City of Rohnert Park
Planning Commission Report

DATE: November 1, 2017

ITEM NO: 8.1

AGENDA TITLE: PLMC16-0001 Local Hazard Mitigation Plan (LHMP)

APPLICANT: City of Rohnert Park

REQUESTED ACTION

Staff is requesting review and input on this draft Local Hazard Mitigation Plan (LHMP) from the Rohnert Park Planning Commission. The project to prepare a new LHMP began in Fall 2016. The completed draft of the LHMP is planned to go to City Council for approval on November 28, 2017, to be followed by submission to FEMA and the California Office of Emergency Services (Cal OES).

SUMMARY

Rohnert Park is nearing the completion of the process of developing a new LHMP in accordance with relevant federal and state laws. The 2011 Association of Bay Area Governments Regional Hazard Mitigation Plan expired as of March 2016. This expiration includes all LHMP Annexes (the various local jurisdictions' plan supplements), of which Rohnert Park's was one. The template used in the 2011 Annex did not meet minimum qualifications for FEMA approval, and could not be used going forward. While portions of the expired 2011 Annex were of value, the planning process has resulted in an entirely new LHMP for the City. The newly written LHMP may also serve as the basis for a new Safety Element in future General Plan updates.

Other cities in the Bay Area are in various stages of developing and approving their own LHMPs. Recently approved plans that the Rohnert Park has looked to for guidance in preparing and writing its plan include both Windsor's and Santa Rosa's.

BACKGROUND

The term "Hazard" is defined by FEMA as "any event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural losses, damage to the environment, interruption of business, or other types of harm or loss. Hazard Mitigation is defined as "any sustained action taken to reduce or eliminate long term risk to human life and property from natural, human-caused, and technological hazards and their effects."

A hazard mitigation plan **should not be confused with emergency response or preparedness plans** that are focused on being ready and responding when a hazard or disaster event occurs and may include such actions as providing emergency response, equipment, food, shelter, and medicine. However, hazard mitigation and emergency preparedness go hand-in-hand and are part of the City's multi-pronged approach to minimizing personal injury and property damage from Hazards in the residential and commercial areas. It compliments other planning documents and regulatory authorities governing pre-disaster land use planning and post-disaster response and recovery.

Individual components of the LHMP provide information and resources to assist citizens and city staff in comprehending the potential hazard related issues facing the City of Rohnert Park. The structure of the LHMP is intended to enable users to quickly and easily access and understand each section as necessary. The structure also allows the City of Rohnert Park to assess and update sections with new and additional data as it becomes available. This is designed to increase the ease of the updating process – resulting in a more practical and relevant plan.

Planning and Outreach Process

Meetings and events were held on the following dates:

- October 5, 2016 – Team Meeting: *discussed LHMP process and team member roles; began preparation of the public involvement campaign.*
- October 20, 2016 – Team Meeting: *reintroduced project with more team members, refined plan for public engagement*
- November 2, 2016 – Community Open House and Presentation: *open house focused on emergency preparedness followed by presentation and Q&A session about the LHMP.*
- November 10, 2016 – Planning Commission: *provided update to planning commissioners on project and solicited their ideas and feedback*
- November 16, 2016 – Team Meeting: *recap of activities and steps to date, mapping refinement, risk assessment and critical facilities inventory*
- December 9, 2016 – Team Meeting: *mapping updates and mitigation goal setting exercise*
- January 10, 2017 – Team Meeting: *discussed further mitigation goals and activities, discussed critical facilities and vulnerabilities*
- January 31, 2017 – Team Meeting: *draft mitigation measures and activities*
- August 31, 2017 – Team Meeting: *update on draft and current status of tasks, preliminary discussions regarding further outreach*
- September 14, 2017 – Team Meeting: *review draft and updated completion timeline, refine plans for public outreach*
- September 20, 2017 – Community Open House and Presentation: *present draft to public during open house*
- TBD, 2017 – Presentation to Sonoma County Area LHMP Task Force
- November 1, 2017 – Planning Commission
- November 28, 2017 – City Council

On September 20, 2017, the City made available the public review draft of the Rohnert Park LHMP. The completed draft was released to the general public for review and comment for a

period of more than 30 days. Letters were sent to relevant stakeholders letting them know that the draft was available and directing them to an electronic copy for their review and comment. Physical copies of the document were placed at the public counter in Development Services, the Department of Public Safety, and with the City Clerk.

On the same day, the City held a community meeting to present the general outcomes of the planning process, to discuss mitigation goals and activities, to solicit additional feedback from members of the public, and to describe the next steps in the plan approval and adoption process.

THE PLAN

The City of Rohnert Park established LHMP mitigation priorities and goals as a component of the planning process in order to guide the development of a thorough plan. The goals were developed by the planning team and drawn from the previous LHMP and the City's General Plan. The mitigation goals and priorities for the LHMP are:

1. Implement the LHMP to increase Rohnert Park's level of preparation for potential disasters and to minimize the impacts associated with natural and man-made hazards.
2. Identify strategies and tools to facilitate community disaster and hazards awareness and education.
3. Provide for the safety of Rohnert Park citizens by maintaining efficient, well-trained, and adequately equipped City personnel.
4. Encourage a disaster-resistant City and surrounding area by reducing the potential for loss of life, property damage, and environmental degradation from disasters and hazards.
5. Reduce the vulnerability of public and private facilities and infrastructure to the effects of earthquakes, flooding, and drought.
6. Promote conditions and strategies that will accelerate the capacity for physical and economic recovery from disasters and hazards.

The City's hazard mitigation goals are intended to develop effective policy choices that protect community members, property, infrastructure, and natural resources from hazards. These goals shape the mitigation actions taken by the City and the community to reduce the risks from natural disasters, and act as a checkpoint that City departments can use to check on the progress of mitigation actions and implementation.

Hazards and Associated Mitigation Activities

FEMA guidance recommends that the Planning Team prioritize hazards using four individual criteria. The four criteria are as follows:

- Probability: the likelihood of the hazard occurring in the future in the community
- Location: the size of the affected area in the community if the hazard occurs
- Maximum probable extent: the severity of the direct damage to the community from the hazard
- Secondary impacts: the severity of indirect damages to the community from the hazard (e.g., the loss of water service a s a consequence of damage to infrastructure)

After going through this process (and subsequent reevaluation to account for the October 2017 fire event) the resultant priority hazards for the City are:

- Earthquake – Shaking (High)
- Drought (High)

- Wildfire/Wildland Urban Interface Fire (Medium)
- Flood (Medium)

Other secondary hazards deemed to be a lower risk to the City include: dam failure, fault rupture, hazardous materials, landslide, and liquefaction. After identifying the hazards and the risks from all of these hazards, the LHMP Team worked to identify the vulnerability of critical infrastructure, community facilities, and the population at large from these hazards. Subsequent to this, the next step was to develop mitigation activities to take to reduce or eliminate the long term risks associated with the identified hazards.

In assessing possible mitigation activities, the following factors were considered by the LHMP Planning Team:

- The frequency and severity of individual hazard types, and the vulnerability of the community to these hazards
- The impacts reduced or avoided by the action
- The amount of benefits provided by the action
- The critical facilities benefited by the action, including the number of facilities and their importance
- The environmental benefits of the action

Mitigation activities are discussed in more detail in the plan, but are short, medium, and long term activities that would address and mitigate the threat from the identified hazards. Such actions include further studies, retrofitting buildings, taking steps to limit the impacts of drought, public outreach and education, investments in equipment and facility upgrades, and common sense policy changes to develop and grow the City in a 'smarter' fashion.

As required by the Disaster Mitigation Act of 2000, the City will update this plan at least once every five years, by exercising the LHMP Team. The City Council is the primary group responsible for adopting and updating the plan. Re-adoption should occur every five years. After the LHMP has been adopted by the City Council, the Rohnert Park Department of Development Services will be responsible for transmitting the adopted version to Cal OES and FEMA for their final approval and records.

October 2017 Fire Event

During the night of October 8-9, multiple offshore wind driven fires ignited across Napa and Sonoma Counties. While no official cause has been determined at the time of this writing, sparks from electrical lines in strong winds are considered the likely cause. Sonoma County experienced the wettest winter on record in 2016-2017 (driving vegetation growth), and one of the hottest summer on record in 2017 (drying out the same vegetation). These factors combined to create conditions favorable for rapid fire growth. The City of Santa Rosa to the north experienced significant devastation and loss of life in the Tubbs Fire due to the sudden and overwhelming nature of the event. An offshoot of the Nuns/Adobe fires, centered in and around Sonoma Valley, headed east over the hills, generally staying south of Crane Canyon Road during the early hours of Monday October 9.

After a more thorough analysis of this fire event by Sonoma County, Cal OES, FEMA, and the City of Rohnert Park, additional modifications and additions to this LHMP as pertaining to wildfire hazard mitigation will be conducted.

RECOMMENDED ACTION

No formal action is needed at this time beyond review and comment on the LHMP.

Attachments

1. Public Review Draft: City of Rohnert Park – 2017 Local Hazard Mitigation Plan

APPROVALS:

Zach Tusinger, Planner II — Date: 10/27/2017

Jeffrey Beiswenger, Planning Manager — Date: 10/27/2017

City of Rohnert Park - 2017 Local Hazard Mitigation Plan

REVIEW DRAFT

CITY OF ROHNERT PARK | 130 AVRAM AVE, ROHNERT PARK, CA 94928

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INTRODUCTION

Purpose

No one is free of natural hazards which may vary across landscapes and time. With Natural hazards comes disasters that can cause loss of life, and damage to our built environment resulting in depletion of the community's economic, social, and environmental well-being. Resiliency and adaptation is crucial, because a community must have sustained ability to use available resources to respond to, withstand and recover from adverse situations. It is the responsibility of the City to protect the health, safety, and welfare of our residents. This LHMP sets in stone the community's emergency management activities that address preparedness, response, recovery and mitigation.

The City of Rohnert Park Local Hazard Mitigation Plan:

- Meets the requirements of federal assistance grant programs, including FEMA's Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PMD) funding.
- Works in conjunction with other plans, including the City's General Plan and the City's Emergency Management Plan.
- Establishes a basis for coordination and collaboration among community entities such as private and public agencies, key stakeholders, and residents to provide for the fullest amount of transparency.
- Identifies and prioritizes future mitigation projects.

The term "Hazard" is defined by FEMA as "any event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural losses, damage to the environment, interruption of business, or other types of harm or loss. Hazard Mitigation is defined as "any sustained action taken to reduce or eliminate long term risk to human life and property from natural, human-caused, and technological hazards and their effects."

A hazard mitigation plan **should not be confused with emergency response or preparedness plans** that are focused on being ready and responding when a hazard or disaster event occurs and may include such actions as providing emergency response, equipment, food, shelter, and medicine. However, hazard mitigation and emergency preparedness go hand-in-hand and are part of the City's multi-pronged approach to minimizing personal injury and property damage from Hazards in the residential and commercial areas. It compliments other planning documents and regulatory authorities governing pre-disaster land use planning and post-disaster response and recovery.

Compliance

FEMA Regulations

The Federal Emergency Management Agency's (FEMA) mission:

> *"to support our citizens and first responders to ensure that as a nation we work together to build, sustain and improve our capability to prepare for, protect against, respond to, recover from and mitigate all hazards."*

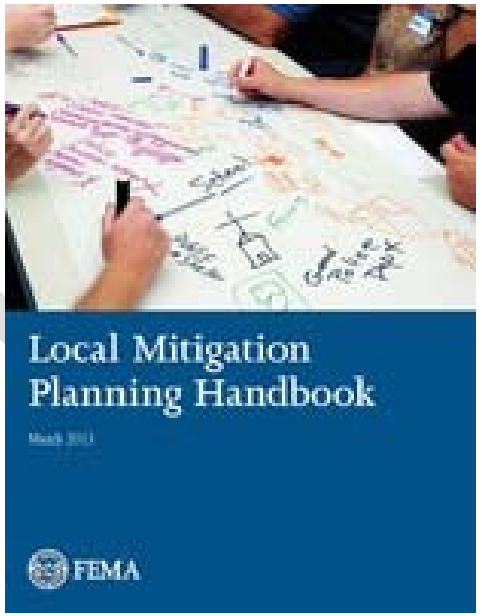

Figure 1.1: LHMP Handbook

Hazard mitigation planning is directed by the Robert T. Stafford Disaster and Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 amended the Stafford Act to require state, local, and tribal governments to develop and submit to FEMA a mitigation plan that outlines processes for identifying the natural hazards, risks, and vulnerabilities of the jurisdiction. Plan approval by FEMA is a prerequisite to receiving federal hazard mitigation grant funds (see 42 USC Section 5165(a)).

To implement the mitigation planning requirements of the Stafford Act, FEMA promulgated 44 Code of Federal Regulations (CFR) Part 201, the federal regulations governing the planning process, plan content, and the process for obtaining approval of the plan from FEMA. The planning requirements set forth in the CFR, including plan revision requirements, are identified through the FEMA Regulation Checklist in the Local Mitigation Plan Review Tool. Local Mitigation Plans must be updated once every five years in order to continue to be eligible for FEMA hazard mitigation project grant funding. Specifically, 44 CFR 201.6(d)(3) reads:

> *A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within (5) years in order to be eligible for mitigation project grand funding.*

For FEMA approval, all Elements including sub-element must be met with current information. The Rohnert Park Local Hazard Mitigation Plan (LHMP) complies with the DMA 2000, Federal Register 44 CFR Parts 201 and 206, Section 322, Mitigation Planning. This law, as of November 1, 2004, requires local governments to develop and submit hazard mitigation plans as a condition of receiving Hazard Mitigation Grant Program (HMGP) and other mitigation project grants.

State of California

In addition to the requirements listed above, the State of California has also enacted revisions to California Government Code Sections 8685.9 and 65302.6 (commonly known as Assembly Bill [AB] 2140 [Chaptered 2006]) which addresses the requirements to have a local hazard mitigation plan. Excerpts of these government code sections are included below.

California Government Code Section 8685.9:

Notwithstanding any other provision of law, including Section 8686, for any eligible project, the state share shall not exceed 75 percent of total state eligible costs unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan in accordance with the federal Disaster Mitigation Act of 2000 (P.L. 106-390) as part of the safety element of its general plan adopted pursuant to subdivision (g) of Section 65302. In that situation, the legislature may provide for a state share of local costs that exceeds 75 percent of total state eligible costs.

California Government Code Section 65302.6:

(a) A city, county, or a city and county may adopt with its safety element pursuant to subdivision (g) of Section 65302 a local hazard mitigation plan (HMP) specified in the federal Disaster Mitigation Act of 2000 (Public Law 106-390). The hazard mitigation plan shall include all of the following elements called for in the federal act requirements:

(1) An initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical governmental functions.

(2) An inventory of private facilities that are potentially hazardous, including, but not limited to, multiunit, soft story, concrete tilt-up, and concrete frame buildings.

(3) A plan to reduce the potential risk from private and governmental facilities in the event of a disaster.

(b) Local jurisdictions that have not adopted a local hazard mitigation plan shall be given preference by the Office of Emergency Services in recommending actions to be funded from the Pre-Disaster Mitigation Program, the Hazard Mitigation Grant Program, and the Flood Mitigation Assistance Program to assist the local jurisdiction in developing and adopting a local hazard mitigation plan, subject to available funding from the Federal Emergency Management Agency.

This LHMP includes the information required by California Government Code Sections 8685.9 and 65302.6.

Plan Use

Individual components of the LHMP provide information and resources to assist citizens and city staff in comprehending the potential hazard related issues facing the City of Rohnert Park. The structure of the plan is intended to enable users to quickly and easily access and understand each section as necessary. The structure allows the City of Rohnert Park to assess and update sections with new and additional data as it becomes available. This is designed to increase the ease of the updating process – resulting in a more practical and relevant plan.

Mitigation Goals and Priorities

The City of Rohnert Park established LHMP mitigation priorities and goals as a component of the planning process in order to guide the development of a thorough plan. The goals were developed by the planning team and drawn from the previous LHMP and the City's General Plan. The mitigation goals and priorities for the LHMP are:

Figure 1.2: Mitigation Cycle

1. Implement the Local Hazard Mitigation Plan to increase Rohnert Park's level of preparation for potential disasters and to minimize the impacts associated with natural and man-made hazards.

2. Identify strategies and tools to facilitate community disaster and hazards awareness and education.

3. Provide for the safety of Rohnert Park citizens by maintaining efficient, well-trained, and adequately equipped City personnel.

4. Encourage a disaster-resistant City and surrounding area by reducing the potential for loss of life, property damage, and environmental degradation from disasters and hazards.

5. Reduce the vulnerability of public and private facilities and infrastructure to the effects of earthquakes, flooding, and drought.

6. Promote conditions and strategies that will accelerate the capacity for physical and economic recovery from disasters and hazards.

PLANNING PROCESS

The Rohnert Park LHMP Planning process was defined from the get-go by the community and its needs. Bringing together local officials, stakeholders and the public in a community□driven planning process to develop the plan also helps build the community's overall hazard mitigation program. The LHMP is the written record, or documentation, of the planning process. This is why some of the plan requirements ask for a "discussion" or "description" of generally, what must be documented in the plan, rather than specify exactly how it must be done. Element A dictates the requirements for what should be included in the Planning Process.

FEMA Element A: Planning Process

- ***A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? 44 CFR 201.6(c)(1)***
- ***A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? 44 CFR 201.6(b)(2)***
- ***A3. Does the Plan document how the public was involved in the planning process during the drafting stage? 44 CFR 201.6(b)(1) and 201.6(c)(1)***
- ***A4. Does the Plan document the review and incorporation of existing plans, studies, reports, and technical information? 44 CFR 201.6(b)(3)***
- ***A5. Is there discussion on how the community(ies) will continue public participation in the plan maintenance process? 44 CFR 201.6(c)(4)(iii)***
- ***A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? 44 CFR 201.6(c)(4)(i)***

Scoping and Kick-Off

Planning for the City of Rohnert Park's Local Hazard Mitigation Plan can be traced back to the Summer of 2016 when the City became aware that the 2010 Association of Bay Area Governments and accompanying Rohnert Park specific annex had expired. A review of available literature including FEMA and State guides was commenced. The team initially assembled in late September with an official initial kick-off meeting held on October 5, 2016. The team was primarily composed of City staff, specifically members of the Development Services Department. Additional team members from the Administrative Unit, Public Works, and Public Safety were also included. An ambitious scope of work was developed. While the general outline of the scope was followed in the preparation and completion of the plan, the overall timeline did get extended.

Schedule and Process

Meetings and events were held on the following dates:

- October 5, 2016 – Team Meeting: *discussed LHMP process and team member roles; began preparation of the public involvement campaign.*
- October 20, 2016 – Team Meeting: *reintroduced project with more team members, refined plan for public engagement*
- November 2, 2016 – Community Open House and Presentation: *open house focused on emergency preparedness followed by presentation and Q&A session about the LHMP.*
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Figure 1.3: November 2016 Community Open House

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Team Members

The planning team for the LHMP was made of various city staff members representing a cross-section of relevant departments within the City of Rohnert Park. Team members brought a variety of strengths and backgrounds to the group.

- Mary Grace Pawson, Director of Development Services – Provided overall guidance and supervision for the team and project.
- Jeff Beiswenger, Planning Manager, Development Services – Served as the primary point person in terms of Planning Documents.
- Zach Tusinger, Planner II, Development Services – Overall project manager, responsible for coordination, plan assembly, and drafting.
- Jay Bradford, Building Official, Development Services – Technical advisor regarding building standards and assessment of city facilities.
- Caitlin Saldanha, Deputy City Clerk – Administration liaison. Responsible for community outreach coordination.
- Marc Bautista, Environmental Coordinator (until March 2017) – Contributed information regarding flooding and infrastructure.
- Nick Bennett, Environmental Coordinator (from August 2017) – Provided supplemental information regarding flooding.
- Jim Thompson, Fire Marshal – Served as Public Safety liaison and provided technical expertise regarding preparedness and hazards.
- Jahfer Aguirre, GIS Analyst – Synthesized data and prepared maps and exhibits for outreach events, analysis, and the plan itself.
- Bonnie Betts, Planning Intern, Development Services – Created the plan template, and contributed to plan and appendices preparation.

