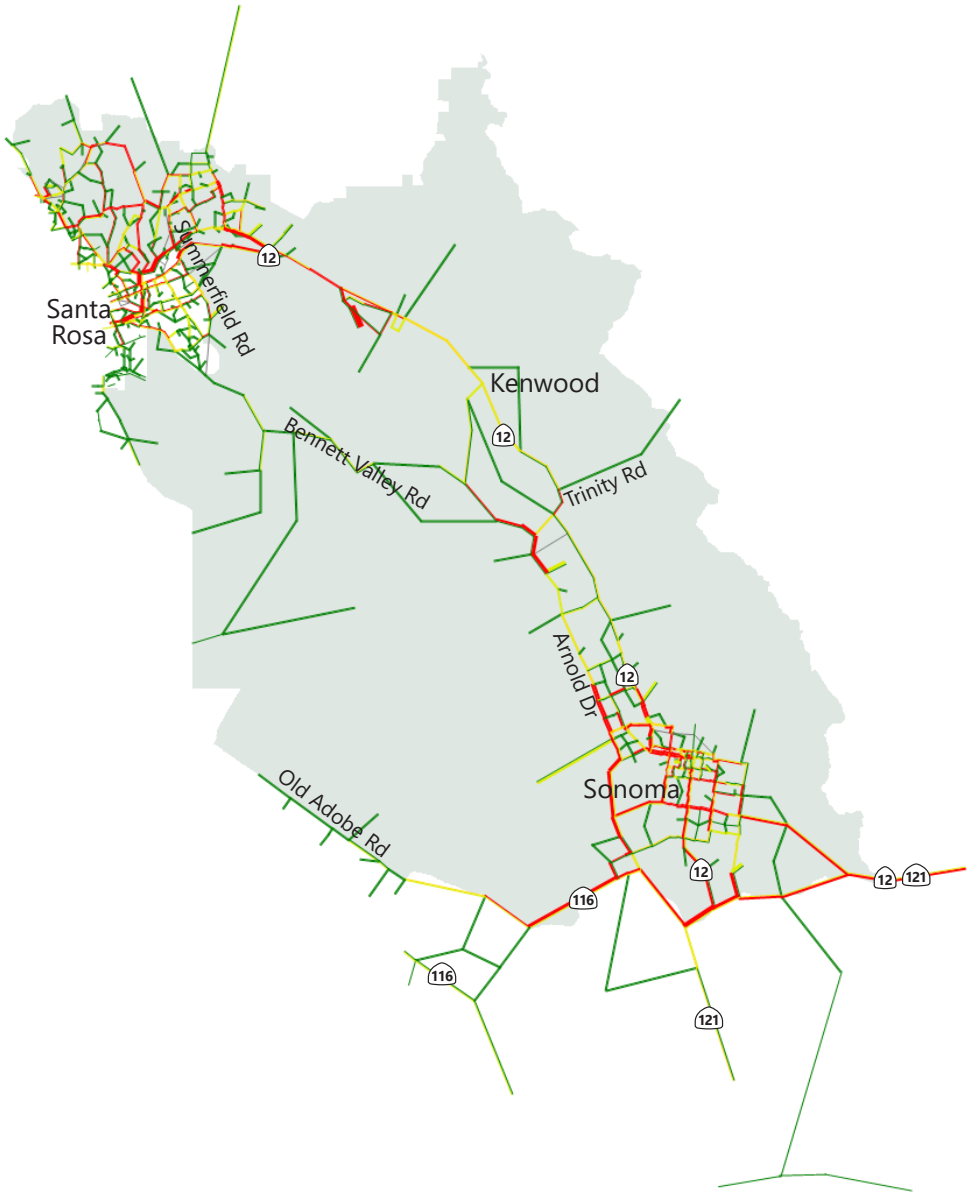


Figure 6.9

Scenario 3 Base Year Model Run - 4:30 PM (start of evacuation)