Figure 1.4: Rohnert Park City Hall

Public Outreach and Stakeholder Involvement Opportunities

Multiple opportunities for public participation and stakeholder input were offered throughout the planning, drafting, and approval processes. The planning team held an event at the Rohnert Park-Cotati Library on the evening of November 2, 2016. This was an opportunity for the team to present some of its initial findings and ideas (as well as draft components of the plan – primarily maps) to citizens and other interested stakeholders. The team felt like this was a great opportunity to invite other relevant departments and agencies to be available with information and materials.

Figure 1.5: Community Meeting Flyer

The first thirty minutes of the event were geared as an open house with various booths, many focused on safety, emergency preparedness, and resiliency. Booths were run by Sonoma-Marin Area Rapid Transit (SMART), The Fire & Emergency Services Department of Sonoma County -- Sonoma County Alerts (SoCo Alerts), the Rohnert Park Pet Shelter, the American Red Cross, The Rohnert Park Department of Public Safety, and The Rohnert Park Department of Public Works (to share information about their sandbagging program) . The remaining hour of the event was reserved for a presentation by the planning team as well as a question and answer session, were community members provided initial feedback and reactions to the planning process. A copy of the PowerPoint, advertising materials, and handout are included in **Appendix A**. Much time was spent at the meeting discussing the differences between emergency preparedness and response, and mitigation

Figure 1.6: Resiliency Concept

Earthquakes were a primary concern of the residents who attended. The memory of the 2014 Napa earthquake was still fresh in everyone's minds, and while there was not any significant damage in Rohnert Park from that earthquake, the shaking was felt within the City.

Public Review Draft

On September 20, 2017, the City of Rohnert Park made available the public review draft of the Rohnert Park LHMP. The completed draft was released to the general public for review and comment for a period of more than 30 days. Letters were sent to relevant stakeholders letting them know that the draft was available and directing them to an electronic copy for their review and comment. Physical copies of the document were placed at the public counter in Development Services, with the Department of Public Safety, and with the City Clerk.

On the same day, the City held a community meeting to present the general outcomes of the planning process, to discuss mitigation goals and activities, to solicit additional feedback from members of the public, and to describe the next steps in the plan approval and adoption process.

Review of Existing Plans and Technical Information

Taming Natural Hazards – Association of Bay Area Governments (ABAG) Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area 2010

City of Rohnert Park - Annex to 2010 ABAG Plan

City of Rohnert Park Emergency Management Plan 2012

City of Rohnert Park General Plan 2020, 8th Edition

Sonoma County Hazard Mitigation Plan 2016

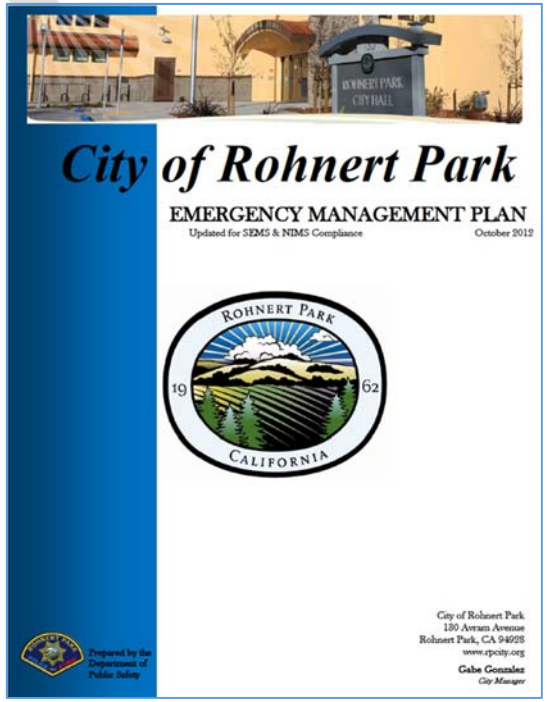

Figure 1.7: Emergency Management Plan

PHYSICAL SETTING & COMMUNITY PROFILE

Physical Setting

Rohnert Park is located in central Sonoma County along US 101. It is the county's third largest city. The Pacific Ocean to the west with its cool marine air, and the warm Sonoma Valley to the east combine to create a mild climate. Rohnert Park lies within the Cotati Valley, with coastal hills to the west and the Sonoma Mountains to the east. Sonoma State University sits just outside Rohnert Park's eastern boundary. Rohnert Park is comprised of approximately 6.9 square miles and with an elevation of 105 feet above sea level. The City has a population of about 40,971 people, based on 2010 census information. Rohnert Park was founded as a master-planned community on the former site of the Rohnert Park Seed Farm. Thoughtfully designed for families, bikeways, and walkways connect its tree-lined boulevards. Several creeks run into the city from the eastern ridgeline. The city is surrounded by farms and grazing land.

Figure 2.1: Rohnert Park Location

Rohnert Park is located in the Santa Rosa-Petaluma Valley where the underlying geologic structure is characterized by sediments deposited by streams on floodplains, alluvial deposits, and basins. Overall, general geologic conditions, slopes, and soils do not vary significantly from one part of the city to another.

Figure 2.2: Rohnert Park US 101 Sign

There are no known active faults within Rohnert Park. The Healdsburg-Rodgers Creek fault zone lies approximately 5 miles to the east of the city. The San Andreas Fault System is located approximately 15 miles west of the city. Secondary seismic hazards that could affect Rohnert Park include ground-shaking, liquefaction, and ground settlement.

Elevations range between 230 feet above mean sea level northeast of the city to 90 feet above mean sea level on the western boundary of the city. Given the relatively flat topography and the nature of soils, there is little risk of mudslides, landslides, or erosion in the immediate Rohnert Park area. Soil liquefaction has the potential to impact the Rohnert Park area during a seismic event. Soils underlying almost the entire area within the city exhibit moderate susceptibility to liquefaction (City of Rohnert Park Emergency Management Plan 2012).

Community Profile

When gathering data regarding the community profile of Rohnert Park, staff looked towards the *2016 Rohnert Park Local Economic Profile.* This document was published by The Sonoma County Economic Development Board (EDB), in partnership with the Sonoma County Workforce Investment Board (WIB), the City of Rohnert Park, and the Rohnert Park Chamber of Commerce. This document offers projections through 2020 that is useful when looking at economic, and social trends.

Historical Context

Beginning in the fall of 1954 a plan for a new town north of Cotati in Sonoma County was beginning to emerge. The core of the plan was the "Neighborhood Unit" concept. The plan was a modification of Pennsylvania's Levittown. It provided that each neighborhood would consist of 200-250 homes centered on a 10-acre school site and 5 -acre pool-park site. No child would have to walk more than 1/3 of a mile to school; the school would be the nucleus of a cohesive community. The commercial and industrial development would be large enough and diverse enough to support the entire community. Eight such subdivisions would constitute a city of 30,000 people. With planned pools, parks, and service the city would be a "country club for the working class".

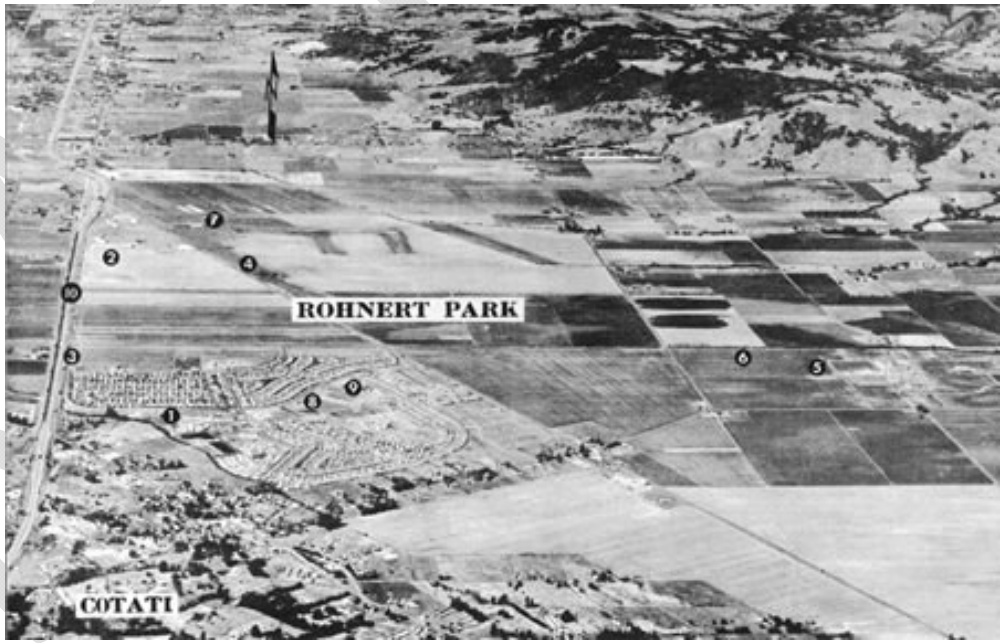

Figure 2.3: Rohnert Park Aerial Circa 1960s.

On August 28, 1962, Rohnert Park was officially incorporated: 1,325 acres, housing an estimated 2,775 persons. It was the fourth largest city in Sonoma County and the first town to incorporate since 1905.

Since 1962, Rohnert Park has grown incrementally into a town of over 40,000 people across numerous neighborhood sections (see Figure 2.4). Today, Rohnert Park is also the home for Sonoma State University, and is the gateway for Graton Resort & Casino.

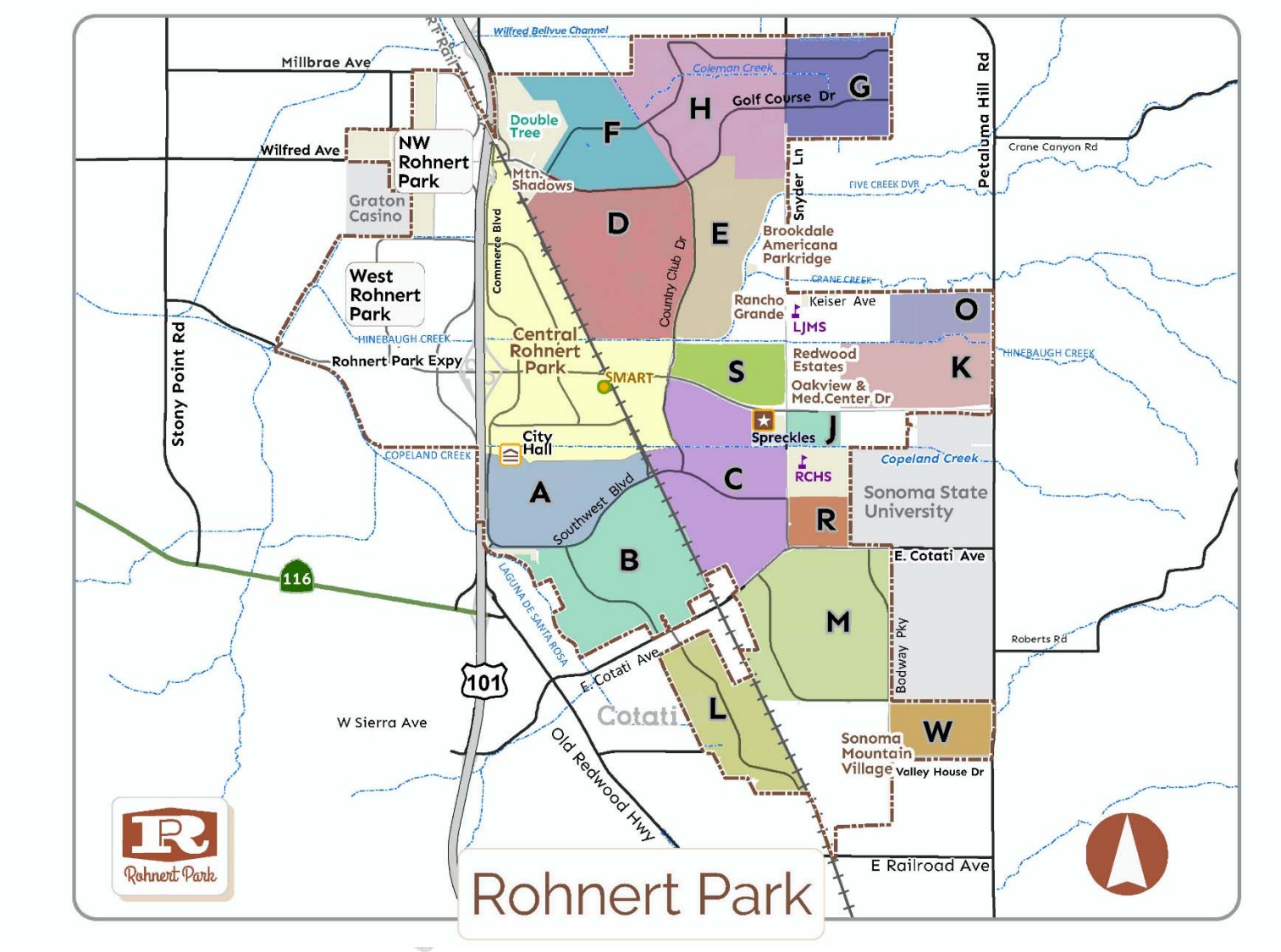

Figure 2.4: Rohnert Park Neighborhood Section Map

Existing Land Use and General Plan

Existing land use information was taken from the Rohnert Park General Plan. Specific Details came from the Land Use Element, Specific Plans, and the adopted Zoning Map. The documents used to implement the General Plan are the zoning code inclusive of the various specific plans and

The Rohnert Park General Plan is a document required by State law and adopted by the City Council that is a comprehensive, long-term plan for the physical development and growth of the city. It is the city's "constitution" for development; the framework within which decisions on how to grow, provide public services and facilities and protect and enhance the environment are made.

The land use framework of the General Plan is embodied in the General Plan Diagram, a graphic representation of the themes and policies in the Plan. The General Plan Diagram designates the proposed general location, distribution, and extent of land use throughout the City.

The Planning Division is responsible for regularly updating the City's General Plan Housing Element. The purpose of the Housing Element is to make adequate provisions for the existing and projected housing needs of all economic segments of the community and to determine how the city will meet its fair share of regional housing needs. The California Department of Housing and Community Development has found that the most recent update, adopted by the City Council in November of 2014, is in full compliance with State Housing Element Law.

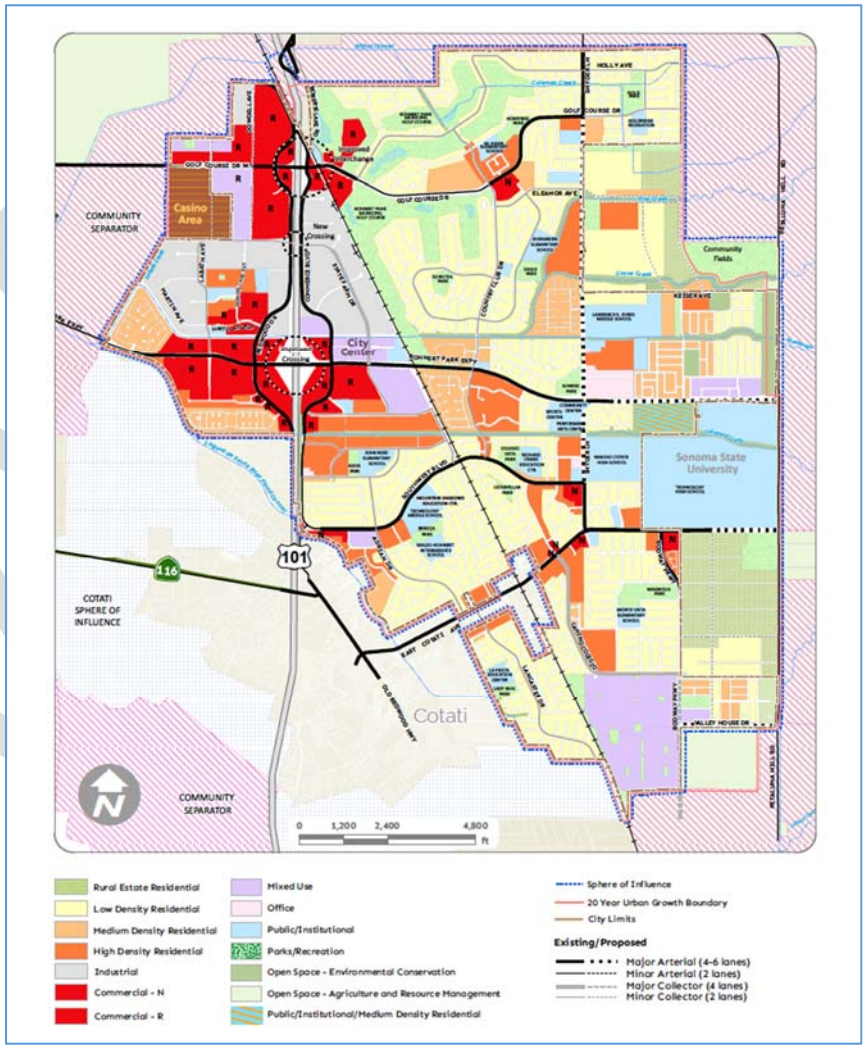

Figure 2.5: Rohnert Park General Plan Map

Specific Plan and Other Areas

Specific Plans

A Specific Plan is a tool for the systematic implementation of the General Plan. It effectively establishes a link between implementing policies of the General plan and the individual development proposals in a defined area. A Specific Plan may be as general as setting forth broad policy concepts, or as detailed as providing direction to every facet of development from the type, location and intensity of uses to the design and capacity of infrastructure, from the resources used to finance public improvements to the design guidelines of a subdivision.

Planned Development

The Planned Development (P-D) zoning district is intended to accommodate a wide range of residential, commercial and industrial land uses, which are mutually-supportive and compatible with existing and proposed development on surrounding properties. P-D zoning districts shall encourage the use of flexible development standards designed to appropriately integrate a project into its natural and/or man-made setting and shall typically be intended for projects that provide for a mix of land uses to serve identified community needs. Furthermore, the P-D zoning process may be used to implement the various specific plans adopted by the city. Once established, the P-D zoning district becomes, in effect the zoning for the area within its respective boundaries.

Priority Development Area Plan

Priority Development Areas, known as PDAs, are areas within existing communities that city or county governments have identified and approved for future growth. PDAs are accessible by one or more transit services and are often located near established job centers and shopping districts.

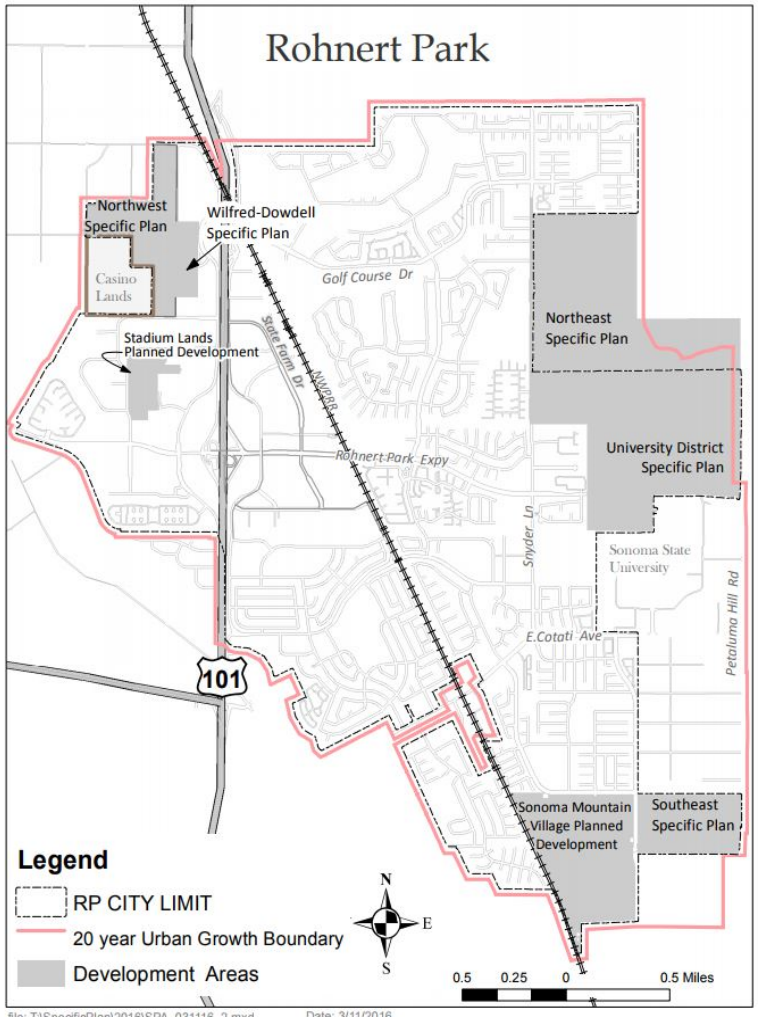

Figure 2.6: Rohnert Park Development Areas

Downtown Development Trends – Priority Development Area Plan

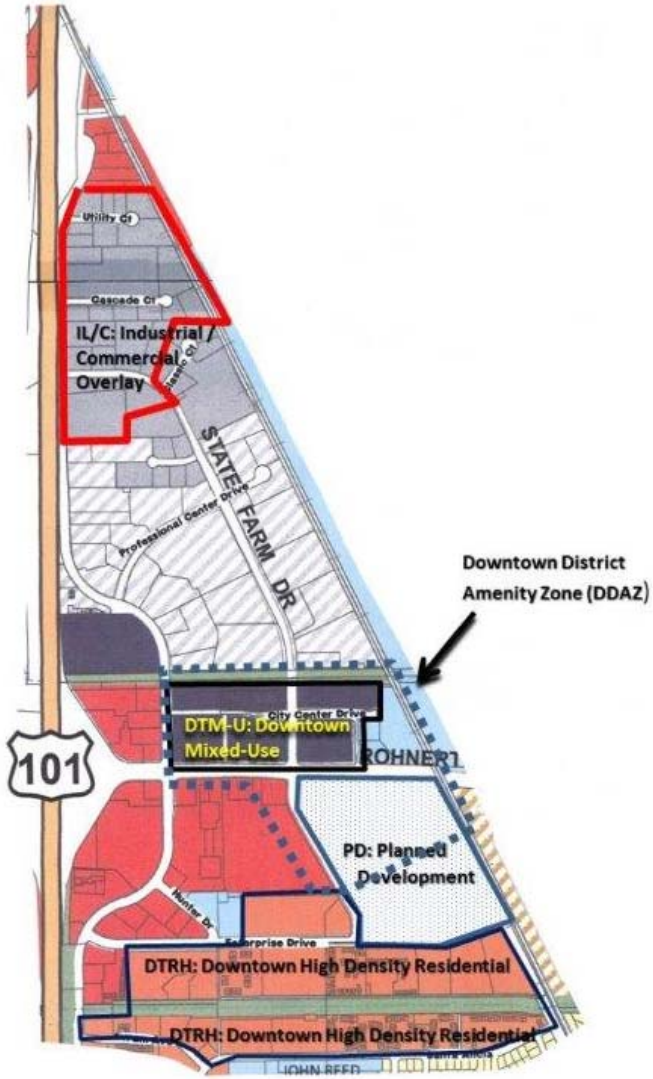

Figure 2.7: Central Rohnert Park PDA

Figure 2.8: New Construction

Creating a Vision for Central Rohnert Park, in March 2016, the City Council adopted the Central Rohnert Park, **Priority Development Area Plan**, along with related General Plan and Zoning Ordinance Updates. The plan covers an approximately 330-acre developed area of the city, roughly centered along Rohnert Park Expressway and State Farm Drive. The plan features the creation of a new Downtown District – approximately 50 acres in size, to create a hub of activity within Central Rohnert Park. The downtown is envisioned to include a vibrant mix retail, office and residential uses, centered at the intersection of Rohnert Park Expressway and State Farm Drive. A key destination in downtown will be the new train platform for the SMART train, which recently completed testing and has entered full revenue service.

In addition to the new Downtown, the Central Priority Development Area Plan will help incentive the construction of the following development over the next 20 or so years: over 800 residential units (concentrated within the one-half mile radius of the SMART rail station); up to 450,000 square feet of retail and services; up to 200,000 square feet of new office facilities; up to 60,000 square feet of public buildings; up to 130,000 square feet of light industrial uses; and 8.5 acres of public parks and a comprehensive network of bicycle and walking pathways.

Housing Development

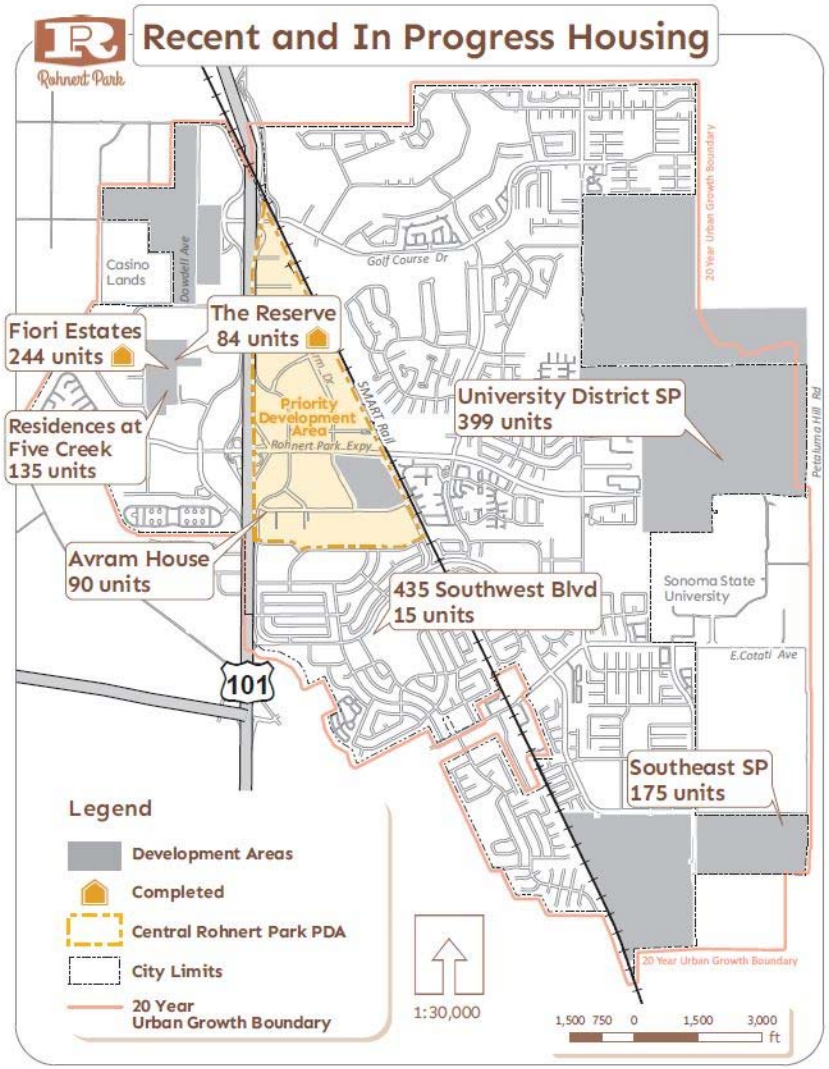

Figure 2.9: Recent Housing Development

Over the last five years (2012-2016) a total of 1,753 new housing units have received final discretionary approvals. The bulk of these are planned to be constructed in the University District. Over that same period 506 units were included in Final Map approvals. The number of building permits approved over the last five years for new housing totals 464. The bulk of those permits have been issued in either the Stadium Lands area or the University District.

Building Permits for model homes in Southeast Rohnert Park are expected to begin being issued before the end of 2017. Additional multi-family developments have been approved on both sides of Highway 101.

Figure 2.10: New Housing in the University District

Potential Housing Growth

Comparison of Specific Plans (SP), Planned Developments (PD) and the Priority Development Area (PDA)

	Northeast SP	Northwest SP	Southeast SP	University District SP	Wilfred-Dowdell SP	Stadium Area PD	Sonoma Mtn. Village PD	Central Rohnert Park PDA
Total Acreage	216 acres	90 acres	80 acres	297 acres	25 acres	30 acres	175 acres	330 acres
Residential Units								
• Rural/Estate	105		29	26			14	
• Large Lot	119							
• Low Density	570		128	382			51	
• Medium Density	96		237	869			635	
• High Density	200			218		463	994	835
• Mixed Use		398	81	150				
• Second Units							198	
Total Units	**1,090**	**398**	**475**	**1,645**		**463**	**1,892**	**835**
Affordable Units	**163**		**72**	**218**		**13**	**248**	**125**
Commercial sq. ft.		458,700	10,000	Max.100,000	302,114	140,000	290,000	429,936
Office sq. ft.							234,000	268,039
Industrial sq. ft.		218,200						129,315
Mixed Use sq. ft.		58,400						
Parks	13.8 acres	2 acres	7.1 acres	19.8 acres.		.7 acres	29 acres	
Other	40.58 acres open space	100 room hotel		53.87 acres open space	163 room hotel	135 room hotel	150 room hotel	
Status	No active planning	Annexed 2015	Annexed 2011 105 units in construction	Annexed 2007 399 units in construction	Annexed 2009	Approved 2008 ongoing residential construction	Approved 2010	Approved March 2016 90 units in design

Table 2.1: Potential Housing Growth by Development Area

Population Data

	2010	2015
Total Population	40,971	41,651
Male	19,793	19,221
Female	20,728	22,430
Total Housing Units	16,000	16,424
Median Household Income	$51,942	$58,719
Median House Value	$300,000	$511,000

Source all: Bay Area Census 2010, ACS 2015, & 2016 Rohnert Park: Local Economic Profile

Table 2.2: Population and Housing Data Comparison

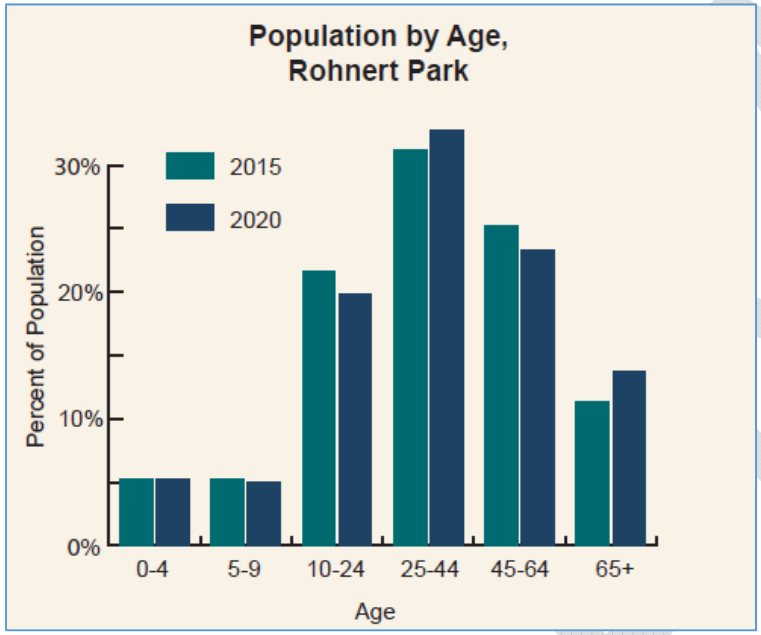

Figure 2.11: Population Comparison

When looking at potential population growth and change as we move closer to the year 2020, the population bracket of 65 and older is expected to increase the greatest amount by 2020. While more people are moving into the age of retirement this is creating a decrease in individuals 10-24 and 45-64 between 2015 and 2020.

Race and Ethnicity Data

Race and Ethnicity	Population (2010)	Percentage of Population (2010)	Population (2015)	Percentage of Population (2015)
White	31,178	76.1%	31,065	74.6%
Black or African American	759	1.9%	916	2.2%
American Indian and Alaska Native	407	1.0%	261	0.6%
Asian	2,144	5.2%	2,658	6.4%
Native Hawaiian and Other Pacific Islander	179	0.4%	147	0.4%
Other Race	3,967	9.7%	4.022	9.7%
Two or More Races	2,337	5.7%	2,582	6.2%
Hispanic or Latino (of any race)	9,068	22.1%	10,035	24.1%

Source: Bay Area Census 2010, United States Census 2010, American Community Survey, 2015

Table 2.3: Race and Ethnicity Data Comparison

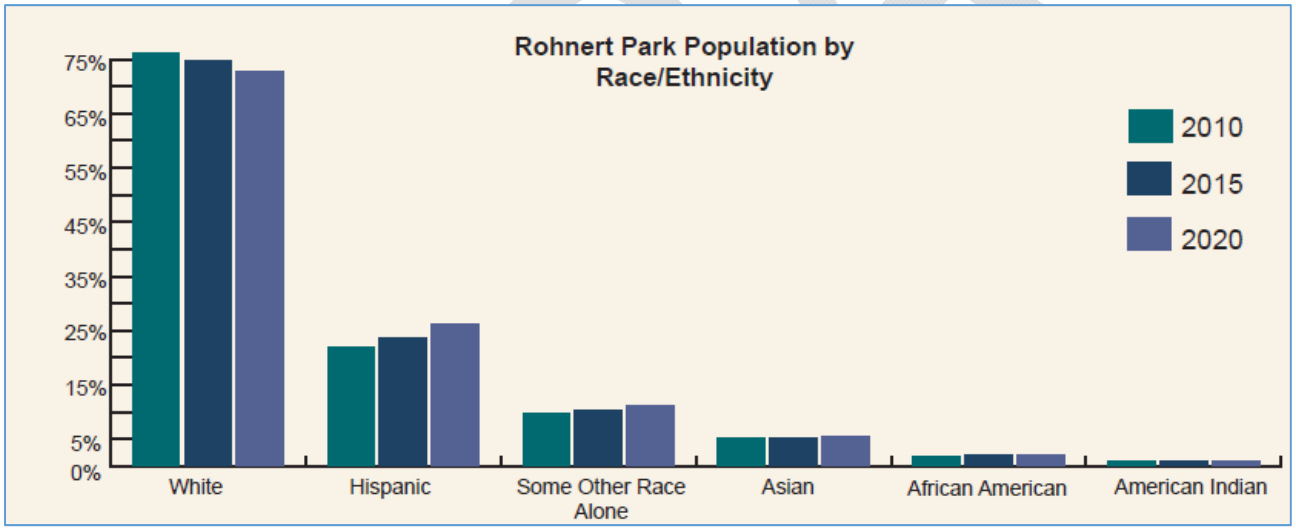

Figure 2.12: Race and Ethnicity Data Comparison

According to the Sonoma County's *2016 Rohnet Park Local Economic Profile* as the community moves closer to the year 2020, a new trend developing is the increase of the hispanic population within the City of Rohnert Park. Between 2010 and 2020 there is predicted to be a 4 percentage point increase.

Educational Attainment

The information and pie chart below are obtained from the *2016 Rohnert Park Local Economic Profile*. In 2015 the population of those 25 and older, 23% of residents had obtained a High School Diploma. This is higher than Sonoma County in the same year with 20% of residents obtaining diplomas. The category of Some College, consisting of individuals who have taken college courses but who have never received their degree. In 2015, about 18% of residents had obtained a Bachelor's Degree and around 7% had received a Graduate or Professional Degree.

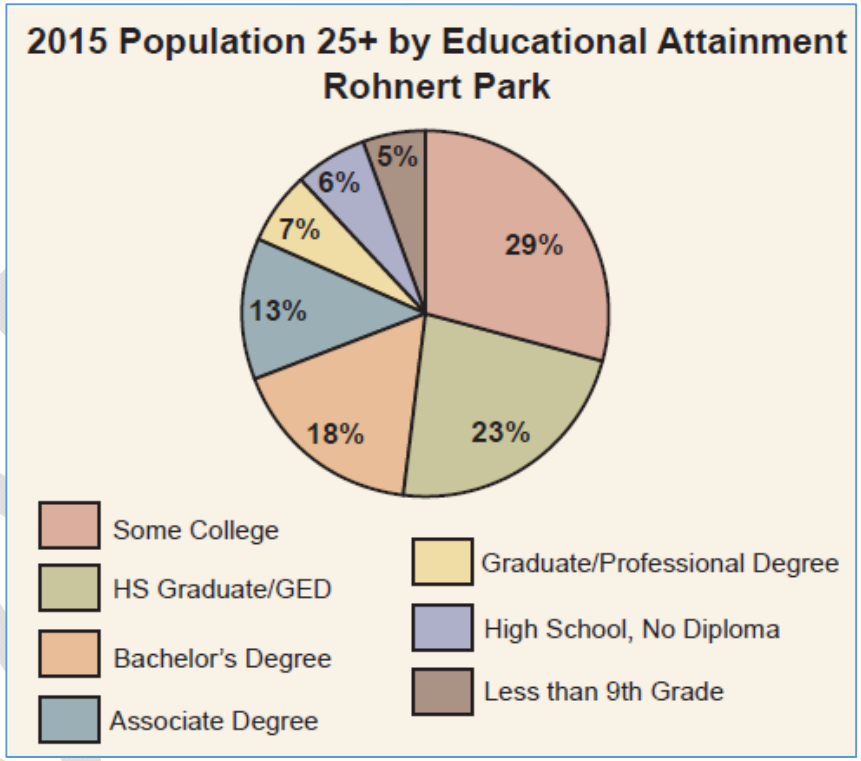

Figure 2.13: Educational Attainment

Economic Trends & Employment

Rohnert Park is located in Sonoma County which is a world destination for tourism. A local Economic Profile of Rohnert Park completed by the City and Sonoma County in 2016 illustrates how the diverse economy and economic growth in the larger Bay Area has impacted Rohnert Park.

Rohnert Park's seasonally unadjusted unemployment rate was 4.5% in June 2015, higher than Sonoma County (4.3%) for the same month. Compared to June of the previous year, Rohnert Park's unemployment rate is down 1.2 points from 5.7%. Unemployment remains significantly lower in Rohnert Park compared to its peak of 11% in March of 2010. Rohnert Park's unemployment rate is below the state (6.2%), as well as the nation (5.5%).

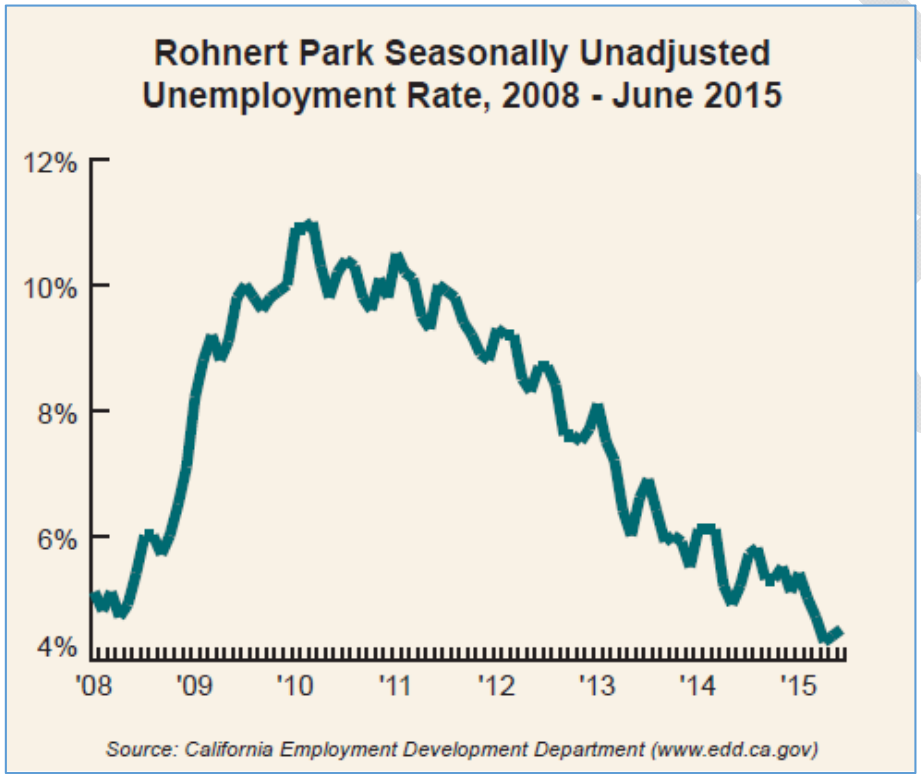

Figure 2.14: Rohnert Park Unemployment

Total employment in Rohnert Park was 22,100 in June 2015, which is up 2.3% from a year earlier. Although it is following an increasing trend, we are noticing a pattern of seasonal employment spikes in the numbers, and employment in Rohnert Park has not regained its maximum from 2008. The total number of business establishments in 2015 in Rohnert Park is 1,555. Sonoma County has about 25,800 business establishments.