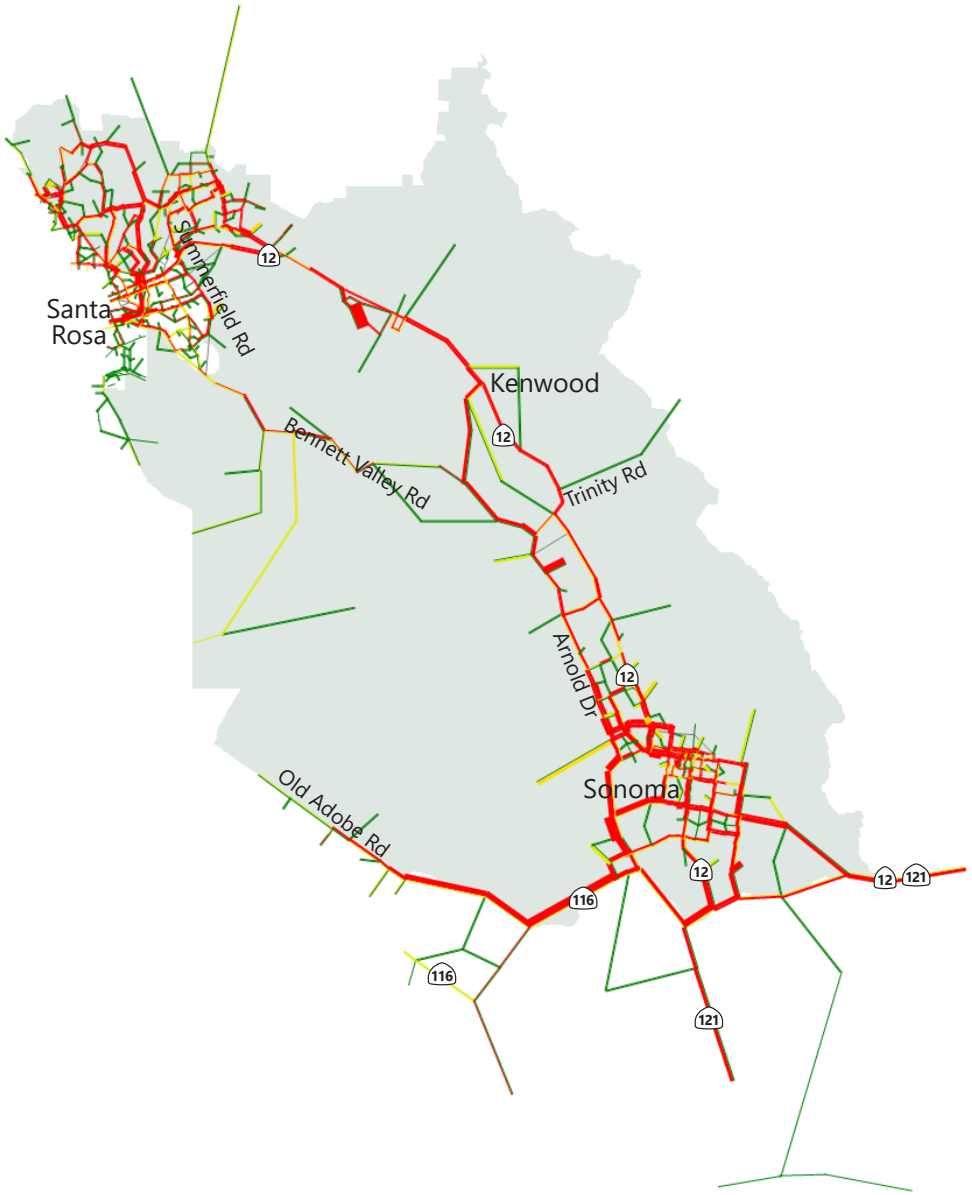


Figure 6.10

Scenario 3 Base Year Model Run - 4:45 PM



Figure 6.11

Scenario 3 Base Year Model Run - 5:00 PM

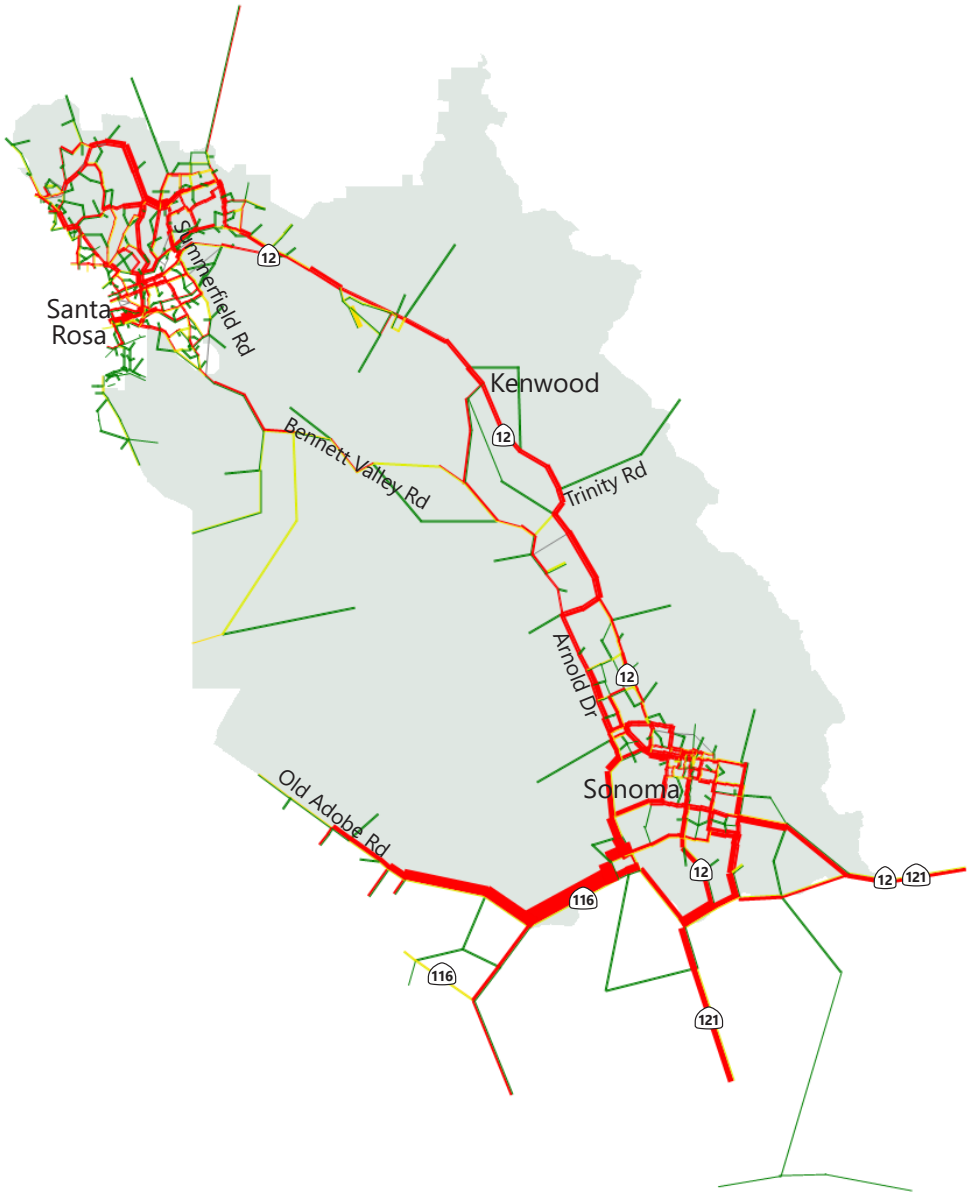


Figure 6.12

Scenario 3 Base Year Model Run - 5:15 PM

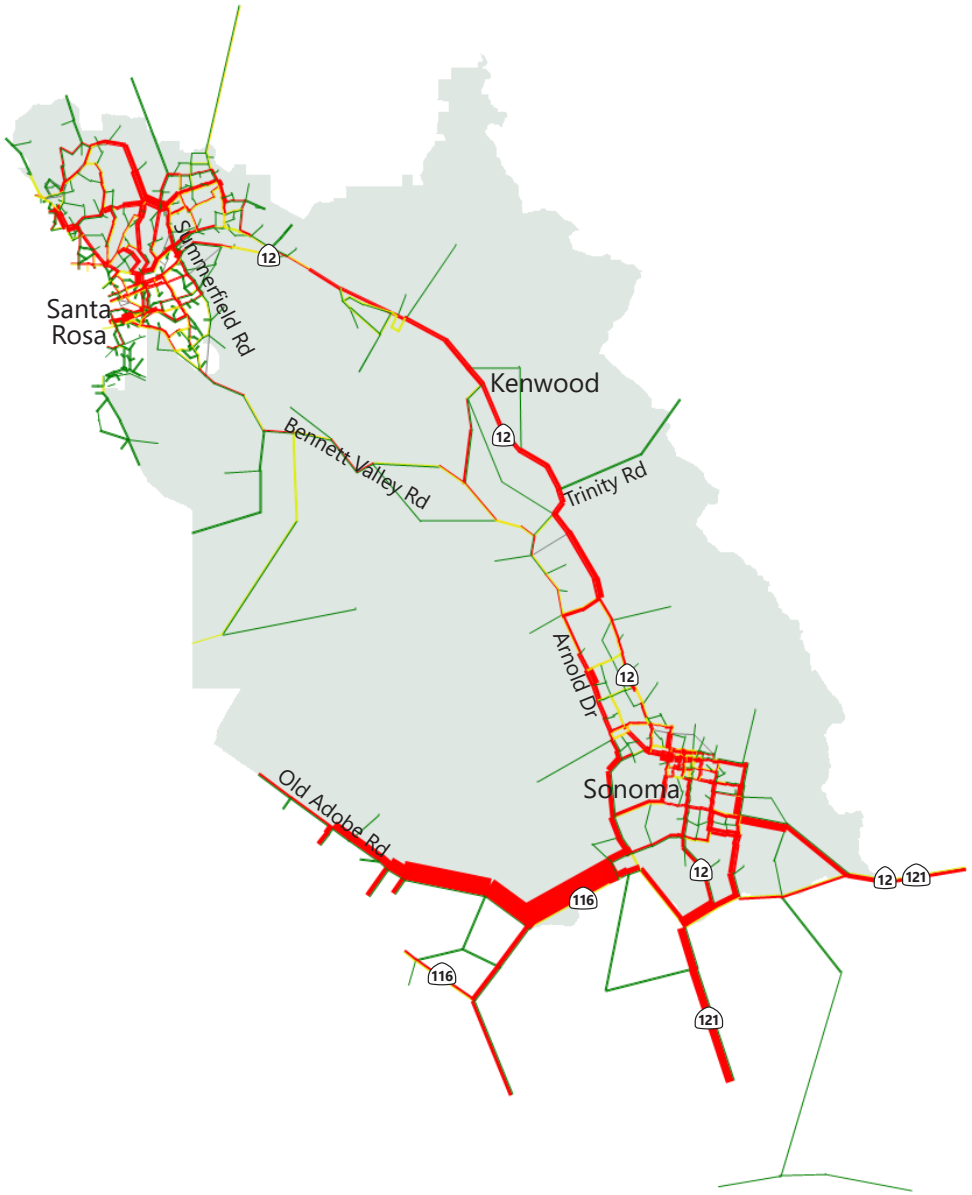


Figure 6.13

Scenario 3 Base Year Model Run - 5:30 PM

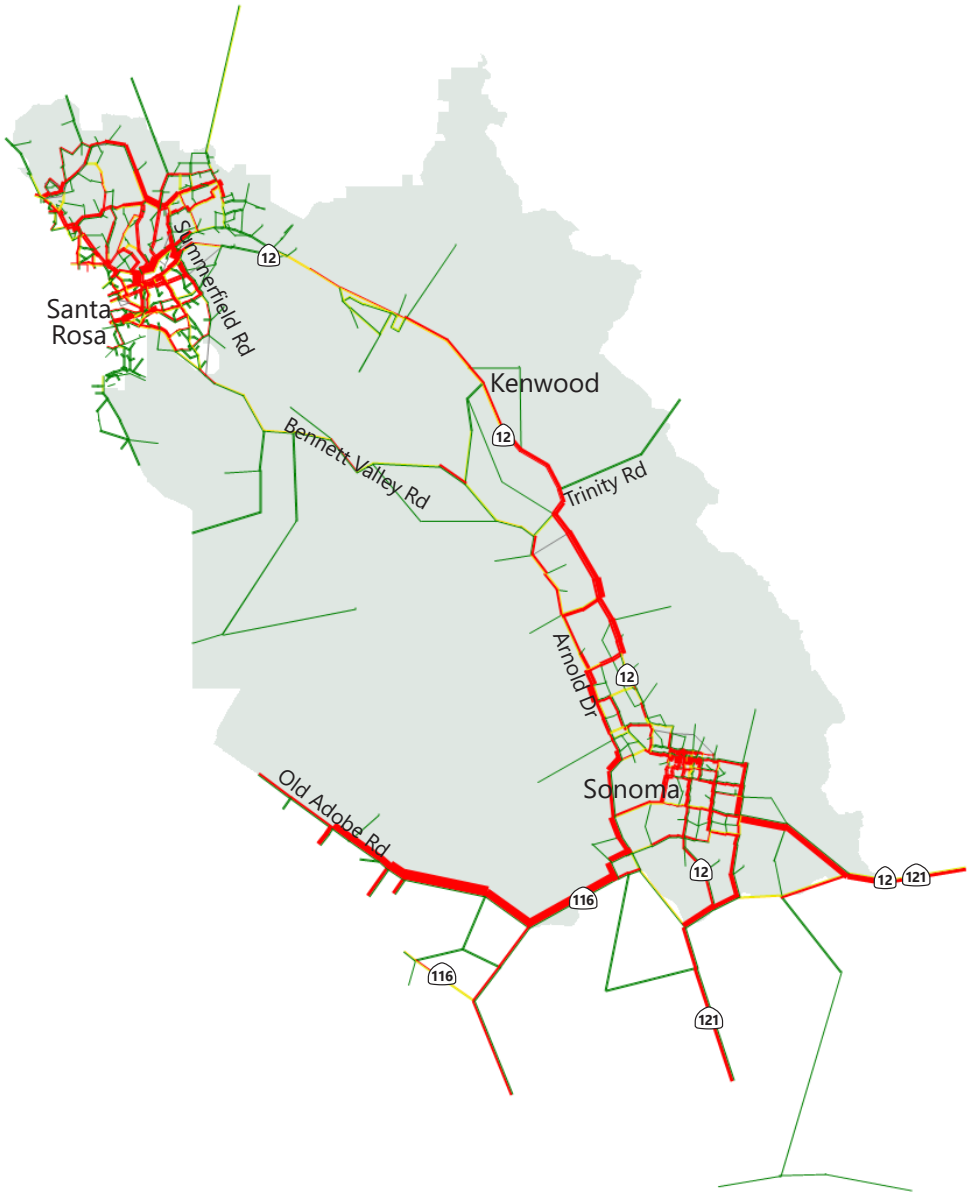


Figure 6.14

Scenario 3 Base Year Model Run - 5:45 PM

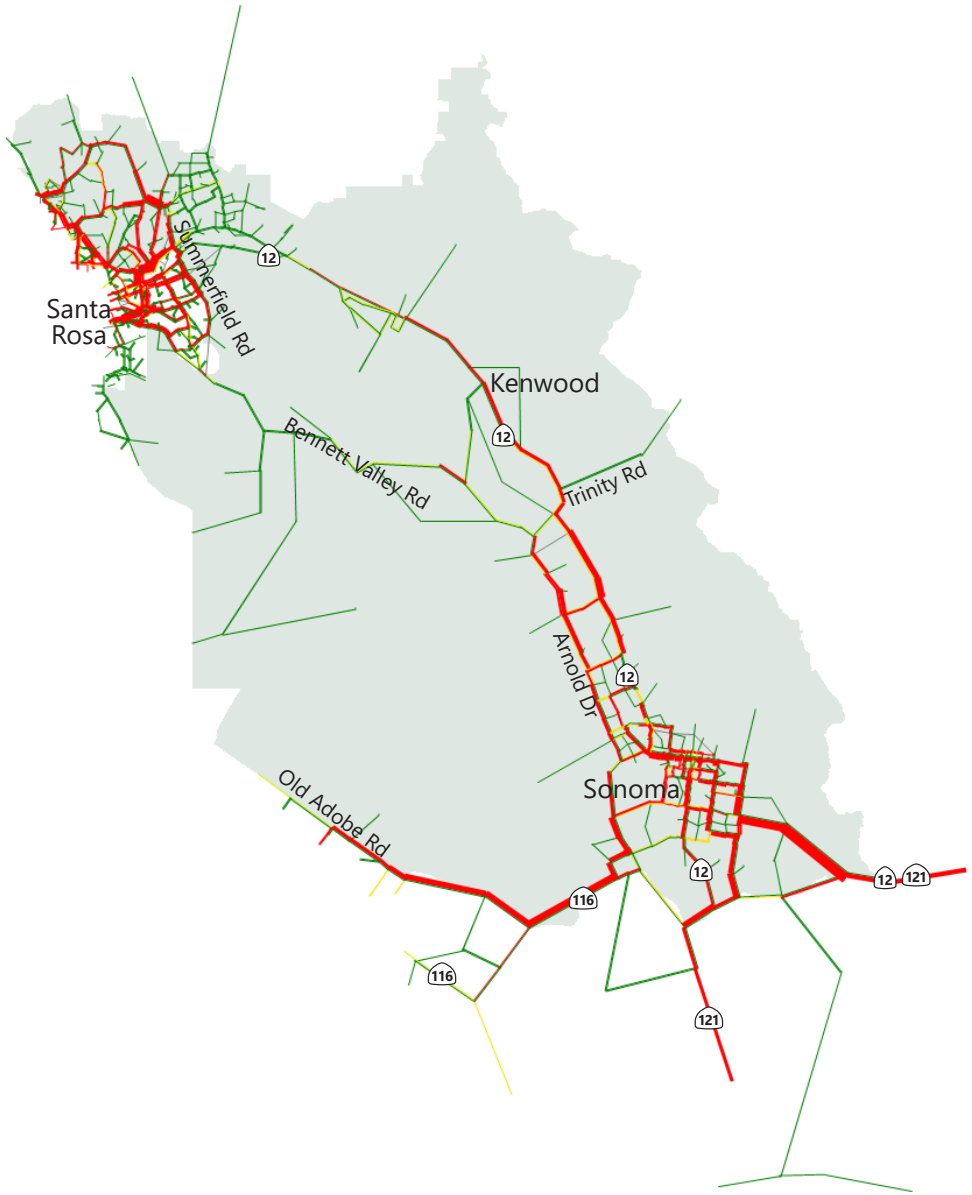


Figure 6.15

Scenario 3 Base Year Model Run - 6:00 PM

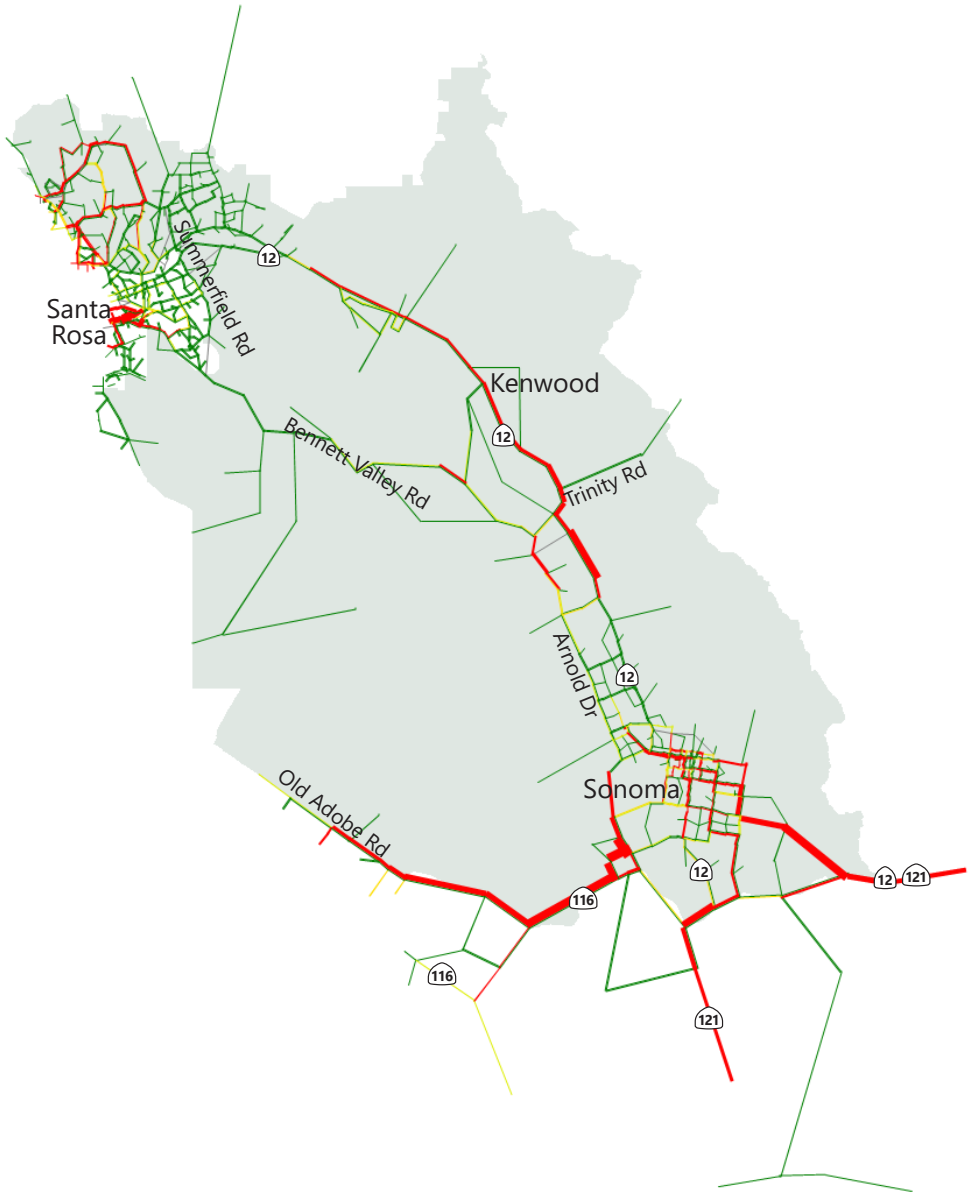


Figure 6.16

Scenario 3 Base Year Model Run - 6:15 PM

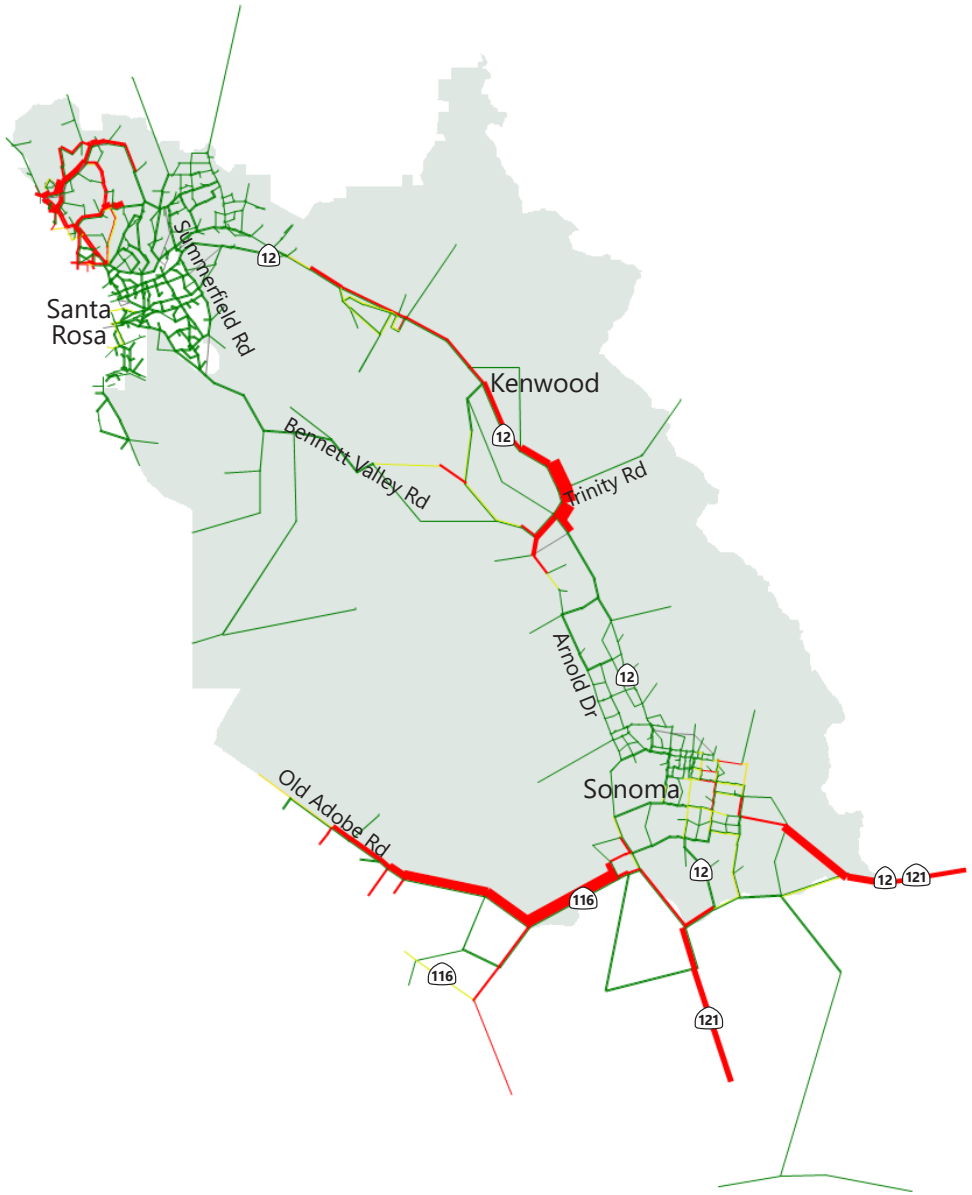


Figure 6.17

Scenario 3 Base Year Model Run - 6:30 PM

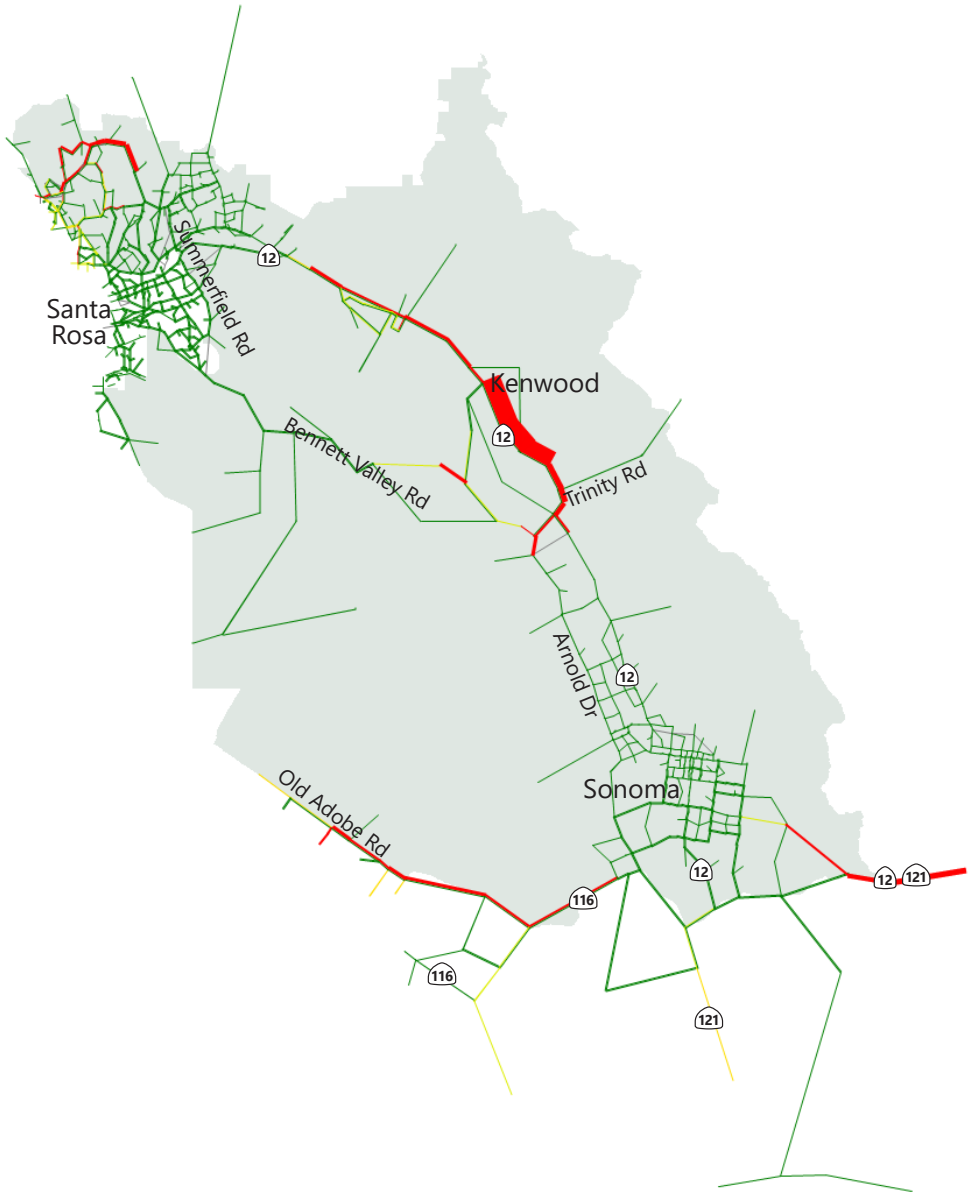


Figure 6.18

Scenario 3 Base Year Model Run - 6:45 PM

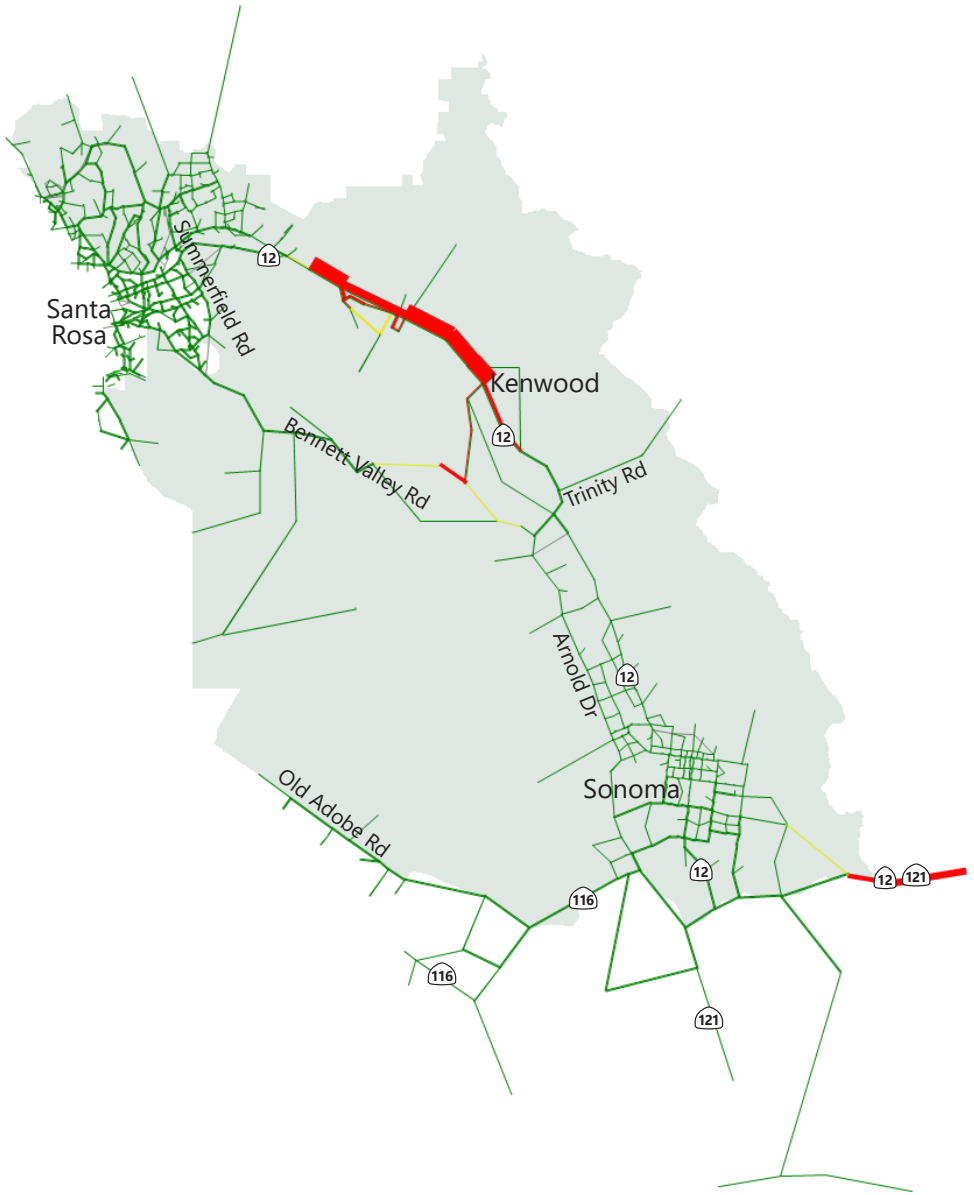


Figure 6.19

Scenario 3 Base Year Model Run - 7:00 PM



Figure 6.20

Scenario 3 Base Year Model Run - 7:15 PM



Figure 6.21

Scenario 3 Base Year Model Run - 7:30 PM

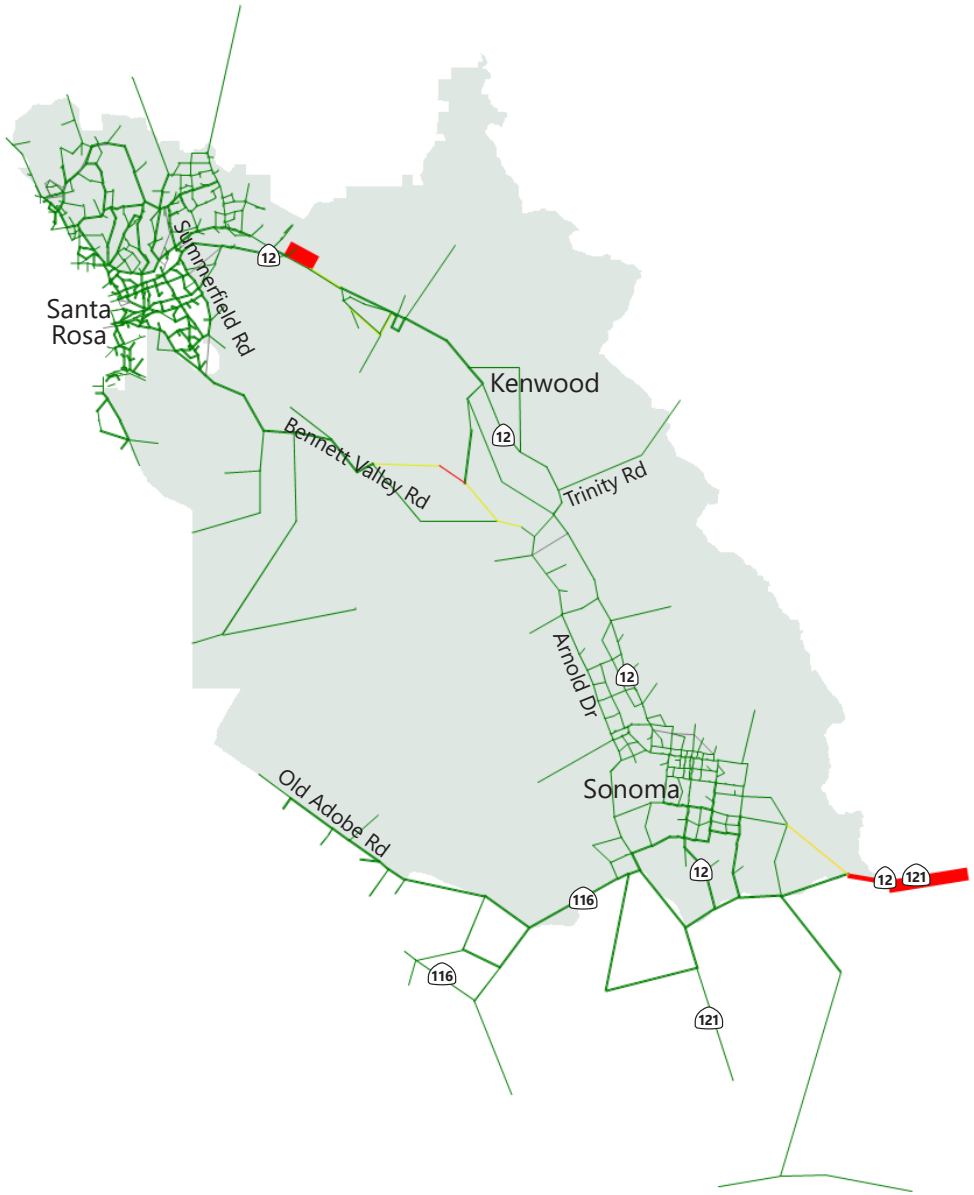


Figure 6.22