About 52% of Rohnert Park's employed population is in the category of Services, which includes education, health care, tourism and legal services. The second largest sector is Retail Trade. This is very similar to the county average, though there is a higher prevalence of Services and Retail Trade in Rohnert Park, while the county has higher percentages of agriculture and manufacture. Rohnert Park also supports Sonoma State University (SSU). The campus is 214 acre that supports 7,000 full time equivalent (FTE) students and 1,200 employees, making it one of the largest employers in the area. In the future SSU looks to extend its capacity to support up to 10,000 FTE students.

Critical Facilities

The LHMP Team identified a number of critical facilities for study and incorporation into the hazard vulnerability and risk analysis. Because of the confidential nature of some facilities (like water pumps), they are not included in the table below. Damage to these facilities has the potential to impact the quality of life of residents and to impair the response and recovery from disaster events.

In addition to City-owned properties, several other facilities that provide important services to the city were included. These include, medical facilities, schools, and mobile home parks.

Table 3.1: Facility	Address	Facility Type
City Properties		
City Hall	130 Avram Avenue	Government Center
Corporation Yard (Public Works)	600 Enterprise Drive	Public Works
Senior Center	6800 Hunter Drive	Community
Community Center	5401 Snyder Lane	Community
Burton Avenue Recreation Center	7421 Burton Avenue	Community
Spreckels Performing Arts Center	5409 Snyder Lane	Community
Callinan Recreation Center	5405 Snyder Lane	Community
Animal Shelter	301 J Rogers Lane	Community
Pump Facility	201 J Rogers Lane	Public Works
Public Safety Facility (Main)	500 City Center Drive	Government Center
Fire Station 2 (North)	5200 Country Club Drive	Fire
Fire Station 3 (West) *(Future)*	5870 Labath Avenue	Fire
Fire Station 4 (South)	1312 Maurice Avenue	Fire
State Farm Expressway Landscaping	State Farm Expressway	Public Works
Enterprise Avenue Landscaping	Enterprise Avenue	Public Works
Water Tanks	Various Locations	Public Works
Parks		
Alicia Park	300 Arlen Drive	Park
Benicia Park	7471 Bernice Avenue	Pool

Table 3.1: Facility	Address	Facility Type
Benicia Pool	7421 Burton Avenue	Park
Caterpillar Park	7430 Circle Drive	Park
Colegio Vista	1200 Southwest Boulevard	Park
Dorotea Park	895 Santa Dorotea Park	Park
Eagle Park	1115 Emily Avenue	Park
Gold Ridge Park	1455 Golf Course Drive	Park
Golis Park	1450 Golf Course Drive	Park
Honeybee Park	1170 Golf Course Drive	Park
Honeybee Pool	1170 Golf Course Drive	Pool
Ladybug Park	8517 Liman Way	Park
Magnolia Park	1401 Middlebrook	Park
Magnolia Pool	1501 Middlebrook Way	Pool
Oak Grove Park *(Future)*	Keiser Avenue	Park
Rainbow Park	1345 Rosana Way	Park
Sunrise Park	5201 Snyder Lane	Park
Twin Creeks Park	Kerry Road	Park
Willow Glen Park *(Future)*	Bodway Parkway	Park
Robert's Lake	5010 Robert's Lake Road	Park
Rohnert Bark (Dog Park)	5010 Robert's Lake Road	Park
Field of Friends (Dog Park)	7471 Bernice Avenue	Park
Creekside Multi-Use Paths	N/A	Multi-Use Paths
Municipal Golf Course (North)	100 Golf Course Drive	Park
Municipal Golf Course (South)	100 Golf Course Drive	Park
Non-City Facilities		
California Highway Patrol	6100 Labath Avenue	State
SMART Station	N/A (Rohnert Park Expressway)	Transportation
Sutter Pacific	1400 Medical Center Drive	Medical
Kaiser Permanente	5900 State Farm Drive	Medical

Table 3.1: Facility	Address	Facility Type
Rohnert Park Cancer Center	301 Professional Center Drive	Medical
Schools		
Marguerite Hahn Elementary	825 Hudis Street	School
Evergreen Elementary	1125 Emily Avenue	School
Technology Middle School	7165 Burton Avenue	School
Rancho Cotate High School	5450 Snyder Lane	School
Monte Vista Elementary	1400 Magnolia Avenue	School
Lawrence E. Jones Middle School	5154 Snyder Lane	School
Richard Crane Elementary	1290 Southwest Boulevard	School
John Reed Elementary	390 Arlen Drive	School
Waldo Rohnert Elementary	550 Bonnie Avenue	School
Technology High School	1801 East Cotati Avenue	School
La Fiesta Elementary	8511 Liman Way	School
Sonoma State University	1801 East Cotati Avenue	University
Credo High School	1300 Valley House Drive	School
Mobile Home/RV Parks		
Rancho Verde	650 Rohnert Park Expressway	Mobile Home Park
Rancho Grande	5099 Snyder Lane	Mobile Home Park
Rancho Feliz	6607 Redwood Drive	Mobile Home Park
Valley Village	6401 Country Club Drive	Mobile Home Park
Las Casitas	7545 Bridget Drive	Mobile Home Park
Wine Country RV Park	7450 Cristobal Way	RV Park

Table 3.2: Parks, Recreation Facilities, and Open Space	Acres	Total per 1,000 residents
Neighborhood, Community, and Mini-Parks	116	2.9
Golf Courses	310	7.8
Other Recreational Facilities	47.5	1.1
TOTAL	473.5	10.9

Table 3.3: Infrastructure	
Roads	130 miles
Rail	4 miles
Bridges and Overpasses	20 (total)

Other Infrastructure

The City of Rohnert Park has the typical types of buildings, water and power systems of a community that experienced the majority of its growth between 1980 and 1999. A brief description follows:

Buildings – Rohnert Park does not have a historic central business district. The majority of the city's structures are single-family, one-story homes built from wood built after 1960. Rohnert Park has no unreinforced masonry buildings. A, B, and C sections of the city are most at risk because they are the oldest; A section being built between 1958-1962, B section from 1963-1965, and C section from 1977-1980.

Water – The City of Rohnert Park currently derives its drinking-water supply from a well field consisting of 42 municipal supply wells, 31 of which were active in 1999; and eight active connections to the Sonoma County Water Agency (SCWA) Petaluma Aqueduct, which supplies water from the Russian River. The Sonoma County Water Agency operates and maintains a water transmission system authorized by the Agreement for Water Supply and Construction of Russian River-Cotati Intertie Project. Parties to the Agreement are the Agency and eight public entities, including Rohnert Park. The total amount of water pumped from the 31 operational wells in 1999 was approximately 1.5 billion gallons. Agricultural users in the vicinity of Rohnert Park use a combination of private well water and reclaimed water for irrigation. Canon Manor residences use both shared and individual wells as their water supply.

Sewer – All development within the 1999 City limits was connected to sewer service as of 1999. The City also provides sewer service to the Sonoma State University (SSU) campus, located east of the 1999 City limits. Residential development in Canon Manor, located outside the 1999 City limits but within its sphere of influence, is served by septic systems, not City sewers. Sewer mains collect wastewater and transport it to the Rohnert Park Pumping Station. As of 1999, the wastewater mains were adequate in size to serve the area within the 1999 City limits. A 24- inch interceptor sewer main extends westward from the pumping station to the treatment plant.

Power - the only significant generating plant in the County is the Geyser's Project. The largest geothermal plant in the world, the Geysers produces 25% of the county's non-hydro green electricity.

Evacuation Routes

US Highway 101 is the primary evacuation route from Rohnert Park. The highway is primarily a north-south route. Other evacuation routes include Petaluma Hill Road on the east side of town, Stony Point Road on the west side of town, Crane Creek Road, leading to Bennett Valley on the east, and Highway 116 leading west (via Cotati) towards Sebastopol.

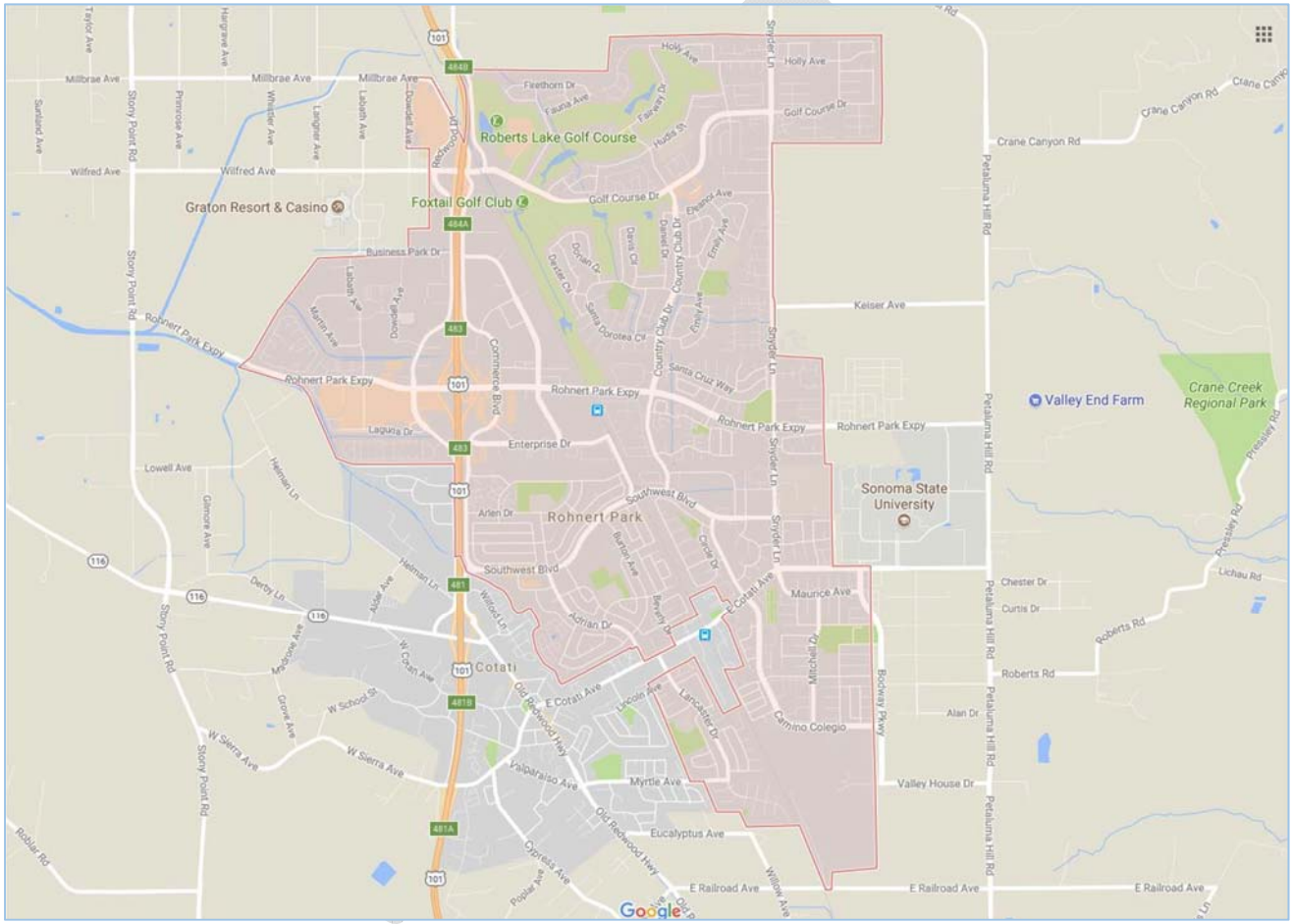

Figure 3.1: Map of Rohnert Park Transportation

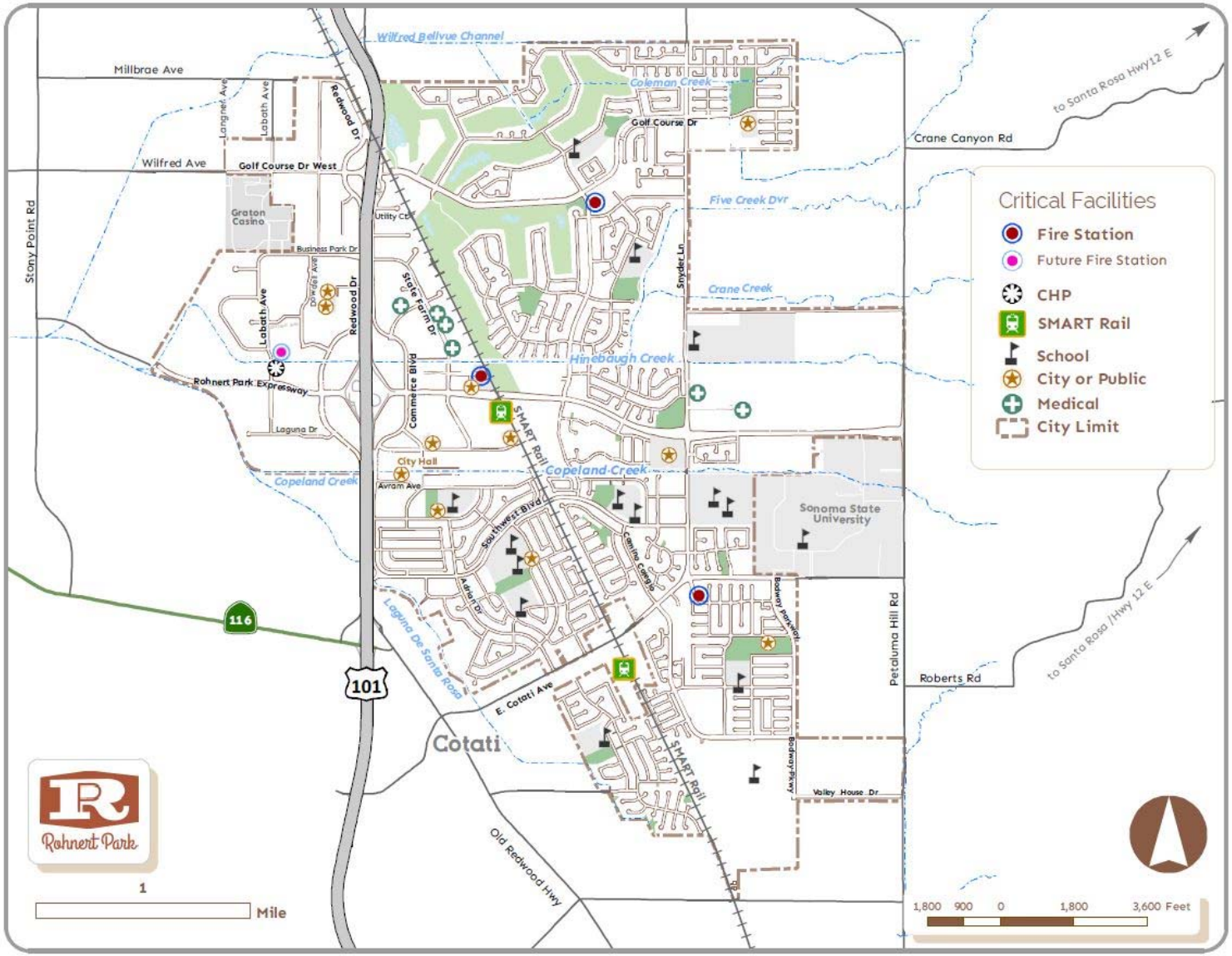

Figure 3.2: Critical Facilities

HAZARD IDENTIFICATION, ANALYSIS AND ASSESSMENT

Hazards are risks that Rohnert Park wants to identify in order to determine the potential impacts to people, economy, and the built and natural environments of the community. Identifying hazards is just one step in the planning process, but provides the foundation for the rest of the mitigation planning process, which focus on identifying and prioritizing actions to reduce risk to hazards. Rohnert Park wants to be prepared in emergency situations by being resilient which will minimize the risk for loss of community livelihood and assets.

Figure 3.3: Risk Assessment

Rohnert Park looks to FEMA's definition of risk which states: *"the potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets (5-1)."* Natural hazards, risk, and community are inevitably connected. It is up to the City to be as prepared as possible to make sure risk is minimalized, overall making it easier for the City to respond. The image below from FEMA illustrates the concept of risk as the relationship between hazards and community. Risk is overlapping both, but the LHMP will help identify key information such as Rohnert Park's own geographic environment, and the hazards associated with that. This awareness closes the overlap of risk making Rohnert Park more resilient.

Using FEMA's hazard mitigation planning resources as guidance, the Rohnert Park LHMP team analyzed the relevance of a comprehensive list of natural hazards in Rohnert Park. The team used the 2012 Emergency Management Plan as a start to identify the risks and hazards that were most pertinent to the City.

FEMA Element B: Hazard Identification and Risk Assessment

- ***B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction? 44 CFR 201.6(c)(2)(i) and 44 CFR 201.6(c)(2)(iii)***
- ***B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? 44 CFR 201.6(c)(2)(i)***
- ***B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? 44 CFR 201.6(c)(2)(ii)***
- ***B4. Does the Plan address NFIP insured structures within each jurisdiction that have been repetitively damaged by floods? 44 CFR 201.6(c)(2)(ii)***

FEMA has identified 21 unique hazards that it recommends for evaluation and inclusion in a hazard mitigation plan. Several of these hazards are not applicable to Rohnert Park. Because of past events, communities may also include other hazards not included on FEMA's list. The Planning Team evaluate a list of hazards, including those recommended by FEMA and determined which hazards should and should not be included in the Plan. Table 3.4 shows the hazards that the LHMP Team evaluated.

Table 3.4: Evaluated Hazards for Rohnert Park LHMP

Hazard	Decision	Explanation
Avalanche	Exclude	Rohnert Park is not near mountainous areas where avalanches occur.
Climate Change	Include (as factor)	Climate change is not stand-alone but affects many other hazards.
Coastal Erosion	Exclude	Rohnert Park is not a coastal community.
Coastal Storm/Storm Surge	Exclude	Rohnert Park is not a coastal community.
Dam Failure	Include	Small portions of Rohnert Park lie within a dam failure inundation zone.
Disease and Pests	Exclude	These are not considered a sufficiently high threat to the City.
Drought	Include	Rohnert Park has been affected by severe droughts in the past.
Earthquakes/Liquefaction	Include	Rohnert Park lies in an area affected by earthquakes in the past.
Erosion/Expansive Soils	Exclude	Neither are a concern for the City of Rohnert Park.
Extreme Cold and Heat	Exclude	These are not a concern for the City, although heat may be in the future.
Fault Rupture	Include	Although not in a fault rupture zone, one is in close proximity.
Flood	Include	Flood zones are present in Rohnert Park.
Hailstorms	Exclude	Hailstorms are not an issue of concern in Rohnert Park.
Hazardous Materials	Include	Included, although generally not an issue of concern in Rohnert Park.
Human Caused Hazards	Exclude	There are no human caused hazards that merit inclusion in Rohnert Park.
Hurricane/Lightning/Wind	Exclude	Rohnert Park is not affected by hurricanes or other severe storms.
Land Subsidence	Exclude	This is not a hazard of concern in Rohnert Park.
Landslide	Include	There is some minor risk of landslides in outlying areas of Rohnert Park.
Sea Level Rise	Exclude	Rohnert Park is not a coastal community.
Severe Winter Storms	Exclude	Refers to blizzards and ice storms; not a concern for Rohnert Park.
Tornado	Exclude	Tornados are not a hazard of concern for Rohnert Park.
Tsunami	Exclude	Rohnert Park is not a coastal community.
Volcano	Exclude	There are no known volcanoes near Rohnert Park.
Wildfire	Include	There are areas of elevated fire risk in and adjacent to Rohnert Park.

Hazard Prioritization

FEMA guidance recommends that the Planning Team prioritize hazards using four individual criteria. The four criteria are as follows:

- Probability: the likelihood of the hazard occurring in the future in the community
- Location: the size of the affected area in the community if the hazard occurs
- Maximum probable extent: the severity of the direct damage to the community from the hazard
- Secondary impacts: the severity of indirect damages to the community from the hazard (e.g., the loss of water service a s a consequence of damage to infrastructure)

For each criterion, the Planning Team assigned a score of 1 to 4, consistent with FEMA guidance. The Planning Team then assigned a weighting factor to each criterion, using values recommended by FEMA, with more important criteria receiving a higher weighing factor. Table 3.5 shows the FEMA recommended rubric used by the Planning Team for this prioritization.

Table 3.5: Hazard Criteria Ranking Scores and Weighing Factors

Probability		***Maximum Possible Extent***	
Based on estimated likelihood of occurrence from historical date	*Weighing Factor: 2.0*	*Based on percentage of damage to typical facility in community*	*Weighing Factor: 0.7*
Probability	Score	Impact	Score
Unlikely	1	Weak – little to no damage	1
Occasional	2	Moderate – some moderate damage	2
Likely	3	Severe – devastating damage	3
Highly Likely	4	Extreme – catastrophic damage	4
Location		***Secondary Impacts***	
Based on size of geographical area of community affected by hazard	*Weighing Factor: 0.8*	*Based on estimated secondary impacts to community at large*	*Weighing Factor: 0.5*
Affected Area	Score	Impact	Score
Negligible	1	Negligible – no loss of function	1
Limited	2	Limited – minimal loss of function	2
Significant	3	Moderate – some loss of function	3
Extensive	4	High – major loss of function	4

Threat Level for Included Hazards

The LHMP Team combined the assigned value of 1 to 4 for each criterion with its weighing factor to determine an overall score for each criterion. In accordance with FEMA guidance the team then summed the scores for location, maximum probable extent, and secondary impacts to calculate the total impact score for each hazard. Lastly, the LHMP Team multiplied the impact score by the probability score to arrive at a total score for each hazard. A total score of 0 to 12 is considered a low-threat hazard, a score of 12.1 to 42 is considered a high-threat hazard. Table 3.6 shows the criterion scores, total scores, and threat levels for all hazards in the Plan.

Table 3.6: Scores and Threat Levels for Included Hazards

Hazard	Probability	Location	Primary Impact	Secondary Impact	Total Score	Threat Level
Dam Failure	1	1	1	1	4.2	Low
Drought	4	4	3	3	54.4	High
Earthquake	4	4	4	4	64.0	High
Fault Rupture	2	1	1	2	6.5	Low
Flood	3	2	3	3	31.2	Medium
Hazardous Materials	1	1	1	1	4.2	Low
Landslide	1	1	1	1	4.2	Low
Liquefaction	1	2	1	1	5.6	Low
Wildfire/WUI-Fire	3	4	3	3	40.8	Medium

Based on this scoring and calculation, drought and earthquake come in with the highest threat level, with flood and wildfire at a medium threat level. All other hazards analyzed in this Plan are at a low threat level.

Earthquakes

Hazard Description

Earthquakes happen when two tectonic plates slip past each other beneath the earth's surface. At the surface, the location of this slip is called a fault. As the plates slide past each other, the stresses between them tend to cause a buildup of energy that when released causes an earthquake. The stored energy from this process is released as seismic waves, causing ground shaking in the area around the slip. The deformation of plates and accumulated stress from this process creates faults in a wider area around the plate boundary, meaning that earthquakes can happen in areas outside of the plate boundary itself.

Modified Mercalli Intensity Scale for Earthquakes

Scale	Equivalent Moment Magnitude	Intensity	Earthquake Effects
I	1.0 to 2.0	Instrumental	Detected only on seismographs
II	2.0 to 3.0	Feeble	Some people feel it
III	3.0 to 4.0	Slight	Felt by people resting; like a truck rumbling by
IV	4.0	Moderate	Felt by people walking
V	4.0 to 5.0	Slightly Strong	Sleepers awake; church bells ring
VI	5.0 to 6.0	Strong	Trees sway; suspended objects swing; objects fall off shelves
VII	6.0	Very Strong	Mild alarm; walls crack; plaster falls
VIII	6.0 to 7.0	Destructive	Moving cars uncontrollable; masonry fractures; poorly constructed buildings damaged
IX	7.0	Ruinous	Some houses collapse; ground cracks; pipes break open
X	7.0 to 8.0	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread
XI	8.0	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards
XII	8.0 or greater	Catastrophic	Total destruction; trees fall; ground rises and falls in waves

Source: USGS 2014

Figure 3.4: Earthquake Intensity Scale

Earthquakes vary in size and intensity with a range of potential impacts. The amount of damage from an earthquake is determined not only by the duration and intensity of ground shaking but also by the conditions in the impacted area, including soil conditions, construction quality, distance from the center of the earthquake, and the type of fault rupture. This hazard profile covers fault rupture, ground shaking, and liquefaction, the most common impacts from an earthquake. When a fault ruptures this is the actual movement and displacement of the ground's surface along the fault boundary which is considered the earthquake. Depending on the type of fault, this displacement may be horizontal, vertical, or both. Damage from fault rupture can be severe depending on the size of the displacement, but is limited to the relatively small area along the fault boundary where the slip occurred. Not all earthquakes result in fault rupture that is visible at the surface, and strong earthquakes can occur without any discernible displacement along the boundary.

Hazard Location and extent

The City of Rohnert Park is just one out of 97 cities within the Bay Area that are within 10 miles of an active fault. Rohnert Park is in the vicinity of several known active and potentially active earthquake faults including the San Andreas and Healdsburg/Rodgers Creek

and the Hayward fault. The City of Santa Rosa is 8 miles to the north of Rohnert Park and has the Rodgers Creek fault running north-south through the center of the City of Santa Rosa. This does pose a high risk of seismic activity in the greater Santa Rosa area.

A major earthquake occurring in or near this jurisdiction may cause many deaths and casualties, extensive property damage, fires, hazardous material spills and other ensuing hazards. The Rodgers Creek fault is considered the greatest earthquake threat to Sonoma County because of the high probability of rupture and its proximity to the County's greatest concentration of population, governmental services and infrastructure. The effects could be aggravated by aftershocks and by the secondary effects of fire, hazardous material/chemical accidents and possible failure of waterways and dams. The time of day and season of the year would have a profound effect on the number of dead and injured. Such an earthquake would be catastrophic in its effect upon the population and could exceed the response capabilities of the City of Rohnert Park, the Sonoma County Op Area and the Governor's Office of Emergency Services and other state agencies. Damage control and disaster relief support would be required from other local governmental and private organizations, and from the state and federal governments.

Hazard Vulnerability and Risk Assessment

Ground shaking: The most significant earthquake action in terms of potential structural damage and loss of life is ground shaking. Ground shaking is the movement of the earth's surface in response to a seismic event. Ground shaking impacts can lead to surface rupture, liquefaction, landslides, and infrastructure failures, which could lead to fires and other secondary hazards. The geology of the impacted area alters the amount of ground shaking felt. Thick, water-saturated, unconsolidated materials will generally experience greater shaking motion than areas of firm bedrock.

The size and magnitude of an earthquake have different ways of being measured. The magnitude of the earthquake, distance from the epicenter, and characteristics of surface geology determine the intensity of the ground shaking and the resultant damages. The magnitude is a number that characterizes the relative size of an earthquake. Magnitude is based on measurement of the maximum motion recorded by a seismograph. Many scales, such as the Richter scale, do not provide accurate estimates for the magnitudes of large earthquakes. To account for these large earthquakes, the moment magnitude scale (abbreviated as MMS; denoted as MW or M) is preferred for its ability to cover a wide range of earthquake sizes and be applied globally. The moment magnitude scale is based on the total moment release of the earthquake. Moment magnitude is a product of the distance a fault moved and the force required to move it. It is derived from modeling recordings of the earthquake at multiple stations. The Modified Mercalli Intensity Scale for Earthquakes shown in the Table below measures ground shaking intensity in terms of perception and damage and takes into account localized earthquake effects. The amount of shaking experienced at different locations varies based not only on the overall magnitude but also on the distance from the fault that ruptured in the earthquake, geologic conditions, and the level of preparedness built into surrounding infrastructure. This hazard is the primary cause of the collapse of buildings and other structures

Liquefaction: Many areas may have buildings destroyed or unusable due to the phenomenon of liquefaction. Liquefaction is the loss of shear strength of a soil. The shear strength loss results from the increase of water pressure caused by the rearrangement of soil particles induced by shaking or vibration. Liquefaction has been observed in many earthquakes, usually in soft, poorly graded granular materials (i.e., loose sands), with high water tables. Liquefaction usually occurs in the soil during or shortly after a large earthquake. In effect, the liquefaction soil strata behave as a heavy fluid. Buried tanks may float to the surface and objects above the liquefaction strata may sink. Pipelines passing through liquefaction materials typically sustain a relatively large number of breaks in an earthquake (Rohnert Park Emergency Management Plan).

Hazard History

The Bay Area has experienced significant, well-documented earthquakes. Since 1855, more than 140 earthquakes have been felt in the Santa Rosa area. Although earthquake records prior to the year 1900 are difficult to interpret, seven earthquakes are believed to have caused damage to structures in Sonoma County during the 19th century. Two earthquakes are of note: the 1868 M7.2 earthquake on the Hayward Fault, and the 1898 M6.7 earthquake believed to have occurred on the Rodgers Creek Fault. Although damage from these two events was limited due to the area's sparse population at the time, a recurrence of either of these events could result in significant damage to today's widespread and varied infrastructure and building stock. The April 18, 1906, M8.3 earthquake on the northern segment of the San Andreas Fault, known for devastating San Francisco, caused major damage in Santa Rosa, Sebastopol, Healdsburg, Petaluma and other communities. Santa Rosa, only 20 miles from the San Andreas Fault, is said to have suffered more damage proportionally to its size than any other Bay Area city.

Figure 3.5: 2014 Napa Earthquake

The 1969 Rodgers Creek / Healdsburg Fault Earthquake was the last major earthquake to occur in the Sonoma County area on October 1, 1969. Two earthquakes of Magnitudes 5.6 and 5.7 originated near the juncture of the Rodgers Creek and Healdsburg Fault, approximately two miles north of Santa Rosa. Total building damage was estimated at $6 million, with dwelling contents losses at $1.25 million. Several County buildings suffered damage, including the Library, Post Office, and Veterans Memorial Building. There was more than expected damage to the newly constructed two-story Sonoma County Social Services Building at the County Administration Center. The 1989 Loma Prieta Earthquake, M6.9 magnitude earthquake was caused by a slip along the San Andreas

Fault. Though the damage in Sonoma County from the quake was very minor, the quake killed 63 people and injured 3,757 throughout Northern California. It caused a total of over 16,700 housing units to be uninhabitable throughout the Monterey and San Francisco Bay Areas and left some 3,000-12,000people homeless. The most recent earthquake in this area, the 2014 Napa Quake, was felt throughout Sonoma County and in Rohnert Park and cause millions of dollars of damage in neighboring Napa County.

Risk of Future Occurrences

A major earthquake occurring in or near this jurisdiction may cause many deaths and casualties, extensive property damage, fires, hazardous material spills and other ensuing hazards. The Rodgers Creek fault is considered the greatest earthquake threat to Sonoma County because of the high probability of rupture and its proximity to the County's greatest concentration of population, governmental services and infrastructure. The effects could be aggravated by aftershocks and by the secondary effects of fire, hazardous material/chemical accidents and possible failure of waterways and dams. The time of day and season of the year would have a profound effect on the number of dead and injured. Such an earthquake would be catastrophic in its effect upon the population and could exceed the response capabilities of the City of Rohnert Park, the Sonoma County Op Area and the Governor's Office of Emergency Services and other state agencies. Damage control and disaster relief support would be required from other local governmental and private organizations, and from the state and federal governments.

Extensive search and rescue operations may be required to assist trapped or injured persons. Injured or displaced persons could require emergency medical care, food and temporary shelter. Identification and burial of many dead persons would pose difficult problems; public health would be a major concern. Mass evacuation may be essential to save lives, particularly in areas downwind from hazardous material releases. Many families would be separated particularly if the earthquake should occur during working hours, and a personal inquiry or locator system could be essential to maintain morale. Emergency operations could be seriously hampered by the loss of communications and damage to transportation routes within, and to and from, the disaster area and by the disruption of public utilities and services.

The economic impact on the City of Rohnert Park from a major earthquake would be considerable in terms of loss of employment and loss of tax base. Also, a major earthquake could cause serious damage and/or outage of computer facilities. The loss of such facilities could curtail or seriously disrupt the operations of banks, insurance companies and other elements of the financial community. In turn, this could affect the ability of local government, business and the population to make payments and purchases.

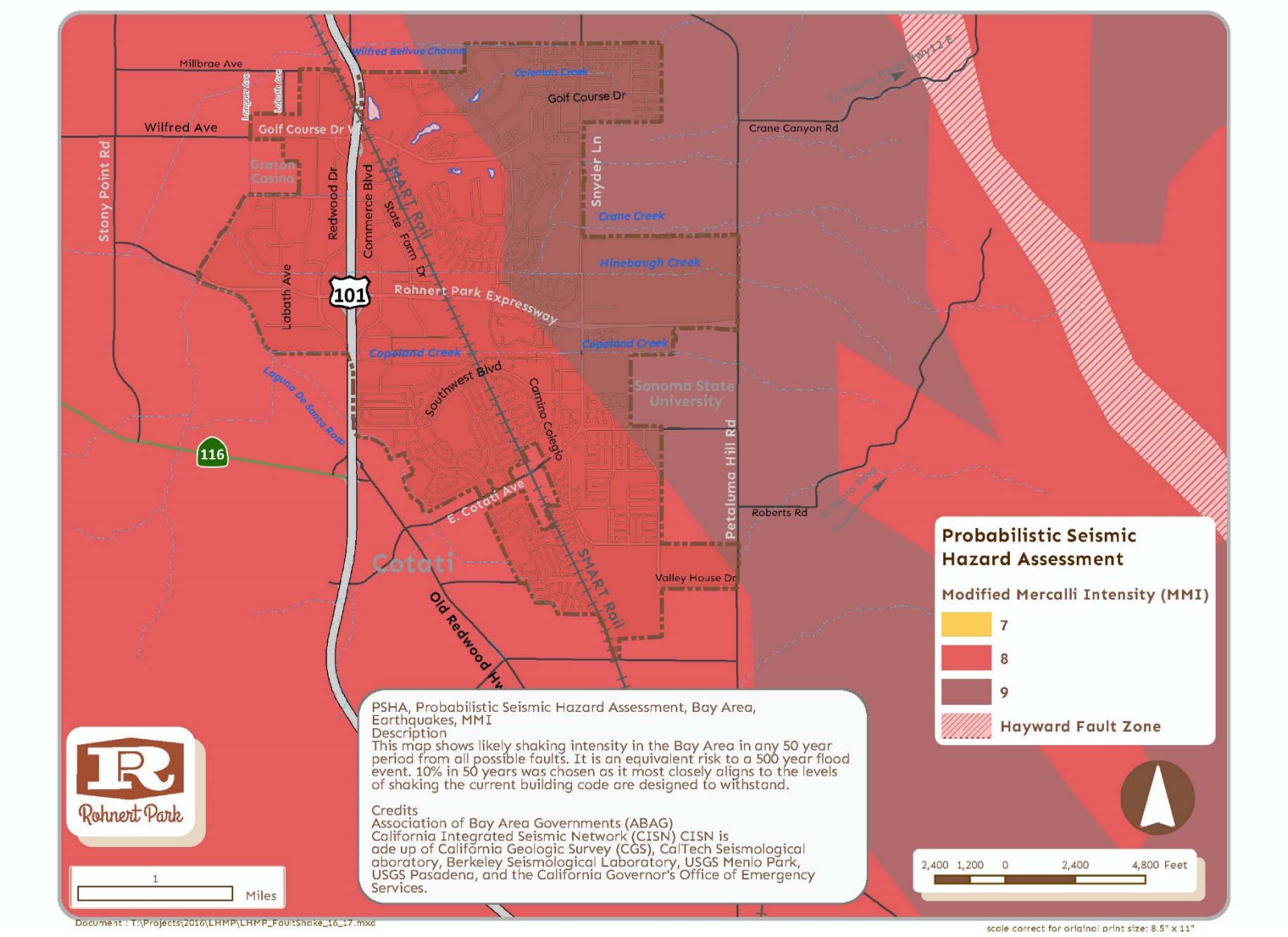

Figure 3.6: Probability of Earthquake Intensity (Shaking)

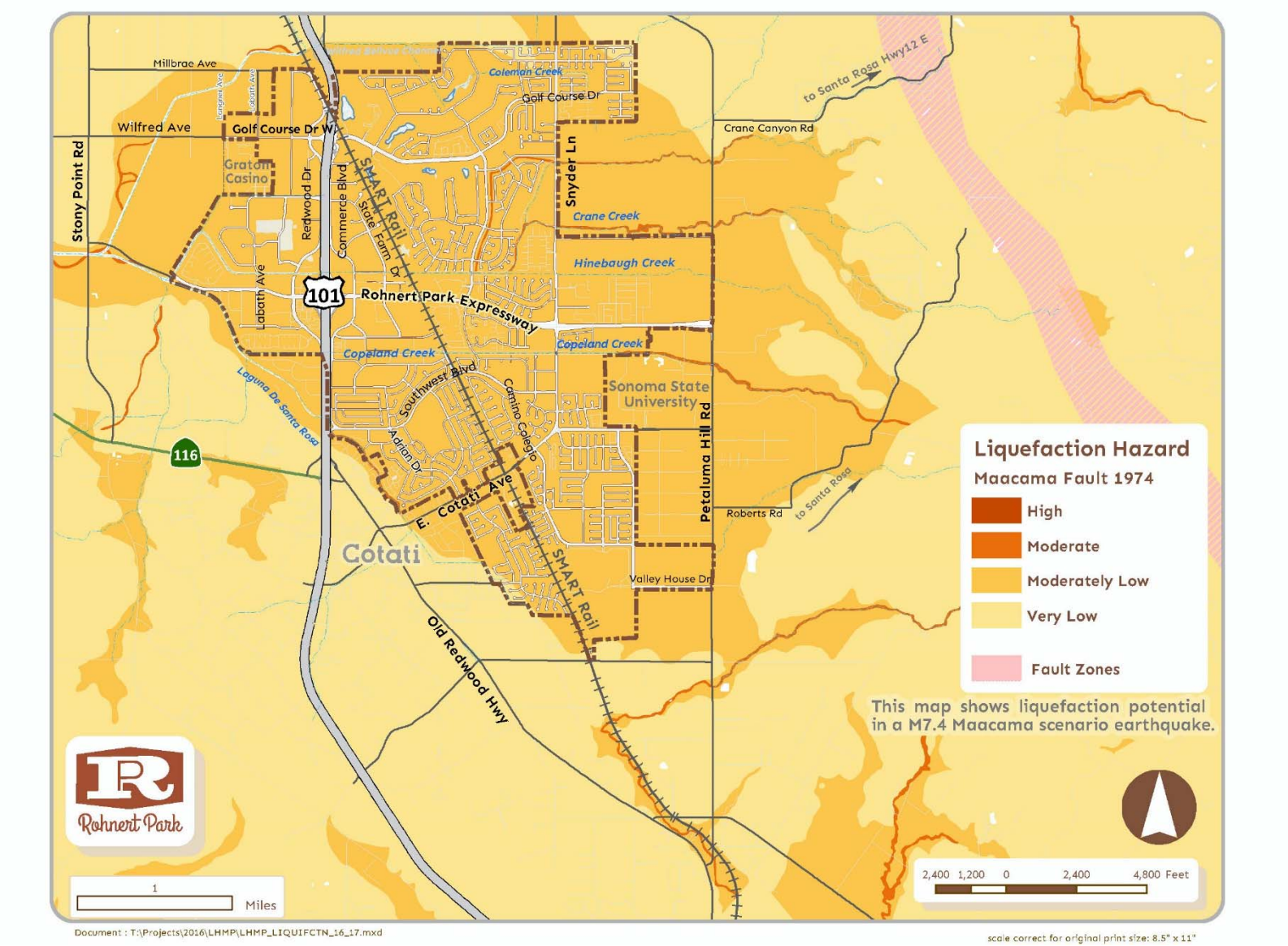

Figure 3.7: Potential Liquefaction

According to the USGS, there is a 31% chance of a major earthquake along the Rogers Creek fault by 2038 and a 93% probability of a magnitude 6.7 or greater in Northern California by 2038.

Climate Change Considerations

Seismic events are not directly impacted by climate change. It is uncertain the likelihood, size and severity of seismic events. Since the field of climate change science is dynamic, the City will continue to review and summarize new research that occurs on this topic during the next update cycle.