Scenario 3 Base Year Model Run - 7:45 PM



Figure 6.23

Scenario 3 Base Year Model Run - 8:00 PM

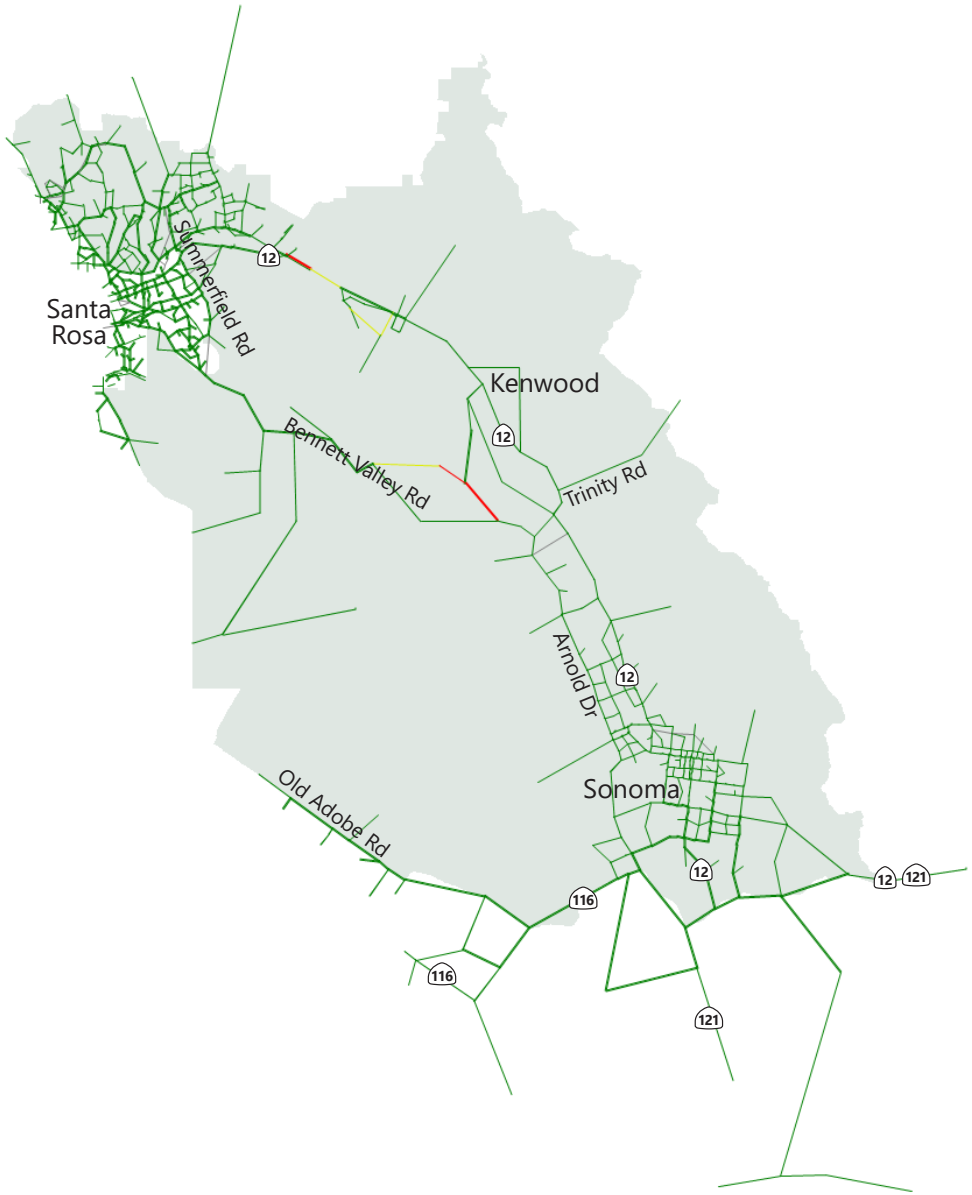


Figure 6.24

Scenario 3 Base Year Model Run - 8:15 PM

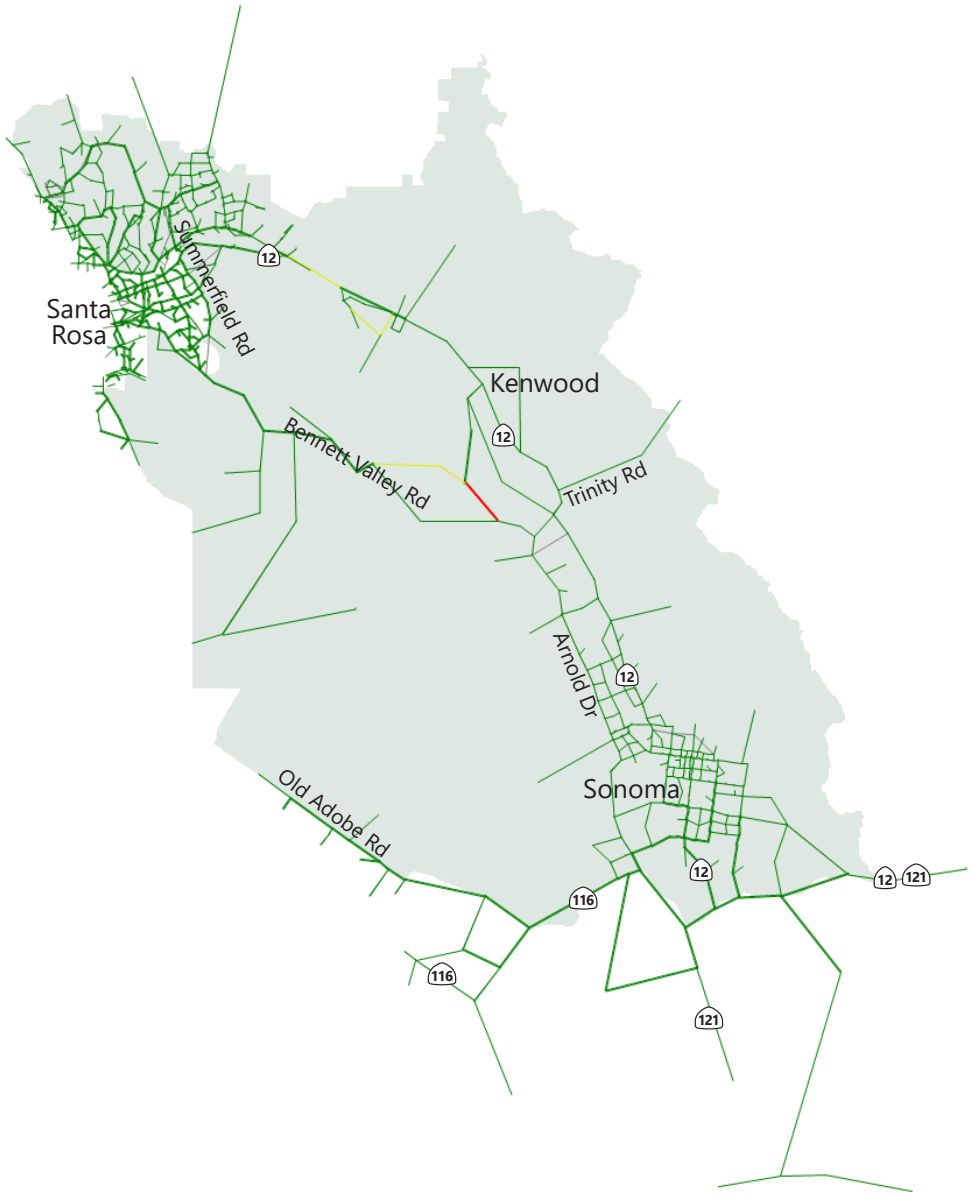


Figure 6.25

Scenario 3 Base Year Model Run - 8:30 PM

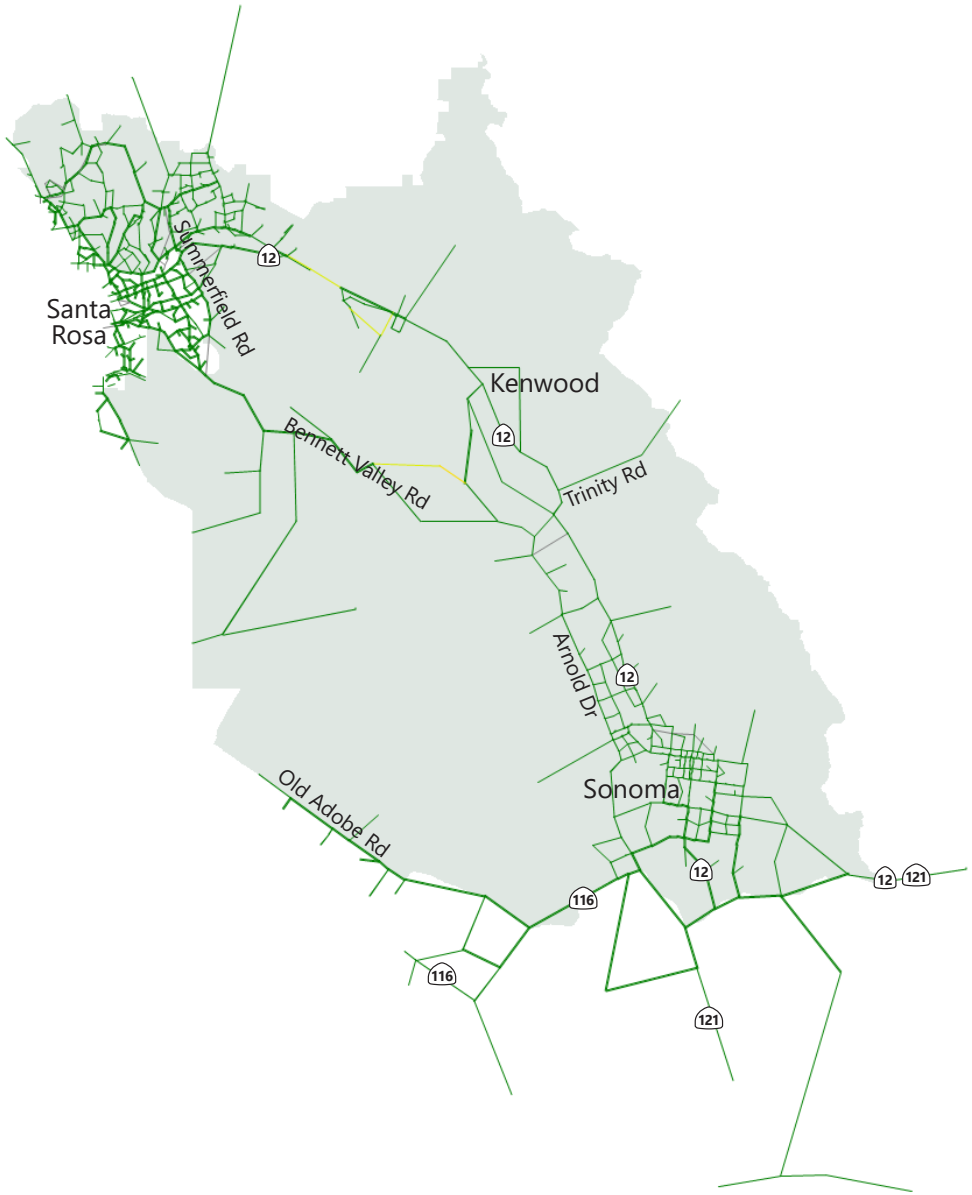


Figure 6.26

Scenario 3 Base Year Model Run - 8:45 PM

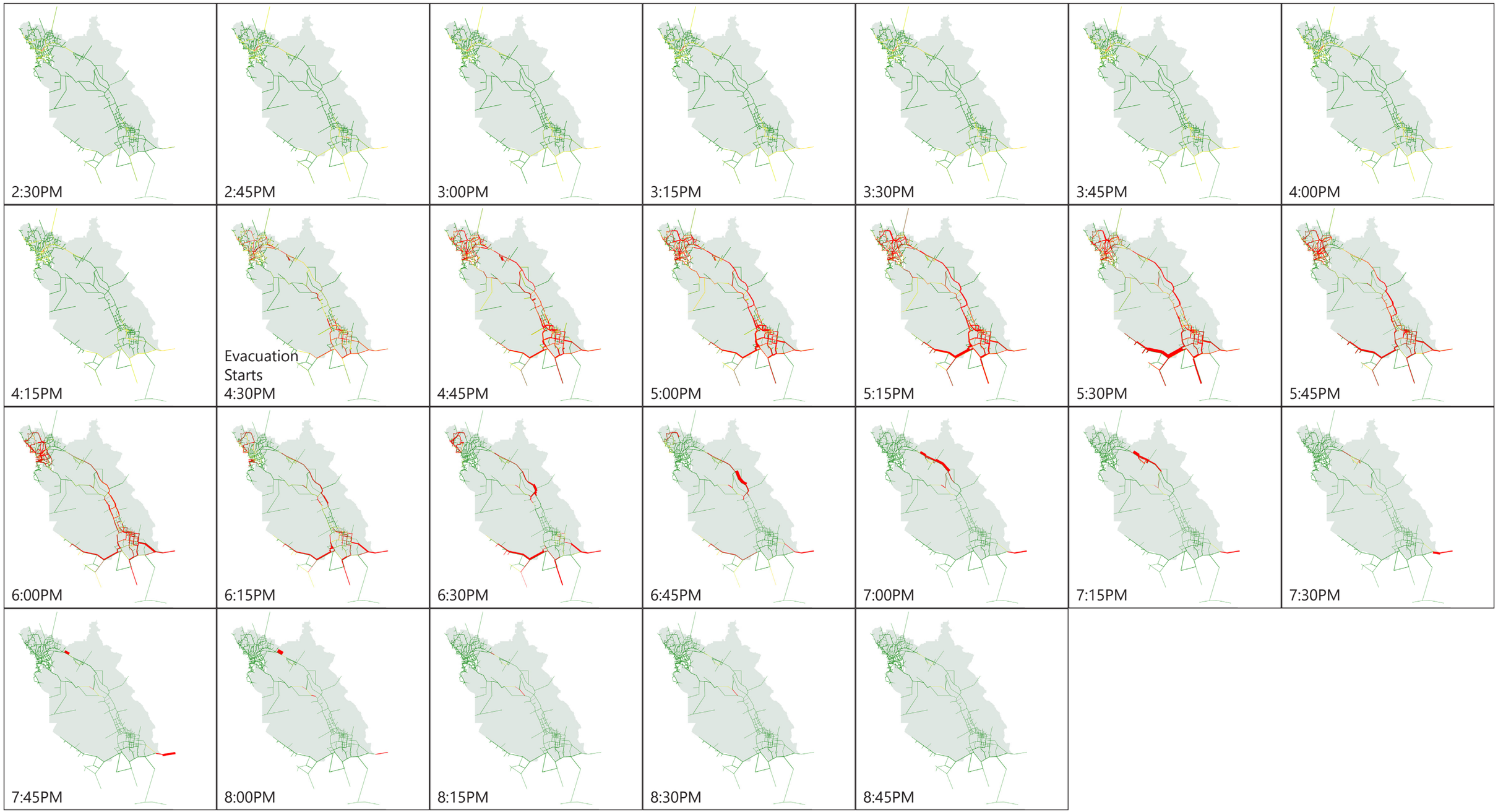


Figure 6.27

Scenario 3 Base Year Model Run Results

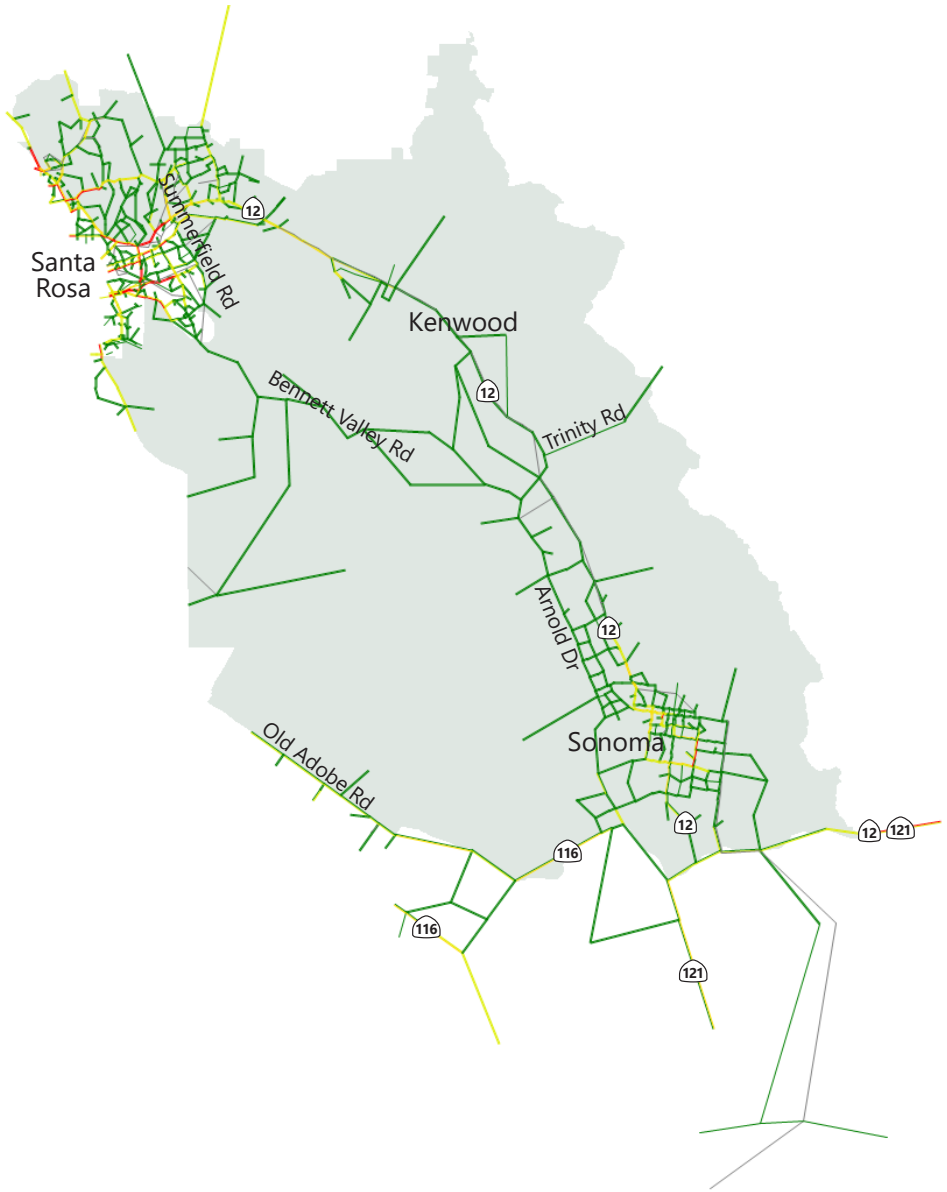


Figure 7.1

Scenario 3 Future Year Model Run - 2:30 PM

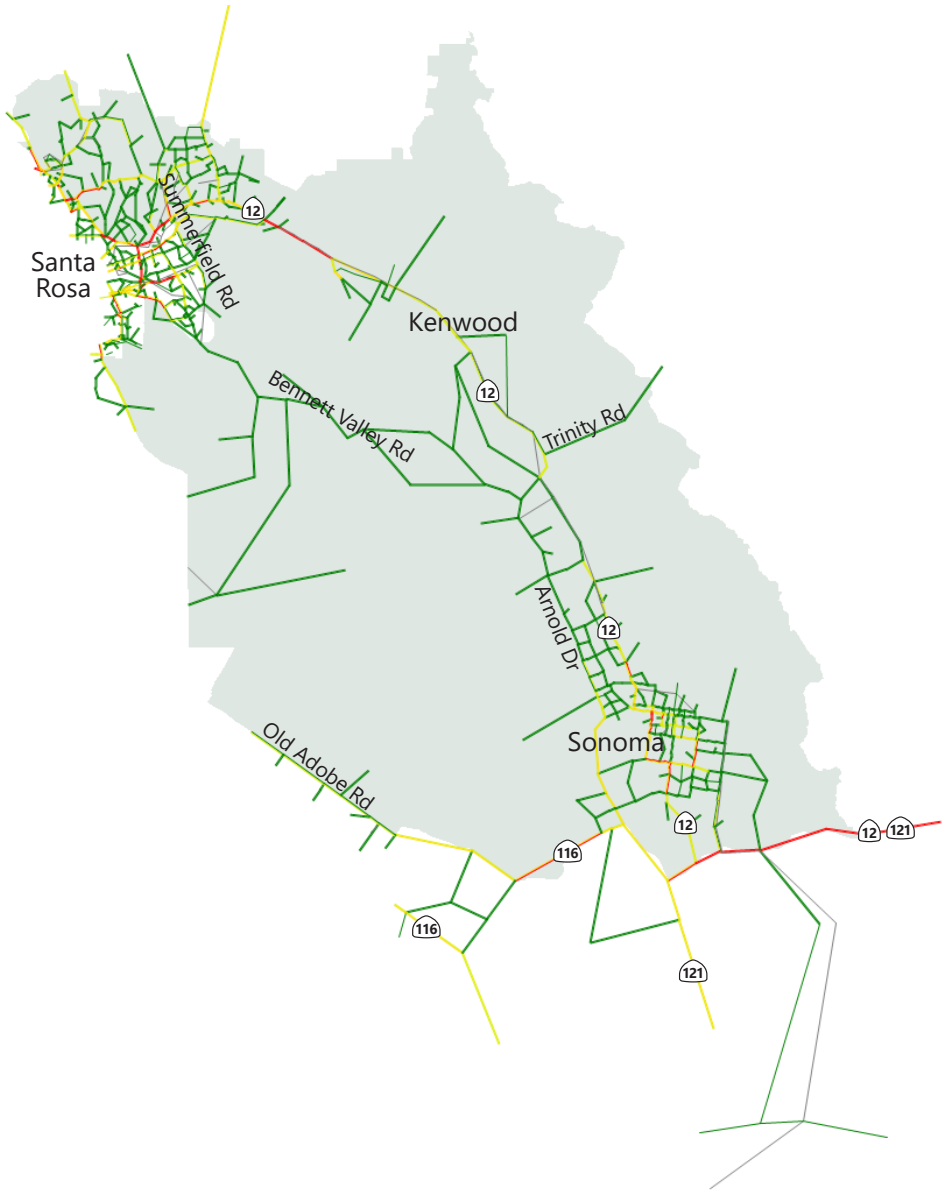


Figure 7.2

Scenario 3 Future Year Model Run - 2:45 PM

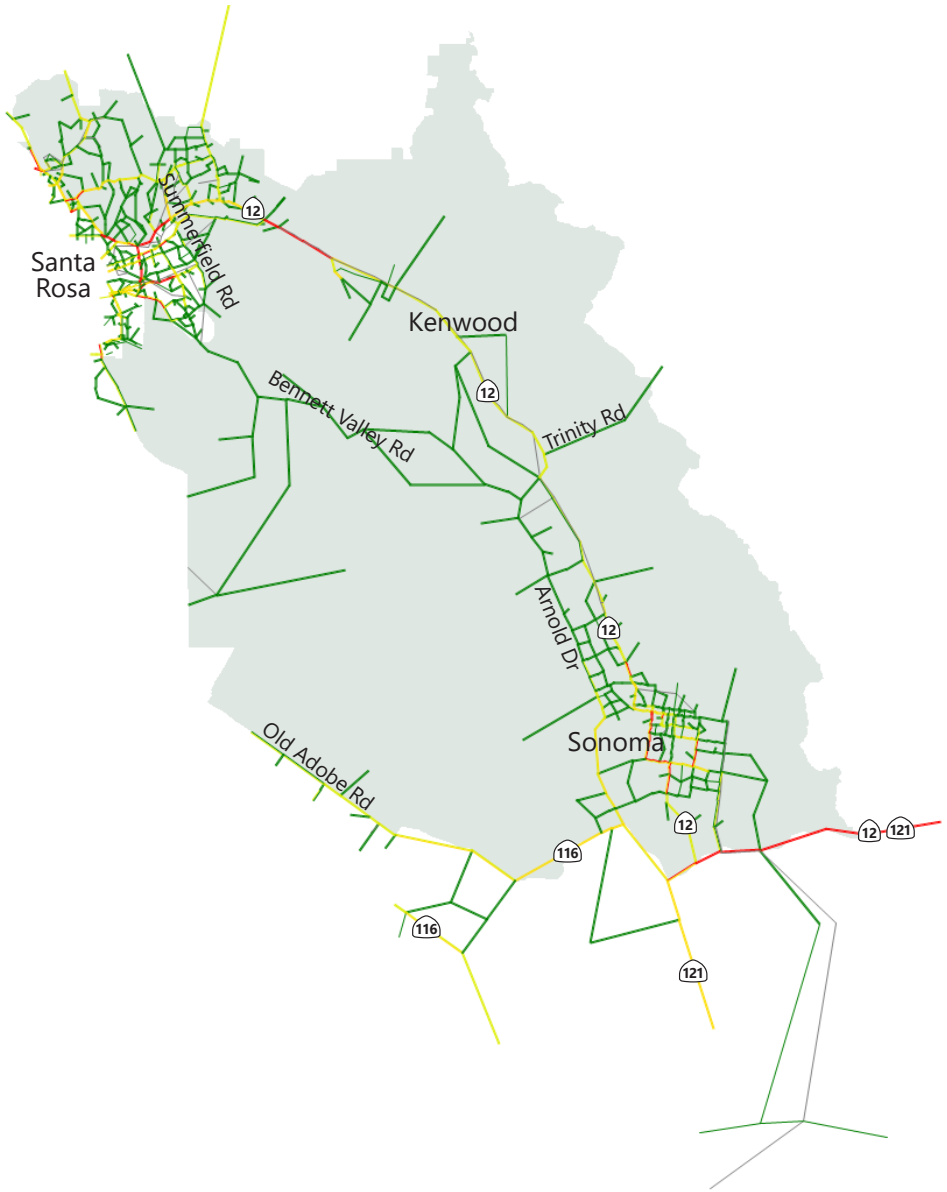


Figure 7.3

Scenario 3 Future Year Model Run - 3:00 PM

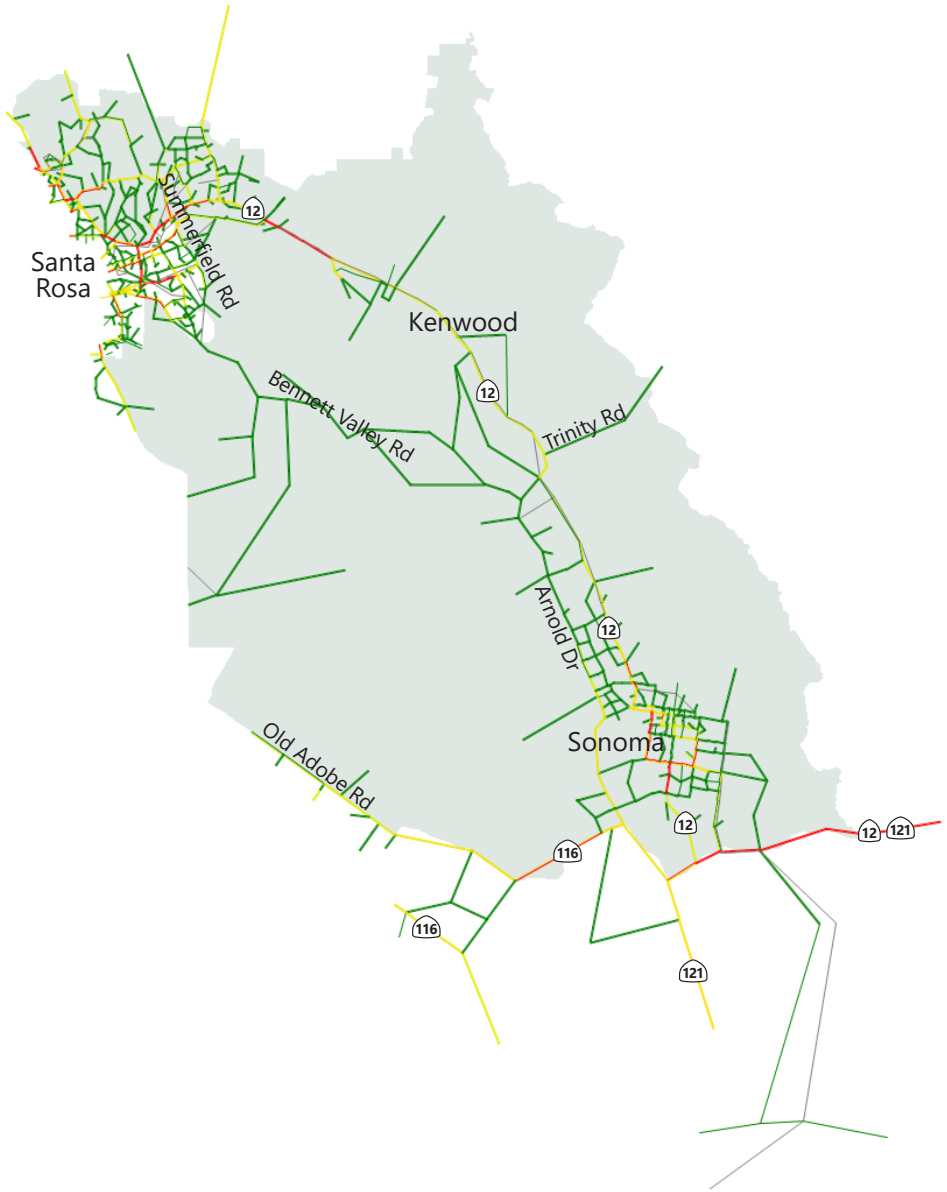


Figure 7.4

Scenario 3 Future Year Model Run - 3:15 PM

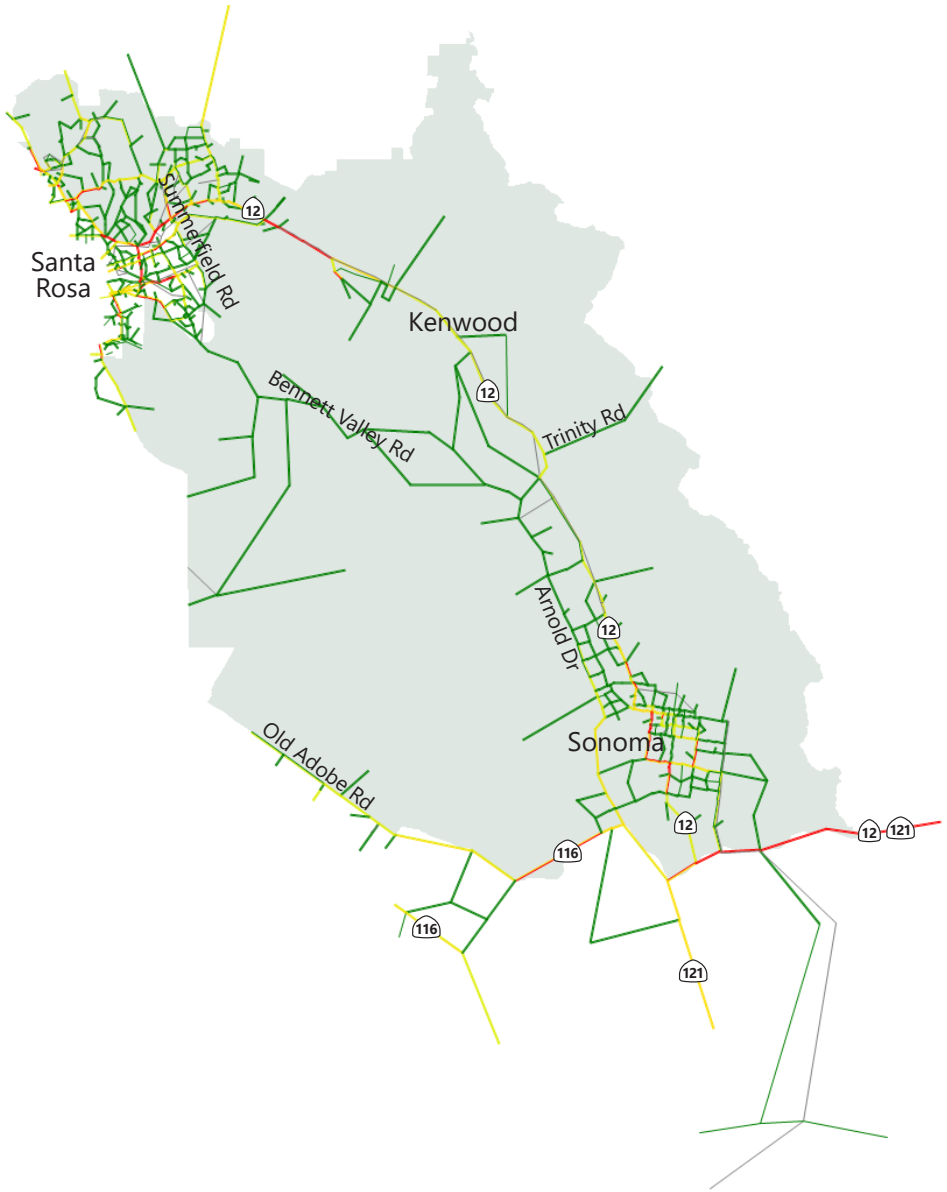


Figure 7.5

Scenario 3 Future Year Model Run - 3:30 PM

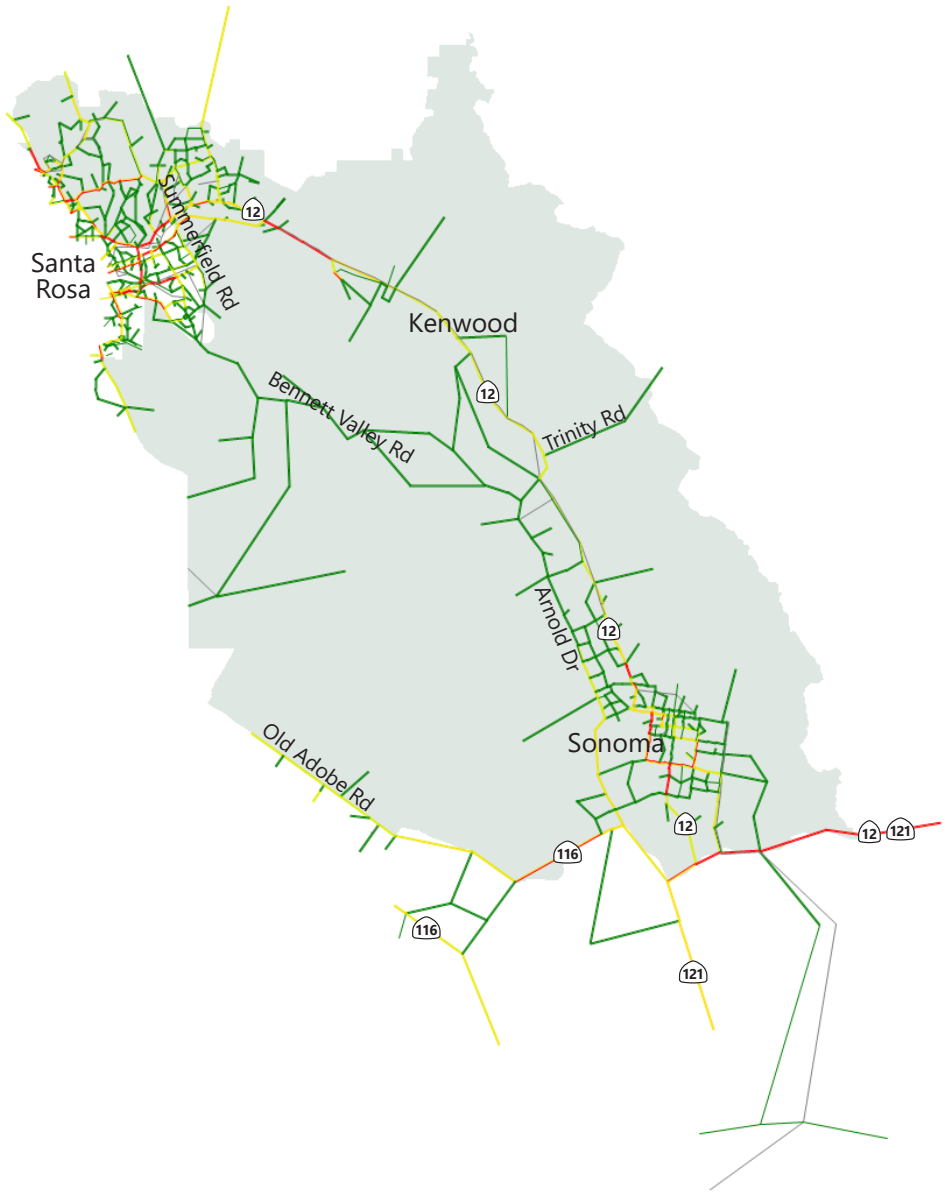


Figure 7.6

Scenario 3 Future Year Model Run - 3:45 PM

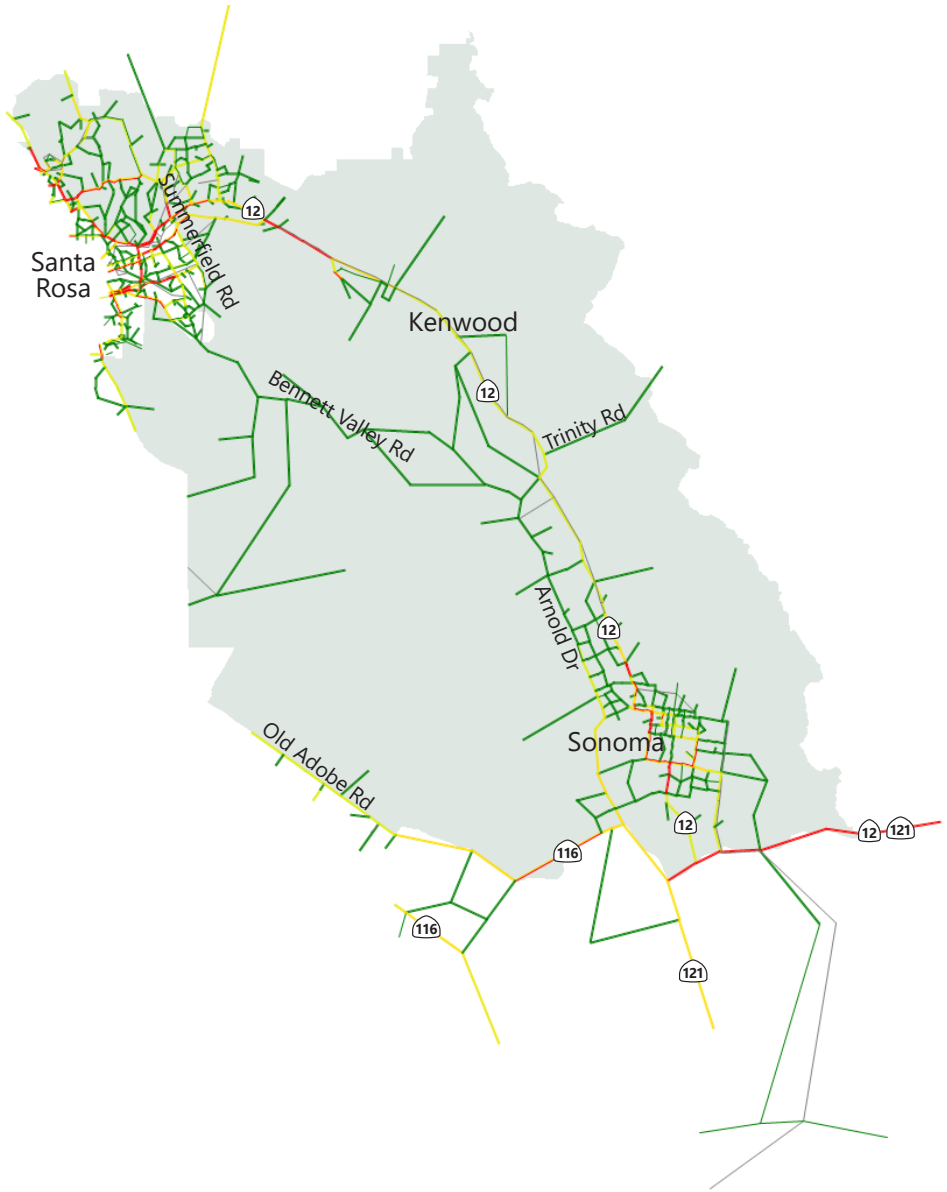


Figure 7.7