Flooding

Hazard Description

Flooding is a temporary condition in which land that is normally dry is partially or completely inundated. Flooding occurs when water bodies, such as streams, rivers, lakes, or reservoirs, are abnormally high and overflow into adjacent low-lying areas. These areas are known as floodplains, defined by their exposure to risk of recurring floods. Given Rohnert Park's inland location the City is protected from coastal flooding which is associated with high tides and coinciding strong winds. Flooding within the City's planning area are a result of heavy rains in low-lying areas with limited drainage routs and along creeks that are prone to flooding in 100-year storm events. Floods can be powerful enough to move large objects swiftly into other objects, cause damage to buildings and infrastructure, and weaken foundations and soils. Secondary impacts of flooding, including saturated soils and erosion from flooding events can cause trees to weaken and collapse, increasing the potential for property damage and loss of life (SR LHMP). Taken from the City's Emergency Management Plan it is stated that floods are generally classed as either slow-rise or flash floods. Slow-rise floods may be preceded by a warning time lasting from hours to days or possibly weeks. Evacuation and sandbagging for a slow-rise flood may lessen flood-related damage. Conversely, flash floods are the most difficult to prepare for, due to the extremely short warning time, if any is given at all. Flash flood warnings usually require immediate evacuation within the hour. Within Sonoma County floods are the most frequent natural hazard, and causing the greatest amount of property losses. Within the State, floods are second most common types of disaster, fires being the first.

Before Rohnert Park was developed, most rainfall fell onto natural areas. The water soaked into the ground until it reached a saturation point, at which time it traveled, sometimes below the surface of the soil, sometimes in above-ground swales, via sheet flow, to the nearest creek or water body. With urban development of the area, impervious surfaces were created. An impervious surface can be a constructed surface -- like paved roads, parking lots and rooftops -- or a natural surface compacted in some way so that the infiltration of surface water is impacted or prevented. Rain falling on impervious surfaces creates runoff that is sent through our storm water system of street gutters and storm drains, quickly to the nearest creek and downstream.

While our conventional storm water system of gutters, pipes and channels has done its job to protect properties and lives here in this urbanized area, it also has had replaced some of the beneficial functions of natural surfaces that protect environments and populated areas downstream, such as lessening the peak storm water level, slowing the velocity of water through the waterbodies, providing infiltration to groundwater, and filtering out pollutants. The City's Public Works Department maintains the City-owned portions of the storm water system, including gutters, inlets, catch basins, pipes and outfalls.

The Sonoma County Water Agency (SCWA) manages most of the flood control channels that course through Rohnert Park. The channels in Rohnert Park are included in "Zone 1A" (Laguna de Santa Rosa - Mark West Creek watershed), one of nine geographical zones encompassing a major watershed. These flood control zones were established in 1958 as a means of financing the construction and maintenance of flood protection works within Sonoma County. SCWA either owns in fee the rights-of-way for constructed flood control channels, or holds easements on them for maintenance. Maintenance of flood control channels and creek beds are under contractual agreement with Sonoma County Water Agency.

Hazard Location and extent

Areas in Rohnert Park are flood prone in heavy rains. This can be visualized on the Rohnert Park 2015 Flood Areas Map. There are several major creeks that intersect with Rohnert Park and could potentially cause flooding within the 100-500 year flood plain and general low-lying areas. The creeks identified on the map are Wilfred Bellvue Channel, Coleman Creek, Five Creek, Crane Creek, Hinebaugh Creek, Copeland Creek, and Laguna De Santa Rosa. A large area in the North West corner of the City right outside city limits is prone to flooding, that looks to span 1 square mile in area where the Laguna De Santa Rosa, Hinebaugh Creek and Wilfred Bellvue channel intersect. Area 1 on the map is adjacent to this area inside the city limits and is designated as Rancho Verde Mobile Home Park and is lining with Hinebaugh Creek. The Streets across the Hinebaugh creek near Labath Ave are prone to flooding as well. Areas lining the major creeks such as Copeland Creek on Avram Ave when City Hall is located is prone to flooding. In the North East corner of the City where the Rohnert Park municipal Golf Course is located including some streets of the neighboring residential are prone to flooding during the rainy seasons as Coleman Creek may overflow. Other areas designated on the map have sporadic locations of low-lying flood prone areas during the rainy season.

Hazard History

Flooding has had a serious impact on the county as a whole in the past. The most recent occurrence was in the winter of 2005-2006 when rainfall measured in the City of Santa Rosa at 17.6 inches (NOAA 2013). The President declared this flood a major disaster, and more than 100 roadways were blocked due to flooding or landslides. Some 2,100 business and residential properties were inundated and 50,000 residents were without power (NOAA 2013). Sonoma County business and residential damages were estimated at $104 million (NOAA 2013). The City was impacted by the 2005/2006 Winter Storms. General impacts from the winter storms were

flooding and power outages. Public works crews assessed the flooded areas and were able to clean out blocked drainage trash gates, removed debris from ditches and culverts and placed flooded, road closed ahead, and road closed signs, as needed, on flooded road sections to warn the public of flooded areas. Public works has some provisions for sandbags – primarily available only to areas where living space would be flooded or impacted. In areas where trees fell in the roadway, the trees were moved out of the roadway and when the storm cleared the trees were cut up and removed. Vehicles, properties and buildings sustained damage from flood waters particularly on Martin Avenue and Heartwood Court.

Hazard Vulnerability and Risk Assessment

The most readily available source of information regarding the 100-year flood is the Flood Insurance Rate Maps (FIRMs) prepared by FEMA to support the National Flood Insurance Program (NFIP). The standard for floodplain management in the United States is to delineate and address flood risks within the area inundated by the 100-year flood or base flood. Floods may be quantified in terms of flow (cubic feet per second (CFS), water elevation, inundated area, and reoccurrence interval. For instance, a 100-year flood has a 1□ percent chance of occurring in any given year. Although the recurrence level is based on statistical averages, the actual occurrence of events varies and could occur at shorter intervals or even within the same year.

Mobile Home Susceptibility

Statewide, the 1996 floods destroyed 156 housing units. Of those units, 61 % were mobile homes and trailers. Many older manufactured home parks are located in floodplain areas. Mobile homes have a lower level of structural stability than stick-built homes, and must be anchored to provide additional structural stability during flood events. Because of confusion in the late 1980s resulting from multiple changes in NFIP regulations, there are some communities that do not actively enforce anchoring requirements. Lack of enforcement of manufactured home construction standards in floodplains can contribute to severe damages from flood events. The City of Rohnert Park has participated in the National Flood Insurance Program since 1981. The City does not participate in the Community Rating System. Staff anticipates seeking City Council direction for participation in the Community Rating System. The City started participation in the NFIP on June 1, 1981. An update, effective December 2, 2008, was released which reflected the current requirements of the NFIP for non-coastal communities. In addition to using FEMA maps to regulate flood hazard areas, the City may require elevation certificates at the building permit stage to verify compliance with NFIP requirements. There are no repeat loss properties within the City of Rohnert Park.

Identification of Flood Areas

Flood maps and Flood Insurance Studies (FIS) are often used to identify flood-prone areas. The NFIP was established in 1968 as a means of providing low-cost flood insurance to the nation's flood-prone communities. The NFIP also reduces flood losses through regulations that focus on building codes and sound floodplain management. NFIP regulations (44 Code of Federal Regulations (CFR)

Chapter 1, Section 60, 3) require that all new construction in floodplains must be elevated at or above base flood level. Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) Floodplain maps are the basis for implementing floodplain regulations and for delineating flood insurance purchase requirements.

A Flood Insurance Rate Map (FIRM) is the official map produced by FEMA which delineates SFHA in communities where NFIP regulations apply. FIRMs are also used by insurance agents and mortgage lenders to determine if flood insurance is required and what insurance rates should apply. Water surface elevations are combined with topographic data to develop FIRMs. FIRMs illustrate areas that would be inundated during a 100-year flood, floodway areas, and elevations marking the 100-year-flood level. In some cases, they also include base flood elevations (BFEs) and areas located within the 500-year floodplain. Flood Insurance Studies and FIRMs produced for the NFIP provide assessments of the probability of flooding at a given location. FEMA conducted many Flood Insurance Studies in the late 1970s and early 1980s. These studies and maps represent flood risk at the point in time when FEMA completed the studies. However, it is important to note that not all 100-year or 500-year floodplains have been mapped by FEMA.
FEMA flood maps are not entirely accurate. These studies and maps represent flood risk at the point in time when FEMA completed the studies, and does not incorporate planning for floodplain changes in the future due to new development. Although FEMA is considering changing that policy, it is optional for local communities. Man-made and natural changes to the environment have changed the dynamics of storm water run-off since then.

Although many communities rely exclusively on FIRMs to characterize the risk of flooding in their area, there are some flood-prone areas that are not mapped but remain susceptible to flooding. These areas include locations next to small creeks, local drainage areas, and areas susceptible to manmade flooding. Communities find it particularly useful to overlay flood hazard areas on tax assessment parcel maps. This allows a community to evaluate the flood hazard risk for a specific parcel during review of a development request. Coordination between FEMA and local planning jurisdictions is the key to making a strong connection with GIS technology for the purpose of flood hazard mapping.

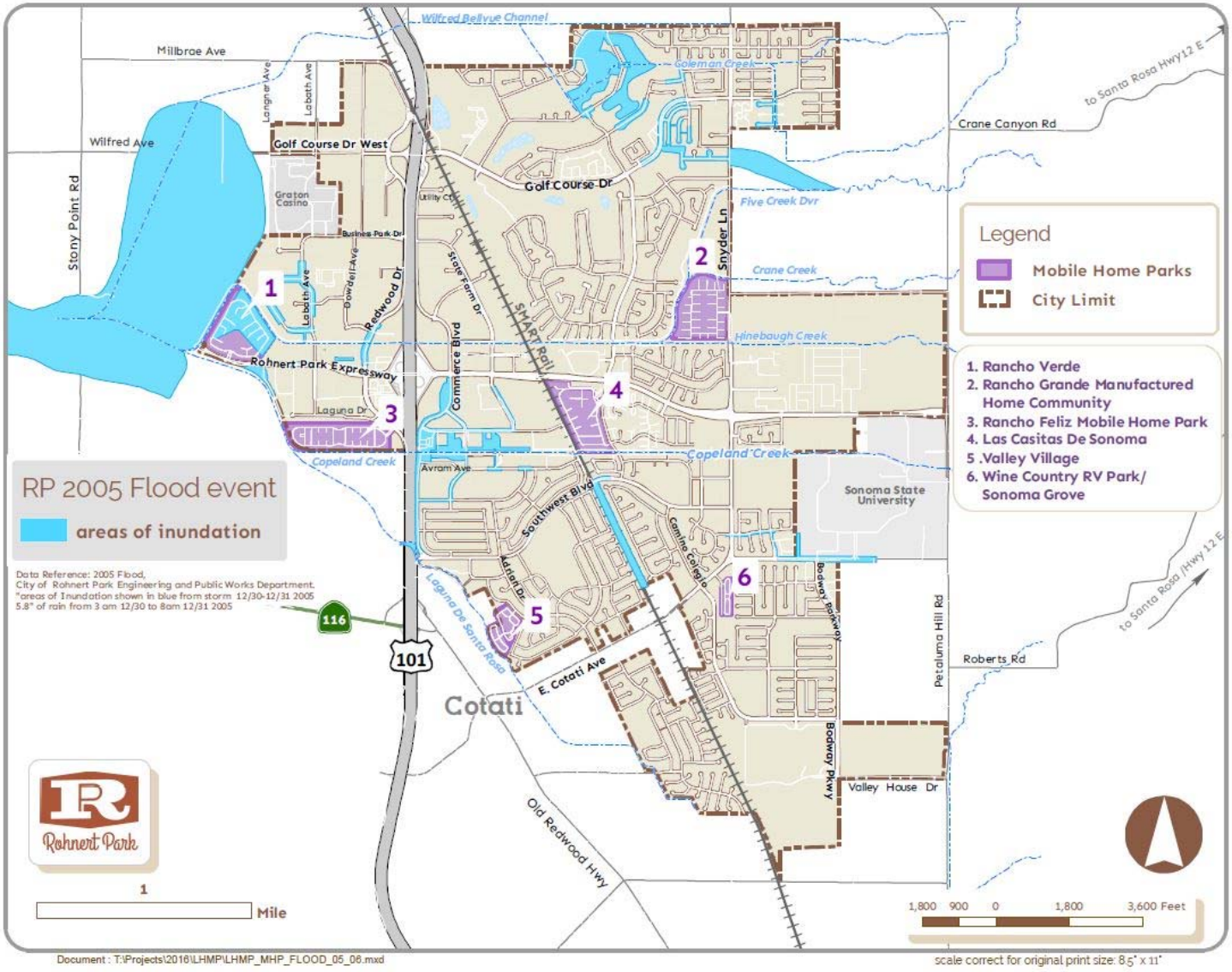

Figure 3.8: Known Flooding from 2005 Flood Event with Mobile Home Parks

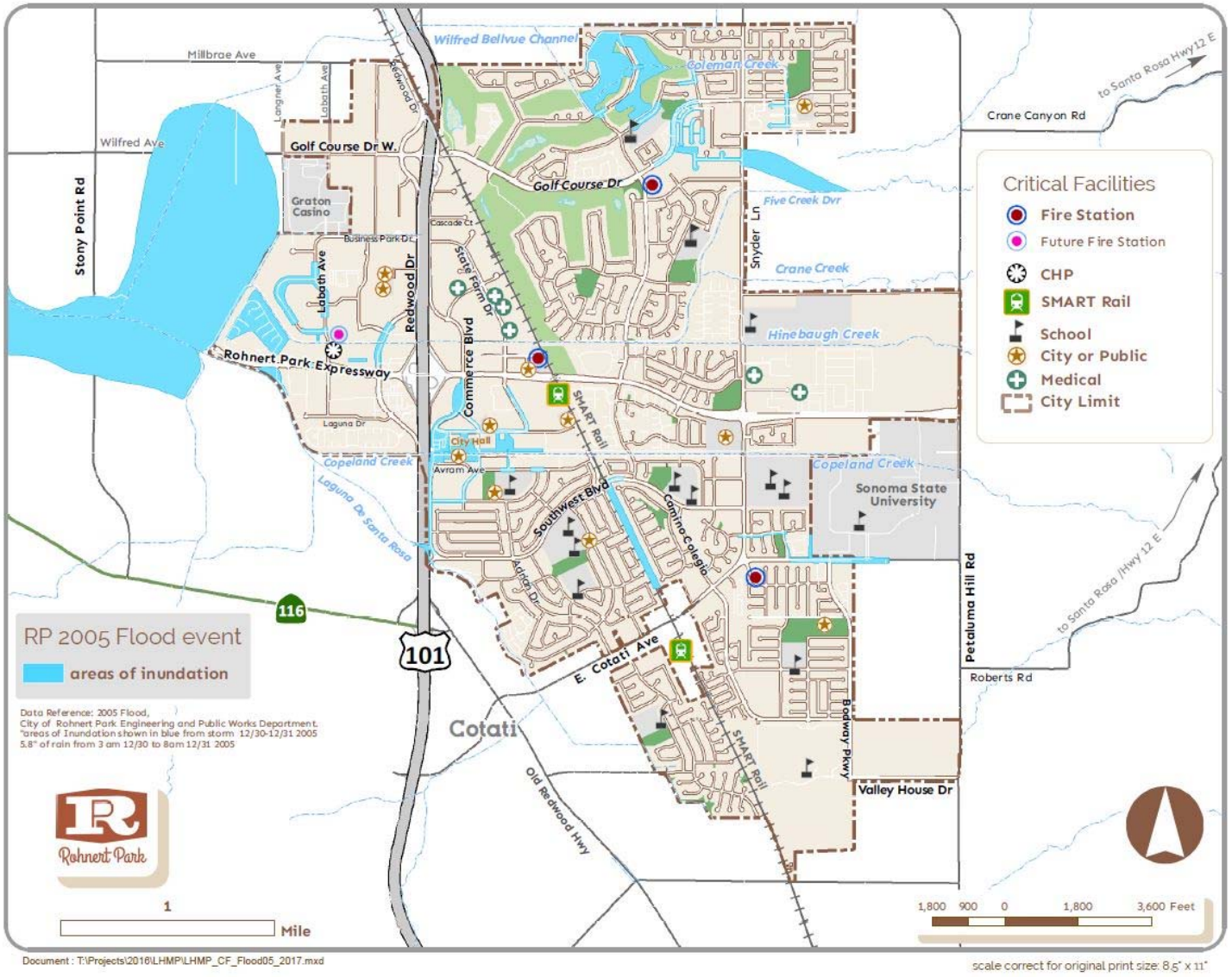

Figure 3.8: Known Flooding from 2005 Flood Event with Critical Facilities

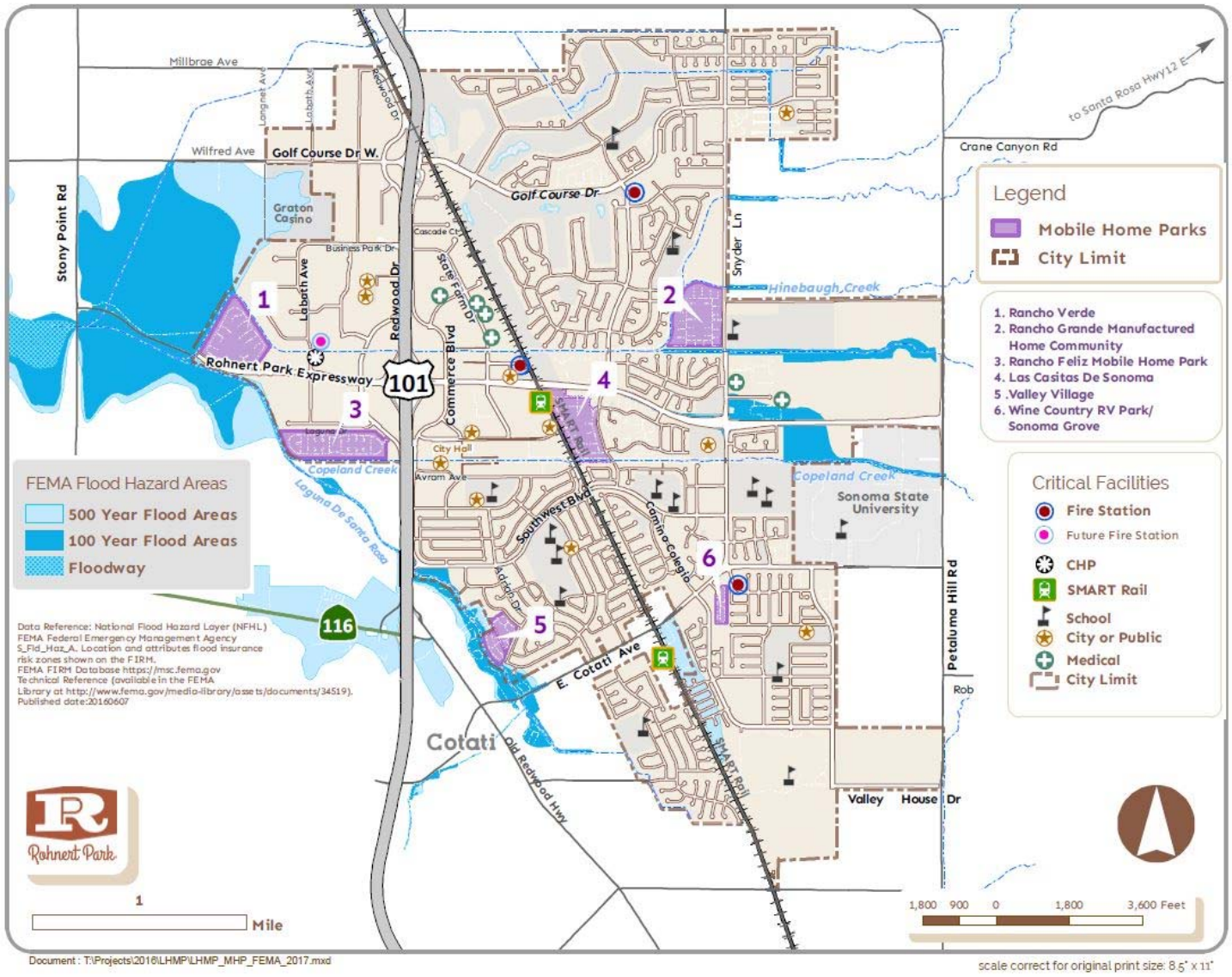

Figure 3.9: FEMA Flood Hazard Areas with Mobile Home Parks

Impact of Development

When structures or fill are placed in the floodway or floodplain water is displaced. Development raises the river levels by forcing the river to compensate for the flow space obstructed by the inserted structures and/or fill. When structures or materials are added to the floodway or floodplain and no fill is removed to compensate, serious problems can arise. Flood waters may be forced away from historic floodplain areas. As a result, other existing floodplain areas may experience flood waters that rise above historic levels. Local governments must require engineer certification to ensure that proposed developments will not adversely affect the flood carrying capacity of the Special Flood Hazard Area (SFHA).

Displacement of only a few inches of water can mean the difference between no structural damage occurring in a given flood event, and the inundation of many homes, businesses, and other facilities. Careful attention should be given to development that occurs within the floodway to ensure that structures are prepared to withstand base flood events. In highly urbanized areas, increased paving can lead to an increase in volume and velocity of runoff after a rainfall event, exacerbating the potential flood hazards. Care should be taken in the development and implementation of storm water management systems to ensure that these runoff waters are dealt with effectively.

Climate Change Considerations

- Scientific evidence involving climate change include more variation in weather patterns for Sonoma County. Overall there are significant challenges for planning around water supply and flood control. Sonoma County's wintertime precipitation comes mainly in storms from the Pacific Ocean brought on atmospheric rivers. Between 1948 and 2011, 87% of floods on the Russian River were due to atmospheric rivers (Dettinger et al., 2011). With the wettest scenarios being considered, Sonoma County including Rohnert Park could see almost a 25% increase in precipitation compared to historical (20th century) conditions while the driest scenario projects an approximately 20% decrease. By the year 2100 Sonoma County will see bigger, more variable floods that will cause potentiality in 1) physical danger and economic impact for people living in low-lying areas along rivers and bay lands, especially those without reliable transportation 2) Death from drowning and injuries from flood 3) Public health risks from damage to sanitation, utility, and irrigation systems 4) Limitations on access to critical services and 5) Economic impact to businesses in or affected by flooded areas.
- All of the scenarios indicate above there will continue to be some years with precipitation similar to historic averages as the error bars for all scenarios in Figure ___ overlap with the 0% change axis. However, the warm/wet scenario projects some years with an almost 75% increase in mean annual precipitation while the dry scenarios project years with decreases between 25 – 50% of historical averages. (SC Climate Ready Hazard Vulnerability.)

Drought

Hazard Description

Droughts are an effect of prolonged periods of little to no rainfall which result in shortages of water. Droughts develop over an extensive period of time. A year with abnormally little precipitation would be considered a dry year. Multiple dry years may develop drought conditions, whereas multiple years of suitable rain or wet years will generally alleviate the drought. In years of drought the inhabitants do slowly feel the effects. In urban areas, drought conditions can cause a decrease in available water supplies, which may lead to increases in water rates or restrictions in water use. Communities may need to seek alternative water supplies to meet demand, which can be a costly and lengthy process.

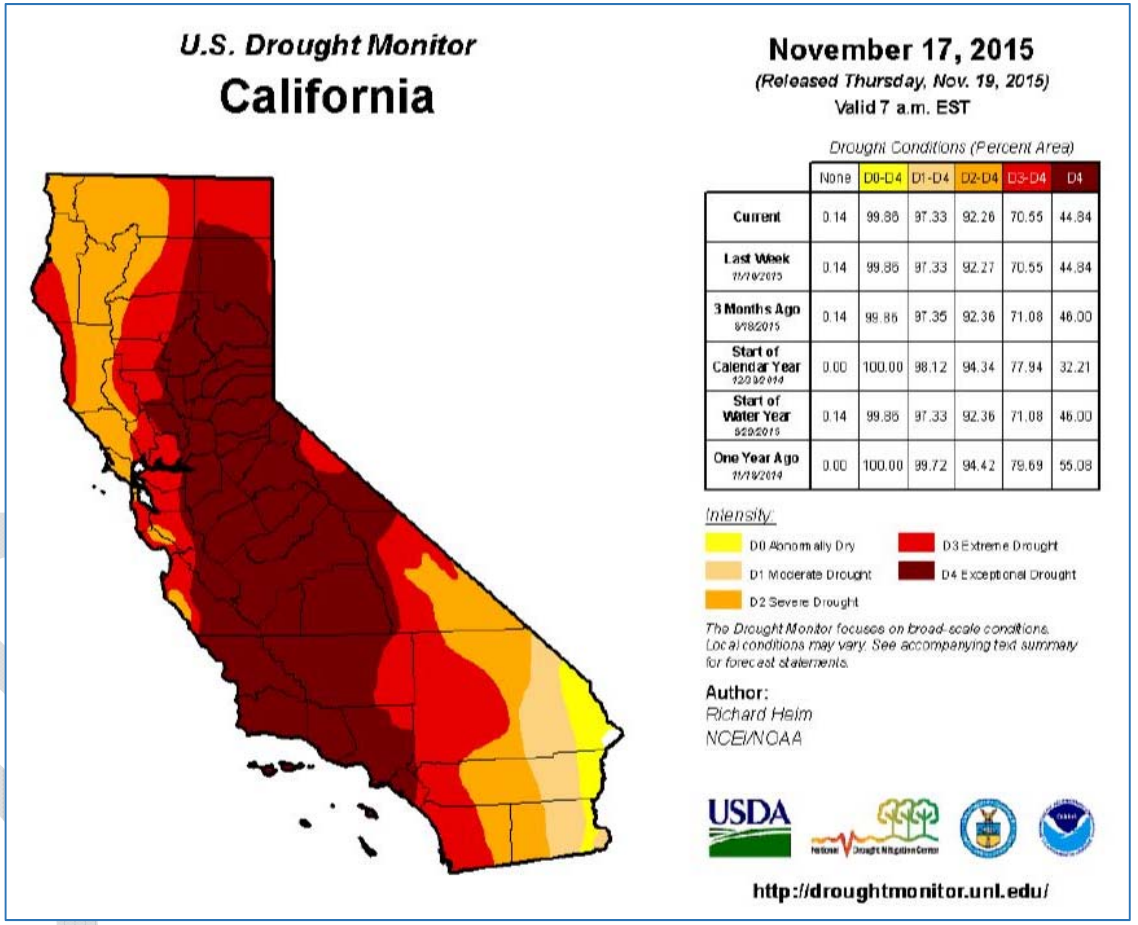

Figure 3.11: California Drought as of November 2015

Drought conditions change the landscape, causing vegetation such as street trees, landscaped areas in public parks to become water stressed which can lead to plant disease or death. Drought conditions harden the ground, which can lead to increased flooding when rains return because the soil cannot easily absorb water. Prolonged drought can also create increased levels of wildfire risk, with prolonged conflagrations fueled by excessively dry vegetation. Drought is not localized, but occurs simultaneously across the region, and may extend statewide or across a larger expanse. For the state droughts have been occurring in prolonged stages that impact every county, as well as local municipalities that are unique in their conditions such as based on local and regional water

supply systems, soil conditions, and the typical climate and vegetation land covering. The effects of drought are managed in the Bay Area through the importation of water and the storage of water in reservoirs.

Hazard History, Location and extent

Droughts are known to reoccur in California. The State have developed advance strategies and water infrastructure networks to deal with water shortages. A drought in one part of the state may have little to no effect in another part of the state due to water resources that are localized. From December of 2011 to April 2017 California experienced yet another state-wide drought. In January 2014, the Governor declared a State of Emergency in California in response to current drought conditions. To date, 2015 is the driest recorded year on record in California, with statewide reservoirs at 18–67 percent of average (California Governor's Office of Emergency Services (2015), as cited in ABAG 2015). Governor Jerry Brown ordered a statewide 25 percent cut in urban water use. A year ago, 21 percent of California was considered in drought monitor classification D4, 42 percent in D3-D4 and 100 percent of California in D0-D4. As of April 2017 the Governor declared the drought emergency over. Now that California is

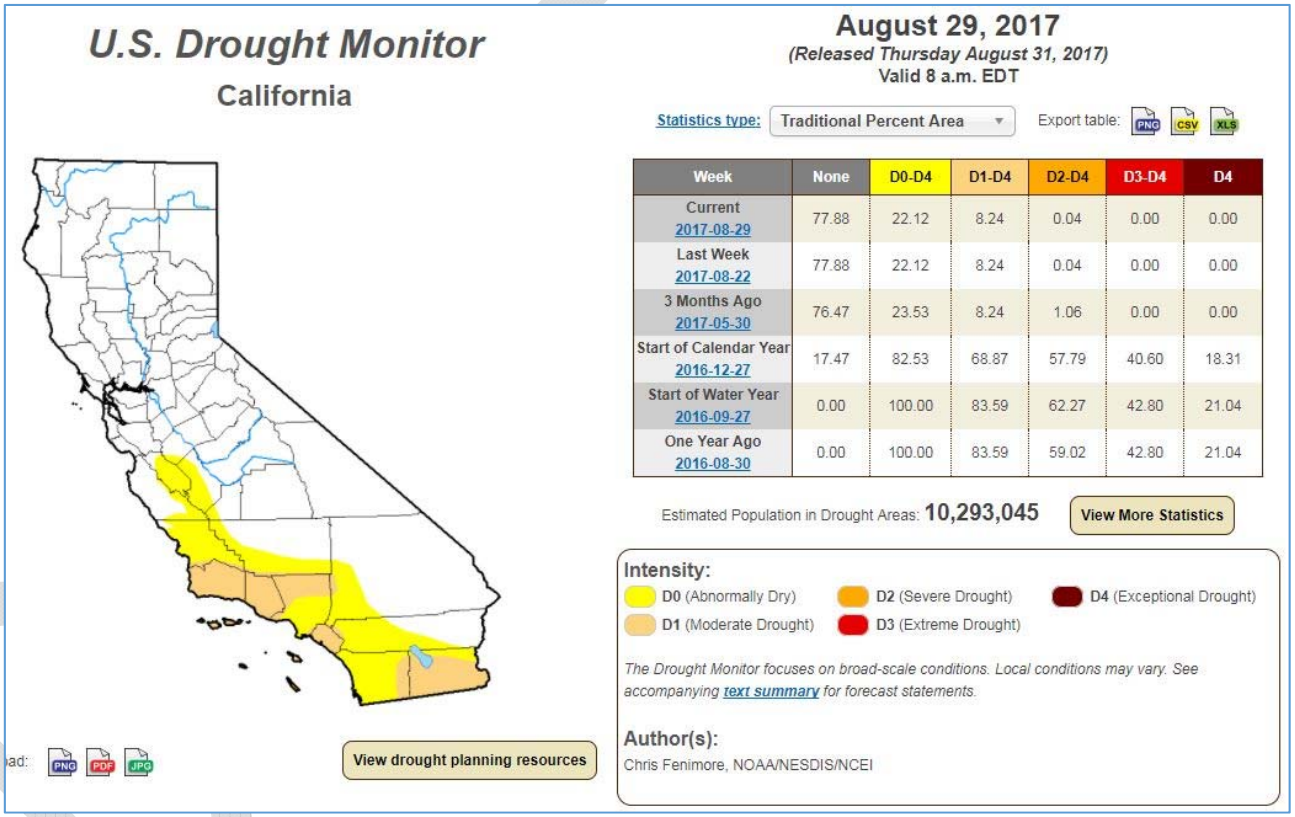

Figure 3.12: California Drought as of August 2017

flourishing it will not be the last or the longest in the years to come. A drought from 1928 to 1937 affected all parts of the state and was the longest drought in California's recorded history. Between 1976 and 1977, California experienced one of its most severe droughts, and 1977 was the state's driest year on record.

Major Droughts that affected the Bay Area, according to ABAG were in 1973, 1976–77, 1987–91, and 2007–09. Drought conditions in 1973 led to a State-declared disaster in Glenn, San Benito, and Santa Clara counties, resulting in $8 million in agricultural loss.

During the statewide drought of 1976 to 1977, four Bay Area counties (Contra Costa, Napa, San Mateo, and Marin) were among those where a state disaster was declared. Marin, Solano, and Sonoma counties were affected in the 1987–91 drought, which caused $1.7 billion in crop losses nationwide (Cal OES 2013, as cited by ABAG 2015).

Locally, Sonoma County declared an emergency for drought in February of 2014. A proclamation was adopted calling for water conservation actions and voluntary water reductions. Rohnert Park adopted Stage 1- voluntary reductions in February 2014. And subsequently adopted Stage 1-mandatory 20% reductions in August 2014 to comply with the State regulations mandating a statewide 25% reduction target. At the drought's peak in 2015, approximately 9 percent of Sonoma County was classified as level D3 drought conditions (extreme drought), with the remainder of the county classified as level D2 (severe drought) which included Rohnert Park.

Recycled Water System

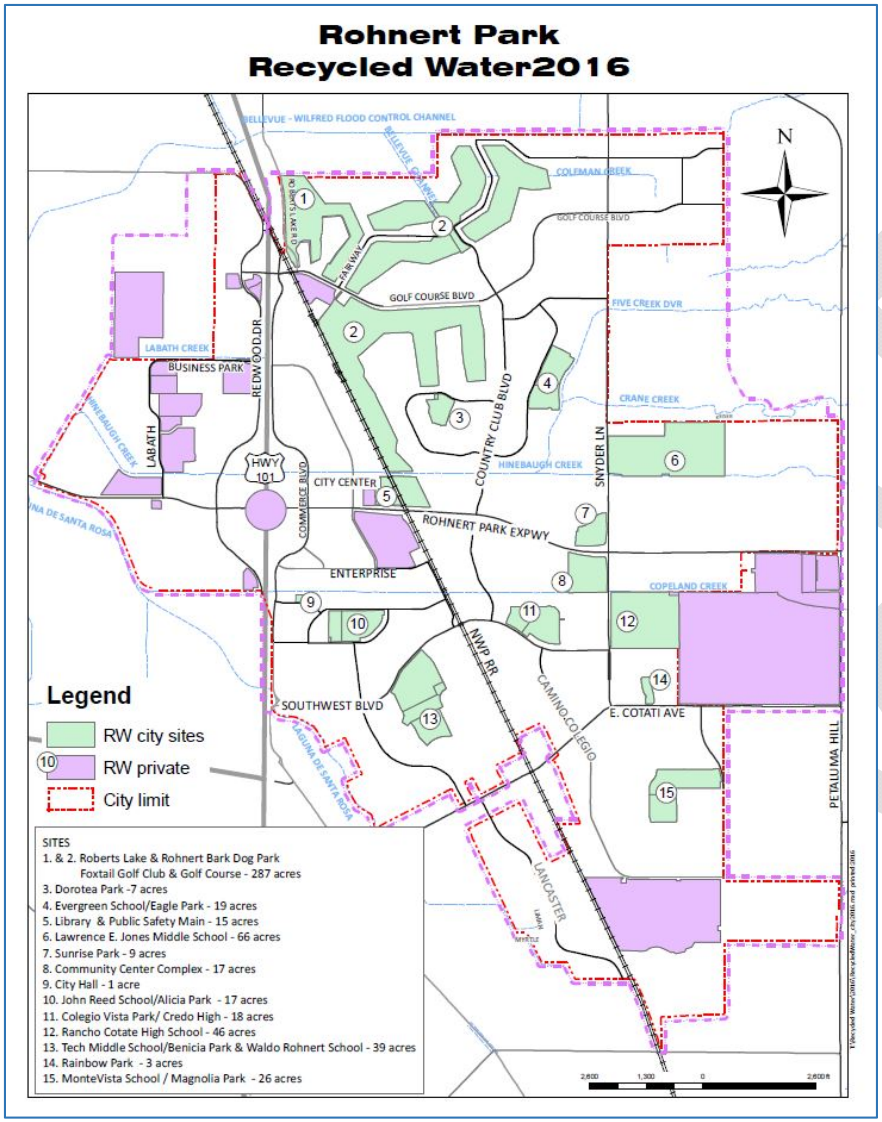

Figure 3.13: Rohnert Park recycled Water System

Rohnert Park's Recycled Water System provides tertiary treated recycled water to 31 customers including City parks, two municipal golf courses, Sonoma State University and several private commercial properties. The City has been at the forefront of recycled water use having used recycled water for over 28 years. In 2015, the City used 310 million gallons on over 580 acres. The use of recycled water significantly lessens the potential impacts of droughts on connected properties. Current development and new city infrastructure is required to connect to the recycled water system where feasible.

Drought Vulnerability and Risk Assessment

Given the historical context and extent to which droughts have happened so far at each spatial level from the state, county, and local municipality, droughts are unique among hazards in this LHMP in that droughts are a more regional disaster meaning that the direct impact is the same throughout the City. Unlike earthquakes, floods, or wildfires where the risk and severity of impacts vary within the community. As a result, all of Rohnert Park is in the potential hazard zone for droughts, and no single area faces higher direct risks. While the severity of any drought conditions will be consistent across Rohnert Park, the indirect impacts of a drought can vary depending on residents' socioeconomic factors. Droughts often lead to more stringent water use regulations, which can include increased service rates for households that use higher amounts of water.

Climate Change Considerations

Scientific evidence suggests that Sonoma County, and California overall are expected to experience more very hot days than in the past, and overall higher temperatures over a longer period of dry weather. Spring will come earlier and fall will come later, and these extended periods of hotter, drier weather will impact regional water supply. The heat will also increase soil moisture deficit and reduce groundwater recharge. Reduction in the overall regional water supply due to reduced precipitation would only exacerbate the local effects of drought (Climate Ready Sonoma County).

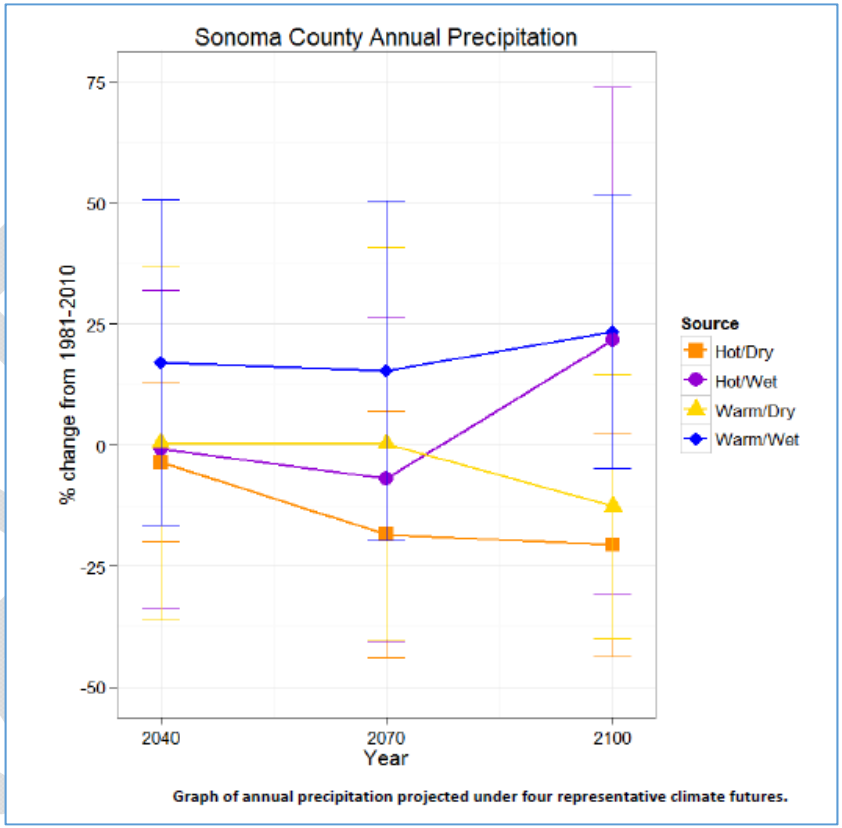

Figure 3.14: Climate Change Precipitation Projections

Wildfire/Wildland-Urban Interface Fires

Hazard Description

The combination of highly flammable fuel, long dry summers and steep slopes creates a significant natural hazard of large wildland fires in many areas of Sonoma County. A wildland fire is a fire in which the primary fuel is natural vegetation. Wild land fires can consume thousands of acres of vegetation, timber and agricultural lands. Fires ignited in wild land areas can quickly spread, if unabated, to areas where residential or commercial structures are intermingled with wild land vegetation. Similarly, fires that start in urbanized areas can grow into wild land fires. Wild land/urban interface fire hazards are especially pronounced in areas of high structure densities adjacent to undeveloped open space areas with dense vegetation. Wild land/urban interface fire results in death, injury, economic loss and a large public investment in firefighting activities.