Scenario 3 Future Year Model Run - 4:00 PM

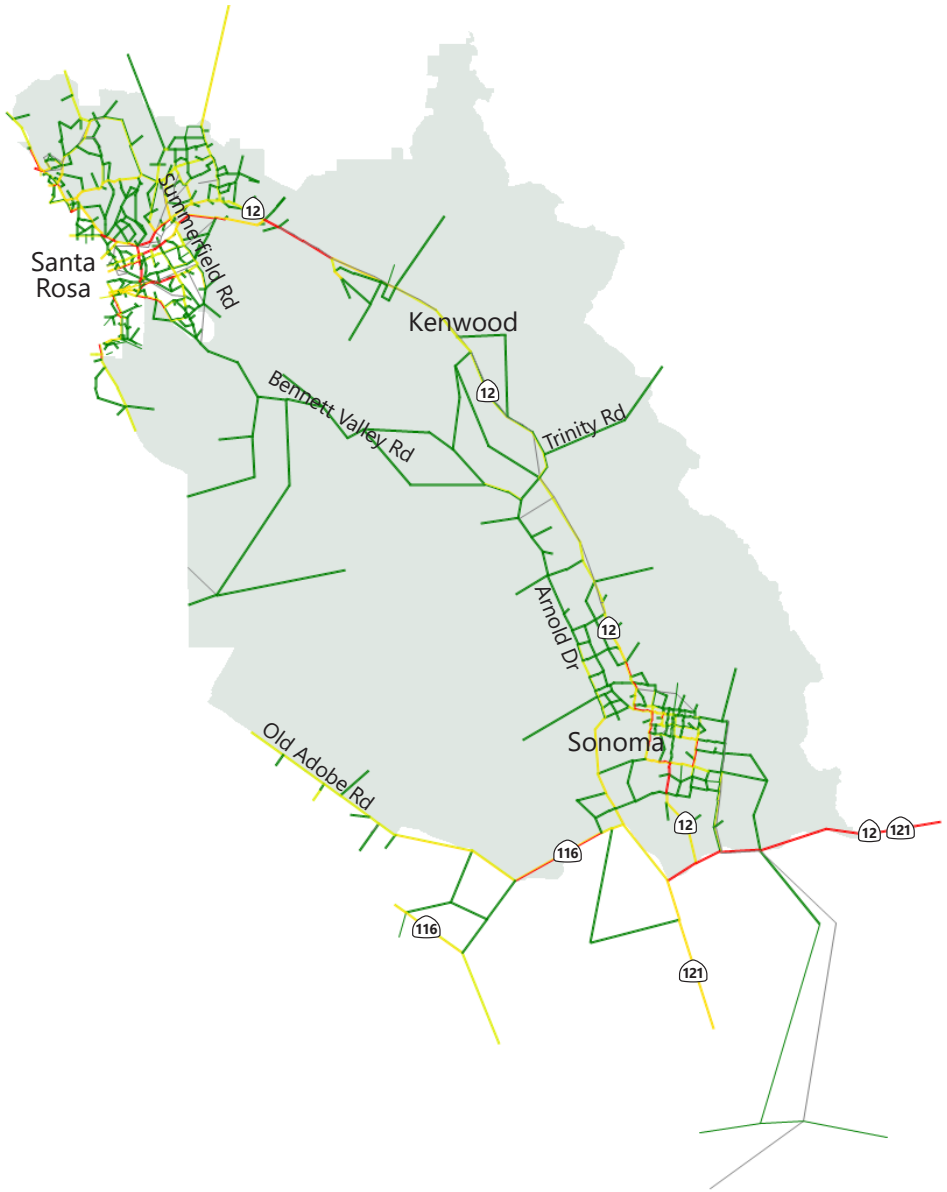


Figure 7.8

Scenario 3 Future Year Model Run - 4:15 PM

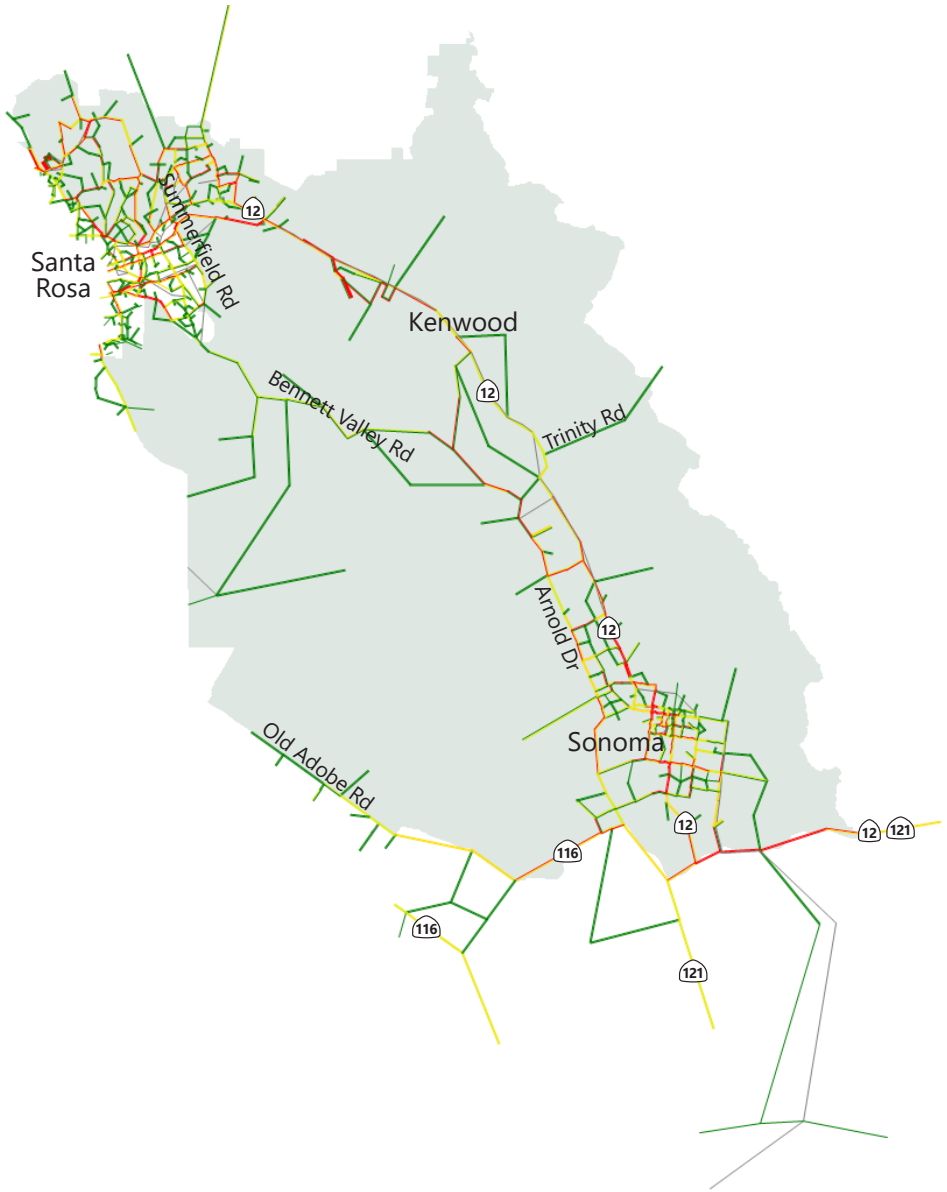


Figure 7.9

Scenario 3 Future Year Model Run - 4:30 PM (start of evacuation)

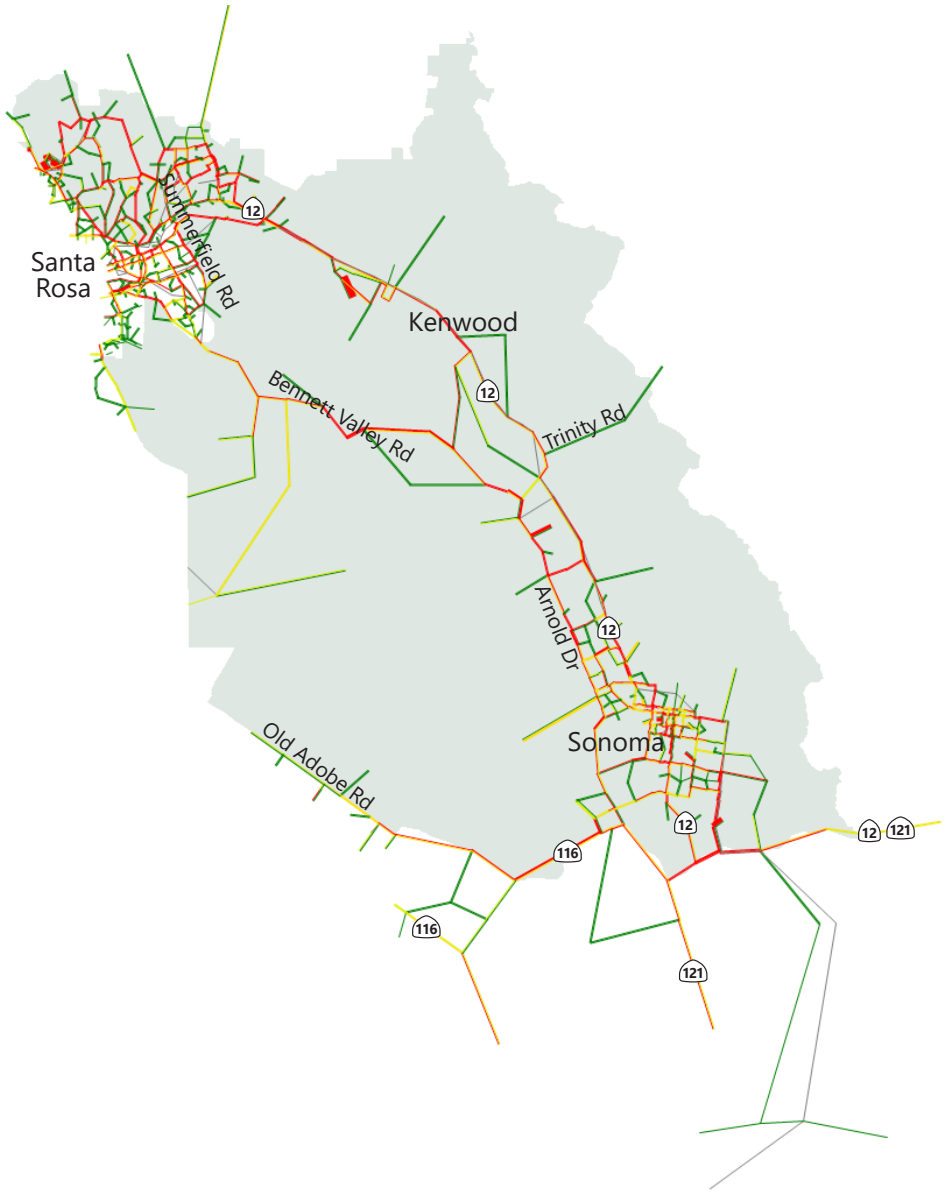


Figure 7.10

Scenario 3 Future Year Model Run - 4:45 PM

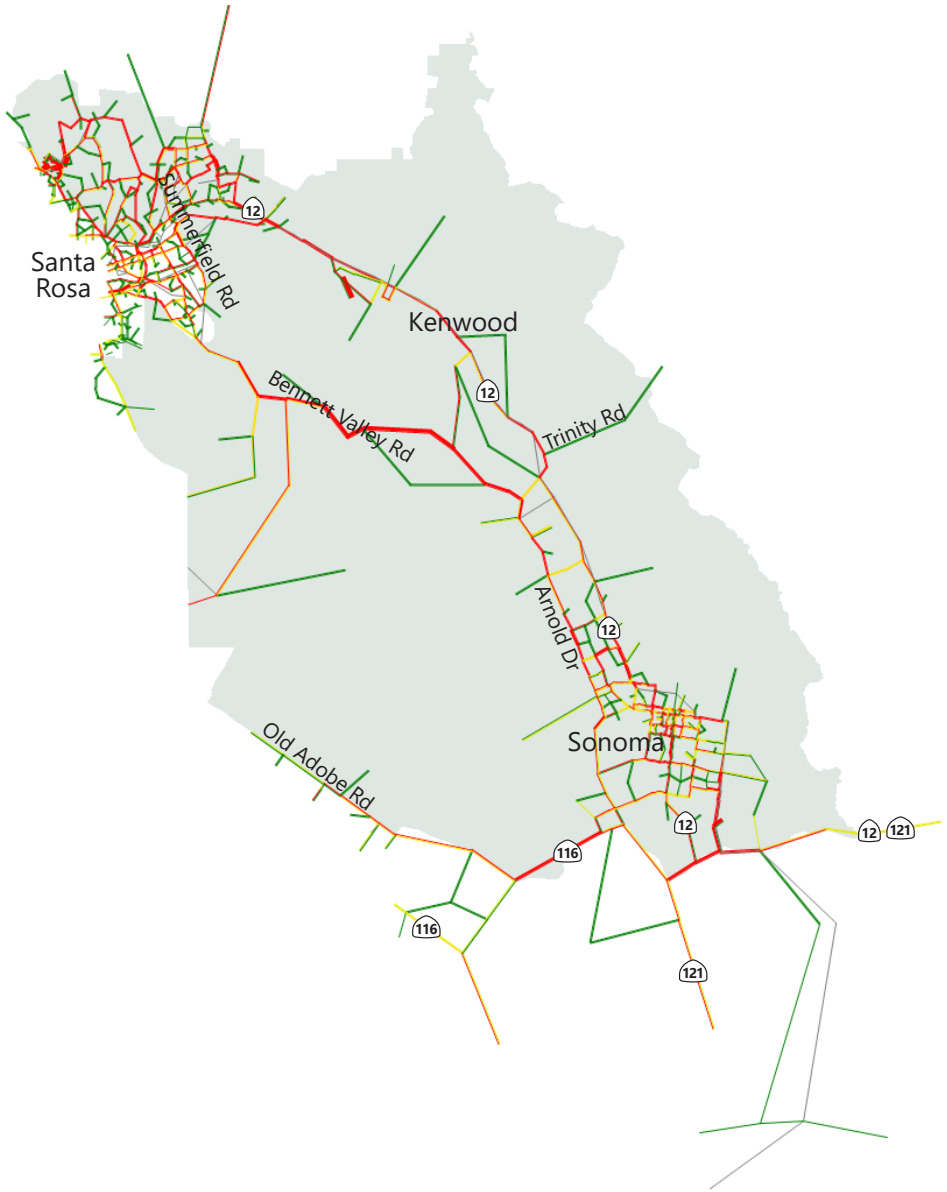


Figure 7.11

Scenario 3 Future Year Model Run - 5:00 PM

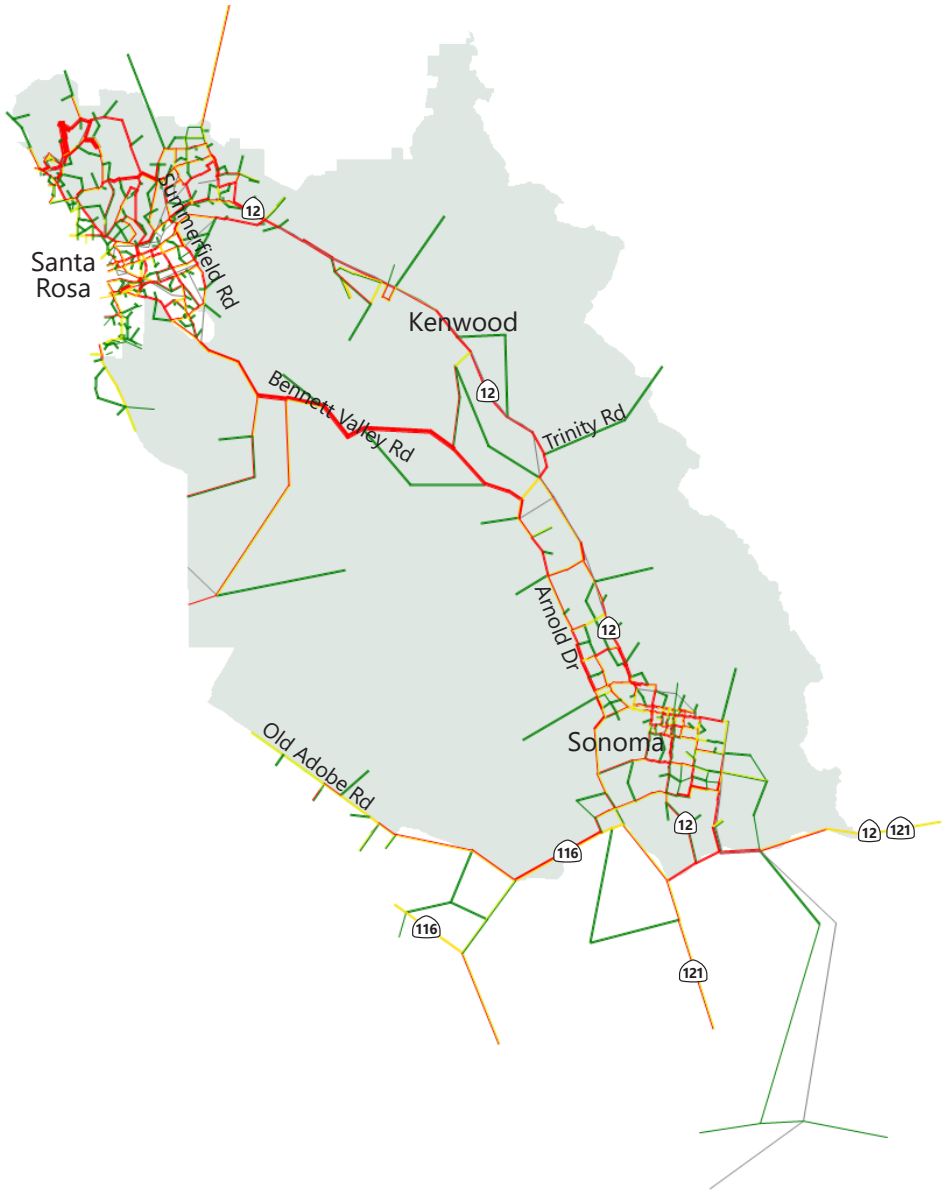


Figure 7.12

Scenario 3 Future Year Model Run - 5:15 PM

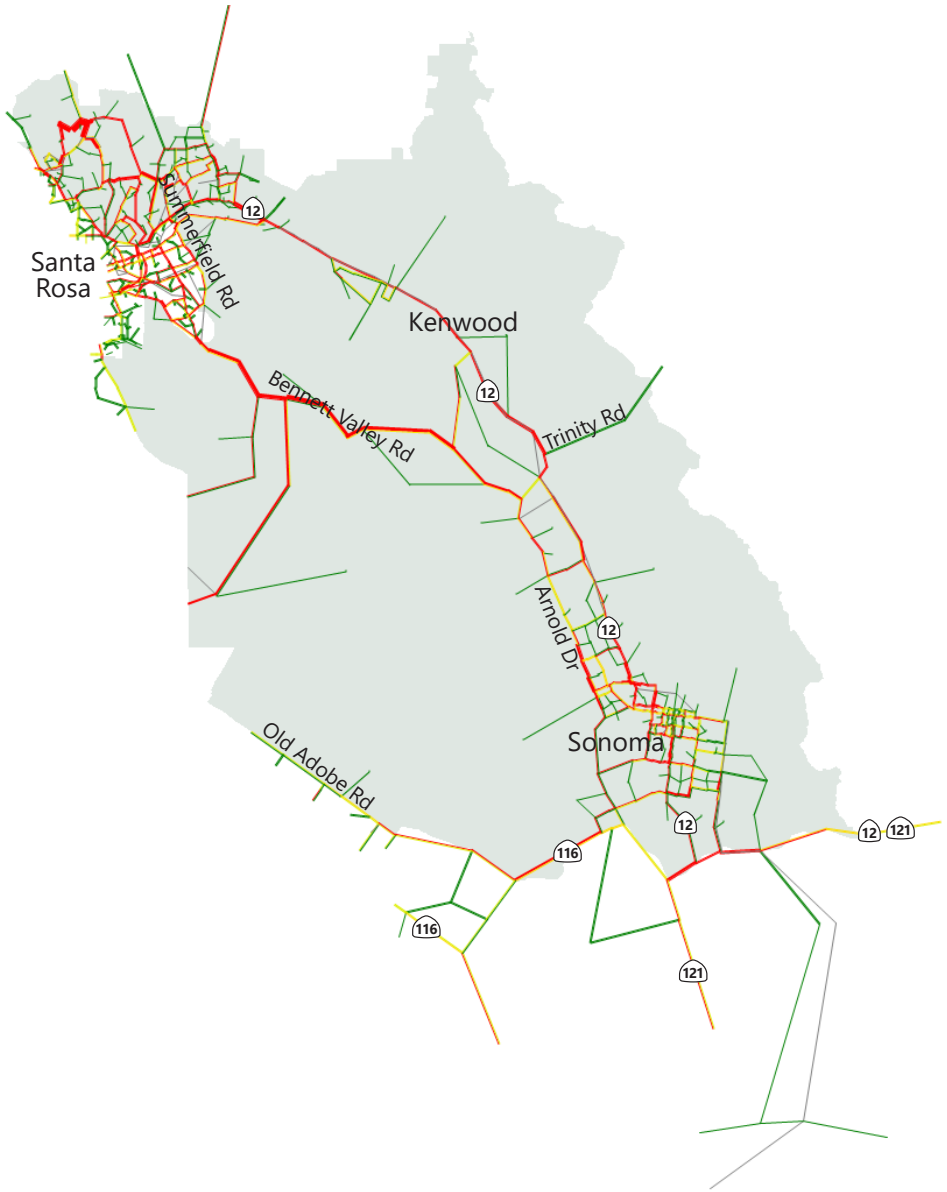


Figure 7.13

Scenario 3 Future Year Model Run - 5:30 PM

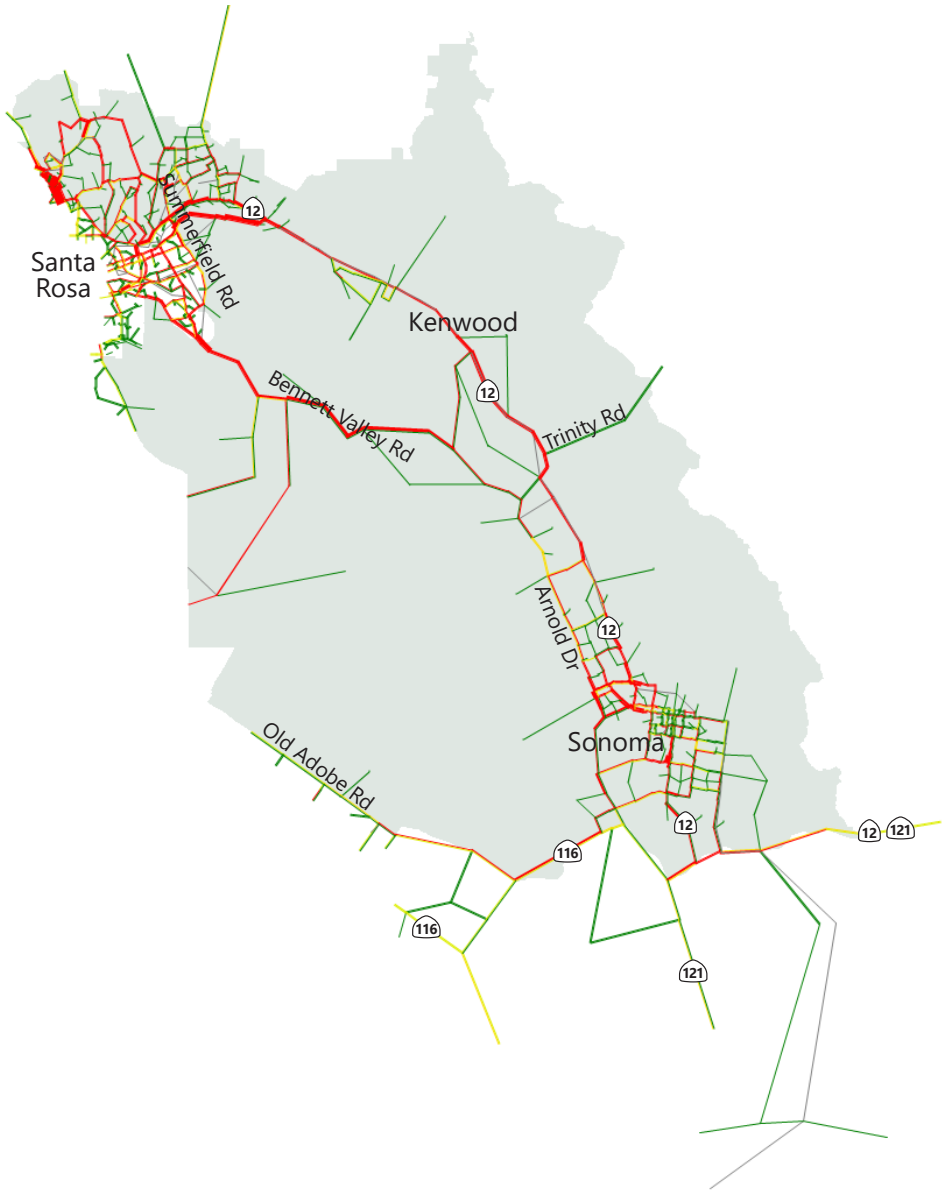


Figure 7.14

Scenario 3 Future Year Model Run - 5:45 PM

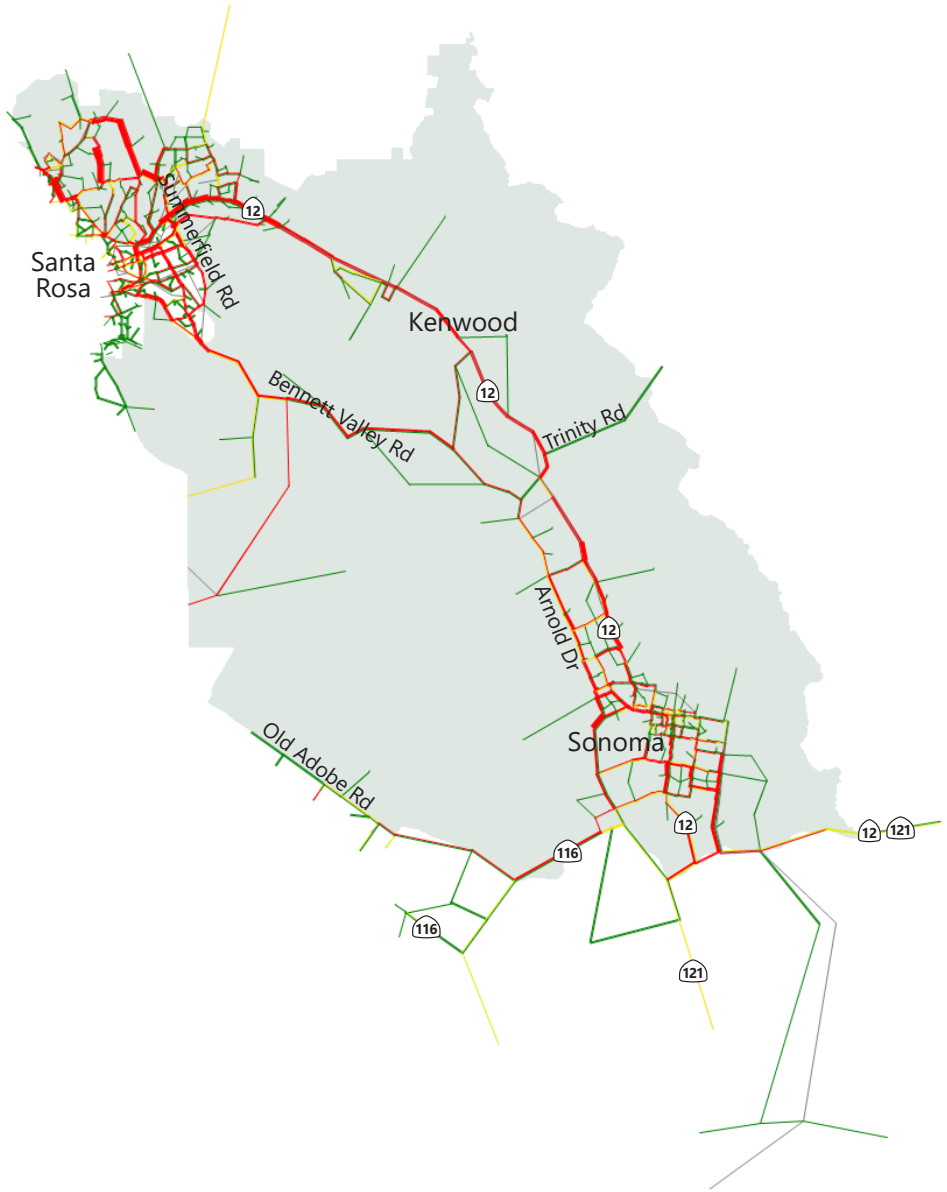


Figure 7.15

Scenario 3 Future Year Model Run - 6:00 PM

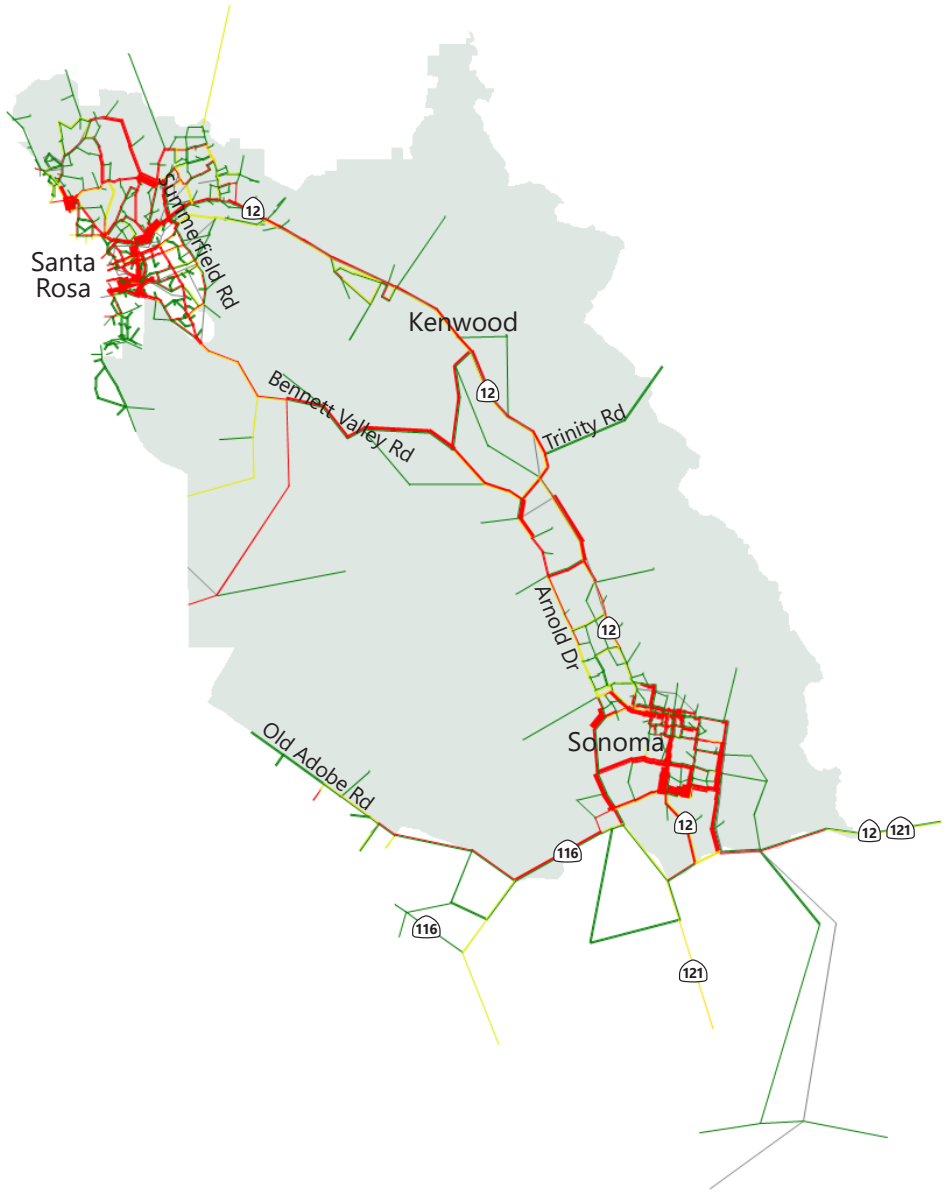


Figure 7.16

Scenario 3 Future Year Model Run - 6:15 PM

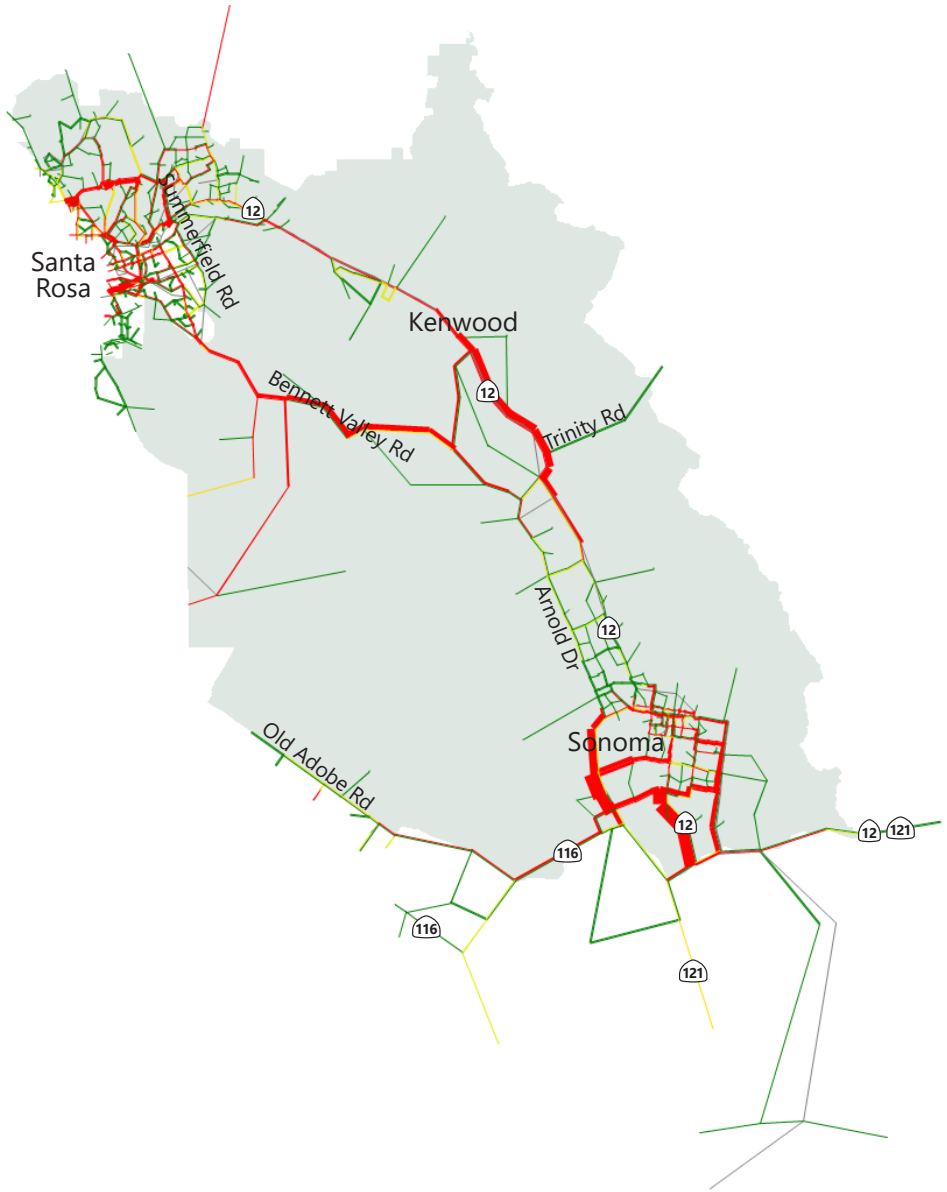


Figure 7.17

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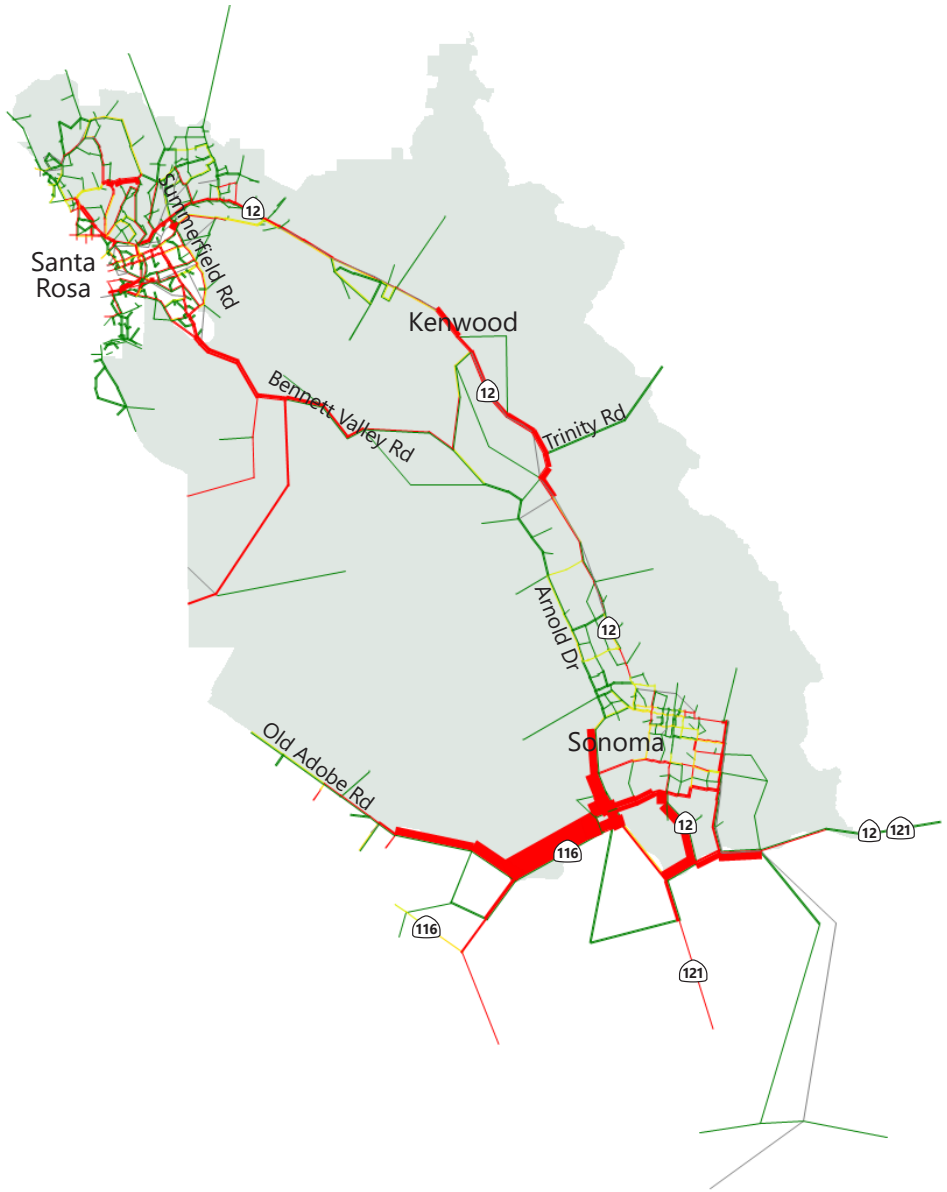


Figure 7.18

Scenario 3 Future Year Model Run - 6:45 PM

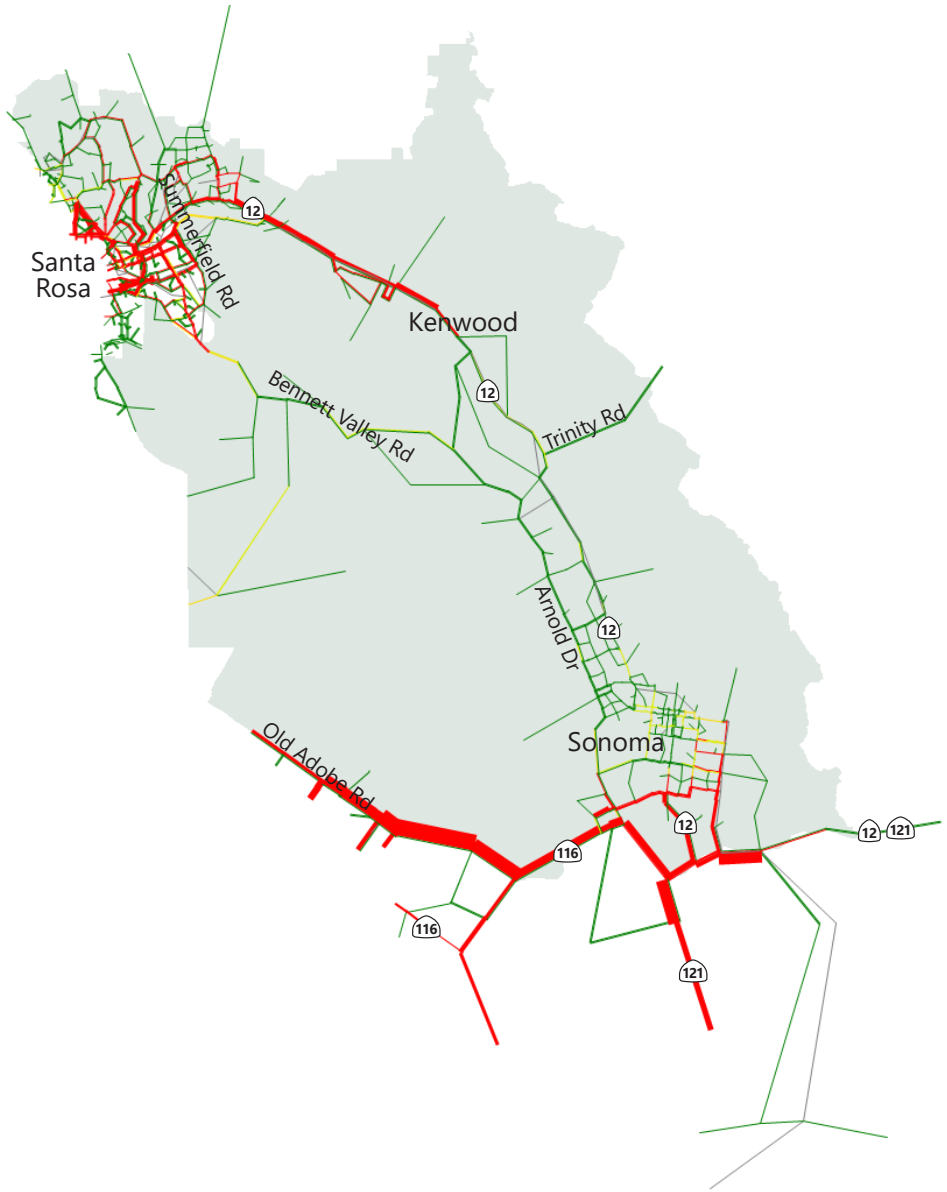


Figure 7.19

Scenario 3 Future Year Model Run - 7:00 PM

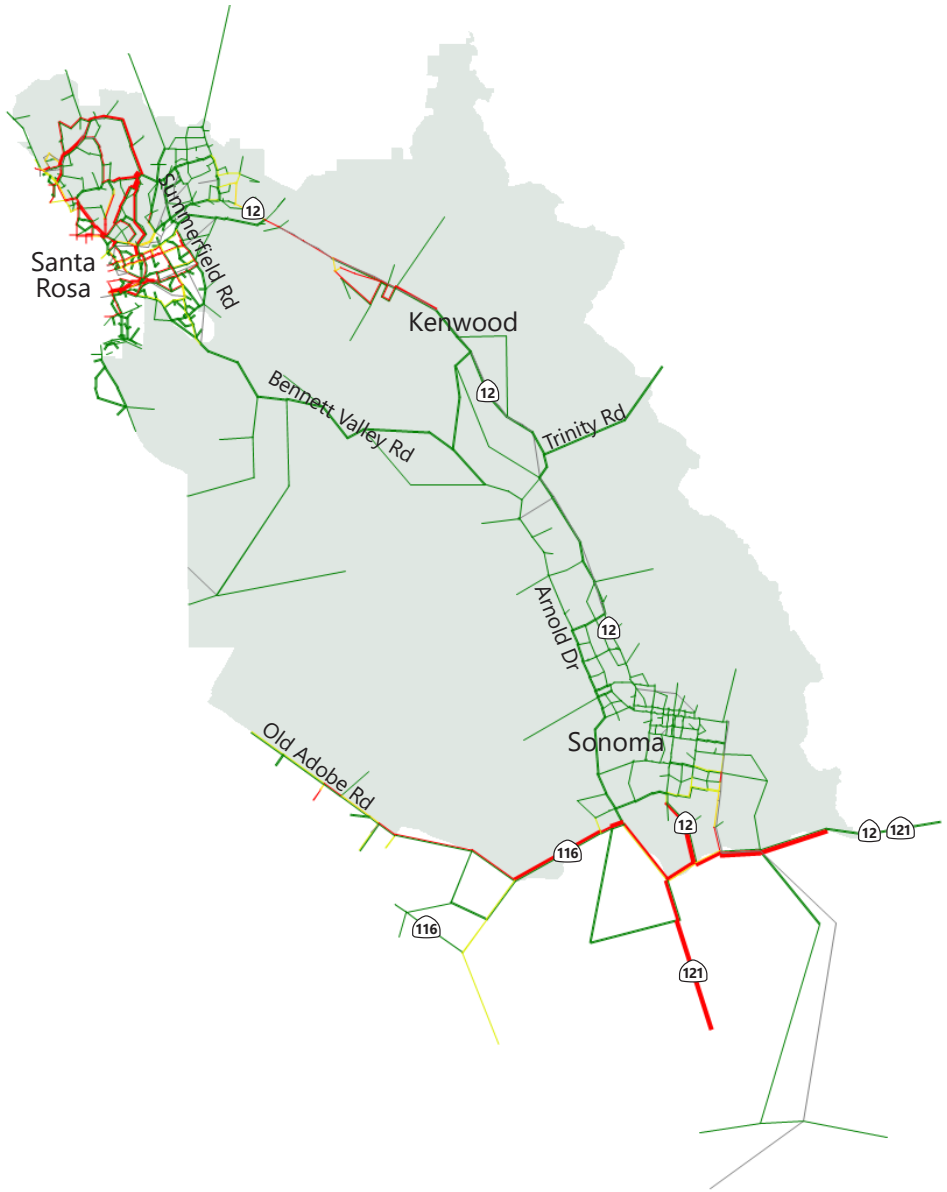


Figure 7.20

Scenario 3 Future Year Model Run - 7:15 PM

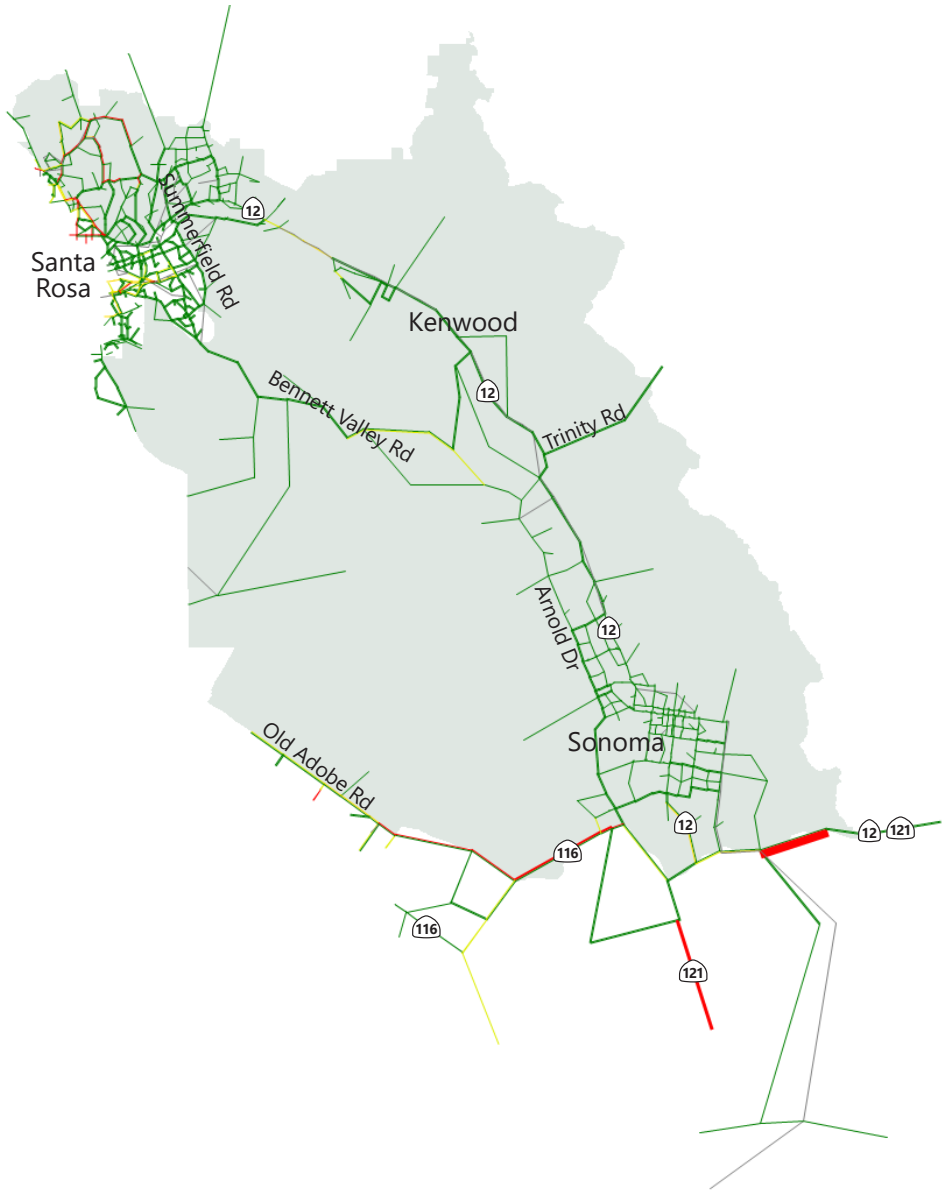


Figure 7.21

Scenario 3 Future Year Model Run - 7:30 PM

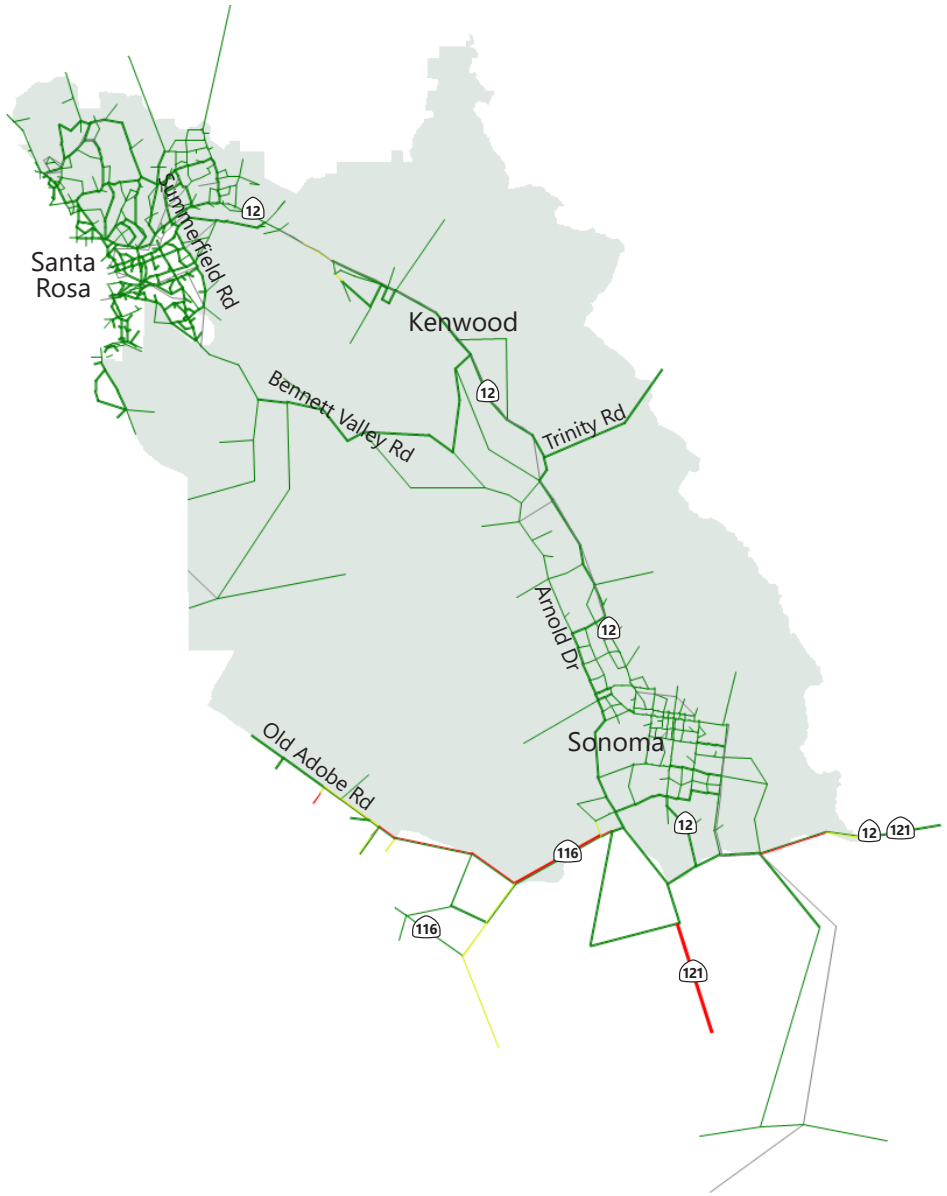


Figure 7.22

Scenario 3 Future Year Model Run - 7:45 PM

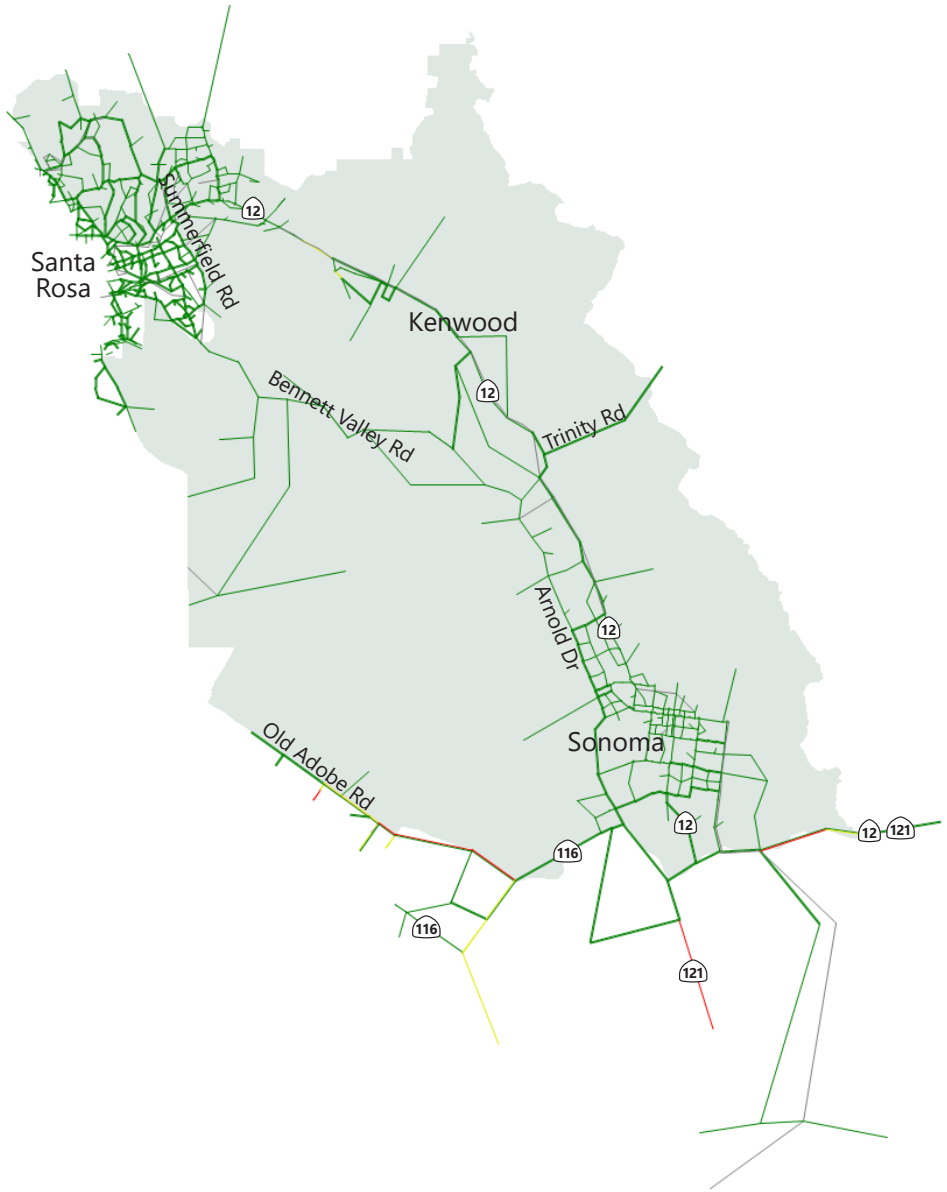


Figure 7.23

Scenario 3 Future Year Model Run - 8:00 PM

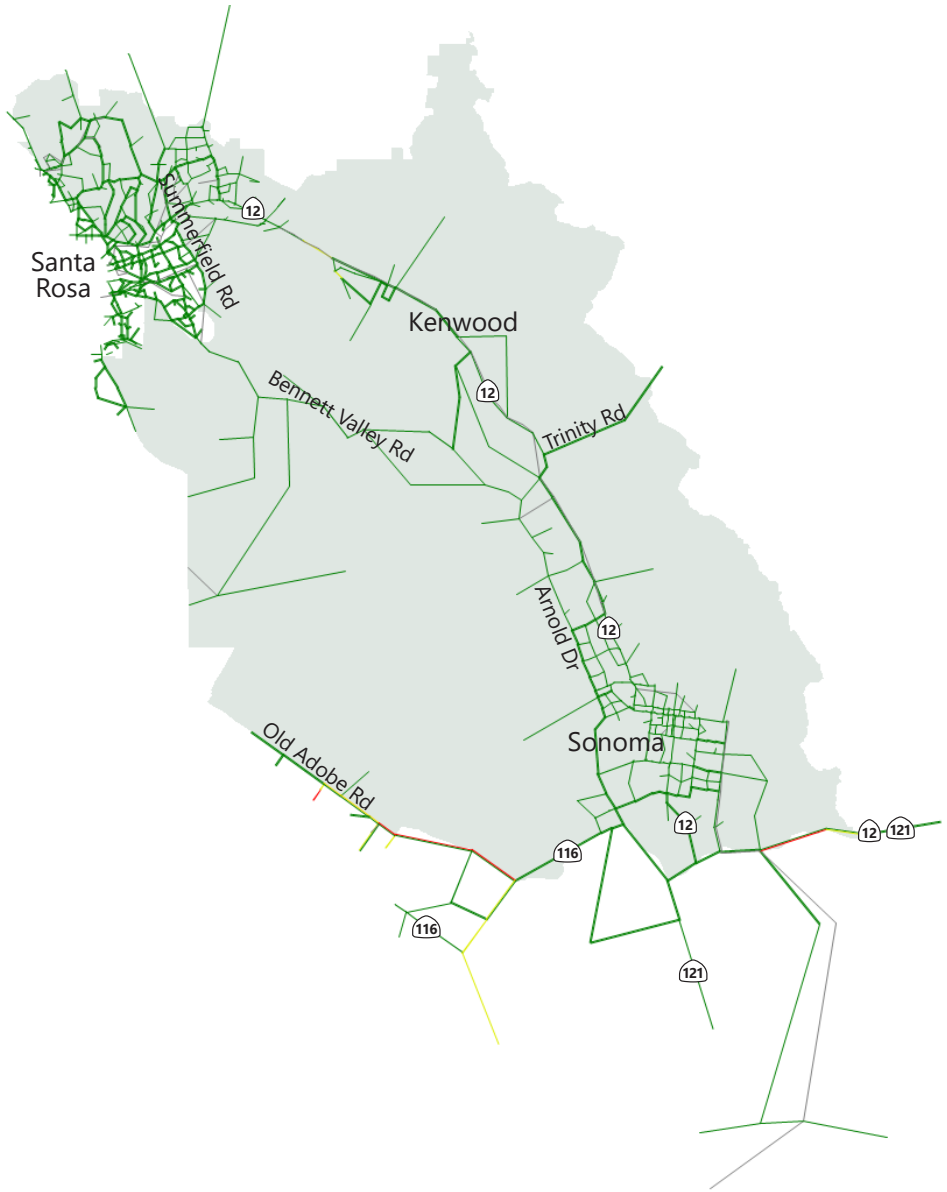


Figure 7.24

Scenario 3 Future Year Model Run - 8:15 PM

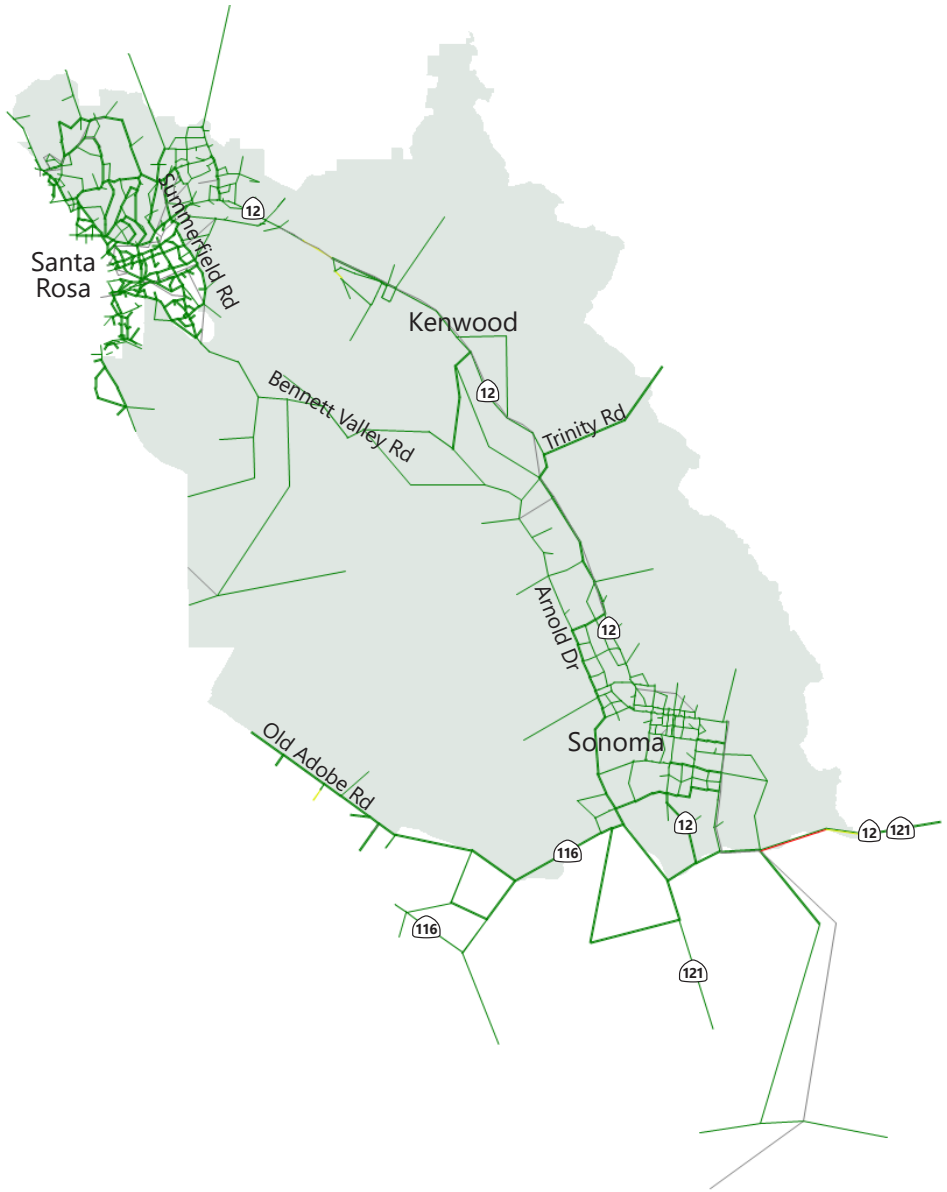


Figure 7.25

Scenario 3 Future Year Model Run - 8:30 PM

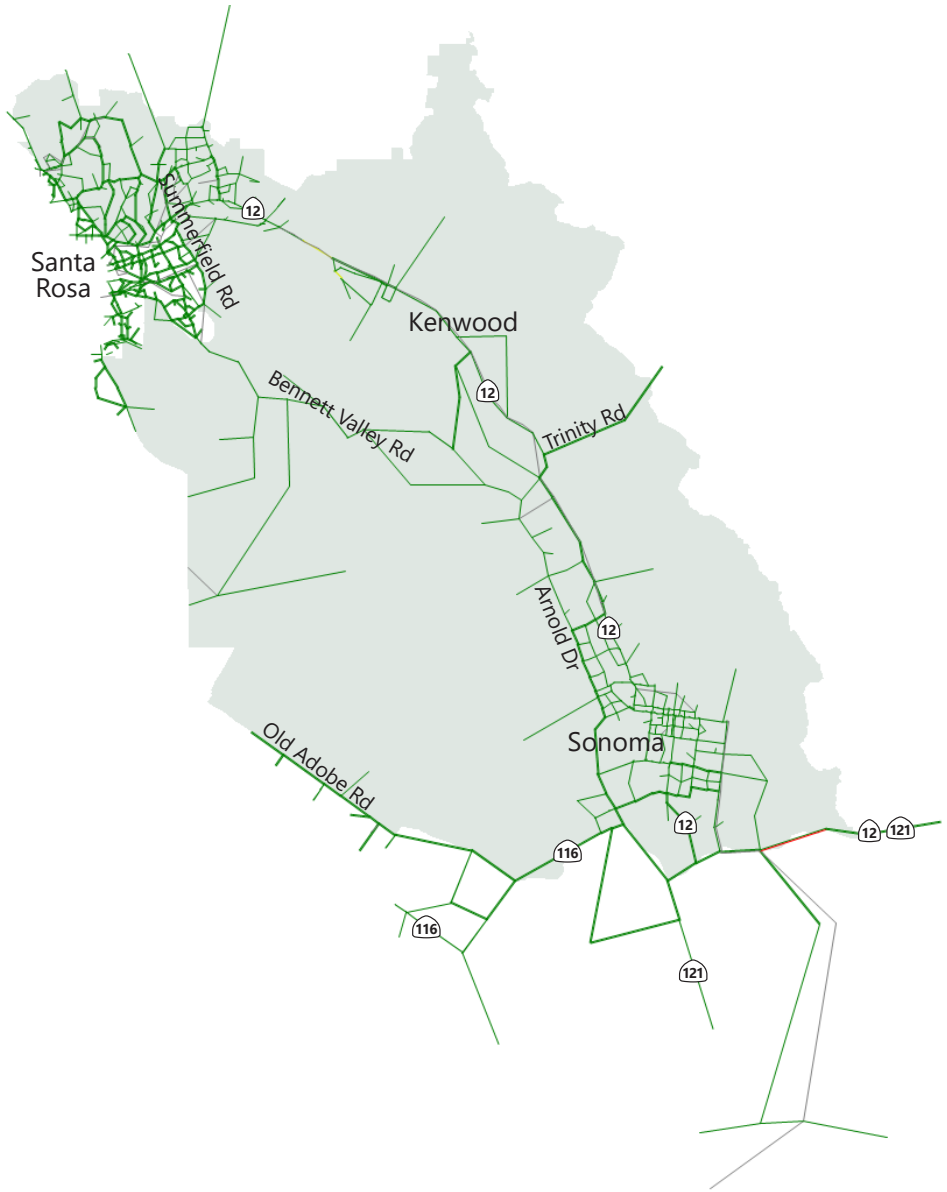


Figure 7.26

Scenario 3 Future Year Model Run - 8:45 PM

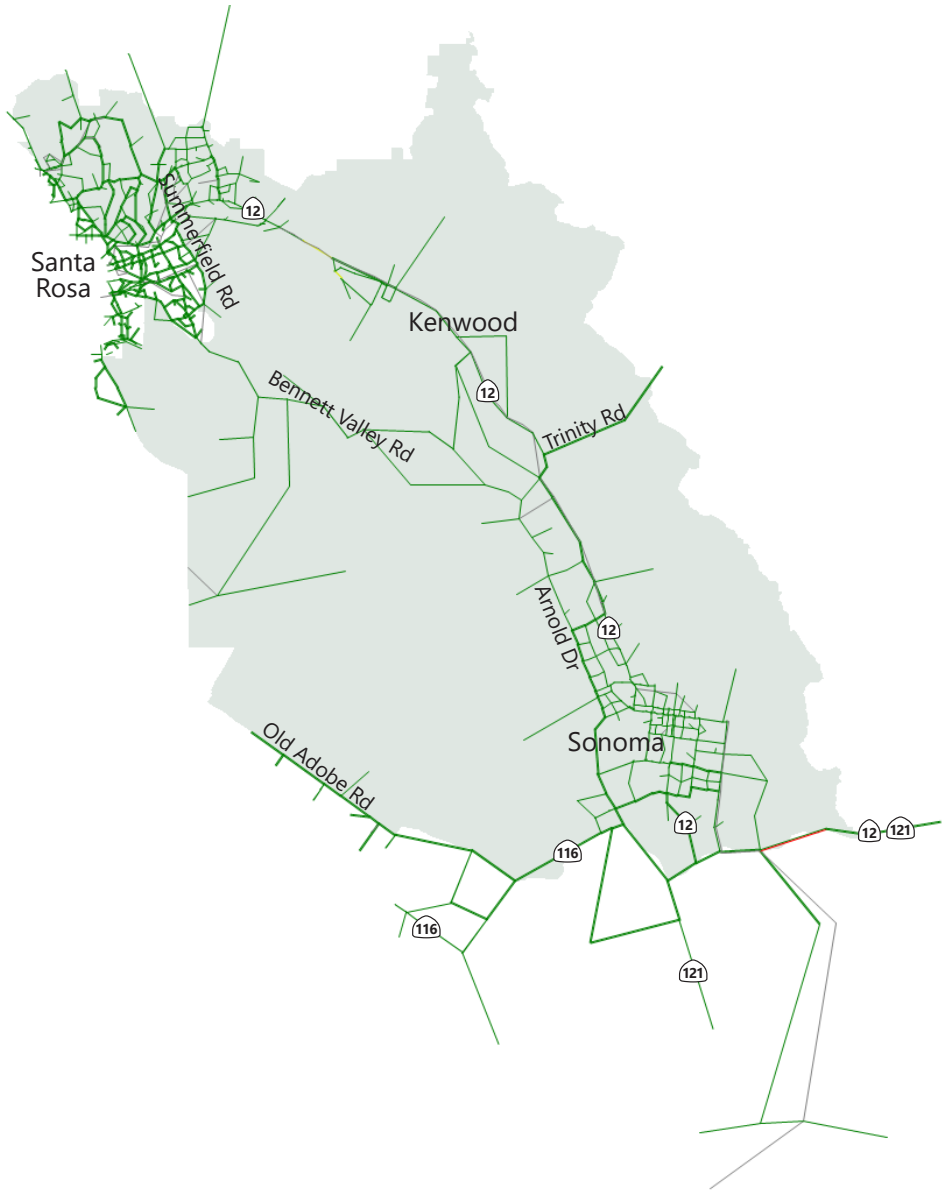


Figure 7.27

Scenario 3 Future Year Model Run - 9:00 PM

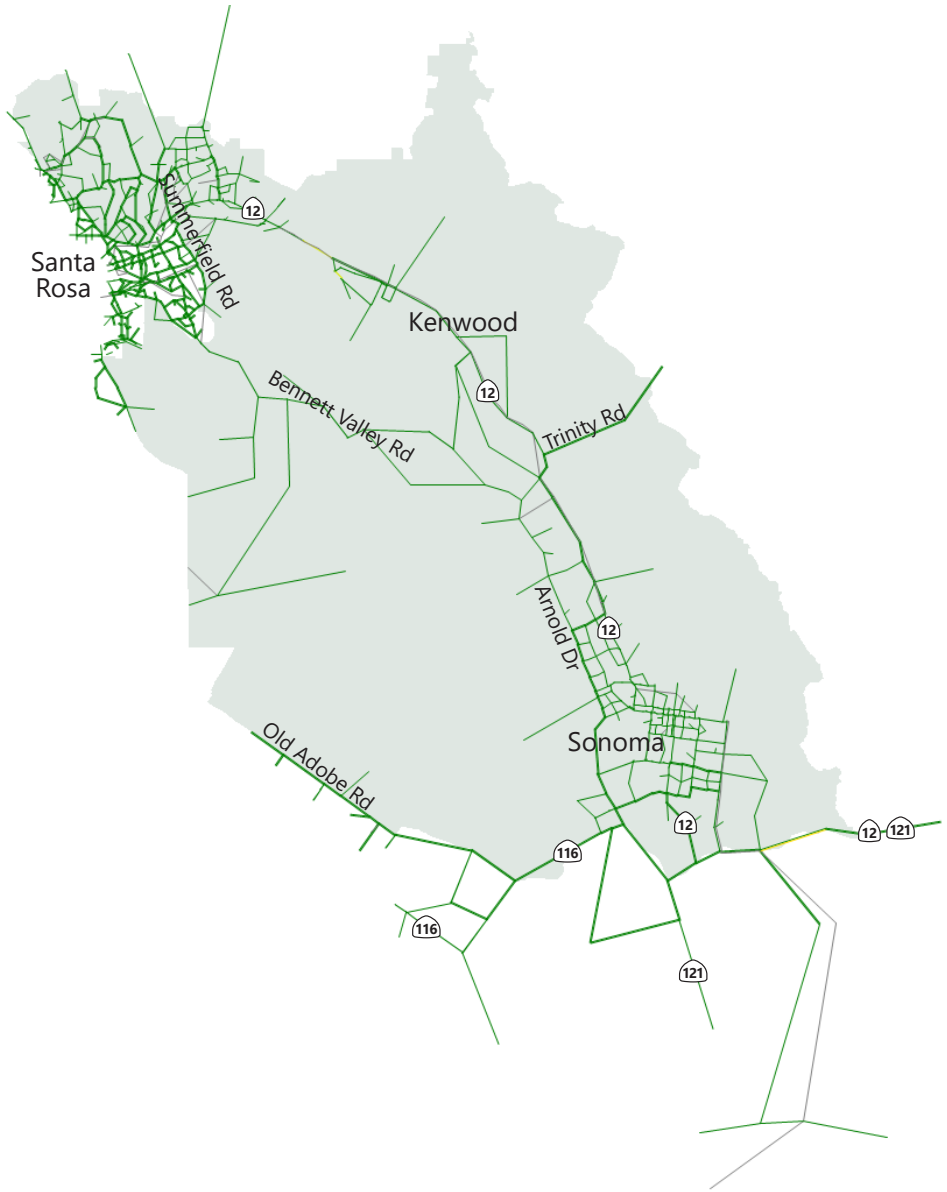


Figure 7.28

Scenario 3 Future Year Model Run - 9:15 PM

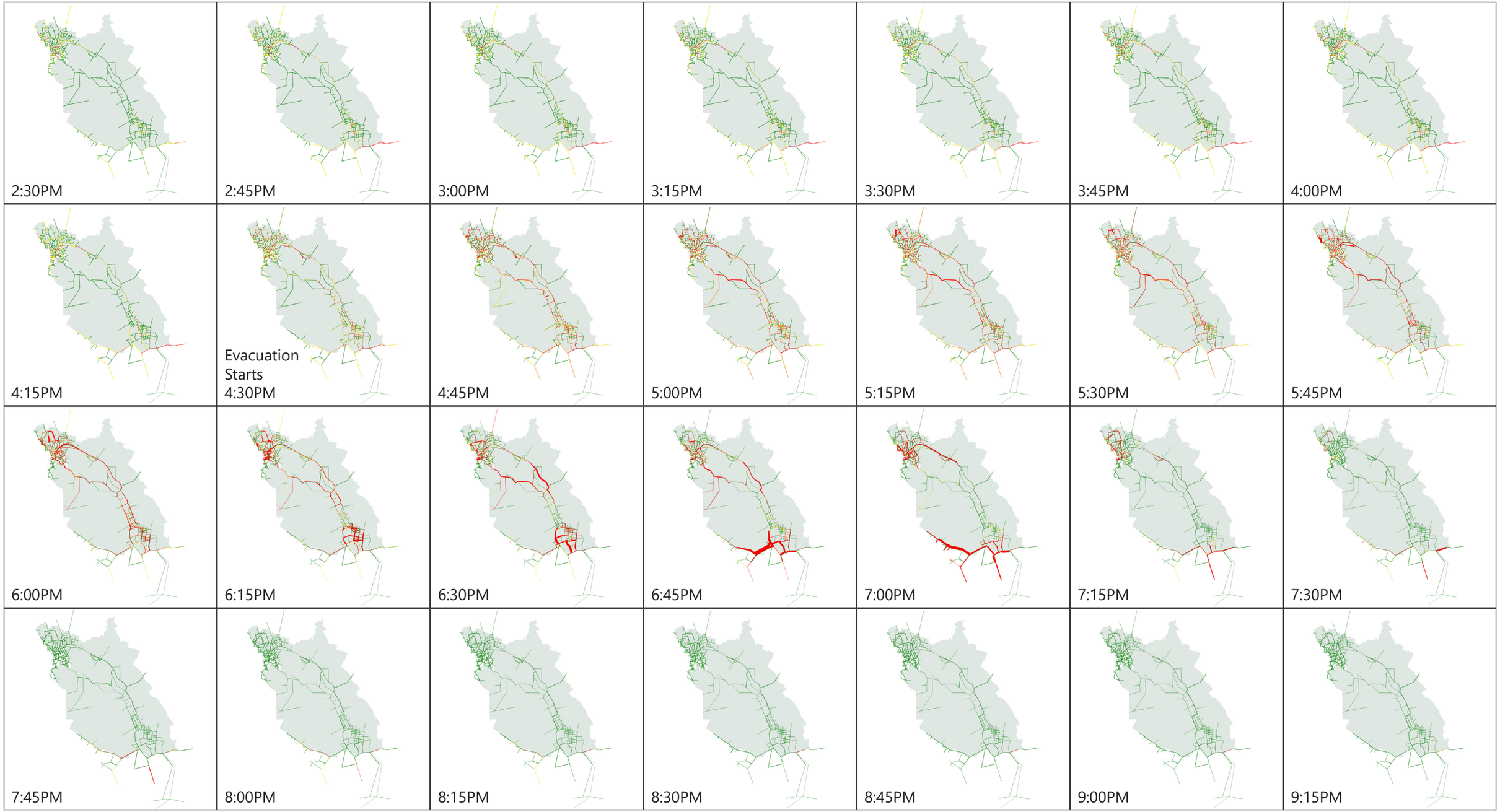


Figure 7.29

Scenario 3 Future Year Model Run Results

Appendix A: Estimated Evacuation Demand

Scenario	Population	Households	Household Vehicle Ownership					Estimated Residential Evacuation Demand (Number of Vehicles)	Employment	Estimated Employee Evacuation Demand (Number of Vehicles)	Estimated Total Evacuation Demand (Number of Vehicles)
			0	1	2	3	4+				
Scenario 1 Base (2019)	31,511	12,684	418	3,853	4,868	2,278	1,267	20,811	7,293	7,293	28,104
Scenario 1 Future (2040)	47,700	19,141	763	5,980	7,174	3,272	1,952	31,059	8,969	8,969	40,028
Scenario 2 Base (2019)	23,158	8,627	244	2,114	3,340	1,996	933	14,695	5,605	5,605	20,300
Scenario 2 Future (2040)	26,633	9,942	303	2,435	3,892	2,265	1,047	17,400	8,613	8,613	26,013
Scenario 3 Base (2019)	100,936	40,059	1,886	13,134	15,305	6,519	3,215	64,752	24,079	24,079	88,831
Scenario 3 Future (2040)	108,994	43,244	2,023	14,209	16,511	7,013	3,488	69,878	37,142	37,142	107,020
Total (2019)	155,605	61,370	2,548	19,101	23,513	10,793	5,415	100,258	36,977	36,977	137,235
Total (2040)	183,327	72,327	3,089	22,624	27,577	12,550	6,487	118,337	54,724	54,724	173,061

Source: Sonoma County Transportation Authority (SCTA) Travel Demand Model, American Community Survey 2019-23.

Addendum to the Sonoma County General Plan 2020 Certified Final Environmental Impact Report

Prepared for the 2025 Safety Element Update

State Clearinghouse No. 2003012020
Project location: countywide

1 Introduction

This document is an Addendum to the Final Environmental Impact Report for Sonoma County General Plan 2020 (referred to in this document as the "GP2020 EIR"), which was certified by the Sonoma County Board of Supervisors on September 23, 2008. The Addendum analyzes the Safety Element Update as a modification to the existing General Plan, and specifically to the General Plan Safety Element, to determine whether adoption of the Safety Element Update could result in any environmental impact not previously considered in connection with General Plan 2020 by the GP2020 EIR. Approval of the Safety Element Update is a discretionary action by the Sonoma County Board of Supervisors, and the County of Sonoma is the CEQA lead agency for the proposed action.

Because the Safety Element Update is a modification to a project for which a final EIR was certified and is a later activity under a Program EIR, it is subject to CEQA's subsequent review standards provided in Public Resources Code Section 21166 and CEQA Guidelines Sections 15162-15164.[1] Under these provisions, when an agency considers changes to a project that was previously approved based on a certified EIR, preparation of an Addendum is appropriate if the agency determines, based on substantial evidence, that a subsequent or supplemental EIR is not required. Public Resources Code Section 21166 provides that after an EIR has been prepared for a project, no subsequent or supplemental EIR shall be required by the lead agency or by any responsible agency, unless one or more of the following events occurs:

(a) Substantial changes are proposed in the project which will require major revisions of the environmental impact report.
(b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report.
(c) New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available.

Per CEQA Guidelines Section 15164 (Addendum to an EIR or Negative Declaration), the lead agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary, but none of the conditions described in CEQA Guidelines Section 15162 have occurred. An addendum need not be circulated for public review. (Guidelines § 15164, subd. (c).) The decision making body shall consider the addendum with the final EIR prior to making a decision on the project. (Id. at subd. (d).)

[1] All references to CEQA are to Public Resources Code, §§ 21000-21189.91. All references to the CEQA Guidelines are to Title 14 of the California Code of Regulations, §§ 15000 et. seq.

The Project Description section of this Addendum details the proposed Safety Element Update and changes to the existing GP2020 Public Safety Element.

As the CEQA lead agency for the Safety Element Update, based on the facts and analysis presented in this Addendum the County has determined that none of the conditions listed in CEQA Guidelines Section 15162 apply that would require preparation of a subsequent or supplemental EIR. Accordingly, pursuant to Guidelines Section 15164, the County determined that an Addendum to the certified GP2020 EIR is appropriate to document the County's determination that no further CEQA review is required for the Safety Element Update. This Addendum will be considered by the Board of Supervisors with the GP2020 Final EIR before the Board takes any action on the proposed Update.

2 Background

2.1 Procedural history of General Plan 2020 and GP2020 EIR

On September 23, 2008, the Sonoma County Board of Supervisors approved Resolution No. 08-0807 certifying the Final Environmental Impact Report for General Plan 2020 (GP2020 EIR), and also approved Resolution No. 08-0808, adopting Sonoma County General Plan 2020 (GP2020), making findings required by CEQA, and adopting a Statement of Overriding Considerations.

The General Plan 2020 Safety Element (called the "Public Safety Element") has been amended twice since GP2020 was adopted in 2008. In September 2014, the Board of Supervisors adopted Resolution No. 14-0355, approving a limited, technical update to the Public Safety Element that incorporated updated hazard maps, new discussion on wildfire hazards in response to changes in state law, and integrated the Sonoma County Hazard Mitigation Plan. The 2014 Update did not make any substantive changes to goals, objectives, or policies of the Public Safety Element, and instead made only grammatical and technical changes to objectives and policies. As provided in the Planning Commission resolution recommending Board of Supervisors approval, the 2014 Update did "not involve revising existing policies in the Public Safety Element except to correct terminology and references to hazard maps; and does not involve adding new policies."[2] The 2014 Public Safety Element update was found to be within the scope of the GP2020 EIR, pursuant to CEQA Guidelines Section 15168(c)(2).

On December 11, 2018, the Board of Supervisors adopted a minor amendment to the Public Safety Element to add new policy PS-1p, modifying local requirements for development in the Alquist-Priolo Earthquake Fault Zone (locally known as the Geologic Hazard Area combining district) for reconstruction of single-family homes located in the Alquist-Priolo Earthquake Fault Zone and destroyed in the 2017 Sonoma Complex Fires.

Unless otherwise specified or clear in context, references to the "GP2020 Public Safety Element" or the "Public Safety Element" include the current Public Safety Element, inclusive of the later amendments.

[2] Planning Commission Resolution No. 14-014, July 17, 2013.

2.2 General Plan 2020 and the General Plan 2020 EIR

2.2.1 The "Project" Analyzed in the GP2020 EIR

The EIR for GP2020 is a Program EIR, as described in CEQA Guidelines § 15168. The "project" analyzed by the GP2020 EIR was implementation and buildout of General Plan 2020, plus adoption of certain zoning code amendments to the Sonoma County Code that were proposed concurrent with General Plan 2020 to create new zoning combining districts and apply the newly created zoning to selected sites. As described in the GP2020 Draft EIR ("DEIR"), for purposes of the EIR's analysis,

> [t]he project encompasses all of the future land uses and development that are projected to occur, including residential, commercial, industrial, agricultural, and other land uses and development, as well as the entire foreseeable public infrastructure that is necessary to serve the projected uses. The Draft GP 2020 is based upon a projected amount of growth, and does not assume that all properties would be fully developed.[3]

The Draft EIR explained that the General Plan was drafted to anticipate and address many of the impacts discussed in the EIR.[4] The analysis in the GP2020 EIR evaluated the draft policies and programs for General Plan 2020 that "would lead to alterations in the physical environment… includ[ing] changes in population, housing, and land use patterns that would occur in Sonoma County as the GP 2020 is implemented."[5]

A key aspect of the EIR's analysis of the changes that would occur in Sonoma County "as the GP 2020 is implemented" was its assumptions about population growth. As a basis for its analysis, the EIR projected that the population of Sonoma County as a whole would increase from 458,614 in 2000 to 546,030 residents in 2020, and that the unincorporated area population would increase from 128,596 in 2000 to 147,660 residents in 2020.[6]

2.2.2 Mitigation Measures

Among other identified measures, the GP2020 Draft EIR identified five CEQA mitigation measures for incorporation into the Public Safety Element in the form of new and revised policies. Distinct from mitigation measures, the GP2020 EIR also discussed "mitigating policies" of GP2020, which were policies already included in the proposed project (the draft General Plan 2020) analyzed by the EIR, which would contribute to reducing the significance of project impacts.

As defined by CEQA Guidelines Section Section 15370, "mitigation" includes:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

[3] General Plan 2020 Draft EIR (Vol. 3 of Final EIR), at p. 2.0-2.
[4] General Plan 2020 Draft EIR (Vol. 3 of Final EIR), at p. 1.0-2.
[5] Ibid.
[6] Ibid.

(e) Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.

The Draft EIR identified and recommended five mitigation measures for adoption as policies in the Public Safety Element. Of these, one was adopted as recommended; two were revised and restructured into three policies and then adopted; one was eliminated by staff before publication of the Final EIR; and one was determined by the Board of Supervisors to be infeasible. The adopted CEQA mitigation measures are listed in Table 1. Underlined portions of a measure or policy denote that portion was specifically added or modified as the EIR mitigation measure.

Table 1. Mitigation Measures Adopted In the GP2020 Public Safety Element

Impact	Mitigation Measure As Identified In DEIR	Policy Adopted as Mitigation
Impact 4.5-12: Potential failure of levees or dams could expose people and structures to inundation and result in loss of property, increased risk, injury or death.	**Mitigation Measure 4.5-12** Revise Policy PS-2u to include a provision for review and rehabilitation of dams and levees that pose a significant threat of inundation to adjacent or downstream development. Revise the end of Policy PS-2u to include the following text: Policy PS-2u: Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitation and maintenance needs as appropriate.	**Policy PS-2w:** Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitative maintenance needs as appropriate.*
Impact 4.13-2: Land uses and development consistent with the Draft General Plan 2020 could result in the increased exposure to hazardous materials in the vicinity of schools.	**Mitigation Measure 4.13-2(a)** Add a new policy to the Public Safety Element as follows: Policy PS-4p: Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal within one-quarter mile of an existing or proposed school facility. **Mitigation Measure 4.13-2(b)** Add a new policy to the Public Safety Element as follows: Policy PS-4q: Work with School Districts to avoid siting of schools within one-quarter mile of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal.	**Policy PS-4h:** Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal in any area subject to a very strong ground shaking hazard identified on Figures PS-1a through PS-1i or within one quarter mile of schools.* **Policy PS-4i:** Avoid siting of hazardous waste repositories, incinerators, or similar facilities intended primarily for hazardous waste disposal in any area designated for urban residential or rural residential use or on agricultural lands or at County approved solid waste disposal facilities.* Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.* **Policy PS-4j:** Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.*

Recommended mitigation measures identified in the Draft EIR but not adopted are as follows:

1. Mitigation measure 4.9-10. This measure was revised by staff before publication of the adoption draft GP2020 to eliminate the proposed mitigation measure. (As noted in the Final EIR, Vol. 2 at p. 2.2-213: "Public Safety Element Policy PS-3m has been revised to require automatic sprinklers in new development with some exceptions. Details would be determined as part of the Code implementation.") The Draft EIR notes that the remainder of the policy was already in effect due to the recent passage of ordinances requiring sprinklers in most new residential and commercial structures and conditionally requiring them at the time of expansion of existing structures.[7]

> ***Mitigation Measure 4.9-10.*** *Revise Policy PS-3m as follows:*
>
> ***Policy PS-3m****: Require automatic fire sprinkler systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural-exempt buildings. Require automatic fire sprinkler systems at the time of expansion of existing residential and commercial buildings except as provided for in the Sonoma County Code.*

Ultimately, Policy PS-3m was renumbered as Policy PS-3l, and provides:

> **Policy PS-3l:** Require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural exempt buildings.*****

2. Mitigation Measure 4.7-1. This measure recommended modifications to the hearing draft Policy PS-1o was deemed infeasible by the Board of Supervisors and not adopted. In the Statement of Overriding Considerations adopted with Resolution No. 08-0808, the Board found that "applying the UMB requirement to older multi family residential structures under recommended Policy PS-1o is not considered appropriate due to the potential impact of costly retrofitting work on rental housing and the potential for displacement of lower income households," among other reasons for finding the measure infeasible. The adopted text of Policy PS-1o was not identified or adopted as a mitigation measure.

> ***Mitigation Measure 4.7-1.*** *Revise Policy PS-1o to specifically include all multiple family residential URM structures.*
>
> ***Policy PS-1o****: Adopt an ordinance requiring strengthening and / or reinforcement of Unreinforced Masonry Buildings, including multi-family, but not single family residential structures.*

As adopted, additional wording was added, reflecting the Board's policy direction. Policy PS-1o was not adopted as a mitigation measure, but was designated as a "mitigating policy," and provides:

> **Policy PS-1o**: Adopt an ordinance requiring strengthening and/or reinforcement of Unreinforced Masonry Buildings, except residential structures, considering the cost of the work and the value, frequency of use, and level of occupancy of the buildings.*

[7] Draft EIR at p. 4.9-67, citing Ordinances 5373 and 5402.

2.2.3 Mitigating Policies

The GP2020 EIR discussed most of the policies in the Public Safety Element as contributors to reducing the significance of relevant impacts. In some cases, the analysis of a policy's contribution to reducing an impact was very general, such as a string of citations to policies that were deemed collectively to contribute to reducing the significance of an impact.

The text of GP2020 does not distinguish between "mitigating policies" and adopted mitigation measures that meet the CEQA Guidelines Section 15370 definition of "mitigation." All 47 of the 1989 Public Safety Element policies that were carried forward into the 2020 General Plan were designated as "mitigating policies." "Mitigating policies" were those policies of GP2020 that were considered to contribute to reduction of the General Plan's environmental impacts. However, as noted in a Master Response D (Effectiveness of Mitigation Measures) in the Final EIR, many of the mitigating policies used non-mandatory wording, such as "avoid" or "encourage," instead of mandatory wording such as "shall" or "will." The Master Response states that "the effectiveness of each policy in reducing the applicable impact was weighed in light of the degree to which future land use and related decisions were bound by the policy. If a policy requires future land use decisions to meet defined environmental standards, then the policy was given relatively high credit for mitigation. However, if a policy encourages future land use decisions to meet the same standard, it was given relatively low credit for mitigation. For example, a policy requiring that 75% of the crops at an agricultural processing operation be locally grown in order to reduce conversion of farmland would be given more credit for mitigation than one which only encouraged locally grown produce." (GP2020 Final EIR, Vol. 2, p. 2.1-3.)

As to the 47 policies that were carried forward to GP2020 from the 1989 General Plan, those policies are designated by the GP2020 EIR and GP2020 as "mitigating policies," but as part of the pre-existing regulatory landscape and to the extent that they are not mandatory and enforceable, they are less likely to qualify as CEQA mitigation measures. Regardless, as discussed in the Project Description, the proposed Safety Element Update the GP2020 mitigating policies forward, although in a reorganized format.

2.2.4 Required CEQA Findings of Fact

When it approved Resolution No. 08-0808 and adopted General Plan 2020, the Board of Supervisors also made the findings of fact required by CEQA Guidelines Section 15091, which provides that a public agency shall not approve or carry out a project for which an EIR is certified which identifies one or more significant environmental effects unless the agency makes written findings regarding each of those significant effects. The possible findings are:

1. Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.

2. Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

3. Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

The Board of Supervisors adopted the findings required by Guidelines Section 15091, subd.(a)(1), for the potentially significant impacts that it determined had been reduced to less than significant by GP2020 policies or by incorporating adopted mitigation measures, including the following findings pertinent to the Public Safety Element and the Safety Element Update:

- ***Impact 4.5-9: Increased Flood Risk from Drainage System Alteration.*** *Section 4.5-9 of the Draft EIR found that future land uses and development consistent with GP 2020 would result in increases in stormwater runoff and peak discharge that could result in failure of existing storm drain systems and subsequent flooding. Mitigating Policies were included in the Public Safety Element that would contribute to reducing this impact to a less than significant level, such as Policies PS-2a through PS-2w that call for increased availability of flood hazard information, coordinated inter-jurisdictional approaches to flood management, and new regulations applying to development activities in flood hazard areas. Most of the Goals, Objectives and Policies cited in the Draft EIR are either unchanged or changes are limited to non-substantive editing in the "Board Draft GP 2020".*

  However, Policy PS-2n, which calls for developing new ''Low Impact Development" regulations, has been revised to provide for reduction rather than prevention of runoff. In addition, Policy PS-2v has been expanded to further address flooding resulting from failure of dams.

  Finding: Based upon the Final EIR and the entire record, the Board finds that the impacts of GP 2020 on flood risk from drainage alteration as described in Section 4.5-9 of the Draft EIR and the responses to comments thereon will be less than significant. This finding is based upon the inclusion of mitigating policies that, among other things, call for increased availability of flood hazard information, coordinated inter-jurisdictional approaches to flood management, and new regulations applying to development activities in flood hazard areas. The revision to the policies described above do not lower the mitigation value of the Policy. First, the revision to Policy PS-2v increases its mitigation value by addressing the flooding that could result from dam failure. Second, the revision to Policy PS-2n reflects the fact that 100% elimination of site runoff is often physically impossible due to site conditions, while retaining the provisions that require that runoff not increase flood risk. Therefore, the Goals, Objectives and Policies of GP 2020 continue to ensure that the impact remains less than significant.

- ***Impact 4.5-10: Place Housing or Structures in 100-Year Flood Hazard Areas***

  Section 4.5-10 of the Draft EIR found that future land uses and development consistent with GP 2020 would allow continued development in the 100 year Flood Hazard Areas, Mitigating Policies were included in the Public Safety Element that would contribute to reducing this impact to a less than significant level, including Policies PS-2e, PS-2h, PS-2i, PS-2o, and PS-2r that call for heightened analyses of flood risks for development proposed in areas subject to 100 year floods as well as expansion of the County "no net fill" regulations to all 100 year flood zones. These Goals, Objectives and Policies are either unchanged or changes are limited to non-substantive editing in GP 2020.

  Finding: Based upon the Final EIR and the entire record, the Board finds that the impacts of GP 2020 from placing structures in flood hazard areas as described in Section 4.5- 10 of the Draft EIR and the responses to comments thereon will be less than significant. This finding is based upon the inclusion of mitigating policies that, among other things, call for heightened analyses of flood risks for development proposed in areas subject to 100 year floods as well as expansion of the County

"no net fill" regulations to all 100 year flood zones. Therefore, the Goals, Objectives and Policies of GP 2020 ensure that the impact remains less than significant.

- ***Impact 4.5-12: Failure of Levee or Dam.*** *Section 4.5-12 of the Draft EIR found that the potential failure of levees or dams under GP 2020 could expose people and structures to inundation, could result in the loss of property, and could result in increased risk of injury or death and determined that this impact would be significant. Mitigating Policies were included in the Public Safety Element, such as Policy PS-2w, that would encourage the completion of flood inundation maps for all dams that could fail. In addition, the Draft EIR recommended Mitigation Measure 4.5-12 that would reduce this impact to a less than significant level. As a result, Policy PS-2w was added to GP 2020, calling for the County to coordinate with the responsible party to investigate structure stability and identify appropriate remedies wherever the inundation maps indicate that failure could cause injury or death.*

  Finding: Based upon the Final EIR and the entire record, the Board finds that the potential for exposure of people and structures to damage from failure of dams or levees will be mitigated to a less than significant level by a combination of existing regulations and the implementation of Mitigation Measure 4.5-12 as described above. This mitigation measure has been incorporated into GP 2020 in the form o Policy PS-2w. Accordingly, changes or alterations have been required in, or incorporated into GP 2020 that mitigate or avoid the significant impact related to failure of dams or levees. As a result, the Goals, Objectives, and Policies of General Plan 2020 will now ensure that the impact will be less than significant.

- ***Impact 4.7-7: Expansive Soils.*** *Section 4.7-7 of the Draft EIR found that land uses and development consistent with GP 2020 could expose property improvements to adverse effects from expansive soils, leading to structural damage to residences, commercial or industrial buildings, and pavement. This potential impact was determined to be less than significant due to the existing regulations of the Uniform Building Code for soil testing and mitigation, and due to GP 2020 Public Safety Element policies, such as PS-1a, PS-1b, PS-1e, PS-1e, PS-1f, and PS-1k, requiring geologic analysis and mitigation for new development in areas subject to ground shaking. These Goals, Objectives, and Policies have been edited, primarily for clarity, without changing their effectiveness in reducing these impacts.*

  Finding: Based upon the Final EIR and the entire record, the Board finds that the impacts of GP 2020 regarding expansive soils described above will be less than significant.

- ***Impact 4.7-8: Septic Suitability of Soils.*** *Section 4.7-8 of the Draft EIR found that land uses and development consistent with GP 2020 could cause damage to improvements and impacts to water resources from development of septic systems on soils incapable of adequately supporting such systems. This potential impact was determined to be less than significant through compliance with existing septic system standards implemented by the County and the applicable Regional Water Quality Control Board and due to GP 2020 Public Safety Element policies, such as PS-1a, PS-1b, PS-1e, and PS- lm, addressing construction in areas subject to serious ground shaking by increasing the available geologic data and by requiring geologic reports and mitigation for projects.*

  Finding: Based upon the Final EIR and the entire record, the Board finds that the impacts of GP 2020 related to septic suitability of soils as described in Section 4.7-8 of the Draft EIR and the responses to comments thereon will be less than significant.

  This finding is based upon future compliance with existing septic system regulations and by the inclusion of mitigating policies that, among other things, address construction in areas subject to

serious ground shaking by increasing the available geologic data and by requiring geologic reports and mitigation for projects.

- ***Impact 4.2-8: Lack of Parking Capacity or Emergency Access.*** *Section 4.2-8 of the Draft EIR found that land uses and development consistent with GP 2020 could result in safety hazards or lack of emergency services due to inadequate parking and/or access. This potential impact was determined to be less than significant due to the existing regulations of the Zoning Code that include requirements for adequate parking and by the GP 2020 Public Facilities and Services Element Policies PS-3d and PS-3e providing for Emergency Service providers to review development projects for appropriate access.*

  Finding: Based upon the Final EIR and the entire record, the Board finds that the impacts of GP 2020 on parking and emergency service access as described in Section 4.2-8 of the Draft EIR and the responses to comments thereon will be less than significant.

- ***Impact 4.13-1: Release of Hazardous Materials.*** *Section 4.13-1 of the Draft EIR found that land uses and development consistent with GP 2020 could result in the transport, use, and/or disposal of hazardous materials, which could result in exposure of such materials to the public either through routine use or due to accidental release. Mitigating Policies were included in the Public Safety Element that would contribute to reducing this impact to a less than significant level, including Policies PS-4a through PS-4o that provide for the regulation of land uses that involve hazardous materials and the control of hazardous materials usage in County operations and impose siting requirements for hazardous waste facilities. Most of the Goals, Objectives and Policies cited in the Draft EIR are either unchanged or changes are limited to non-substantive editing in GP 2020. Policy PS-4h has been revised to also avoid siting hazardous waste facilities near schools. Policy PS-4o has been revised to encourage, rather than require through an ordinance, less use of potentially hazardous pesticides associated with County operations.*

  Finding: Based upon the Final EIR and the entire record, the Board finds that the impacts of GP 2020 regarding the transport, use, and/or disposal of hazardous materials and subsequent exposure of such materials to the public as described in Section 4.13-1 of the Draft EIR and the responses to comments thereon will be less than significant. This finding is based upon the inclusion of mitigating policies that, among other things, provide for control of hazardous materials usage in County operations and impose siting requirements for hazardous waste facilities. The revision to PS-4h described above will further reduce hazardous materials impacts compared to the impact analyzed in the Draft EIR. Although the above revision to PS-4o would slightly reduce the effectiveness of this Policy in mitigating the hazardous materials impact, other policies in this section provide a sufficient basis for control of these substances in County operations to avoid a significant environmental impact. In addition, the revision reflects that an ordinance is not the appropriate mechanism for controlling County operational use of pesticides.

  Therefore, the Goals, Objectives, and Policies of GP 2020 continue to ensure that the impact remains less than significant.

- ***Impact 4.13-2: Hazardous Materials, Substances, or Waste near School Sites.*** *Section 4.13-2 of the DEIR found that future land uses and development consistent with GP 2020 could result* ***in*** *increased exposure to hazardous materials in the vicinity of schools and that this impact would be potentially significant.*

Mitigating Policies were included in the Public Safety Element that would contribute to reducing this impact to a less than significant level, including Policies PS-4a through PS-4o that provide for the

regulation of land uses that involve hazardous materials and the control of hazardous materials usage in County operations and impose siting requirements for hazardous waste facilities. The Draft EIR also identified Mitigation Measure 4.13-2(a) and 4.13 2(b) that would reduce this impact to a less than significant level by reducing the potential for siting of hazardous waste facilities near schools and vice-versa. These measures, in the form of Policies PS-4h, PS-4i, and PS-4j, have been incorporated into GP 2020.

Finding: Based upon the Final EIR and the entire record, the Board finds that the potential for exposure to hazardous materials near schools will be mitigated to a less than significant level by Policies PS-4a through PS-4o, as well as the implementation of Mitigation Measures 4.13-2(a) and 4.13-2(b). These mitigation measures have been incorporated into GP 2020 in the form of Policies PS-4h, PS-4i, and PS-4j.

Accordingly, changes or alterations have been required in, or incorporated into GP 2020 that mitigate or avoid the significant effect on exposure of people to hazardous materials near schools. As a result, the Goals, Objectives, and Policies of GP 2020 will now ensure that the impact will be less than significant.

The Board also adopted findings pursuant to Guidelines Section 15091 for significant impacts that could not be fully mitigated and were therefore unavoidable, including the following findings most pertinent to the Public Safety Element and the Safety Element Update:

- ***Impact 4.5-5: Groundwater Level Decline.*** *Section 4.5-5 of the Draft EIR found that land uses and development consistent with GP 2020 would increase demand on groundwater supplies and could result in the decline of groundwater levels and that this impact is significant and unavoidable. Mitigating Policies in the Public Safety and Water Resources Elements have been included in GP 2020, including proposed Mitigation Measure 4.5-5, in the form of a revised Policy WR-2f, that will reduce these impacts.*

  Revised Policy WR-2f calls for voluntary guidelines for protecting groundwater recharge and retention of runoff from rural development. Policies WR-2a through WR-2n provide for improved groundwater monitoring and assessment, improved well permit standards, and groundwater management actions in problem areas.

  These Mitigating Policies have been edited since the publication of the DEIR, primarily for clarity, without changing their effectiveness in reducing these impacts. However, Policy WR-2g has been revised to limit well monitoring to public wells and voluntary private wells. Also, Policy PS-2m has been revised to call for the reduction, rather than the prevention, of stormwater runoff.

  However, in spite of these measures, groundwater conditions in many parts of the County are largely unknown and declines could occur before the assessments are completed.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce groundwater decline has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of Water Resources and Public Safety Element policies calling for voluntary guidelines for protecting groundwater recharge and retention of runoff from rural development, improved groundwater monitoring and assessment, improved well permit standards, groundwater management actions in problem areas, and consideration of low impact development regulations protecting recharge areas, groundwater decline will be a significant and unavoidable impact.

The revision to Policies PS-2m and WR-2f described above will not result in a substantially more severe groundwater impact because development involving impervious surfaces in rural areas is not likely to cover a significant portion of the typically larger lots in these areas, leaving ample room for groundwater recharge. Larger projects in rural areas are also subject to existing County requirements for minimizing stormwater runoff.

Similarly, the revision to Policy WR-2g described above will not result in a substantially more severe groundwater impact. The existing well monitoring program for commercial and industrial uses (Policy WR-2d) remains in effect and will be supplemented by information from public wells and voluntary private wells, with the latter supported by consideration of funding assistance from the County. In addition, Policy WR-2d calls for additional monitoring of new wells if the need is established by the voluntary program. Based upon testimony from numerous agricultural representatives and rural land owners, across-the-board monitoring of all new private wells may not be justified based upon current knowledge of groundwater conditions. Such an aggressive monitoring program may also lead to delays in the implementation of the monitoring program due to the lack of acceptance by participating well owners.

In addition, numerous parties recommended that the County immediately engage in a countywide groundwater management plan. However, the Board finds that such a strategy is premature and not as likely to succeed as one that focuses on areas where geologic conditions suggest that groundwater decline is a problem and where there is sufficient agreement among affected parties in resolving the problems. For that reason, the Board favors a cooperative approach with public water suppliers, agriculture, environmental groups, and landowners in studying groundwater conditions in each of the major basins in the County. In addition, the Board has commissioned groundwater studies (Kleinfelder) in several areas of fractured geology in order to determine groundwater conditions outside of the basins. These studies will form the basis of annual reports to the Board that will enable groundwater management to be designed to address the specific conditions in each area.

The Board finds that the success of a monitoring program in identifying groundwater conditions in the County as well as future groundwater management initiatives is dependent upon the willingness of property owners in order to succeed. Therefore, it is not feasible for the County to further reduce this impact to a less than significant level and additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.5-8: Changes to Drainage Patterns Leading to Streambank Erosion*** *Section 4.5-8 of the Draft EIR found that land uses and development consistent with GP 2020 would result in alterations to drainage patterns that would increase erosion and that this impact is significant and unavoidable. Mitigating Policies in the Public Safety, Water Resources and Open Space and Resource Conservation Elements have been included in GP 2020. These include Mitigation Measure 4.5- 8, in the form of Policy WR-1v, that will reduce this impact by calling for revision of the Sonoma County Water Agency (SCWA) Flood Control Design Criteria to address stream geomorphology and bank protection. Policies PS-2c, PS-2g, PS-2h, PS-21, and PS-2m would add new regulations for development along streams, stormwater retention, and cooperative flood hazard planning in the Petaluma Watershed. Policies OSRC-8b, OSRC-8b, and OSRC-8d would regulate land uses and development along all USGS streams to protect against erosion.*

  These Mitigating Policies have been edited in GP 2020, primarily for clarity, without changing their effectiveness in reducing these impacts. However, Policies PS-2g, PS-2h, and PS-2i have been added

to GP 2020 to further address drainage impacts at a watershed level. Policies OSRC-8b and OSRC-8d have been revised to reduce the streamside conservation area and to provide more flexible development standards within the area.

In spite of these measures, erosion from drainage patterns will likely continue to occur, at least until the new regulations and drainage programs are in place and their effectiveness can be determined.

Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce alterations to drainage patterns that would increase erosion has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of Public Safety, Water Resources and Open Space and Resource Conservation Element policies adding new regulations for development along streams, stormwater retention,. and cooperative flood hazard planning in the Petaluma Watershed as well as regulations for land uses and development along all USGS streams, drainage alterations increasing erosion will be a significant and unavoidable impact.

The revision to Policies OSRC-8b and OSRC-8d described above will not result in a substantially more severe drainage/erosion impact since the reduced streamside conservation areas and standards appear to be sufficient for protection against erosion, as noted by comments from the Agricultural Commissioner and agricultural industry representatives. In addition, the larger conservation areas would reduce the available land for agricultural use and subject currently permitted uses that could alter drainage courses, such as agricultural production, to lengthy and costly discretionary permit procedures, contrary to GP 2020 goals fostering agriculture. Therefore, it is not feasible for the County to further reduce. this impact to a less than significant level. Additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.5-11: Impede or Redirect Flows in Flood Hazard Areas.*** *Section 4.5-11 of the Draft EIR found that land uses and development consistent with GP 2020, particularly structures within the 100 year flood hazard areas, could impede or redirect flood flows resulting in secondary flooding and erosion and that this impact is significant and unavoidable. Mitigating Policies in the Public Safety and Water Resources Elements have been included in GP 2020. These include Mitigation Measure 4.5-8, in the form of Policy WR-1v, that will reduce this impact by calling for revision of the Sonoma County Water Agency (SCWA) Flood Control Design Criteria to address stream geomorphology and bank protection. In addition, Policies PS-2e and PS-2f would regulate fills in flood hazard areas. These Mitigating Policies have been edited in GP 2020, primarily for clarity, without changing their effectiveness in reducing these impacts.*

  However, in spite of these measures, flooding and erosion from structures impeding or redirecting flood flow will likely continue to occur, at least until the new regulations are in place and their effectiveness can be determined.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the impact of land uses in flood hazard areas leading to flooding and erosion has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of Public Safety and Water Resources Element policies regulating fills in flood hazard areas, impedance or redirection of flood flows will be a significant and unavoidable impact. These policies, coupled with current regulations regarding the placement of structures in flood hazard areas, would not affect some land uses that are not subject to County permit review procedures. In addition, subjecting currently permitted uses that could alter drainage courses, such as agricultural

production, to lengthy and costly discretionary permit procedures could jeopardize the success of agricultural operations in the County, contrary to GP 2020 goals fostering agriculture.

Therefore, it is not feasible for the County to further reduce this impact to a less than significant level. Additional feasible mitigation measures are not available for the reasons stated above. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

Cumulative Impact: Hydrology and Water Resources. *Section 6.0 of the Draft EIR found that land uses and development consistent with GP 2020, when combined with future growth within the Cities, would result in significant cumulative water quality, groundwater, drainage, and flooding impacts and that the County's contribution to these impacts would be cumulatively considerable. Based upon the Final EIR and the entire record, the Board finds that, in spite of the inclusion of Mitigating Policies in GP 2020 described in Exhibit A and above for Impacts 4.5-1 through 4.5-12, these impacts will be cumulatively considerable and that additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.*

- ***Impact 4.7-1: Seismic Ground Shaking***

  Section 4.7-1 of the Draft EIR found that land uses and development consistent with GP 2020 would expose people or structures to substantial adverse seismic effects, including the risk of loss, injury, or death involving strong seismic ground shaking and that this impact is significant and unavoidable. Mitigating Policies have been included in GP 2020 that will reduce this impact, including Policies PS- 1a through PS-1o. These policies call for increased assessment of geologic conditions, increased regulation of development in geologic hazard areas, strategic siting of essential service buildings to avoid hazardous areas, and strengthening and reinforcement of non residential Unreinforced Masonry Buildings (UMB). These Mitigating Policies have been edited, primarily for clarity, without changing their effectiveness in reducing this impact. Recommended Mitigation Measure 4.7-1, revising Policy PS-1o to include reinforcement of older multi-family residential structures, was not included.

  However, in spite of these measures, there is a likelihood that significant damage could still occur during a severe earthquake and associated ground shaking.

  *<u>Finding and Rationale</u>**:** Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the risk of loss, injury, or death involving strong seismic ground shaking has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety Element policies that call for increased assessment of geologic conditions, increased regulation of development in geologic hazard areas, strategic siting of essential service buildings to avoid hazardous areas, and strengthening and reinforcement of non residential Unreinforced Masonry Buildings (UMB), damage resulting from seismic ground shaking will be a significant and unavoidable impact.*

  The Board finds that applying the UMB requirement to older multi family residential structures under recommended Policy PS-1o is not considered appropriate due to the potential impact of costly retrofitting work on rental housing and the potential for displacement of lower income households. Given the fact that the entire County is subject to seismic ground shaking to some degree, it is not feasible for GP 2020 to assure that these policies would reduce the impact from the most severe seismic events to a less than significant level. As a result, it is not feasible for the County to further reduce this impact to a less than significant level. Additional feasible mitigation

measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.7-2: Seismic Related Ground Failure.*** *Section 4.7-2 of the Draft EIR found that land uses and development consistent with GP 2020 would expose people or structures to substantial adverse seismic effects, including the risk of loss, injury, or death from seismic related ground failure and that this impact is significant and unavoidable. Mitigating Policies have been included in GP 2020 that will reduce this impact, including Policies PS-1a through PS -1g, PS-1k, and PS-1m that provide for increased assessment and knowledge of geologic conditions and appropriate mitigation for development in hazard areas. These Mitigating Policies have been edited, primarily for clarity, without changing their effectiveness in reducing this impact.*

  However, in spite of these measures, future loss and/or damage from seismic related ground failure, particularly to roads, public facilities, and other County projects, during a severe earthquake will likely be significant.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the risk of loss, injury, or death from seismic related ground failure has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety Element policies that call for increased assessment and knowledge of geologic conditions and appropriate mitigation for development in hazard areas, increased risk of loss or injury from seismic related ground failure would be a significant and unavoidable impact.

  Given the fact that the entire County is subject to seismic related ground failure to some degree, it is not feasible for GP 2020 to assure that these policies would reduce this impact from the most severe seismic events to a less than significant level. Additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.7-3: Landsliding.*** *Section 4.7-3 of the Draft EIR found that land uses and development consistent with GP 2020 would expose people or structures to substantial damaging effects of landsliding, including the risk of loss, injury, or death from downslope earth movement, set off by earthquake, soil saturation, and/or grading and that this impact is significant and unavoidable. Mitigating Policies have been included in GP 2020 that will reduce this impact, including Policies PS-1a through PS-1g, PS-1k, and PS-1m that provide for increased assessment and knowledge of geologic conditions and appropriate mitigation for development in hazard areas. These Mitigating Policies have been edited, primarily for clarity, without changing their effectiveness in reducing this impact.*

  However, in spite of these measures, future loss and/or damage from landslides and downslope earth movement will not be entirely avoidable during severe seismic events.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the risk of loss or injury from landsliding and downslope earth movement has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety Element policies that provide for increased assessment and knowledge of geologic conditions and appropriate mitigation for development in hazard areas, increased risk of loss or injury from landsliding and downslope earth movement would be a significant and unavoidable impact. Given the fact that the entire County is subject to landsliding and earth movement, particularly during heavy rainfall and intense seismic events, it is not feasible for GP 2020 to ensure that these policies would reduce this impact from the most severe seismic

events to a less than significant level. Additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.7-4: Subsidence and Settlement.*** *Section 4.7-4 of the Draft EIR found that land uses and development consistent with GP 2020 would expose property or structures to the damaging effects of ground subsidence triggered by seismic activity, soil saturation, or grading and that this impact is significant and unavoidable. The current UBC requirements also address geologic hazards. Mitigating Policies have been included in GP 2020 that will reduce this impact, such as Policies PS-1f, PS-1k, and PS-1m that require geologic reports and mitigation for private and public projects and provide geologic hazard information to the public. These Mitigating Policies have been edited, primarily for clarity, without changing their effectiveness in reducing this impact.*

  However, in spite of these measures, future loss and/or damage from ground subsidence and settlement will not be entirely avoidable during severe seismic events.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the risk of loss or injury from ground subsidence has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety Element policies that require geologic reports and mitigation for private and public projects and provide geologic hazard information to the public, as well as the existence of the current UBC requirements for addressing geologic hazards in structures, the risk of loss or injury from ground subsidence would be a significant impact. Given the fact that much of the County is susceptible to seismic activity and resulting subsidence, particularly during the most intense seismic events, it is not feasible for GP 2020 to ensure that these future damages from these events can be reduced to a less than significant level.

  Additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.7-5: Tsunamis and Seiches.*** *Section 4.7-5 of the Draft EIR found that land uses and development consistent with GP 2020 would expose people or structures in Coastal and Bay margins of the County to substantial adverse effects from seismically induced flooding and tidal action that could include risk of loss, injury, or death and that this impact is significant and unavoidable. Mitigating Policies have been included in GP 2020 that will reduce this impact, including Policies PS-1a through PS -1-PS-1k, and PS-1m that provide for increased assessment and knowledge of geologic conditions, appropriate mitigation for development in hazard areas, and improved availability of geologic hazard information. These Mitigating Policies have been edited, primarily for clarity, without changing their effectiveness in reducing this impact.*

  However, in spite of these measures, future loss and/or damage from such flooding and tidal action will not be entirely avoidable during the most severe seismic occurrences.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the risk of loss or injury from seismically induced flooding or tidal action has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety Element policies that provide for increased assessment and knowledge of geologic conditions, appropriate mitigation for development in hazard areas, and improved availability of geologic hazard information, the risk of loss or injury from seismically induced flooding or tidal action would be a significant impact. Given the fact that the Coastal and Bay margins of the County cover a significant geographic area where damage could result from

tsunamis and seiches, it is not feasible for GP 2020 to ensure that these policies would reduce this impact from the most severe seismic events to a less than significant level. Additional feasible mitigation measures are not available.

This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.7-6: Soil Erosion.*** *Section 4.7-6 of the Draft EIR found that land uses and development consistent with GP 2020 would result in erosion and exposure of improvements to erosion- related damage and that this impact is significant and unavoidable. Mitigating Policies have been included in GP 2020 that will reduce this impact, including Policies PS-1a through PS -le, PS-1e, PS-1f, and PS-1k that provide for increased assessment and knowledge of geologic conditions and appropriate mitigation for development in hazard areas. These Mitigating Policies have been edited, primarily for clarity, without changing their effectiveness in reducing this impact.*

  However, in spite of these measures, future loss and/or damage from erosion will not be entirely avoidable during the more severe maximum rainfall occurrences.

  Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce increased damages from erosion has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety Element policies that provide for increased assessment and knowledge of geologic conditions, appropriate mitigation for development in hazard areas, and improved availability of geologic hazard information, as well as existing UBC requirements, erosion and exposure of improvements to erosion-related damage would be a significant impact. Given the fact that the much of the County is susceptible to soil erosion due to steep slopes and high rainfall events, it is not feasible for GP 2020 to assure that these policies would reduce this impact during periods of high rainfall over a short duration to a less than significant level.

  Additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

  Cumulative Impacts: Geology and Soils. *Section 6.0 of the Draft EIR found that land uses and development consistent with GP 2020, when combined with future growth within the Cities and the cumulative projects, would result in significant cumulative geology and soils impacts, primarily from geologic and soil hazards, such as seismic ground shaking and landsliding, and from soil erosion and that the County's contribution to these impacts would be cumulatively considerable. Based upon the Final EIR and the entire record, the Board finds that, in spite of the inclusion of Mitigating Policies in GP 2020 described in Exhibit A and above for Impacts 4.7-1 through 4.7-9, geology and soils impacts from severe rainfall and seismic events will be cumulatively considerable and that adopting standards that address the impacts of the most extreme possible events would be costly and of little benefit in return.*

  Additional feasible mitigation measures are not available. This impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

- ***Impact 4.9-10: Wildland Fire Hazards***

  Section 4.9-10 of the Draft EIR found that implementation of GP 2020 would expose people or structures to risk of loss, injury, or death involving wildland fires and that this impact is significant and unavoidable. Mitigating Policies in the Public Safety and Land Use Elements have been included in GP 2020, including Mitigation Measure 4-9-10, in the form of Policy PS-31, and the

Land Use Maps. Policies PS-3a through PS-3m reduce this impact by requiring consideration of fire safety as part of project review, by educating residents about fire safety, and by standardizing the County's street addressing system. Policies WR-3b, WR-3o, WR-5a, WR-5b, LU-2a, LU-3c, LU-3d, LU-5b, LU-5d, and LU-6a contribute to reducing wildland fire danger and related fire and emergency service demand by placing limitations on development in the unincorporated area. These policies have been edited, primarily for clarity, in GP 2020 without changing their effectiveness in reducing these impacts.

However, in spite of these measures, there is considerable uncertainty about the ability of fire and emergency service providers to respond to wildland fires in a timely manner in the future.

Finding and Rationale: Based upon the Final EIR and the entire record, the Board finds that all feasible mitigation to reduce the risk of loss, injury, or death involving wildland fires has been incorporated into GP 2020. The Board further finds that, in spite of the inclusion of GP 2020 Public Safety, Water Resources, and Land Use Element policies requiring consideration of fire safety as part of project review, by educating residents about fire safety, by standardizing the County's street addressing system, and by placing limitations on development in the unincorporated area, increased exposure of people and structures to wildland fire will be a significant and unavoidable impact. Given the large size of the rural county, the uncertainty of funding for increased service capabilities and the high vulnerability of the rural landscape to wildland fires in the County, it is not feasible for GP 2020 to assure that these policies would reduce this impact to a less than significant level. Additional feasible mitigation measures are not available. Therefore, this impact is overridden by project benefits as set forth in the Statement of Overriding Considerations.

2.2.5 Statement of Overriding Considerations

When significant effects cannot be mitigated to a less than significant level, the agency is required to balance the benefits of the project against its unavoidable environmental risks when determining whether to approve the project. If the benefits of a project outweigh the unavoidable adverse environmental effects, the adverse effects may be considered "acceptable," in which case the lead agency must adopt a formal statement of overriding considerations in accordance with Public Resources Code Section 21081 and CEQA Guidelines Section 15093.

After balancing the following specific economic, legal, social, technological and other benefits of GP 2020, the Board identified those benefits in a Statement of Overriding Consideration (Exhibit D to Res. No. 08-0808) and determined that any one of benefits, independently, outweighed the unavoidable adverse impacts of GP 2020. The Statement of Overriding Considerations adopted by the Board of Supervisors in 2008 provided the following specific considerations and rationale for each:

- **Need for an Updated General Plan:** GP 2020 fulfills a necessary mandate under State Planning law, a General Plan that provides the County with policy guidance for its future decisions regarding growth, land use and development, and environmental quality. It is critical that the General Plan be periodically updated so that it accurately reflects the vision and desire of the community over time.
- **Agricultural Production:** GP 2020 fully supports the continued economic viability of agricultural production. Among other policies, accommodating agricultural support uses and agricultural tourism on agricultural lands is a necessary component of this continuing support.

Fundamentally, GP 2020 goals, objectives, and policies allow farmers to continue making a living in agriculture as the primary means of withstanding the increasing pressure from urbanizing areas to convert to non-agricultural use. Contributing to this support is the County's desire to continue to treat agricultural production as a permitted use, to streamline permits for such uses as farmworker housing, and to reduce operational costs as much as possible through such provisions as the Right- To-Farm ordinance. Agriculture industry representatives have provided testimony regarding the necessity of minimizing the regulatory cost for their operations, particularly with respect to currently permitted uses such as grazing and cultivation. By continuing to support agricultural viability in this way, County residents benefit from the contribution of agriculture to the local economy and from the by products of agricultural activity, including the visual aesthetics of growing crops and raising animals, the maintenance of large areas of open space, reduced pressure for urban and rural residential development, control of urban sprawl, and continuing employment opportunities in the agricultural industry.

- **Water Resources Element:** Adoption of GP 2020 includes a new Water Resources Element that integrates previous General Plan policies addressing water issues into one Element and expands upon the scope of water resource issues that are addressed. The focus of this stand-alone Element reflects its importance to the community at large and enables the Board, other County decision makers, and the public to have a comprehensive picture of water resource issues and, more importantly, the County's strategy to address them in the context of land use planning. Whether the issue is effective planning for future water supplies, resolving problems associated with groundwater decline, or other water issues, the adoption of this new element is critically important to a successful General Plan and reducing the water related impacts of GP 2020.

- **Stream Protection:** The GP 2020 Open Space and Resource Conservation Element includes policies addressing the protection of streams. The policies were substantially revised from the then-current (1989) General Plan to increase stream protection and preserve the wide range of riparian functions, including groundwater recharge, flooding, streambank stability, water quality, water supply, and fish and wildlife habitat. The GP 2020 revisions will increase the protected streams from about 500 to about 3200 stream miles, with concurrent policy support for improved mapping and understanding of stream conditions over time.

- **Housing and Employment:** As described in Master Response I of the Final EIR, GP 2020 supports and plans for a level of growth in housing that reflects regional population projections as well as the ability of the County to sustain its quality of life and public services and infrastructure into the future. This growth includes housing for all income levels as mandated by State law. While reducing the potential housing growth in GP 2020 would reduce the impacts of residential construction and use, housing opportunities are necessary not only for addressing the housing needs of County citizens, but also to maintain consistency with the General Plan Housing Element, certified by the State in 2002, that is required to demonstrate that an adequate inventory of housing sites is available to meet its identified housing needs. In addition, GP 2020 plans for business and industrial growth that will provide employment opportunities to existing and future residents. Reductions in job opportunities would have a secondary effect of forcing existing workers to commute out of the county for work or leave for other areas. Balanced

housing and employment opportunities are also fundamental to implementing GP 2020's community centered "smart growth" land use policies.

- **Economy:** GP 2020 supports economic activities in the form of businesses and industry that not only provide the agricultural production, housing, and employment benefits described above, but that also stimulate revenue growth in the community that enable residents and businesses to contribute to community activities, charities, and a full range of programs that improve the quality of life. These endeavors also provide a sales and property tax base that contribute funds for public services and infrastructure that are necessary for existing and future citizens.

- **Public Services and Infrastructure:** GP 2020 includes substantial support for maintaining and, where necessary, expanding public services and infrastructure as needed to serve planned growth. Although future growth is substantially limited in GP 2020, many services and infrastructure facilities are not currently adequate to meet the needs of existing, let alone future residents and businesses. This problem is compounded by budget problems at the State and Federal level, as well as increasing restrictions on the County's ability to obtain the revenue it needs. Without this policy support, the County's ability to access some revenues will be further undermined, including fair-share funding for transportation improvements, grant funds for the planning and development of locally operated wastewater management systems, funding of transit operations and facilities, and the like.

- **Cooperation of Property Owners:** GP 2020 recognizes the importance of willing property owners in development and implementation of its land use policies. A large majority of Sonoma County is privately owned, meaning that successful implementation of many GP 2020 policies and programs is dependent upon the cooperation of private individuals. Since the impacts of GP 2020 are cumulative in nature and future growth is limited, many of these impacts, such as air quality, groundwater, biological resources, and traffic congestion, can only be substantially lessened by the future activities of existing landowners, residents, and businesses that are typically not subject to new regulation. In some cases, aggressive policy restrictions on the use of property may actually hinder efforts to improve environmental quality. For example, it appears on the surface that the most effective way to obtain data regarding groundwater conditions is by requiring that all new wells be monitored. However, many existing residents oppose this new regulation without substantial evidence of groundwater problems. In the end, the shift to a voluntary program offers the potential for a more successful monitoring program over time because it can be initiated right away, albeit on a more limited basis, rather than waiting many years for litigation to be completed. Similarly, GP 2020 recognizes that expanding permit requirements for all future land uses, such as discretionary permits for single family homes or growing crops, will also likely result in substantially increased costs and time, placing an unreasonable burden on property owners and their reasonable use and enjoyment of their property.

- **Climate Change:** Although the issue of climate change did not come to the forefront of GP 2020 until well into the process, GP 2020 was modified to include a number of additional policies and programs that support the Statewide efforts to implement AB 32, the Global Warming Solution Act or 2006. GP 2020 does this though a wide array of policies related to energy resources, air

and water resources, transportation, etc. Without GP 2020, the County's ability *to* provide policy support for new programs, regulations, studies, and funding would be impaired.

2.3 Statutory Requirements for Safety Elements

All jurisdictions in California are required to have a safety element as part of their General Plan. Safety elements must provide for the protection of the community from unreasonable risks associated with seismic and geologic hazards such as landslides and ground shaking, flooding, and wildland and urban fires. Required components of a safety element are generally outlined in Government Code Sections 65302(g) and 65302.15. Safety elements must be revised upon each revision of the jurisdiction's housing element or local hazard mitigation plan, but not less than once every eight years, to identify new information relating to flood and fire hazards and climate adaptation and resiliency strategies. (Government Code § 65302.15(b)).

Since the last planned update to the Sonoma County General Plan Safety Element in 2014, a series of changes to state law expanded the information and assessment requirements for safety elements. Updated safety elements are now required to:

- Evaluate climate vulnerabilities and, based on the findings of the assessment, include climate adaptation and resilience policies and implementation measures upon the next revision to the local hazard mitigation plan, or beginning on or before January 1, 2022 (Government Code § 65302(g)(4), enacted via Senate Bill 379, 2015);
- Identify evacuation routes and their capacity, safety, and viability and evacuation locations under a range of emergency scenarios upon the next revision to the local hazard mitigation plan, or beginning on or before January 1, 2022 (Gov. Code § 65302.15(a); enacted by Assembly Bill 747, 2019, and amended by Assembly Bill 1409, 2021); and
- Identify residential developments in hazard areas without at least two emergency evacuation routes (Gov. Code § 65302(g)(5); enacted by Senate Bill 99, 2019).

The current Sonoma County Local Hazard Mitigation Plan was adopted in December 2021, and the Sonoma County Housing Element Update was adopted in August 2023. These plan updates triggered an update to the County's General Plan Safety Element. Concurrently, the County is preparing a draft Environmental Justice Element for adoption into the General Plan.

3 Project Description

3.1 Description of Proposed Safety Element Update

The proposed Safety Element Update would replace the existing GP2020 Public Safety Element in its entirety. Similar to the existing Public Safety Element, the proposed Safety Element Update establishes goals and policies to reduce the potential short- and long-term risks to people, property, and systems resulting from fires, floods, earthquakes, landslides, climate change, and other hazards.

The draft Safety Element Update document is broken into ten topic areas. The draft Safety Element also includes updated maps of hazard areas based on the latest available data; context on each topic

including relevant local, state, or federal regulations; and an implementation plan. The draft carries forward many of the policies from the existing Public Safety Element, includes new strategies to address the new statutory topic areas (e.g. climate change hazards and vulnerabilities), and incorporates related planned and ongoing County department and agency work. The draft Safety Element Update is broken into the following 10 topic areas. Topics 4, 5, 6, and 7 (Wildland and Structure Fire, Flooding and Inundation, Geologic and Seismic Hazards, and Hazardous Materials) are continued from General Plan 2020. Six of the 10 topic areas are new, as noted below.

1. Emergency Preparedness, Response, and Recovery. This section is new to the Safety Element and includes goals and policies related to the three general phases of the emergency management cycle: emergency preparedness, response, and disaster recovery.
2. Equitable Community Safety. This section is new. Its policies focus on ensuring that all community members can prepare, respond to, recover from emergencies by providing equitable resources, investments, and services.
3. Resilient Facilities and Infrastructure. This section is new and provides policies to improve the physical resilience of the County's critical facilities and infrastructure, such as communications infrastructure, roadways, bridges, and public facilities. This section also includes policies to improve telecommunication and broadband access, and general communication systems to support community safety during emergency events. This section was informed by the Climate Change Vulnerability Assessment and aligns with goals of the County's 2021-2026 Strategic Plan.
4. Wildland and Structural Fires. This section carries forward or modifies many of the policies in the Protection From Fire Hazards topic in the existing GP2020 Public Safety Element. New policies address compliance with fire safe standards for existing nonconforming development, new development and redevelopment, establishing and maintaining community fire breaks and safe vegetation road clearance, requirements for new development (e.g. fire protection plans), coordination on funding and provision of fire suppression needs, and coordination on multi-benefit wildfire resilience projects.
5. Flooding and Inundation. This section carries forward or modifies many of the policies in the Protection from Flood Hazards topic in the current GP2020 Public Safety Element and is organized around two goals: reducing flood hazards to prevent unnecessary exposure and building long-term flood resilience.
6. Geologic and Seismic Hazards. This section carries forward or modifies many of the policies in the Protection from Geologic Hazards topic in the existing GP2020 Public Safety Element. New policies relate to seeking funding opportunities for building retrofits and minimizing alterations to land that may increase landslide hazards.
7. Hazardous Materials. This section largely carries forward or modifies policies in the Protection from Hazardous Materials topic in the existing GP2020 Public Safety Element. A new policy requires remediation on known contaminated sites prior to development.
8. Sea Level Rise. This section is new to the Safety Element and addresses both coastline and shoreline areas that may be impacted by sea level rise, and largely reflects the policy direction of the newly updated Sonoma County Local Coastal Plan. Policies call for the use of updated data and the best available science in sea level rise planning and development project review, assessing vulnerability and preparing adaptation plans, coordinating with stakeholders to limit

saltwater intrusion on groundwater, and consideration of vulnerable communities in adaptation planning.

9. Air Quality and Extreme Temperatures. This section is new and includes policies to reduce community exposure to air quality and temperature climate impacts and build community capacity to adapt to changing conditions.
10. Drought. This section is new and establishes a framework to proactively plan for drought and improve the reliability and safety of water supply during drought periods. Policies direct the coordination between public and private agencies and the community on drought preparedness and response, monitoring of drought conditions, provision of drought information resources, and development strategies to improve water conservation. The General Plan Water Resources Element further provides water conservation and supply and watershed management strategies.

3.1.1 All Proposed Goals and Policies

Each of the draft Safety Element's 10 topic areas has one or more goals and related policies to help achieve the goal. The goals and policies included in the Safety Element Update are listed below. Policies that are being carried forward and were designated as "mitigating policies" in the GP2020 Public Safety Element are noted with an asterisk (*).

Emergency Preparedness, Response, and Recovery

Goal SE-1: Prepare community members and County staff for emergencies through information and resources, training, planning, and assessment.

Policy SE-1a: Maintain and update as necessary the Sonoma County Operational Area Emergency Operations Plan and associated annexes, including evacuation protocols.

Policy SE-1b: Update the Hazard Mitigation Plan every five years and use the plan to guide mitigating actions to protect the whole community and the environment.

Policy SE-1c: Continue to prepare for increased capacity and redundancy during emergencies through strategic coordination and partnerships, such as through memorandums of understanding, before disasters occur between community-based organizations, fire agencies, CAL FIRE, the Department of Emergency Management, the Sheriff's Office, and other public safety partners.

Policy SE-1d: Invest in building trust and relationships with community-based organizations to improve communication systems, address language access needs, and develop a shared understanding of community needs and resources available (such as legal or medical support, transportation, and evacuation or resilience centers) as a core strategy for emergency preparedness. Assist with building community-based organizations capacity to support their community members during a disaster.

Policy SE-1e: Coordinate, assist, and promote community-specific emergency preparedness and evacuation planning through new and existing programs like Community Emergency Response Training (CERT), Communities Organized to Prepare for Emergencies (COPE), and Map your Neighborhood (MYN) to increase disaster preparedness at the community/neighborhood level. Prioritize efforts in high hazard areas and systemically vulnerable communities, and coordinate with community organizations to target hard-to-reach populations.

Policy SE-1f: Promote a culture of self-preparedness for residents and businesses to increase readiness for and resilience to disaster events.

Policy SE-1g: Continue to conduct community evacuation exercises in known hazard areas.

Policy SE-1h: Provide and support opportunities for inter-agency training with local fire agencies, the Sheriff's Office, the Department of Emergency Management, and other emergency services and response staff to effectively coordinate multi-agency response and mutual aid in the event of a wildfire or other hazard incident.

Goal SE-2: Support safe and efficient emergency response and evacuation through accessible and effective alerts, improved safety of evacuation routes, and emergency response planning.

Policy SE-2a: Continue to use and refine early warning notification systems to provide emergency response information, alert community members of the need to evacuate, provide the location of evacuation routes and locations, and identify how to access transportation support. Distribute evacuation information in multiple languages and increase the number of channels of communication.

Policy SE-2b: Continue to refine protocols for dissemination of information during an emergency through all available media sources to ensure that messages are coordinated, accurate, and available in multiple languages. Coordinate information flow between frontline emergency personnel, media sources, school districts, and other community channels.

Policy SE-2c: Continue to explore and implement strategies to enhance safe evacuation protocols for workers inside evacuation zones.

Policy SE-2d: Encourage undergrounding of utilities where feasible along evacuation routes to prevent downed wires.

Policy SE-2e: Ensure road design supports efficient and safe evacuations during emergencies.

Policy SE-2f: Explore the viability of on-street parking limitations to ensure that access roads are not blocked by parked vehicles.

Policy SE-2g: Ensure that fire departments and fire districts have adequate access to all locations in the County, including gated communities and critical infrastructure within the County's jurisdiction.

Policy SE-2h: Require new development and redevelopment to provide adequate access for fire and emergency services consistent with local and State regulations.

Policy SE-2i: Continue to evaluate constraints to safe and efficient evacuation, building upon existing efforts and studies. Use data on demographics, infrastructure, and environmental factors to continue to explore the safety, viability, and capacity of the local road network and to identify additional areas of the unincorporated county without at least two evacuation routes. Incorporate findings into future updates to the General Plan, the Hazard Mitigation Plan, and the County's Emergency Operations Plan as appropriate.

Policy SE-2j: Develop traffic control strategies as part of emergency response planning and explore traffic control improvements that reduce vulnerability and allow for dynamic emergency response.

Policy SE-2k: Consider the presence of non-residents, including visitors and tourists, in all evacuation planning efforts.

Policy SE-2l: Work with the Sheriff's Office and Department of Emergency Management to explore decision-support tools that provide insight into real-time evacuation conditions. Consider technological solutions to monitor traffic to identify problem areas, determine the effectiveness of responses, and change responses as needed. Seek to provide evacuees with information on evacuation route conditions and rerouting information to decrease travel times and reduce congestion on highly traveled roads.

Policy SE-2m: Partner with Caltrans, cities, and neighboring jurisdictions on measures to protect and maintain critical evacuation routes. Work with local agencies to develop contingency plans that address disconnected routes and explore roadway improvements for better emergency access.

Policy SE-2n: Continue to develop and maintain evacuation options for populations with Access and Functional Needs.

Goal SE-3: Increase the community's ability to recover from a disaster event.

*Policy SE-3a: Work collaboratively with disaster survivors, the community, County departments and agencies, key groups and stakeholders, and other local and regional governments to develop and implement a Post-Disaster Recovery Framework, including a strategic plan for damage assessment and recovery of County-owned public facilities after a major disaster.**

Policy SE-3b: Use disaster relief funding to support long-term recovery efforts, targeting small businesses and systemically vulnerable communities. Create dedicated funds to provide immediate financial assistance to those affected by disasters, ensuring that mixed-documentation-status households and other marginalized groups have access.

Policy SE-3c: Partner with the cities, community groups, and other relevant agencies or organizations to ensure people have access to medical and mental health services and resources in the aftermath of disasters. Where feasible, deploy mobile clinics to provide medical and mental health services in affected areas, ensuring accessibility for people with physical limitations or transportation barriers.

Policy SE-3d: Establish streamlined rebuilding processes and temporary housing programs, including measures that support displaced renters and low-income households, for post-disaster recovery.

Policy SE-3e: Assist property owners with debris removal and site remediation post-disaster through coordinated resources and information.

Policy SE-3f: Work with County departments and agencies, conservation organizations, and property owners to support efforts to restore wildfire-impacted landscapes and protect against post-fire flooding and soil movement by removing debris along watercourses, implementing erosion control measures, replanting native vegetation, and educating property owners on soil stabilization.

<u>Equitable Community Safety</u>

Goal SE-4: Support all community members in preparing for, responding to, and recovering from emergencies through equitable resources, investments, and services.

Policy SE-4a: Provide resources for risk reduction in areas that are vulnerable to hazards and within systemically vulnerable communities, including public education about risk reduction and effective resilience improvements, and information on funding options.

Policy SE-4b: Collaborate with health care providers to augment physical and mental health care capacity in areas with systemically vulnerable communities during and after emergencies.

Policy SE-4c: Continue to incorporate diversity, equity, inclusion, and belonging (DEIB) principles and language access into County Emergency Operations Center operations and emergency services to ensure culturally responsive emergency management.

Policy SE-4d: Increase peak capacity of emergency services to respond to anticipated increased demand during climate hazards events and other disasters.

Policy SE-4e: Strengthen communication between County departments and agencies, cities, and emergency service providers to reduce gaps and enhance coordination of emergency service provision countywide.

Policy SE-4f: Promote household awareness and personal preparation for evacuation scenarios. Support the development of evacuation strategies for all community members, including those with limited or no access to transportation in the event of an emergency.

Policy SE-4g: Engage and involve the Sonoma County community, especially systemically vulnerable communities and access and functional needs populations, in emergency planning.

Policy SE-4h: Provide culturally appropriate emergency preparedness, response, and recovery communications in multiple languages and through a variety of channels, strategies, and media, including radio.

Resilient Facilities and Infrastructure

Goal SE-5: Protect the well-being of community members and emergency personnel through resilient facilities and infrastructure.

Policy SE-5a: Seek to close gaps in backup power availability for critical services and community members with underlying health conditions or sensitivities that require uninterrupted power sources.

Policy SE-5b: Maintain defensible space and additional vegetation management around critical transportation and utility infrastructure at-risk to wildfire hazards.

Policy SE-5c: Prioritize road design improvements and maintenance that increase safe ingress and egress for emergency responders and residents, and resilience to anticipated climate extremes.

Policy SE-5d: Engage and empower rural communities by expanding self-sufficiency resources for disaster-isolated communities.

Policy SE-5e: Assess risks to and vulnerability of County-owned critical facilities to all hazards and climate change impacts and evaluate adaptation and resilience strategies such as a relocation or hardening.

Policy SE-5f: Continue to explore funding sources for capital improvements necessary for emergency response. Prioritize capital improvements and maintenance of existing at-risk facilities and infrastructure serving the greatest number of people and systemically vulnerable communities, and improvements to existing facilities that ensure they can operate as resilience centers, local assistance centers, or other community resource centers during emergency events.

Policy SE-5g: Prioritize equity in the capital improvement plan process by engaging systemically vulnerable and underserved communities and using data to assess impacts and benefits.

Policy SE-5h: Pursue redundancy of critical transportation infrastructure, such as roadways, bridges, and traffic control measures, to allow for continued access and movement in the event of an emergency or power outage.

Policy SE-5i: Locate new critical facilities, such as hospitals and health care facilities, emergency shelters, fire stations or police stations, emergency command centers, and other emergency service facilities and infrastructure to minimize exposure to hazards identified in this Element where feasible, except those facilities that provide frontline access. New facilities that must be located in hazard areas should be designed, located, and sufficiently protected to remain operational during hazard events.

Policy SE-5j: Consider climate impacts and risk in the design of capital improvements.

Goal SE-6: Improve telecommunication and broadband access and communication system resilience.

Policy SE-6a: Provide and expand alternative channels of communication, such as radios, for emergency personnel and community emergency notification in the case of telecommunication system disruption.

Policy SE-6b: Promote the availability of backup power at telecommunication facilities in alignment with state and federal requirements.

Policy SE-6c: Support efforts to improve the reliability of critical communications facilities during disasters.

Policy SE-6d: Streamline permitting for new telecommunication and broadband facilities.

Policy SE-6e: Identify underserved broadband areas and support efforts of the Economic Development Collaborative through its Access Sonoma Broadband program to coordinate countywide broadband planning and broadband deployment, grant application development, and outreach.

Wildland and Structural Fire

Goal SE-7: Minimize risk and vulnerability to fire hazards to protect people, property, and environmental resources.

Policy SE-7a: Identify existing development and public roads that do not conform to contemporary fire safety standards and, as feasible, assist in the retrofit and/or upgrade of such development to meet current standards.

Policy SE-7b: Ensure that redevelopment of property within the State Responsibility Area and Very High Fire Hazard Severity Zones in Local Responsibility Areas complies with the Office of the State Fire Marshal and California Board of Forestry and Fire Protection requirements, including adequate provisions for emergency access, vegetation management, and firefighting, in compliance with current fire codes.

Policy SE-7c: Establish and maintain community fire breaks and fuel modification or reduction zones, including public and private road clearance in areas at risk to wildfire. Work cooperatively with local agencies, Fire Safe Councils, community organizations, and private landowners to achieve long term maintenance of fuel reduction projects.

Policy SE-7d: Through inspection programs, community education, and grant seeking, provide assistance to systemically vulnerable communities to help ensure that all properties and private roadways comply with applicable state and local regulations for defensible space and vegetation management.

Policy SE-7e: Where feasible, support the development of additional points of ingress and egress, roadway improvements, and other fire safety measures in single access neighborhoods identified by this Element, in subdivisions identified by CAL FIRE's Subdivision Review Program pursuant to Public Resources Code Section 4290.5, in High and Very High Fire Hazard Severity Zones, and in areas that have experienced repeated fires over time.

Policy SE-7f: Encourage utility undergrounding projects to reduce potential fire ignition sources. Promote and support vegetation management around high voltage utility lines as necessary to maintain public safety.

Policy SE-7g: As part of regular roadway maintenance, keep public roads clear of encroaching vegetation, prioritizing critical evacuation routes, areas with high hazard risk, or areas with a history of repeated fire events.

*Policy SE-7h: The Fire Prevention Division of Permit Sonoma shall continue to offer assistance to local fire agencies in adoption and enforcement of fire safety regulations and continue work with local agencies to develop proposed improvements to County codes and standards to align with changing State legislation and current industry research.**

*Policy SE-7i: Continue enforcement of the Office of the State Fire Marshal requirements for fire safety.**

Policy SE-7j: Continue to identify local funding sources and leverage grant funding to support and participate in wildfire risk reduction and forest health projects, including strategic placement, creation and maintenance of shaded fuel breaks, targeted vegetation management, prescribed/cultural burning, maintenance of fire roads, and other priorities as identified in the current Hazard Mitigation Plan, the Sonoma-Lake-Napa Unit Strategic Fire Plan, the Sonoma County Community Wildfire Protection Plan and other planning documents.

*Policy SE-7k: Continue the Permit Sonoma addressing and road naming program that improves and standardizes the County street addressing system in order to reduce emergency service response times. Where applicable, coordinate the program with the cities and local tribal governments.**

*Policy SE-7l: Continue to provide fire hazard information signs in areas at risk to wildfire in a manner consistent with Area Plans and that does not degrade Scenic Corridors and scenic views.**

Policy SE-7m: Evaluate regulatory barriers to vegetation management activities and identify opportunities for streamlining.

Goal SE-8: Regulate new development to prevent unnecessary exposure of people and property to risks of damage, injury, or loss from fire hazards.

*Policy SE-8a: Consider the severity of natural fire hazards (as may be exacerbated by climate change), potential damage from wildland and structural fires, and adequacy of fire protection and mitigation measures, consistent with the General Plan, in the review of discretionary projects.**

*Policy SE-8b: Maintain and update County building and fire codes and regulations to meet or exceed State requirements and reflect contemporary fire safe practices.**

Policy SE-8c: In reviewing development projects, maintain stringent initial site design and ongoing maintenance standards, and incorporate adequate mitigation measures as necessary to achieve an acceptable level of risk. Development must meet State Minimum Fire Safe Regulations (Title 14, California Code of Regulations (CCR), §§ 1270-1276.05), State Fire Hazard Reduction Around Buildings and Structures Regulations (Title 14 CCR, §§ 1299-1299.05) the California Building Standards Code (Title 24, CCR), and the County Fire Code as applicable.

*Policy SE-8d: Continue to refer projects and code revisions to the Fire Prevention and Hazardous Materials Division of Permit Sonoma and responsible fire protection agencies for their review and comment.**

*Policy SE-8e: Continue to require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, agricultural exempt buildings, and certain accessory dwelling units.**

Policy SE-8f: In Very High Fire Hazard Severity Zones, avoid new residential development and new or expanded commercial or industrial development that involves highly flammable materials or that could place large numbers of occupants at unreasonable risk of wildfire, where feasible. Prioritize new housing in areas with lower wildfire hazard.

Policy SE-8g: Require fire protection plans for all new discretionary developments in all High and Very High Fire Hazard Severity Zones. Ensure the plans include a site-specific risk analysis and address fire response capabilities, compliance with fire safety requirements including but not limited to defensible space, access and water supply, building materials and site design, emergency preparedness and evacuation plans, property maintenance, and other hazard and risk reduction measures.

Policy SE-8h: Require all new development to have adequate water supply to meet fire suppression needs and comply with applicable fire flow requirements.

Goal SE-9: Increase wildfire and climate resilience through strategic coordination in fire preparedness planning, response, and land management.

*Policy SE-9a: Continue to utilize the most recent available data and information on wildland and structural fire hazards from CAL FIRE and research institutions. Make fire hazard maps available to the public.**

*Policy SE-9b: Continue to work with CAL FIRE, local fire agencies, and community members to identify areas of high fire fuel loads and take advantage of opportunities to reduce those fuel loads, particularly in areas where fuels may increase fire spread to nearby communities.**

Policy SE-9c: Partner with Fire Safe Sonoma, local Fire Safe councils and FireWise Communities, CAL FIRE, local fire districts, Resource Conservation Districts and other community groups to provide educational opportunities for residents and property owners on the best available science for defensible space, home hardening, and vegetation management. Continue to promote emergency preparedness including "know your evacuation Zone" efforts, pre-emergency planning and supplies for family safety, and executing evacuation drills. Target at-risk populations such as older adults,

*individuals with disabilities, non-English speaking residents, and individuals with chronic health conditions.**

Policy SE-9d: Coordinate with Sonoma Water, Santa Rosa Plain Groundwater Sustainability Agency (GSA), Petaluma Valley Groundwater Sustainability Agency (GSA), Sonoma Valley Groundwater Sustainability Agency (GSA), other water districts and agencies, CAL FIRE, and fire districts as appropriate to support the provision of adequate water supply and storage to meet peak fire demands during times of peak domestic demand.

Policy SE-9e: Coordinate with local fire agencies to support funding availability to maintain all fire equipment in an operable state and adequate to respond to a major disaster. Ensure adequate equipment, staffing, training, and resources are provided to meet current and future projected service demands and fire protection needs.

Policy SE-9f: Regularly evaluate the county's fire suppression capacity and future water supply availability as part of the Sonoma County Hazard Mitigation Plan updates.

Policy SE-9g: Support and prioritize wildfire resilience projects on natural and working lands, including wildlands, that have multiple benefits, including but not limited to wildfire hazard and risk reduction, species and habitat protection, agricultural and forest resource protection, water quality, and carbon sequestration and storage. Consider the ecological, environmental, social, and economic benefits and tradeoffs. Utilize existing plans and guidance, such as the Climate Resilient Lands Strategy, to inform project design.

Policy SE-9h: Balance and integrate fuel modification with habitat and open space management, and vegetative soil cover and erosion management to reduce conflicts between safety and environmental goals.

Policy SE-9i: Encourage efforts to restore wildfire impacted areas and reduce the potential for post-fire flooding and landslides through replanting of native vegetation cover using best practices and slope stabilization measures.

Flooding and Inundation

Goal SE-10: Reduce existing flood and inundation hazards and prevent unnecessary exposure of people and property to risks of damage, injury, or loss from flood hazards.

*Policy SE-10a: Maintain data and information on flooding and flood hazards in the appropriate County departments and make flood hazard maps available to the public.**

Policy SE-10b: Support efforts to provide cost-effective strategies for reducing flood risk to low income communities located in nonurbanized areas.

*Policy SE-10c: Partner with local, regional, State, and federal agencies, including but not limited to the cities, Sonoma Water, the U.S. Army Corps of Engineers, and the Federal Emergency Management Agency (FEMA), to develop and maintain an adequate information base on existing and potential flood hazards and drainage impacts for the County's major watersheds, prepare analyses and risk assessments, and identify and implement floodplain management activities and other strategies to reduce flooding impacts. Request changes in FEMA flood hazard maps where appropriate to reflect new data or analyses.**

*Policy SE-10d: Work with regional flood protection responsible agencies, the public, and other stakeholders to develop and implement a long-term plan for reducing repetitive flood losses in the Russian River basin. As part of the plan, consider upstream improvements that could expand flood storage capacity and existing regulatory barriers to flood prevention projects.**

*Policy SE-10e: Continue to participate in the National Flood Insurance Program (NFIP) by maintaining and enforcing County code requirements on construction in flood hazard areas and other adopted floodplain management regulations. Consider participating in the NFIP's Community Rating System to qualify Sonoma County property owners for discounted flood insurance.**

Policy SE-10f: Continue and expand public awareness programs to inform the general public, property owners and renters about flood hazards, potential dam failure inundation, flood elevation and risk reduction resources, and the importance of watershed management.

*Policy SE-10g: Continue to enforce zero net fill requirements in the 100-year FEMA Special Flood Hazard Area to retain floodplain storage capacity. Avoid fill in areas outside of the 100-year FEMA Special Flood Hazard Area that retain or could retain flood waters.**

Policy SE-10h: When making land use decisions and during development review:

a) On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards;
b) Use FEMA flood hazard maps and data, or parcel specific scaled interpretations of these maps and site specific elevation data;
c) Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of amendments to the General Plan Land Use Map; and
d) Consider the potential risk of damage from flooding in the design and review of projects, including projects that could facilitate floodplain development.*

*Policy SE-10i: Avoid variances to building setbacks along streams and in the 100-year floodplain.**

*Policy SE-10j: Regulate development, water diversion, vegetation management, grading, and fills to minimize any increase in flooding and related damage to people and property.**

*Policy SE-10k: Require that tentative and final subdivision maps and development site plans show flood hazard areas as designated by FEMA.**

*Policy SE-10l: Give priority to floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where possible, maintain flood channel capacity.**

*Policy SE-10m: Require that the design and construction of drainage facilities be subject to the review and approval of Permit Sonoma. The costs of drainage facilities to handle surface runoff from new development shall be the responsibility of the developer.**

*Policy SE-10n: Support Sonoma Water in the prioritization and implementation of flood hazard mitigation projects within waterways subject to the policies of the Open Space and Resource Conservation Element.**

Policy SE-10o: Require that the design and location of new dams and levees be in accordance with applicable design standards and specifications and accepted design and construction practices.

*Policy SE-10p: Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitative maintenance needs as appropriate.**

Policy SE-10q: Explore funding sources, such as the Building Resilient Infrastructure and Communities, Flood Mitigation Assistance, and Hazard Mitigation grant programs from the Federal Emergency Management Agency, to further support retrofitting and relocation of structures in flood-prone areas. Consider developing a voluntary, community-led relocation program through public purchase of flood-prone property, prioritizing repetitive loss areas.

Goal SE-11: Build long-term flood resilience.

Policy SE-11a: Encourage and participate in multi-benefit, nature-based solutions, such as restoration and conservation projects on natural and working lands, that increase flood resilience, reduce risks of related hazards such as landslides and erosion, and improve watershed management.

Policy SE-11b: Work with agencies and private providers that operate public facilities, such as wastewater treatment plants, gas, electrical, and water systems, located within areas subject to 100- and 500-year frequency floods to relocate or retrofit facilities to minimize or eliminate potential flood damage.

Policy SE-11c: Consider projected increases in precipitation from climate change in the design of upgraded flood control channels and basins, and design and siting of new critical facilities and infrastructure.

Policy SE-11d: Identify areas in need of expansion of stormwater and flood protection infrastructure capacity to accommodate changes in precipitation and extreme weather events.

Policy SE-11e: Prioritize flood prevention efforts in areas with high flood hazard exposure and systemically vulnerable communities.

Policy SE-11f: Balance the need for continuity of existing resident-serving businesses and services in flood-prone communities with risk reduction goals to protect life and property in the creation of new or modified development standards and rebuilding policies.

Geologic and Seismic Hazards

Goal SE-12: Prevent unnecessary exposure of people and property from risks of damage, injury, or loss from geologic and seismic hazards.

*Policy SE-12a: Continue to use the most recent available data on geologic hazards and related risks from the appropriate agencies. Make available to the public all maps identifying geologic hazards in Sonoma County.**

*Policy SE-12b: Upon each update to the Safety Element, review and update building standards to ensure up-to-date considerations of earthquake and liquefaction risk in building siting and design. Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the Uniform Building Code which increase resistance of structures to ground shaking and other geologic hazards.**

Policy SE-12c: Seek grant funding opportunities to support building retrofits, particularly in systemically vulnerable communities, to improve seismic resilience.

*Policy SE-12d: Continue to require appropriate studies of geologic and seismic hazards during the development review process. In earthquake fault zones, geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability. For regulatory hazard areas covered by the Seismic Hazards Mapping Act, require the preparation of and review of geotechnical reports and geologic hazards assessments by a California Registered Geologist, Civil Engineer, or Soils Engineer prior to decisions on projects within or in close proximity to geologic or seismic hazards, including landslide, ground rupture, liquefaction, and ground shaking areas.**

*Policy SE-12e: Continue to prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Earthquake Fault Zoning Act and implementing provisions of Title 14 of the California Code of Regulations) within 50 feet of the surface trace of any fault. Continue to implement existing regulations in the County Code governing development in designated Earthquake Fault Zones.**

Policy SE-12f: Pursuant to the Seismic Hazards Mapping Act (SHMA) of 1990 (Public Resources Code, Chapter 7.8), the County shall not authorize the subdivision of land nor permit any structure for human occupancy, as defined by the Act, within designated Seismic Hazard Zones unless the specific provisions of the Act and Title 14 of the California Code of Regulations have been satisfied.

Policy SE-12g: Minimize soil erosion by maintaining compatible land uses, suitable building designs, and appropriate construction techniques. Contour grading, where feasible, and revegetation shall be required to mitigate the appearance of engineered slopes and to control erosion.

Policy SE-12h: Discourage avoidable alteration of land that will increase landslide hazards, including concentration of water through drainage, irrigation, or septic system installation, removal of vegetative cover, and steepening or undercutting of unstable slopes.

Policy SE-12i: To address the increased frequency and severity of landslides, explore enhanced landslide monitoring and improved response protocols.

Policy SE-12j: Reduce vulnerability and safeguard essential services by relocating or hardening critical facilities within tsunami hazard areas.

*Policy SE-12k: Require dynamic analysis of structural response to earthquake forces prior to County approval of building permits for structures whose irregularity or other factors prevent reasonable load determination and distribution by static analysis.**

*Policy SE-12l: Enforce State seismic safety requirements for design and construction of buildings and facilities subject to State and Federal standards such as bridges, dams, power plants, hospitals and schools.**

*Policy SE-12m: Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.**

Policy SE-12n: Use the following criteria in siting and design of essential service buildings and facilities, particularly those of high public occupancy:

(1) To the extent feasible, avoid siting such buildings and facilities in areas subject to a Modified Mercalli Index (MMI) Groundshaking Intensity Level of Very Violent (X), Violent (IX), or Very Strong (IIX).

*(2) Where such buildings and facilities must be located in the above areas, design and construct them to the highest feasible safety standard.**

*Policy SE-12o: Support and integrate research on geologic hazards, their probabilities, and their effects within Sonoma County.**

*Policy SE-12p: Develop a program, including outreach, regulation, and funding, to strengthen and/or reinforce unreinforced masonry buildings throughout the County. Consider the cost of the work and the value, frequency of use, and level of occupancy of the buildings in designing the program. **

Hazardous Materials

Goal SE-13: Regulate the handling, storage, use, and disposal of hazardous materials to minimize community exposure and reduce risks of damage and injury to people and environmental resources.

*Policy SE-13a: Ensure that facilities involving the storage, handling, disposal, or use of hazardous materials or hazardous wastes be designed, constructed, and operated in accordance with applicable federal, state, and local hazardous materials and waste management laws and regulations, including requirements for management plans, security precautions, and contingency plans.**

Policy SE-13b: Maintain existing hazardous materials programs administered by the County's Hazardous Materials Unit acting as the Certified Unified Program Agency (CUPA).

*Policy SE-13c: Continue to promote the reduction of the use of hazardous materials in County operations, private businesses, and households.**

*Policy SE-13d: Support and coordinate with regulatory agencies to ensure the safe transportation of hazardous materials. **

*Policy SE-13e: Continue to encourage and educate the public about green business opportunities, safe alternatives to common hazardous materials, and resources and programs for the proper management and disposal.**

Policy SE-13f: Continue to require remediation, cleanup, and risk evaluation on known contaminated sites prior to development.

Policy SE-13g: Consider siting and design during application review for new and redevelopment projects to minimize impacts to surrounding uses and people due to pesticide runoff, aerial spray, or other means of exposure.

*Policy SE-13h: Continue to design and operate County owned solid waste disposal facilities to prevent improper disposal of and contamination by hazardous materials.**

*Policy SE-13i: Require a use permit for any commercial or industrial use involving hazardous materials in threshold quantities as determined by Federal and State laws. Require development applications to include detailed information concerning hazardous waste reduction, recycling, and storage. Hazardous materials management plans shall be required as a condition of approval for such permits.**

*Policy SE-13j: Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal in any area subject to a very strong ground shaking hazard as identified in this Element or within one quarter mile of schools.**

*Policy SE-13k: Avoid siting of hazardous waste repositories, incinerators, or similar facilities intended primarily for hazardous waste disposal in any area designated for urban residential or rural residential use or on agricultural lands or at County approved solid waste disposal facilities.**

*Policy SE-13l: Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.**

*Policy SE-13m: Maintain inventories of sites with storage or use of hazardous materials in threshold quantities as determined by Federal and State laws.**

*Policy SE-13n: Maintain the Hazardous Materials Area Plan, consistent with State requirements, which provides for effective responses to releases of hazardous materials, the safe disposal of hazardous wastes, and a public information program.**

Sea Level Rise

Goal SE-14: Increase community resilience to sea level rise, and prevent unnecessary exposure of people, property, and environmental resources to risks of damage, injury, or loss from the impacts of sea level rise.

Policy SE-14a: Update hazard data every 5 years or at intervals recommended by responsible agencies, whichever is more frequent, using the best available scientific estimates, aligning with projections used by regional, state and federal agencies.

Policy SE-14b: Use the best available science and technical analyses available in combination with site-specific information when evaluating discretionary land use or development proposals in areas vulnerable to sea level rise.

Policy SE-14c: Identify and assess risks to existing development, critical facilities and infrastructure, and environmental resources that are vulnerable to projected sea level rise inundation, and develop an adaptation plan, consistent with the directives of the Local Coastal Plan.

Policy SE-14d: Coordinate with groundwater sustainability agencies, public water system operators, and private groundwater users to develop and implement strategies to limit saltwater intrusion from sea level rise and avoid impacts caused by saltwater intrusion to beneficial uses of freshwater aquifers.

Policy SE-14e: Coordinate land use strategies with the Local Coastal Plan to ensure a cohesive approach to protecting communities, critical facilities and infrastructure, and environmental resources from sea level rise.

Policy SE-14f: Regulate the location, design, and construction of development and redevelopment in areas vulnerable to sea level rise. In coastal areas, follow the directives of the Local Coastal Plan.

Policy SE-14g: Continue to coordinate with local, regional and State entities, and engage the broader community, to address sea level rise and align adaptation efforts. In the development and

implementation of adaptation strategies, consider the impacts and benefits to vulnerable communities.

Air Quality and Extreme Temperatures

Goal SE-15: Reduce the community's exposure to poor air quality and extreme temperature events and build community capacity to adapt to a changing climate.

Policy SE-15a: Broaden the functionality and expand the locations of resilience centers, beginning in systemically vulnerable communities.

Policy SE-15b: Support transportation access to resilience centers for systemically vulnerable communities and people with mobility or transportation constraints.

Policy SE-15c: Consider lowering threshold temperature or air quality triggers for the activation and operation of resilience centers.

Policy SE-15d: Seek grant funding to identify and map existing community facilities that can serve as resilience centers.

Policy SE-15e: Incentivize, promote, and establish standards for temporary resilience centers on private property, especially clean air refuges for outdoor workers.

Policy SE-15f: Explore the development of programs for private employers to provide hazard pay to include employees working during extreme heat events, wildfires, and unhealthy air quality days.

Policy SE-15g: Work with energy service providers to promote programs encouraging reduced energy use during extreme heat events without negatively impacting the health and wellbeing of community members.

Policy SE-15h: Require parking lots for new commercial and industrial uses to mitigate heat gain through installation of shade trees, shade structures with solar arrays, or other emerging cooling technologies. Prioritize the use of solar arrays where feasible and appropriate.

Policy SE-15i: Utilize drought-tolerant plantings and shade structures, including solar arrays, as part of cooling strategies for County projects located in areas with impermeable surfaces to help reduce heat islands and energy demand during extreme heat events.

Drought

Goal SE-16: Proactively plan for drought, and improve the reliability and safety of water supply during periods of drought.

Policy SE-16a: Proactively coordinate with public agencies, private agencies, and community organizations that have roles in drought preparedness and response on conditions monitoring, hazard and risk assessments, contingency planning, and water resources management.

Policy SE-16b: Continuously monitor drought conditions, weather, and water availability.

Policy SE-16c: Provide drought information resources, including the timely and accurate assessments of drought impacts on agriculture, industry, government, wildlife, tourism, health, and other areas.

Policy SE-16d: Provide resources, guidance, and technical assistance, as feasible, to groundwater well users, small water suppliers, and other water users vulnerable to drought on water quality testing and water conservation measures. Prioritize resources for low-income households.

Policy SE-16e: Identify and support the pursuit of State and federal drought resources and funding.

Policy SE-16f: Improve drought resiliency and minimize economic risk through assessment of past drought periods in Sonoma County to identify barriers and opportunities.

Policy SE-16g: Encourage and support nature-based solutions for increasing the resilience of the watershed.

Policy SE-16h: Support the implementation of the Groundwater Sustainability Plans for the Santa Rosa Plain, Sonoma Valley, and Petaluma Valley groundwater subbasins.

Policy SE-16i: Evaluate, prioritize, and implement water saving features and stormwater best management practices to promote groundwater recharge in existing and newly constructed County facilities.

Policy SE-16j: Explore opportunities to update design guidelines and building or zoning codes to require or incentivize low impact development, recycled and greywater use, rainwater capture, water-efficient landscaping, and other water conservation measures.

Policy SE-16k: Consider developing pre-approved design details for low impact development and greywater systems to reduce design and permitting costs.

3.1.2 Changes to General Plan 2020 Public Safety Element Policies

The Safety Element Update carries forward all of the existing Public Safety Element policies that were adopted as EIR mitigation measures. It also carries forward the policies denoted as "mitigating policies." Although many of the retained GP2020 policies have been revised and reordered, the substance of each is substantially retained. Table 2 includes each policy in the GP2020 Public Safety Element, shown with its corresponding policy or policies in the proposed Safety Element Update. These policies are shown side by side to demonstrate that the substance of the GP2020 "mitigating policies" has been retained in the draft Public Safety Element draft. Several of the policies in GP2020 were combined into a single policy in the draft Safety Element Update, as shown. Four policies are not being carried forward, and are noted with "N/A" in the Safety Element Update column; none of these policies were identified in GP2020 as a mitigating policy.

Table 2. GP2020 Public Safety Element policies with corresponding Safety Element Update policies

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-1a	Continue to use all available data on geologic hazards and related risks from the appropriate agencies.*	SE-12a	Continue to use the most recent available data on geologic hazards and related risks from the appropriate agencies. Make available to the public all maps identifying geologic hazards in Sonoma County.*
PS-1b	Continue to use studies of geologic hazards prepared during the development review process.*	SE-12d	Continue to require appropriate studies of geologic and seismic hazards during the development review process. In earthquake fault zones, geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability. For regulatory hazard areas covered by the Seismic Hazards Mapping Act, require the preparation of and review of geotechnical reports and geologic hazards assessments by a California Registered Geologist, Civil Engineer, or Soils Engineer prior to decisions on projects within or in close proximity to geologic or seismic hazards, including landslide, ground rupture, liquefaction, and ground shaking areas.*
PS-1c	Consider amendments of this Element to incorporate new data which significantly change the hazard assessments contained herein.*		See Implementation Program SE-M.1; also see Policy SE-12a
PS-1d	Support and integrate research on geologic hazards, their probabilities, and their effects within Sonoma County.	SE-12o	Support and integrate research on geologic hazards, their probabilities, and their effects within Sonoma County.*
PS-1e	Continue to implement the "Geologic Hazard Area" combining district which establishes regulations for permissible types of uses and their intensities and appropriate development standards.*	SE-12e	Continue to prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Earthquake Fault Zoning Act and implementing provisions of Title 14 of the California Code of Regulations) within 50 feet of the surface trace of any fault. Continue to implement existing regulations in the County Code governing development in designated Earthquake Fault Zones.*
PS-1f	Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards areas shown on Public Safety Element hazard maps and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an	SE-12d	*See text of SE-12d paired with GP2020 PS-1b, above*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
	engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.*		
PS-1g	Prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Special Studies Zones Act and related Administrative Code provisions) within 50 feet of the surface trace of any fault.*	SE-12e	*See text of Policy SE-12e, above*
PS-1h	Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the Uniform Building Code which increase resistance of structures to groundshaking and other geologic hazards.*	SE-12b	Upon each update to the Safety Element, review and update building standards to ensure up-to-date considerations of earthquake and liquefaction risk in building siting and design. Adopt, upon approval by the International Code Council (ICC) and the State of California, revisions to the Uniform Building Code which increase resistance of structures to ground shaking and other geologic hazards.*
PS-1i	Require dynamic analysis of structural response to earthquake forces prior to County approval of building permits for structures whose irregularity or other factors prevent reasonable load determination and distribution by static analysis.*	SE-12k	Require dynamic analysis of structural response to earthquake forces prior to County approval of building permits for structures whose irregularity or other factors prevent reasonable load determination and distribution by static analysis.*
PS-1j	Encourage strong enforcement of State seismic safety requirements for design and construction of buildings and facilities subject to State and Federal standards such as bridges, dams, power plants, hospitals and schools.*	SE-12l	Enforce State seismic safety requirements for design and construction of buildings and facilities subject to State and Federal standards such as bridges, dams, power plants, hospitals and schools.*
PS-1k	Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.*	SE-12m	Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level.*
PS-1l	Use the following criteria in siting and design of essential service buildings and facilities, particularly those of high public occupancy: (1) To the extent feasible, avoid siting such buildings and facilities in areas subject to a Modified Mercalli Index (MMI) Groundshaking Intensity Level of Very Violent (X), Violent (IX), or Very Strong (IIX) as shown on Figures PS-1a. (2) Where such buildings and facilities must be located in the above areas, design and construct them to the highest feasible safety standard.*	SE-12n	Use the following criteria in siting and design of essential service buildings and facilities, particularly those of high public occupancy. To the extent feasible, avoid siting such buildings and facilities in areas subject to a Modified Mercalli Index (MMI) Groundshaking Intensity Level of Very Violent (X), Violent (IX), or Very Strong (IIX). Where such buildings and facilities must be located in the above areas, design and construct them to the highest feasible safety standard.*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-1m	Make readily available to property owners and the public all maps identifying geologic hazards in Sonoma County, particularly the MMI Groundshaking Intensity Level maps noted above.*	SE-12a	Continue to use the most recent available data on geologic hazards and related risks from the appropriate agencies. Make available to the public all maps identifying geologic hazards in Sonoma County.*
PS-1n	Develop a Strategic Plan for damage assessment and recovery of essential service buildings and facilities, particularly those of high public occupancy, as part of the County's emergency response planning, focused in areas subject to an MMI Groundshaking Intensity level of Very Violent (X), Violent (IX), or Very Strong (IIX). *	SE-3a	Work collaboratively with disaster survivors, the community, County departments and agencies, key groups and stakeholders, and other local and regional governments to develop and implement a Post-Disaster Recovery Framework, including a strategic plan for damage assessment and recovery of County-owned public facilities after a major disaster.*
PS-1o	Adopt an ordinance requiring strengthening and/or reinforcement of Unreinforced Masonry Buildings, except residential structures, considering the cost of the work and the value, frequency of use, and level of occupancy of the buildings. *	SE-12p	Develop a program, including outreach, regulation, and funding, to strengthen and/or reinforce unreinforced masonry buildings throughout the County. Consider the cost of the work and the value, frequency of use, and level of occupancy of the buildings in designing the program. *
PS-1p	Notwithstanding the foregoing, Policies PS-lf and PS-lg shall not apply to an application to reconstruct a single-family dwelling located in the Geologic Hazard Area Combining District that was destroyed in the October 2017 Sonoma Complex Fires, provided that the dwelling would comply with and qualify for an exemption under the state Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code, sec. 2621 et seq.), and provided further that the application complies with all applicable requirements of that certain ordinance adopted by the Board of Supervisors on December 11, 2018 and relating to reconstruction of single family homes in the Geologic Hazard Area Combining District. This policy shall not be interpreted to apply to any project other than reconstruction of a single-family home destroyed in the 2017 Sonoma Complex Fires that is proposed to be rebuilt on the same lot.		N/A
PS-2a	Maintain available information on flooding and flood hazards in the appropriate County departments. *	SE-10a	Maintain data and information on flooding and flood hazards in the appropriate County departments and make flood hazard maps available to the public.*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-2b	Coordinate flood hazard analysis and management activities with the U.S. Army Corps of Engineers, Federal Emergency Management Agency (FEMA), and other responsible agencies. Using the flood data collection program, request changes in FEMA maps where appropriate to reflect new data or analyses.*	SE-10c	Partner with local, regional, State, and federal agencies, including but not limited to the cities, Sonoma Water, the U.S. Army Corps of Engineers, and the Federal Emergency Management Agency (FEMA), to develop and maintain an adequate information base on existing and potential flood hazards and drainage impacts for the County's major watersheds, prepare analyses and risk assessments, and identify and implement floodplain management activities and other strategies to reduce flooding impacts. Request changes in FEMA flood hazard maps where appropriate to reflect new data or analyses.*
PS-2c	Participate with the City of Petaluma in implementation of the regional components of the Petaluma River Watershed Master Drainage Plan (Sonoma County Water Agency, June 2003), Petaluma River Floodplain Management Plan (City of Petaluma, October 2001), Petaluma River Access and Enhancement Plan (City of Petaluma, May 1996), and City of Petaluma General Plan 2025 (Water Resources Element).*	SE-10c	*See text of SE-10c, above*
PS-2d	Work with the County Community Development Commission, County Department of Fire and Emergency Services, responsible agencies, public, and other stakeholders to develop and implement a long-term plan for reducing repetitive flood losses in the Russian River basin, to include: (1) Systematic collection of flood data and damage by geographic location; (2) Consideration of acquisition of properties in flood hazard areas; (3) An ongoing Flood Elevation Program; (4) A Sonoma County Flood Mitigation Plan, including a Repetitive Loss Plan, to allow County participation in FEMA's Flood Mitigation Assistance (FMA) Program and additional Hazard Mitigation Grant Program (HMGP) grants; (5) Possible participation in the National Flood Insurance Program's Community Rating System; (6) Use of Redevelopment funds to supplement FEMA grant funds in reducing repetitive flood losses; and (7) Consideration of permit fee reductions for elevation of structures in flood hazard areas and outreach to inform property owners in flood hazard areas about various options for coverage under the National Flood Insurance Program, including Increased Cost of Compliance (ICC) coverage.*	SE-10d	Work with regional flood protection responsible agencies, the public, and other stakeholders to develop and implement a long-term plan for reducing repetitive flood losses in the Russian River basin. As part of the plan, consider upstream improvements that could expand flood storage capacity and existing regulatory barriers to flood prevention projects.*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-2e	Expand the County's zero net fill requirements to address all areas of the unincorporated County that are located within the 100-year FEMA special flood hazard area.*	SE-10g	Continue to enforce zero net fill requirements in the 100-year FEMA Special Flood Hazard Area to retain floodplain storage capacity. Avoid fill in areas outside of the 100-year FEMA Special Flood Hazard Area that retain or could retain flood waters.*
PS-2f	Preserve floodplain storage capacity by avoiding fill in areas outside of the 100-year FEMA special flood hazard area that retain or could retain flood waters. *	SE-10g	*See text of SE-10g, above*
PS-2g	Base land use planning and development review on FEMA maps and data or parcel specific scaled interpretations of these maps and site specific elevation data.*	SE-10h	When making land use decisions and during development review: a) On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards; b) Use FEMA flood hazard maps and data, or parcel specific scaled interpretations of these maps and site specific elevation data; c) Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of amendments to the General Plan Land Use Map; and d) Consider the potential risk of damage from flooding in the design and review of projects, including projects that could facilitate floodplain development.*
PS-2h	Work cooperatively with each City to prepare a comprehensive analysis of the potential flood hazards and drainage impacts for the watersheds with major flood problems in the County (i.e., Russian River, Sonoma Creek, and Petaluma River). Include the following in the analysis: (1) Identification of flood hazard areas; (2) Identification of historic drainage patterns and existing retention/detention characteristics serving each watershed; (3) Identification of impacts associated with placement of significant new impervious surfaces; (4) Identification of downstream impacts on existing development and land uses; (5) Identification of mitigation measures to reduce flood hazards; (6) Identification of significant water recharge areas; (7) Identification of sources of significant soil sedimentation and/or stream bank failures; and (8) Identification and adoption of regional mitigation measures to be applied to new development to address the proportionate fair share of flood hazard reduction.*	SE-10c	Partner with local, regional, State, and Federal agencies, including but not limited to the cities, Sonoma Water, the U.S. Army Corp of Engineers, and the Federal Emergency Management Agency (FEMA), to develop and maintain an adequate information base on existing and potential flood hazards and drainage impacts for the County's major watersheds, prepare analyses and risk assessments, and identify and implement floodplain management activities and other strategies to reduce flooding impacts. Request changes in FEMA flood hazard maps where appropriate to reflect new data or analyses.*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-2i	Until such time as the analysis under Policy PS-2h is completed and the regional mitigation measures adopted, each discretionary project located in the above watersheds with major flood problems shall analyze drainage and flooding impacts and include feasible and appropriate mitigation measures to reduce flood hazards from the project. Thereafter, each project shall implement its proportionate fair share of the regional mitigation measures.*	SE-10h	When making land use decisions and during development review: a) On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards; b) Use FEMA flood hazard maps and data, or parcel specific scaled interpretations of these maps and site specific elevation data; c) Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of amendments to the General Plan Land Use Map; and d) Consider the potential risk of damage from flooding in the design and review of projects, including projects that could facilitate floodplain development.*
PS-2j	Work with the City of Petaluma to preserve critical floodplain detention areas, including but not limited to the confluence of Willow Brook and Lichau Creeks and Liberty, Marin, and Wiggins Creeks north of Petaluma.		N/A
PS-2k	Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of any amendments of the Land Use Map.*	SE-10h	*See full text of SE-10h above, and particularly Policy SE-10h, subsection (c), excerpted here:* *** (c) Use the 100-year flood event and corresponding elevations as the County measure of acceptable level of risk and protection in the consideration of amendments to the General Plan Land Use Map; ***
PS-2l	On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards. *	SE-10h	*See full text of SE-10h above, and particularly, subsection (a), excerpted here:* *** a) On-site and off-site flood related hazards shall be reviewed for all projects located within areas subject to known flood hazards; ***
PS-2m	Regulate development, water diversion, vegetation management, grading, and fills to minimize any increase in flooding and related damage to people and property. *	SE-10j	Regulate development, water diversion, vegetation management, grading, and fills to minimize any increase in flooding and related damage to people and property.*
PS-2n	Consider developing regulations that require the use of low impact development techniques to reduce stormwater runoff from future development.*	SE-16j	Explore opportunities to update design guidelines and building or zoning codes to require or incentivize low impact development, recycled and greywater use, rainwater capture, water-efficient landscaping, and other water conservation measures.

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-2o	Costs for drainage facilities to handle the surface runoff from new development shall be the responsibility of the new development. *	SE-10m	Require that the design and construction of drainage facilities be subject to the review and approval of Permit Sonoma. The costs of drainage facilities to handle surface runoff from new development shall be the responsibility of the developer.*
PS-2p	Require that design and construction of drainage facilities be subject to the review and approval of the Permit and Resource Management Department.*	SE-10m	*See text of SE-10m, above*
PS-2q	Require that tentative and final subdivision maps and approved site plans show areas subject to flooding as shown on the FEMA maps.*	SE-10k	Require that tentative and final subdivision maps and development site plans show flood hazard areas as designated by FEMA.*
PS-2r	Give priority to floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where possible, maintain flood channel capacity.	SE-10l	Give priority to floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where possible, maintain flood channel capacity.*
PS-2s	Consider the potential risk of damage from flooding in the design and review of projects, including those which could facilitate floodplain development.*	SE-10h	*See full text of Policy SE-10h, above, and particularly subsection (d), as follows:* *** d) Consider the potential risk of damage from flooding in the design and review of projects, including projects that could facilitate floodplain development.*
PS-2t	Avoid variances to building setbacks along streams and in 100-year flood plains without the review and approval of the Permit and Resource Management Department. *	SE-10i	Avoid variances to building setbacks along streams and in the 100-year floodplain.*
PS-2u	Request that the Sonoma County Water Agency prioritize and undertake flood hazard mitigation projects on a continuous basis on selected waterways subject to the policies of the Open Space and Resource Conservation Element. *	SE-10n	Support Sonoma Water in the prioritization and implementation of flood hazard mitigation projects within waterways subject to the policies of the Open Space and Resource Conservation Element.*
PS-2v	Continue to enforce County code requirements on construction in flood hazard areas and other adopted regulations which implement the National Flood Insurance Program.*	SE-10e	Continue to participate in the National Flood Insurance Program (NFIP) by maintaining and enforcing County code requirements on construction in flood hazard areas and other adopted floodplain management regulations.* Consider participating in the NFIP's Community Rating System to qualify Sonoma County property owners for discounted flood insurance.

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-2w	Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitative maintenance needs as appropriate.*	SE-10p	Encourage the timely completion and filing of inundation maps for all dams whose failure could cause loss of life or personal injury within Sonoma County. Where inundation maps indicate dam or levee failure could cause loss of life or property or personal injury, coordinate with the corresponding responsible party to investigate levee or dam stability and management and identify rehabilitative maintenance needs as appropriate.*
PS-3a	Continue to use available information on wildland and structural fire hazards.*	SE-9a	Continue to utilize the most recent available data and information on wildland and structural fire hazards from CAL FIRE and research institutions. Make fire hazard maps available to the public.*
PS-3b	Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with the Public Safety Element in the review of projects.*	SE-8a	Consider the severity of natural fire hazards (as may be exacerbated by climate change), potential damage from wildland and structural fires, and adequacy of fire protection and mitigation measures, consistent with the General Plan, in the review of discretionary projects.*
PS-3c	Continue to adopt revisions to the Uniform Fire and Building Codes and other standards which address fire safety as they are approved by inspection organizations and the State of California. Review, revise, and/or adopt existing or new local codes, ordinances, and Fire Safe Standards to reflect contemporary fire safe practices.*	SE-8b	Maintain and update County building and fire codes and regulations to meet or exceed State requirements and reflect contemporary fire safe practices.*
PS-3d	Refer projects and code revisions to the County Department of Fire and Emergency Services and responsible fire protection agencies for their review and comment.*	SE-8d	Continue to refer projects and code revisions to the Fire Prevention and Hazardous Materials Division of Permit Sonoma and responsible fire protection agencies for their review and comment.*
PS-3e	The County Department of Fire and Emergency Services shall offer assistance to local agencies in adoption and enforcement of fire safety regulations and shall work with local agencies to develop proposed improvements to County codes and standards.*	SE-7h	The Fire Prevention Division of Permit Sonoma shall continue to offer assistance to local fire agencies in adoption and enforcement of fire safety regulations and continue work with local agencies to develop proposed improvements to County codes and standards to align with changing State legislation and current industry research.*
PS-3f	Encourage strong enforcement of State requirements for fire safety by the California Department of Forestry and Fire Proetction.*	SE-7i	Continue strong enforcement of the Office of the State Fire Marshal requirements for fire safety.*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-3g	Encourage continued operation of California Department of Forestry and Fire Protection (CalFire) programs for fuel breaks, brush management, controlled burning, re-vegetation, and fire roads.*	SE-7j	Continue to identify local funding sources and leverage grant funding to support and participate in wildfire risk reduction and forest health projects, including strategic placement, creation and maintenance of shaded fuel breaks, targeted vegetation management, prescribed/cultural burning, maintenance of fire roads, and other priorities as identified in the current Hazard Mitigation Plan, the Sonoma-Lake-Napa Unit Strategic Fire Plan, the Sonoma County Community Wildfire Protection Plan and other planning documents.
PS-3h	Develop a program to improve and standardize the County street addressing system in order to reduce emergency service response times. Where applicable, coordinate the program with the cities.*	SE-7k	Continue the Permit Sonoma addressing and road naming program that improves and standardizes the County street addressing system in order to reduce emergency service response times. Where applicable, coordinate the program with the cities and local tribal governments.*
PS-3i	Encourage and promote fire safe practices and the distribution of fire safe educational materials to the general public, permit applicants, and local planning agencies.*	SE-9c	Partner with Fire Safe Sonoma, local Fire Safe councils and FireWise Communities, CAL FIRE, local fire districts, Resource Conservation Districts and other community groups to provide educational opportunities for residents and property owners on the best available science for defensible space, home hardening, and vegetation management. Continue to promote emergency preparedness including “know your evacuation Zone” efforts, pre-emergency planning and supplies for family safety, and executing evacuation drills. Target at-risk populations such as older adults, individuals with disabilities, non-English speaking residents, and individuals with chronic health conditions.*
PS-3j	Provide fire hazard information signs in Very High or High Fire Hazard Severity Zones in a manner consistent with Area Plans and that does not degrade Scenic Corridors and scenic views. *	SE-7l	Continue to provide fire hazard information signs in areas at risk to wildfire in a manner consistent with Area Plans and that does not degrade Scenic Corridors and scenic views.*
PS-3k	Work with the California Department of Forestry and Fire Protection (CalFire) to identify areas of high fire fuel loads and take advantage of opportunities to reduce those fuel loads, particularly in Very High or High Fire Hazard Severity Zones.	SE-9b	Continue to work with CAL FIRE, local fire agencies, and community members to identify areas of high fire fuel loads and take advantage of opportunities to reduce those fuel loads, particularly in areas where fuels may increase fire spread to nearby communities.*
PS-3l	Require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, and agricultural exempt buildings.*	SE-8e	Continue to require automatic fire sprinkler systems or other on-site fire detection and suppression systems in all new residential and commercial structures, with exceptions for detached utility buildings, garages, agricultural exempt buildings, and certain accessory dwelling units.*

PS-3m	Consider additional impact or mitigation fees, or a benefit assessment, to offset the impact of new development on fire services.		N/A
PS-4a	While maintaining the autonomy granted to it pursuant to State zoning laws, implement Federal, State, and County requirements for the storage, handling, disposal, and use of hazardous materials, including requirements for management plans, security precautions, and contingency plans. *	SE-13a	Ensure that facilities involving the storage, handling, disposal, or use of hazardous materials or hazardous wastes be designed, constructed, and operated in accordance with applicable federal, state, and local hazardous materials and waste management laws and regulations, including requirements for management plans, security precautions, and contingency plans.*
PS-4b	Prepare and maintain an inventory of sites with storage or use of hazardous materials in threshold planning quantities as determined by Federal and State laws.*	SE-13m	Maintain inventories of sites with storage or use of hazardous materials in threshold quantities as determined by Federal and State laws.*
PS-4c	Require a use permit for any commercial or industrial use involving hazardous materials in threshold planning quantities as determined by Federal and State laws. Hazardous materials management plans shall be required as a condition of approval for such permits. *	SE-13i	Require a use permit for any commercial or industrial use involving hazardous materials in threshold quantities as determined by Federal and State laws. Require development applications to include detailed information concerning hazardous waste reduction, recycling, and storage. Hazardous materials management plans shall be required as a condition of approval for such permits.*
PS-4d	Work with applicable regulatory agencies to regulate the transportation of hazardous materials consistent with adopted County policies.*	SE-13d	Support and coordinate with regulatory agencies to ensure the safe transportation of hazardous materials. *
PS-4e	Continue to design and operate County owned solid waste disposal facilities to prevent disposal of and contamination by hazardous materials.*	SE-13h	Continue to design and operate County owned solid waste disposal facilities to prevent improper disposal of and contamination by hazardous materials.*
PS-4f	Continue as needed the hazardous materials business advisory group, and consider adding an agricultural representative.*		N/A
PS-4g	Maintain the Sonoma County Operational Area Hazardous Materials Incident Response Plan, which provides for effective responses to releases of hazardous materials, the safe disposal of hazardous wastes, and a public information program.*	SE-13n	Maintain the Hazardous Materials Area Plan, consistent with State requirements, which provides for effective responses to releases of hazardous materials, the safe disposal of hazardous wastes, and a public information program.*
PS-4h	Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal in any area subject to a very strong ground shaking hazard identified on Figures PS-1a through PS-1i or within one quarter mile of schools. *	SE-13j	Avoid siting of hazardous waste repositories, incinerators, facilities that use a substantial quantity of hazardous materials, or other similar facilities intended primarily for hazardous waste disposal in any area subject to a very strong ground shaking hazard as identified in this Element or within one quarter mile of schools.*

GP2020 Policy #	Text of GP2020 Policy	2025 Policy #	Text of Safety Element Update Policy
PS-4i	Avoid siting of hazardous waste repositories, incinerators, or similar facilities intended primarily for hazardous waste disposal in any area designated for urban residential or rural residential use or on agricultural lands or at County approved solid waste disposal facilities.*	SE-13k	Avoid siting of hazardous waste repositories, incinerators, or similar facilities intended primarily for hazardous waste disposal in any area designated for urban residential or rural residential use or on agricultural lands or at County approved solid waste disposal facilities.*
PS-4j	Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.*	SE-13l	Site hazardous waste facilities which have the primary purpose of reuse, recycling, or source reduction of hazardous wastes in areas designated for industrial use in close proximity to users of hazardous materials and/or generators of hazardous wastes.*
PS-4k	Continue to educate the public about and promote the Sonoma County Waste Management Authority's Household Hazardous Waste Program. Encourage free drop-off and reuse of computers and similar equipment containing hazardous materials.*	SE-13e	Continue to encourage and educate the public about green business opportunities, safe alternatives to common hazardous materials, and resources and programs for the proper management and disposal.*
PS-4l	Continue to educate the public about green business opportunities and expand and promote the County Department of Fire and Emergency Services Sonoma Green Business Program.*	SE-13e	Continue to encourage and educate the public about green business opportunities, safe alternatives to common hazardous materials, and resources and programs for the proper management and disposal.*
PS-4m	Continue to educate the public about, encourage, and promote the reduction in use of hazardous materials and the use of safe alternatives to hazardous materials in County operations and private businesses.*	SE-13c	Continue to promote the reduction of the use of hazardous materials in County operations, private businesses, and households.*
PS-4n	Encourage the private sector to reduce the use of potentially hazardous pesticides and to use alternatives such as best management practices.*	**EJ-2b**	**Environmental Justice Element Policy EJ-2b:** Minimize agricultural pollution spray and runoff by supporting implementation of reduced-risk pesticide use, bioswale and groundcover vegetation plans, and agricultural field location and orientation, particularly in Environmental Justice Communities and in areas with high levels of pesticide exposure.
PS-4o	Encourage reduction in the use of potentially hazardous pesticides and increased use of alternatives, such as best management practices, in County operations, including but not limited to maintenance of roads, parks, and facility grounds. Emphasize the use of alternatives to potentially hazardous pesticides in areas likely to drain to waterways. Coordinate with the cities in this effort.*	**EJ-1e**	**Environmental Justice Element Policy EJ-1e:** Reduce or eliminate the use of pesticides and herbicides on County-owned parks and other county-owned landscaped areas such as medians and parkways, publicly accessible open spaces, and facility grounds. Support the use of safe alternatives and best management practices.

3.1.3 Implementation Plan

The draft Safety Element includes 80 programmed implementation actions that the County will undertake on either a set timeline or ongoing basis. Each program is associated with one or more goals

and policies of the Safety Element. For each program, the implementation plan establishes a lead County department or agency, supporting departments or agencies (if any), the anticipated timeframe to accomplish the program, the related policies that the program implements, and a metric to use as a measure of successful implementation. The programs include a variety of actions such as interdepartmental coordination or with external partners, planning and feasibility studies, analysis or assessment, community outreach and engagement, improving public information, funding identification, and code updates. Many of the implementation programs reflect ongoing or planned departmental work and do not require additional funding. Where funding may not be currently available, the program states that funding will need to be identified and established before implementation.

The programs included in the Implementation Plan are listed in Table 3, in short form, with their associated policies. Additional detail regarding identity of lead and supporting department(s) and metrics is available in the draft Safety Element Update document.

Table 3. Proposed Safety Element Update Implementation Programs.

	Program
1	Continue to maintain and update as necessary the Sonoma County Emergency Operations Plan and associated annexes. Develop new annexes as warranted.
2	Update the Local Hazard Mitigation Plan (LHMP) for Sonoma County, incorporated by reference into this Element, at least every five years and use the plan to guide decisions on mitigating actions to protect the community and the environment, particularly vulnerable communities. With each LHMP update, evaluate the County's fire suppression capacity and future water supply availability. Where feasible, coordinate and collaborate on hazard mitigation planning with other jurisdictions and special districts within the County. During the comprehensive update to the General Plan, update and expand upon the evacuation route assessment required by Government Code Section 65302.15 and the residential egress assessment required by Government Code Section 65302(g(5), based on the availability of new information, data, or assessment techniques, to evaluate the capacity, safety, and viability of evacuation routes and locations under a range of emergency scenarios and areas of the unincorporated county in hazard areas without at least two evacuation routes. Use the findings from the updated studies to inform the land use and circulation elements, and future updates to the safety element and LHMP. (SE-1b, SE-2i)
3	Identify collaborative networks and community-based organizations within the County that provide emergency services, such as Sonoma Community Organizations Active in Disaster (COAD), and meet bi-annually to identify opportunities for the County to work in collaboration with these community-based organizations (CBOs) in their emergency response approach and discuss how to fill gaps in community needs and resources for emergency preparation, response, and recovery. (SE-1c, SE-1d)
4	Identify funding streams to provide community-based organizations involved in the County's emergency planning with grants or other forms of compensation for their planning and action efforts. (SE-1c, SE-1d)
5	Continue supporting and administering community preparedness programs, such as Community Emergency Response Training (CERT), Communities Organized to Prepare for Emergencies (COPE), and Map your Neighborhood (MYN), to foster neighbor to neighbor collaboration efforts. Prioritize efforts in high hazard areas and systemically vulnerable communities, and coordinate with community organizations and partners to target hard-to-reach populations. (SE-1e)
6	Conduct alert and warning, and evacuation exercises at the neighborhood or community levels, prioritizing high hazard areas and single-access communities, to provide public safety agencies an opportunity to test the County alert system and residents an opportunity to practice evacuating. To reduce last-minute evacuations and concentrated demand on the roadway network, encourage advanced preparation, leaving early, and limiting the number of evacuating vehicles during the exercises and as part of other emergency preparedness public information initiatives. (SE-1g)

7	Continue to provide easy to access public emergency response information on the County's website and social media pages. (SE-2b)
8	Work with schools and local businesses to promote emergency preparedness, distributing age-appropriate educational materials or business continuity planning resources. (SE-2b)
9	Partner with local media, including popular local social media pages, to provide information on emergency preparedness and response. (SE-2b)
10	Secure funding to assess on-street parking on County-owned roads in Moderate, High, or Very High Fire Hazard Severity Zones to evaluate parking constraints to safe and efficient egress. If the assessment indicates potential constraints, explore options to implement more stringent on-street parking limitations. (SE-2f)
11	Conduct a study to identify vulnerable areas for traffic signal improvements and contingency plans for loss of power and communications grids. Investigate adaptive signal control (ASC) systems that can adjust traffic signal timing to account for high volumes that occur during hazard events. (SE-2j)
12	Work with community stakeholders and County agencies/departments to prepare a Post-Disaster Recovery Framework to increase the County's capacity to recover after disaster events. (SE-3a)
13	Secure funding for and develop a strategic plan for damage assessment and recovery of County-owned public facilities after a major disaster event. (SE-3a)
14	Secure funding for long-term recovery efforts for small businesses and systemically vulnerable communities through federal and state disaster relief funds and local budget. (SE-3b)
15	Partner with local hospitals, clinics, and non-profit organizations to secure medical staff, equipment, and supplies for mobile clinics following disaster. (SE-3c)
16	Update the County code to establish streamlined rebuilding standards and procedures, and temporary housing allowances that apply after proclamation of a local emergency. (SE-3d)
17	Create an at-home hazard guide, focusing on hazards identified in the Safety Element and Hazard Mitigation Plan, for residents in multiple languages that provides details on hazard avoidance, prevention, and response, and points to various funding sources, such as the Green and Resilient Retrofit Program or local programs, for residents seeking climate-resilient home retrofits. Distribute guides in English and Spanish at community events and provide guides in additional languages upon request. (SE-4a)
18	Partner with healthcare providers throughout the County to regularly meet with the Sonoma County Mobile Support Team (MST), Community Oriented and Equity (CORE) Team, Specialized Assistance for Everyone (SAFE) Team, and other crisis response or mental health services teams to create an Emergency Medical Assistance Plan identifying opportunities to provide mobile mental and physical health services and coordinated operations during and after an emergency event. (SE-3c, SE-4b)
19	Partner with healthcare providers to identify funding sources to support efforts to increase physical and mental health care capacity during emergencies and post-disasters, including the Centers for Disease Control, California Department of Public Health, California Department of Social Services, and the California Department of Managed Health Care. Assist in applying for funding through collaborative partnerships, information sharing, and technical support as needed. (SE-3c, SE-4b)
20	Establish and train a formalized network of community organizations and volunteers to provide additional support during emergencies and post-disasters. This can include mental health first aid training, establishing community health worker programs, and creating support networks for vulnerable populations. (SE-3c, SE-4b, SE-4d)
21	Continue to host regular seasonal readiness meetings that include public safety partners, community-based organizations, and County agencies to discuss the capacity of emergency services to serve all community members equitably. (SE-4c, SE-4d, SE-4e)

22	Continue to integrate Diversity, Equity, Inclusion, and Belonging (DEIB) principles into Emergency Operations Center (EOC) operations through the EOC Management positions of Equity Officer and Access and Functional Needs Coordinator, in alignment with the Sonoma County Strategic Plan Racial Equity and Social Justice Pillar for departments engaged in emergency and safety related and post-disaster recovery programs. (SE-4c)
23	Schedule regular meetings between County departments and public agencies working on projects or initiatives related to emergency response or services to discuss ongoing projects, share updates, and address any communication gaps. (SE-4e)
24	Identify funding for and conduct an evacuation transportation needs assessment to identify areas of the County with populations that have access and functional needs that need transportation support to evacuate safely and timely during a disaster event. The assessment should be informed by data and community input. Log the findings in a GIS database for reference by the Emergency Operations Center during disaster response and planning efforts. (SE-4f)
25	Encourage and support community or neighborhood efforts in developing localized emergency response plans, in alignment with the County Emergency Operations Plan, by providing hazard data and technical guidance and coordination with local fire agencies and other public safety partners. (SE-4f)
26	Create a public information campaign in multiple languages and using multiple forms of media, including through trusted community-based organizations, informing the public of various existing emergency alert options and where to look for information regarding public emergencies, hazards, resilience center openings, and safety instructions. Provide this information virtually and in frequented public locations, such as libraries, with printouts of the necessary links and numbers residents may call, text, or search for additional information on emergencies and evacuation routes. Collaborate with County departments and agencies that work closely with the public, such as Health Services, to disseminate information. (SE-2a, SE-4h)
27	Address language and accessibility barriers to emergency alert programs and emergency preparedness resources by ensuring County emergency response operations follow the County of Sonoma's Language Access Plan and require that contractors hired by the County follow the County's Language Access Plan. (SE-4h)
28	Provide information and handouts on preparedness resources and procedures at County events and tabling opportunities. (SE-1e, SE-4h)
29	Identify funding to acquire additional sources of backup power, power storage, and/or onsite power generation for critical facilities and services, and resilience centers. (SE-5a)
30	Conduct a feasibility study to identify potential areas to install neighborhood microgrids and battery energy storage facilities to improve electricity grid resilience. Prioritize areas with systemically vulnerable communities. (SE-5a)
31	Work with utility providers to establish and adhere to standards for maintaining defensible space around critical infrastructure such as power lines, electrical substations and other energy facilities, cell phone towers and communications facilities, broadband infrastructure, water pipelines, reservoirs, waste water facilities, solid/hazardous waste facilities, and recycling facilities. (SE-5b)
32	Continue to regularly assess County-maintained roads and facilities and conduct any needed vegetation clearing or maintenance to ensure defensible space is maintained. (SE-5b)
33	Conduct a study to identify County transportation infrastructure that is critical for the provision of emergency services such as evacuation, or that provide access to critical facilities that are located within high-risk wildfire, landslide, or flood hazard areas. Integrate information into a GIS-based database for critical transportation infrastructure to incorporate into emergency plans and to help prioritize and track improvements and upgrades. (SE-5c)
34	Identify strategies for near- and long-term hardening/resilience projects of critical transportation infrastructure, especially those needed for the continuation of critical services in highly impacted and systemically vulnerable communities during climate hazards. Hardening projects may include widening evacuation routes, strengthening bridges, raising drainage and creek crossings, repaving flood-prone roads with permeable pavement, regular hazardous fuels clearing, and other projects and maintenance activities. (SE-5c)

35	Using the countywide Community Engagement Plan as a guide, increase participation of community members in small and isolated rural communities in emergency planning and decision-making processes and disaster preparedness events. Strategies should include locating engagement events in small and isolated rural communities, timing events outside of work hours, providing child-friendly options at the events, running bilingual engagement events, and providing tangible resources to improve self-sufficiency and disaster preparedness when feasible. (SE-1f, SE-5d)
36	Conduct a detailed assessment of vulnerability and risks to County-owned critical facilities and infrastructure from all hazards and climate change impacts, and identify adaptation and resilience strategies to reduce risks and ensure continuity of services. Integrate findings and recommended projects into the Capital Improvement Plan. (SE-2.5, SE-12g)
37	Identify and apply for funding that may be used for capital improvements necessary for emergency response. Explore funding sources that could be used for assessment or physical improvements of critical facilities and infrastructure throughout the county. Prioritize capital improvements that serve the greatest number of people and systemically vulnerable communities, and that allow existing facilities to be used during emergency events. (SE-5f)
38	Conduct a programmatic equity impact assessment with each update to the County's Capital Improvement Plan. Gain input from community leaders of systemically vulnerable communities to ensure the equity impact assessment addresses concerns meaningfully. This can be achieved by organizing community forums and focus groups, conducting surveys, and holding one-on-one interviews. (SE-5g)
39	During the comprehensive update to the Sonoma County General Plan, review existing land use designations for public facilities in relation to planned critical facilities, evacuation routes, and hazard areas. Work with Sonoma Public Infrastructure and the Department of Emergency Management to identify necessary changes to the land use map to accommodate planned projects. (SE-5i)
40	Continue the existing Auxiliary Communication Service program to supplement government emergency communications with professional, unpaid volunteer staff. (SE-6a)
41	Assess new technologies and seek funding as needed to upgrade County emergency response communications equipment. (SE-6c)
42	Work with the federal Cybersecurity & Infrastructure Security Agency to obtain free telecommunications priority services by enrolling in programs such as Wireless Priority Service (WPS) or the Government Emergency Telecommunications Service (GETS). Notify County public safety partners of the availability of these programs. (SE-6c)
43	Evaluate zoning requirements and explore opportunities to streamline the permitting process for new or modified telecommunication and broadband facilities. Explore the development of guidelines for microtrenching to support broadband deployment without harming infrastructure. (SE-6d)
44	Coordinate with the Economic Development Collaborative's Access Sonoma Broadband initiative to expand and improve wireless broadband services in the county. (SE-6e)
45	Identify and map public roads in the State Responsibility Area that do not meet the standards of the State Fire Safe Regulations. Make the map publicly available on the County's online GIS mapping hub. (SE-7a)
46	Review and evaluate the County's existing defensible space and vegetation management regulations in Sonoma County Code Chapter 13A (Duty to Maintain Defensible Space and Abate Hazardous Vegetation and Combustible Material) to identify amendments to better align the regulations with State legislation and current industry research. (SE-7h)
47	Continue the work of the Resilience Coordination Team, led by the County Administrator's Office, and its corresponding technical advisory committees and/or working groups to coordinate the scope, organization, management, and funding mechanisms of wildfire resilience programs, projects, and initiatives across County departments, agencies, and partners. (SE-7c, SE-7d, SE-7j, SE-9b, SE-9g)

48	Actively seek grant funding for defensible space and vegetation management projects. Coordinate project identification, prioritization, and selection with the County Resilience Coordination Team (Program SE-14.11.1). (SE-7c, SE-7d, SE-7j, SE-9b, SE-9g)
49	Working through the Resilience Coordination Team (Program SE-14.11.1), conduct an assessment of regulatory barriers to vegetation management activities and identify opportunities for streamlining, including the use of the California Vegetation Treatment Program (CalVTP) and Program Environmental Impact Report for eligible projects in the State Responsibility Area. The assessment should recommend updates to Sonoma County Code, plans, or policies to reduce barriers. (SE-7j, SE-7m)
50	Publish on the County's website information, resources, and guidance to assist development applicants with complying with the County's Fire Safe Standards (Sonoma County Code Chapter 13, Article V) and the State Fire Safe Regulations, including instructions on the process for applying for exceptions to standards. (SE-8c)
51	Track Exceptions to Standards with Same Practical Effect Determinations made by the Director and County Fire Marshal pursuant to State Minimum Fire Safe Regulations (Title 14, California Code of Regulations (CCR), Division 1.5, Chapter 7, Subchapter 2) through the publicly available permit information and parcel history available through Permit Sonoma. (SE-8c)
52	Review and update as necessary relevant County Code sections and application submittal checklists to require fire protection plans for all discretionary development projects in High and Very High Fire Hazard Severity Zones in both the Local and State Responsibility Areas. Required plans shall include a site-specific risk analysis and address fire response capabilities, compliance with fire safety requirements including but not limited to defensible space, access and water supply, building materials and site design, emergency preparedness and evacuation plans, property maintenance, and other hazard and risk reduction measures. Risk reduction measures should be incorporated into project design or conditions of approval. (SE-8g)
53	In partnership with Fire Safe Councils, local fire agencies, CAL FIRE, and other community groups and agencies, implement a public information campaign in multiple languages and through multiple forms of media on defensible space, home hardening, and vegetation management. Educational materials should discuss the risk reduction impact, regulatory requirements, and resources available to support property owners and renters on implementing hardening or fuels reduction activities. (SE-7d, SE-9c)
54	Develop fire-safe landscaping guidelines, including native, fire- and drought-resistant plant palettes and defensible space measures. (SE-7d, SE-9c)
55	Explore the feasibility of a pilot program to provide emergency towing services during flood events for travel trailers occupied by tenants renting space in RV or mobile home parks sited in flood hazard areas to reduce damage or loss of housing units. (SE-10b)
56	Secure funding to establish the Countywide Flood Risk Assessment Management Partnership as recommended by the 2024 Countywide Flood Risk Management Assessment Project report. The Partnership, composed of organizations and agencies with flood risk management roles and responsibilities in Sonoma County, should meet quarterly to build relationships across flood risk management functions and jurisdictions, facilitate interorganizational communication, and carry out the recommendations identified in the 2024 Assessment report related to policies and standards; monitoring, modeling, and decision support; stream maintenance; and communication and community engagement. (SE-10c)
57	Develop a systematic approach for conducting proactive technical review on Sonoma County waterways for the purpose of updating the Flood Insurance Rate Maps (FIRMs) through collaboration with the Federal Emergency Management Agency (FEMA). (SE-10c)
58	Secure funding to conduct a flood risk and vulnerability assessment then prepare a flood mitigation and adaptation plan for the Russian River watershed to develop long-term strategies to reduce repetitive flood losses and build flood resilience. The plan should include systematic collection of flood data and damage, community engagement and outreach, and coordination with relevant partner agencies and jurisdictions. The mitigation and adaptation plan should consider strategies such as the acquisition of properties in flood hazard areas; an ongoing flood elevation program; permit fee reductions for structure elevations; floodplain conservation and restoration; updates to policies and

	regulations; and site- or area-specific projects. The planning process should evaluate potential upstream improvements that could expand flood storage capacity and existing regulatory barriers to flood prevention projects. (SE-10c, SE-10d)
59	Update the County website to expand on and integrate existing informational resources to create a comprehensive public information program on flood and inundation hazards, risk reduction resources, and the importance of watershed management. (SE-10f)
60	Secure funding to identify, evaluate, and prioritize conservation projects to implement on County-owned lands to mitigate flooding, drought, and sea level rise. (SE-11a, SE-14c, SE-14g, SE-16g)
61	Review Sonoma County Code Chapter 7B Flood Damage Prevention Ordinance) and Chapter 26 (Zoning), including standards for construction or fill in special flood hazard areas and regulations limiting the reconstruction of non-conforming uses, to identify potential code amendments necessary to support the replacement of damaged or destroyed resident-serving businesses and services in repetitive loss, flood-prone areas to ensure that communities continue to have access to daily resources and services, such as grocery stores. Proposed code amendments should support existing residents and businesses while continuing to implement necessary floodplain management regulations to maintain compliance with the National Flood Insurance Program and provide for adequate retention of floodplain capacity and protection for structures located within special flood hazard areas. (SE-10e, SE-10g, SE-11f)
62	Adopt Appendix A of the California Existing Building Code entitled Guidelines for the Seismic Retrofit of Existing Buildings. (SE-12b)
63	Update the County Code to require geologic hazard assessments or geotechnical reports for new development within or in close proximity to geologic or seismic hazards, including landslide, ground rupture, liquefaction, and ground shaking areas. (SE-12d)
64	Explore the deployment of advanced monitoring technologies to detect early signs of landslides and review existing response protocol. (SE-12i)
65	Using the County's existing inventory of unreinforced masonry buildings, conduct outreach to property owners to gather and confirm data on existing unreinforced buildings. Then apply for grant funding from sources like the California Office of Emergency Services to conduct a seismic retrofit feasibility study, adopt an ordinance requiring the strengthening and/or retrofitting of unreinforced masonry buildings, and fund necessary retrofits for identified structures in the county, prioritizing retrofits to buildings in systemically vulnerable communities. (SE-12c, SE-12p)
66	Maintain existing hazardous materials programs administered by the County's Hazardous Materials Unit acting as the Certified Unified Program Agency (CUPA). Provide program information on the County website. (SE-13b)
67	Update the County website and provide resources to educate residents and businesses about integrated pest management principles and ways to reduce or discontinue the use of pesticides and herbicides on their property. (SE-13c)
68	Develop a maintenance program for all County facilities that specifies the least toxic maintenance methods and materials. (SE-13c)
69	Update the relevant pages of the County's website to include information about common household chemicals or items that can be hazardous, such as electronic cigarettes, and that require safe disposal practices. Include the common examples of household hazardous wastes list generated by the Zero Waste Sonoma, safer alternatives, and information on resources and programs for safe disposal. (SE-13c, SE-13e)
70	Continue to use data from sources like the California Department of Toxic Substances Control to ensure buildings and sites have been adequately remediated prior to development or redevelopment. If there is reason to believe an existing building or site may contain hazardous materials that pose a threat to occupants, require investigation for the presence of hazardous materials or contamination and risk evaluation prior to development. Continue to require remediation and construction techniques as conditions of approval where necessary for adequate protection of construction workers, future occupants, adjacent residents, and the environment from hazards associated with contamination. (SE-13f)

71	Prepare updated sea level rise and coastal hazard assessments and adaptation plans for the Sonoma County outer-coast, San Pablo Bay and Petaluma area shorelines based on the best available science and State guidance, and in compliance with State legislation (Public Resources Code Section 30985) and the directives of the Local Coastal Plan. The assessments and plans shall evaluate vulnerability and identify adaptation strategies, including policy recommendations and potential projects for private development, critical public facilities, infrastructure and land, and natural ecosystems. Coordinate with the City of Petaluma, Coastal Commission, and the San Francisco Bay Conservation and Development Commission on this effort. (SE-14c, SE-14g)
72	In coordination with the local Groundwater Sustainability Agencies, study, monitor, develop, and implement a plan to mitigate the impacts to groundwater from saltwater intrusion resulting from sea level rise and storm events based on the best available science. (SE-14d)
73	Complete an analysis of physical locations and County-owned assets within the County that have the potential to serve as resilience centers, in coordination with community-based organizations that serve systemically vulnerable communities. Identify opportunities to establish new resilience centers or expand the functionality of existing centers. Develop a searchable database, accessible across all county departments, of all County-owned facilities that can function as resilience centers, and update regularly to reflect improvements and retrofit or hardening efforts. (SE-15a)
74	Coordinate with local transit providers to publicize transit options to reach resilience centers during emergency events. (SE-15b)
75	Secure grant funding to work with the community to identify and map existing community facilities that could serve as potential resilience centers in partnership with the County. Document existing conditions, capabilities, and resources of each facility such as air conditioning, heat pumps, air filters, backup power, or emergency supplies. (SE-15d)
76	Update the County Code to establish permitting, design, development, and operation standards for temporary resilience centers on private property. Use community input to inform the Code update. (SE-15e)
77	Use County communication channels to promote methods of safe energy conservation during extreme heat events in alignment with energy providers' messaging. Share information on improvements that are low-cost and low-effort, such as caulking, door sweeps, portable fans, and home window insulation. (SE-15g)
78	Update the County Code to require parking lots for new commercial and industrial uses to incorporate cooling strategies such as landscaping or shade structures. Enforce requirement during application review, providing flexible options for compliance. (SE-15h)
79	Maintain and regularly convene the Sonoma County Drought Task Force, led by the Department of Emergency Management with support from Sonoma Water, in compliance with California Water Code Section 10609.70. The Task Force shall proactively coordinate with public agencies, private agencies, and community organizations that have roles in drought preparedness and response on conditions monitoring, hazard and risk assessments, contingency planning, and water resources management. The Task Force shall monitor drought conditions, weather, and water availability; identify and support the pursuit of State and federal drought resources and funding; and during periods of drought, provide public report outs on drought impacts to agriculture, industry, government, wildlife, tourism, health, and other areas. (SE-10a, SE-10b, SE-10c, SE-10d)
80	Review and evaluate the Sonoma County Code and development design guidelines for opportunities to require or incentivize low impact development, recycle and greywater use, rainwater capture, water-efficient landscaping, and other water conservation measures. Explore the development of pre-approved design details for low impact development or greywater systems to reduce costs to applicants. (SE-16j, SE-16k)
M.1	Periodically review and update as necessary the General Plan to include new information related to climate adaptation and resiliency strategies and geologic and seismic, flooding and inundation, and wildfire hazards, as required by Government Code Section 65302.15. Continue to use data from appropriate agencies and research institutions to inform the Safety Element. Make hazard maps available to the public and maintain and share hazard data across departments and agencies. (SE-9a, SE-10a, SE-12a)

M.2 When updated or new hazard maps that impact land use and development regulations are produced by state or federal agencies, notify property owners that are directly impacted by changes. Hazard maps include but may not be limited to Earthquake Fault Zones mapped by the California Department of Conservation, Fire Hazard Severity Zones mapped by the State Fire Marshal, and Special Flood Hazard Areas mapped by the Federal Emergency Management Agency. (SE-9a, SE-10a, SE-12a

While it is clear in the above table that most of the implementation programs could not have a significant effect on the environment, where it is applicable CEQA review will be conducted before the program action is undertaken. The scope of this Addendum is limited to the programmatic goals and policies of the proposed Safety Element Update, consistent with the GP2020 Program EIR.

3.1.4 Changes to GP2020 Public Safety Element Implementation Plan

The existing Public Safety Element has eleven implementation programs. Ten of these programs were approved when GP2020 was adopted in 2008; Program 11 (Implement Sonoma County Hazard Mitigation Plan) was added in 2014 in the technical update. Program 6 (Unreinforced Masonry Buildings) is carried forward in the Safety Element Update, in a modified form. The current status of each program is shown in Table 4. Where applicable, such as with Programs 8 (Zero Net Fill) and 11 (Local Hazard Mitigation Plan), implementation actions were subject to CEQA review.

Table 4. General Plan 2020 Public Safety Element Implementation Programs and Current Status

GP2020 Public Safety Element Program	Program Description and GP2020 Policy Reference	Status
1. Safety Hazards Information System	Log and maintain records of all mapping and reports regarding geologic and flood hazards information prepared for project applications and by other sources. Use the information in assessing constraints (Policies PS-1a, 1b, 1c, 2a, 2b).	Ongoing and incorporated into 2025 Safety Element Update.
2. Drainage. Erosion & Fire Safety Standards for Subdivisions	Prepare amendments to Chapter 25 of the Sonoma County Code to clarify standards for drainage, erosion control, and fire safety (Policies PS-2n, 2v, 3c).	Grading ordinance adopted 2009. Fire Safe Standards address fire safety.
3. Hazard Materials Incident Response Plan	Maintain the Sonoma County Operational Area Hazardous Materials Incident Response Plan addressing prevention of and response to releases of hazardous materials and the proper disposal of hazardous wastes (Policy PS-4g).	Ongoing; Operational Area Hazardous Materials Incident Response Plan is now called the Hazardous Materials Area Plan.
4. Fire Sprinkler Ordinance	Prepare and adopt an ordinance requiring automatic sprinkler or other on-site fire detection and suppression systems in new residential and commercial structures (Policy PS-3l).	Completed
5. Public Facility Recovery Plan	Develop a strategic plan for recovery of essential public facilities following disasters, particularly earthquakes (Policy PS-1n).	A Continuity of Operations Plan is included in County's Emergency Operations Plan.
6. Unreinforced Masonry Buildings	Prepare and adopt an ordinance requiring strengthening and/or reinforcement of unreinforced masonry buildings, except residential structures, that would consider the cost of the work and the value, frequency of use, and level of occupancy of the buildings (Policy PS-1o).	Carried forward to 2025 Safety Element Update; see Implementation Programs
7. Reduction of Russian River Flood Damage	Develop a comprehensive plan addressing flood losses in the Russian River (Policy PS-2d).	Emergency Management regularly updates the Incident Response Plan. Emergency Management prepared a Russian River Flood Plan in March 2023, which addresses resident warning, life safety,

		and timely evacuation procedures.
8. Zero Net Fill Ordinance	Prepare and adopt an ordinance addressing zero net fill requirements in all areas of the unincorporated County subject to the 100-year FEMA special flood hazard areas (Policy PS-2e).	Completed
9. Reduction of Petaluma River Flood Damage	Cooperatively with the City of Petaluma, initiate a program to identify existing risks and implement regional flood reduction projects within the Petaluma Subbasin (Policy PS-2h).	Ongoing. Sonoma Water working partnership with City of Petaluma.
10. Street Addressing Improvements	Develop a program to improve countywide street addressing in order to reduce emergency response times (Policy PS-3h)	Program developed; implementation ongoing. (See 2025 draft Policy SE-7k)
11. Implement Sonoma County Hazard Mitigation Plan	Implement mitigation measures and actions identified in the Sonoma County Hazard Mitigation Plan to the degree possible based on their priority and available funding. Update the plan and monitor mitigation progress on an ongoing basis as required by law.	Partially completed; ongoing. The County's current Hazard Mitigation Plan was adopted by the Board of Supervisors in 2021.

4 Analysis

4.1 Legal Standards

The GP2020 EIR is a Program EIR, prepared in compliance with CEQA and the CEQA Guidelines. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related, including geographically or in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program. (CEQA Guidelines, § 15168(a).) An agency must examine later activities in the program in light of the Program EIR to determine whether a further CEQA document must be prepared. (Ibid. at subd. (c).) If the agency finds that no subsequent EIR would be required pursuant to CEQA Guidelines Section 15162, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required. (Id. at subds. (c), (c)(2).) Guidelines Section 15168, subd. (c), explains that whether a later activity is within the scope of a program EIR is a factual question for the lead agency, based on substantial evidence in the record. Section 15168 enumerates factors that the lead agency may consider in its determination, including "consistency of the later activity with the type of allowable land use, overall planned density and building intensity, geographic area analyzed for environmental impacts, and covered infrastructure, as described in the program EIR." (Id. at subd. (c)(2).) Feasible mitigation measures developed in the Program EIR must be incorporated into later activities in the program. (Id. at subd. (c)(3).)

Under Public Resources Code Section 21166 and CEQA Guidelines Section 15162, when an EIR has been certified for a project, no subsequent EIR shall be prepared for the project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, that one or more of the following has occurred:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Under Public Resources Code Section 21166 and CEQA Guidelines Section 15162, no subsequent EIR shall be prepared for the project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(4) Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(5) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(6) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR ;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

4.2 Comparison of the Safety Element Update to the conditions listed in CEQA Guidelines Section 15162

The proposed Safety Element Update is a program-level policy document. It does not make any changes in land use, building density and intensity, or cause any other change in the physical environment. It would not directly or indirectly cause population growth, or place additional demands on natural resources, public services, or infrastructure. Future implementation actions under the proposed Safety Element that could have a significant effect on the environment, if any, would be subject to all applicable CEQA review.

For purposes of the analysis in this Addendum, General Plan 2020 and the General Plan 2020 Public Safety Element are the "Original Project" that is proposed to be revised; the proposed Safety Element Update is the "Revised Project."

The discussion below addresses each of the primary conditions set forth in CEQA Guidelines 15162 as they relate to the Safety Element Update.

1. Are substantial changes proposed in GP2020 that will require major revisions to the GP2020 EIR, due to new significant environmental effects or a substantial increase in the severity of previously identified significant effects?

Adoption of the Safety Element Update will not cause new or substantially increased significant environmental effects, beyond those already identified in the GP2020 EIR. The proposed Safety Element carries forward the mitigation measures and mitigating policies in the current Public Safety Element, and adds new policies that either complement the effectiveness of the existing policies, or clearly would cause no effect on the environment. These changes are not "substantial changes" requiring "major revisions" to the GP2020 EIR.

As noted in the background section on the General Plan 2020 EIR, one of the foundations of the EIR's analysis of the environmental effects of project buildout was its assumptions about population growth through 2020. The EIR projected that the population of Sonoma County as a whole would increase from 458,614 in 2000 to 546,030 residents in 2020, and that the unincorporated area population would increase from 128,596 in 2000 to 147,660 residents in 2020.[8]

Sonoma County's population remains well below the population projected by the GP2020 EIR. The annual State Department of Finance (DOF) population estimates for Sonoma County show that Sonoma County's population today remains well below the population projected for 2020 by the GP2020 EIR. In its May 2025 *Population and Housing Estimates for Cities, Counties, and the State*, DOF provisionally

[8] Ibid.

estimated that on January 1, 2025, the countywide population was 482,848 and the unincorporated area population was 130,801.[9]

As discussed above, in the CEQA Findings of Fact adopted for General Plan 2020, the Board of Supervisors addressed each of GP2020's significant and unavoidable impacts, as well as impacts reduced to less than significance through mitigation or by design of the mitigating policies. The Safety Element Update retains each of the GP2020 policies that is discussed as contributing to reducing the significance or severity of an impact pertinent to the Safety Element. The Safety Element Update will not cause new or substantially more severe significant environmental effects, beyond those already identified in the GP2020 EIR.

2. *Have substantial changes occurred in the circumstances under which the project is being undertaken that will require major revisions in General Plan 2020 EIR?*

No substantial changes have occurred in the circumstances under which the project is being undertaken that will require major revisions in the General Plan 2020 EIR. The "project" is General Plan 2020, and General Plan 2020 as amended by the Safety Element Update. The General Plan is a policy-level document that applies countywide. Countywide population remains less than the population that GP2020 EIR projected for General Plan buildout.

3. Has new information of substantial importance to the project, that was not known and could not have been known when the EIR was certified, become available?

There is no new information of substantial importance to the project, that was not known and could not have been known when the EIR was certified. New regulations and new regulatory maps are not "new information" within the meaning of Guidelines Section 15162. (*Olen Props. Corp. v. City of Newport Beach* (2023) 93 Cal. App. 5th 270, 280-81; *Concerned Dublin Citizens v. City of Dublin* (2013) 214 Cal.App.4th 1301, 1318–132.) Information about the impacts of greenhouse gases and climate change are not new information if the issue was known and could have been raised before the original EIR was certified. (See *Citizens for Responsible Equitable Environmental Development v. City of San Diego* (2011) 196 Cal. App. 4th 515 [new information on greenhouse gases and climate change did not trigger Subsequent EIR because issue could have been raised in 1994 when city considered Final EIR]; *Citizens Against Airport Pollution v. City of San Jose* (2014) 227 Cal. App. 4th 788 [impacts of greenhouse gas emissions did not constitute new information].) General Plan 2020, the GP2020 EIR, and the Board's CEQA findings extensively addressed climate change. Similarly, severe wildfire hazards were recognized and addressed in the GP2020 EIR. To establish "new information" as a ground for requiring preparation of a subsequent EIR, the information must be both "of substantial importance" and "not known and could not have been known with the exercise of reasonable diligence at the time GP2020 was certified. (CEQA Guidelines Section, § 15162(a); *Citizens for a Megaplex-Free Alameda v. City of Alameda* (2007) 149 Cal. App. 4th 91, 113.)

The revised and new policies and programs in the Safety Element Update would not result in changes to the physical environment or approval of any development project.

[9] State of California, Department of Finance, *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2024 and 2025*. Sacramento, California, May 2025.

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5 Conclusion

No substantial changes are proposed in the project (again, defined as the existing General Plan and Public Safety Element), and there are no substantial changes in the circumstances under which the updated project will be undertaken, that will require major revisions to the GP2020 EIR due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. There is no "new information of substantial importance," as provided in CEQA Guidelines Section 15162(a)(3). The Safety Element Update is a programmatic document that will not result in any direct or indirect physical change in the environment. Therefore, based on all the information in this Addendum and incorporated by reference in this Addendum, the County of Sonoma has determined that the GP2020 EIR is adequate for adoption of the Safety Element Update, and no subsequent or supplemental CEQA review is necessary or appropriate. The Addendum documents the County's basis for this determination, pursuant to Guidelines Sections 15162 and 15164. No additional CEQA documentation is required.

6 Documents incorporated by reference

The GP2020 Final EIR evaluated impacts associated with General Plan 2020, including cumulative impacts associated with future development occurring under the General Plan. The Final EIR is made up of three volumes: Vol. 1 (Introduction to Comments and Responses; List of Agencies/Persons Commenting; Comment letters), Volume 2 (Master Responses and Responses to Comments); and Volume 3 (Draft EIR), plus technical appendices. General Plan 2020 was adopted by Board of Supervisors Resolution No. 08-0808, and the Final EIR for GP2020 was certified by the Board via Resolution No. 08-0807. General Plan 2020 The Public Safety Element was updated in 2014, via Board of Supervisors Resolution No. 14-0355, and amended in 2018, via Board of Supervisors Res. No. 18-0535. All of the documents referenced in this paragraph are incorporated into this Addendum by reference, including any attachments, exhibits, technical reports and appendices, and documents incorporated by reference, consistent with CEQA Guidelines Section 15150. The incorporated documents are hyperlinked in References, below.

7 References

Final EIR for Sonoma County General Plan 2020, Volume 1 (Introduction to Comments and Responses; List of Persons and Agencies Commenting; Comment Letters)

Final EIR for Sonoma County General Plan 2020, Volume 2 (Master Responses; Responses to Comments)

Draft EIR for Sonoma County General Plan 2020 (Vol. 3 of Final EIR Sonoma County General Plan 2020)

Sonoma County General Plan 2020

Sonoma County General Plan 2020 Public Safety Element (as updated 2014)

Board of Supervisors Resolution No. 08-0807 (September 23, 2008), certifying the Final EIR for General Plan 2020

Board of Supervisors Resolution No. 08-0808 (September 23, 2008), adopting General Plan 2020 and making the findings required by CEQA

Board of Supervisors Resolution No. 14-0355 (September 9, 2014), amending General Plan 2020 to adopt a technical update to the Public Safety Element and finding the update within the scope of the GP2020 EIR

Board of Supervisors Resolution No. 18-0535 (December 11, 2018), amendment to GP2020 Public Safety Element adding new Policy PS-1p, modifying local geologic report requirements for reconstruction of single-family homes located in the Alquist-Priolo Earthquake Fault Zone and destroyed in the 2017 Sonoma Complex Fires.

State of California, Department of Finance, E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2024 and 2025. Sacramento, California, May 2025.