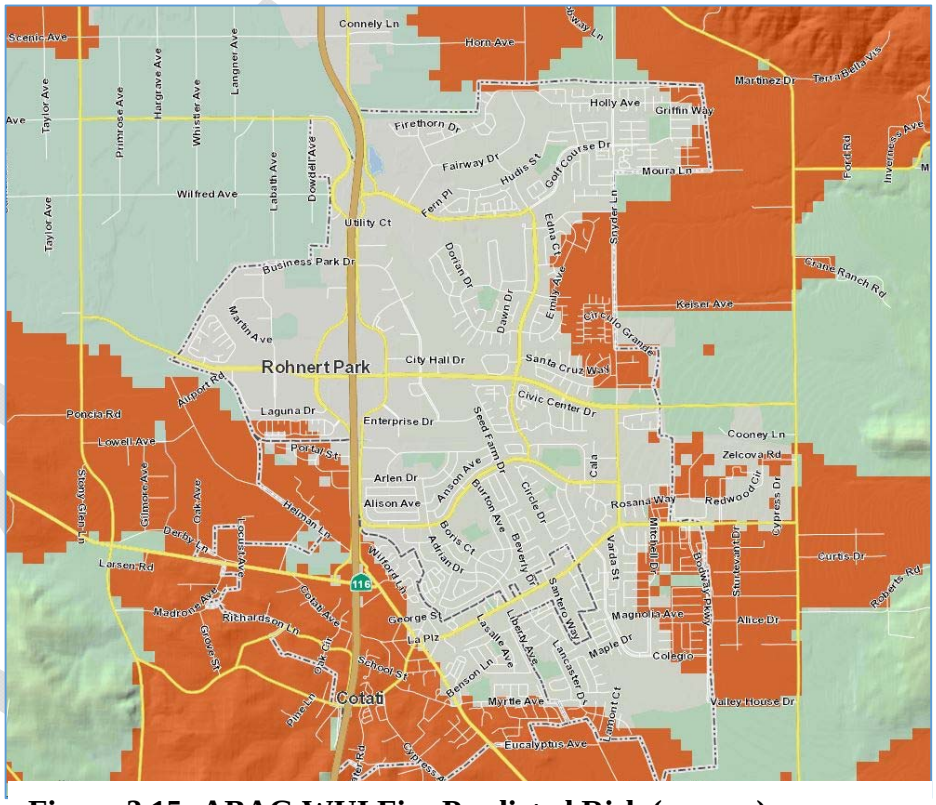

Figure 3.15: ABAG WUI Fire Predicted Risk (orange)

Wildfire behavior is based on three primary factors: weather, topography and fuel. Wildland fire season in Sonoma County spans the months after the last spring rains have fallen and until the first fall or winter rains occur. The months of August, September and October have the greatest potential for wild land fires as vegetation dries out, humidity levels fall, and off shore winds blow. In Northern California, Diablo Winds, while rare can occur. These are similar to the Santa Ana winds founds in Southern California which can drive fires swiftly and unpredictably.

The population of tan oak vegetation in various areas of the County has particular risk due to the rise of Sudden Oak Death Syndrome. In specific areas, tan oak proliferation and the rapid encroachment of the disease has created an environment of increased vulnerability to wildland fire.

Hazard Location and extent

Wildfires can be caused by natural events, such as lightning or high winds. However, most wild land fires are human caused. Campfires, careless smokers, electrical sparks, and arson cause most wild land and wild land/urban interface fires. In the City of Rohnert Park and the adjacent rural areas of Sonoma County, electrical equipment, such as power lines and transformers, has caused numerous fires. An emerging cause for concern is fires started by mowing, use of power equipment and other work around very dry vegetation. Trees growing into power lines have caused large and damaging fires within the county.
The adjacent hillsides surrounding Rohnert Park are a high-risk area for wild fires. With off shore winds any such fire, once started, could blow fire brands and ash into the City of Rohnert Park.

Figure 3.16: Typical hillside adjacent to Rohnert Park

Hazard Vulnerability and Risk Assessment

The risk of wildland fires in Rohnert Park is generally low compared to peer cities in Sonoma County. The City has very little area that would be considered Wildland-Urban Interface. The City's planned development patterns, relatively compact nature, and the existence of an urban growth boundary have prevented Rohnert Park from sprawling out in low densities into the surrounding hillsides where the risk of fire is greater. The existence of agriculture on three sides of the City, as well as the presence of the City of Cotati to the south, also mitigate the chances of an extreme fire event. Current mitigation activities include abatement of grassland areas adjacent to and within the City Limits.

Climate Change Considerations

Changing weather and precipitation patterns as a result of climate change, further impacted by continuing development, will change the way large fires originate, grow, and ultimately impact Rohnert Park in the future. Increased precipitation during the rainy season will increase the growth of grass and brush that will later dry out in the summer, increasing the amount of fuel available for fires. Warmer summers will contribute to drier conditions and will place more stress on plants, bushes and trees leaving them vulnerable to pests and disease. Increasing numbers of trees may die out, subsequently leaving increased amounts of fuel ready to burn.

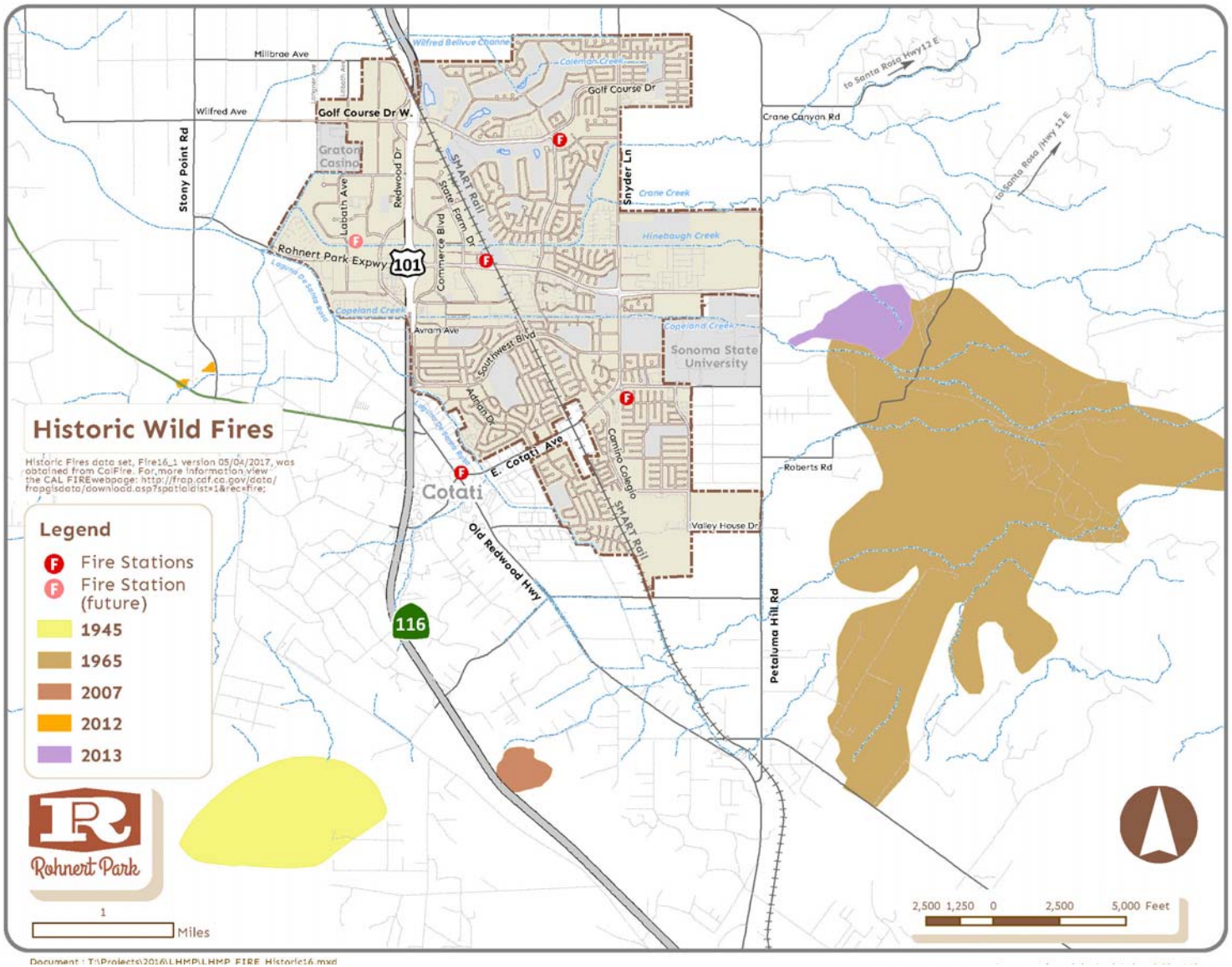

Figure 3.17: Historic (Pre-2017) Wildfires near Rohnert Park

October 2017 Fire Event

During the night of October 8-9, multiple offshore wind driven fires ignited across Napa and Sonoma Counties. While no official cause has been determined at the time of this writing, sparks from electrical lines in strong winds are considered the likely cause. Sonoma County experienced the wettest winter on record in 2016-2017 (driving vegetation growth), and one of the hottest summer on record in 2017 (drying out the same vegetation). These factors combined to create conditions favorable for rapid fire growth. The City of Santa Rosa to the north experienced significant devastation and loss of life in the Tubbs Fire due to the sudden and overwhelming nature of the event.

An offshoot of the Nuns/Adobe fires, centered in and around Sonoma Valley, headed east over the hills, generally staying south of Crane Canyon Road during the early hours of Monday October 9. The City of Rohnert Park mobilized over the coming days to build emergency fire breaks around the eastern and northern sides of the City. The G, H, and K Sections were evacuated for a period of time. Actions by the City, combined with shifting wind patterns prevented the fire from directly damaging the City of Rohnert Park.

Figure 3.18: October 2017 Sonoma County Fires

***After a more thorough analysis of this fire event by Sonoma County, Cal OES, FEMA, and the City of Rohnert Park, additional modifications and additions to this LHMP as pertaining to wildfire hazard mitigation will be conducted.**

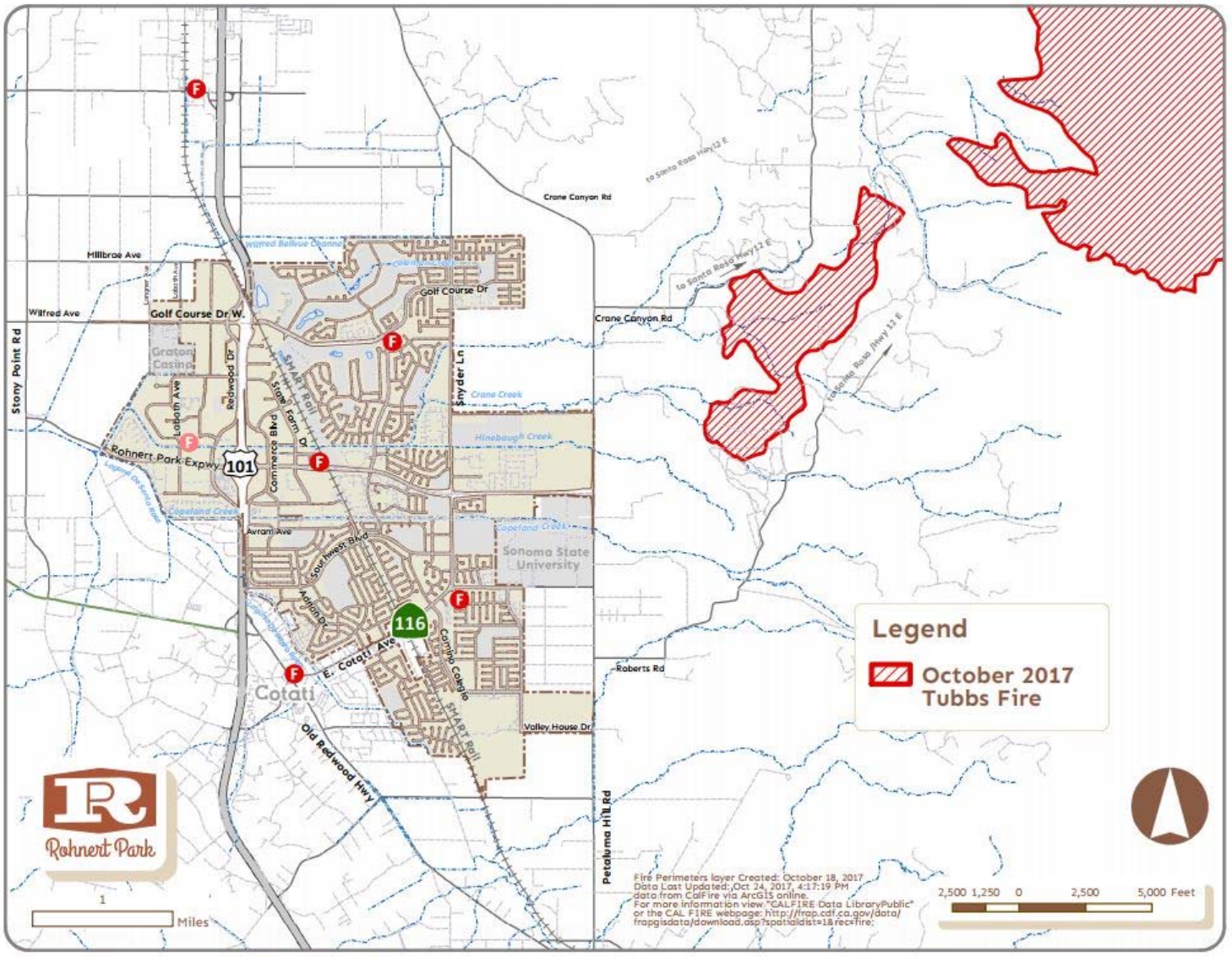

Figure 3.19: October 2017 Sonoma County Fires in the Rohnert Park Vicinity

Minor or Secondary Hazards

While not identified as primary hazards through the planning process, these hazards are still important and have the potential to directly or indirectly threaten lives, property, and infrastructure in and around Rohnert Park.

Hazardous Materials

Hazard Description

California law defines a hazardous material as follows:

> *A substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed of, or otherwise managed (California Health and Safety Code Section 25141b).*

Hazardous materials are dangerous substances that encompass a wide range of substances that include toxic substances, flammable or explosive materials, corrosive substances such as acids, and radioactive substances. While some hazardous materials are dangerous at all times, others may only be dangerous under specific conditions such as flammable materials, which can be harmless until exposed to a spark or a heat source. Hazardous materials that are no longer used and have been disposed of or awaiting disposal. Emergencies involving hazardous materials are often technological and Man-made Hazards. These types of emergencies also sometimes occur as a secondary impact of another emergency such as an earthquake or flood.

Hazard Location and Extent

Hazardous material releases can occur from buildings such as factories and processing facilities, as well as from vehicles that transport chemicals or other hazardous substances. Road vehicles, trains, and (more rarely) aircraft can all suffer accidents that cause a release of hazardous materials. According to the Rohnert Park Emergency Preparedness Plan 2010, the likelihood of occurrence is every so often, and the severity of an instance could range of low to high.

Hazard History

According to county records indicated by the Rohnert Park Emergency Management Plan, spill history indicates most problems occurring in the transportation corridors. Although most of these incidents have been easily handled, the potential still exists for an extreme threat to life, the environment, and property.

Hazard Vulnerability and Risk Assessment

In the City of Rohnert Park, commercial businesses that use hazardous materials include, but are not limited to, dry cleaners, film processors, auto service providers, drycleaners and medical clinics. Residences also generate household hazardous wastes in the form of paints, thinners, pesticides, fertilizers. Earthquake shaking can release hazardous materials. There is the potential that trucks or train cars carrying dangerous materials could be tipped over by an earthquake and materials dangerous to health or the environment could be released. Some of these sources may contain gases or liquids that are potentially harmful to human health. Leaking products present a serious fire hazard (RP Emergency Preparedness Plan 2010).

Hazardous materials also pass through the City in route to other designations via the freeway, rail, and surface street system. The Department of Transportation (DOT) regulates the transport of hazardous materials on state highways and rail lines using established criteria for safe handling procedures. Federal safety standards are also included in the California Administrative Code and the California Health Services Department regulates the haulers of hazardous waste (RP Emergency Management plan 2010).

Risk of Future Hazards

An accident with hazardous materials can happen every once in a while, and especially during a natural disaster like an earthquake or severe flooding. Hazardous waste generators and users in the City are required to comply with regulations enforced by several federal, state, and county agencies. The regulations aim toward reducing risk associated with human exposure to hazardous materials and minimizing adverse environmental effects. Sonoma Fire Department in partnership with the Rohnert Park Department of Public Safety for fire protection services conduct inspections related to hazardous materials. The Hazardous Materials Compliance Division of the County Environmental Health Services Department ensures compliance and reporting in accordance with the Sonoma County Hazardous Waste Management Plan. Highways 101 has a greater potential for a Hazardous Materials release, Petaluma Hill Road and the Rohnert Park Expressway also has materials traveling through on a daily basis. (RP Emergency Management Plan 2010).

Landslides

Hazard Description

Landslides occur when soils a hill side become unstable and slide down towards the base of the hill. They can occur very quickly or may transgress slowly over a period of days, weeks, months, or years. Landslides are capable of damaging or destroying any structures built on or in the moving soil, and the flow of material can cause further damage to any structure in its path. Landslide risk depends on the types of earth materials of the hillside and the steepness of the slope.

There are multiple types of landslides and they can be triggered by a number of different events, but the two most common forms are earthquake-induced landslides and moisture-induced (rain, flooding, irrigation) landslides. During Earthquakes landslides can happen because the ground shaking makes the soil unstable and loose. During the rainy season, moister-induced landslides can occur when the

ground soaks up excess water causing the ground to weaken and become unstable. Water is capable of eroding the base of slops on hillsides causing risk of landslides.

Hazard Location and extent

According to the Rohnert Park Emergency Management Plan, the likelihood of occurrence in very infrequent, and the severity of the occurrence is low. Landslides can occur in the event of a major Earthquake at a magnitude of 7 to 7.9. However, areas designated at risk of landslides are entirely outside and away from the city limits.

The rolling hills, coastal ranges, and steep canyons that characterize Sonoma County's landscape contribute to a widespread landslide hazard. Landslides are described as downward movement of a slope and materials under the force of gravity. In addition to gravity, extended periods of intense rainfall during the winter months is the primary cause of landslides in the County. Landslides can also be triggered by seismic activity. Landslides are a significant secondary hazard to wild land fire, where periods of heavy rainfall on denuded slopes cause landslides and mudslides.

The main types of landslide activity that can impact Sonoma County include:

- Slides: Mass movements, where there is a distinct zone of weakness that separates the slide material from more stable underlying material.
- Falls: Abrupt movements of masses of geologic materials, including rocks and boulders that become detached from steep slopes or cliffs.
- Debris Flows: Rapid mass movement of a combination of loose soil, rock, organic matter, air, and water that mobilize as a slurry flowing down slope. These are most often caused by heavy precipitation and intense surface water runoff in steep gullies.
- Mudflows: Earth flow consisting of material that is wet enough to flow rapidly and contains at least 50 percent sand, silt, and clay sized particles. Mudflows can travel at speeds of 35 mph or greater.
- Creep: Imperceptibly slow, steady, downward movement of slope-forming soil or rock.
- The occurrence of landslides is determined by both natural and human factors. Natural factors include the cohesive strength and shrink-well characteristics of the affected minerals, the orientation of joints and planes of weakness between slide material and bedrock, the steepness of slopes, the degree of saturation of ground materials (highly affected by rainfall), and the density of vegetation. Human factors include the over steepening and overloading of slopes, the removal of natural vegetation, and the addition of water to the soil by watering of lawns and septic system drain fields, and onsite ponding of storm runoff.

Hazard History

- Numerous minor landslides have occurred in Sonoma County in areas adjacent to Rohnert Park. However, due to Rohnert Park's relatively flat topography, and the relative stability of the hillsides immediately adjacent to the City, any impacts from landslides outside the city limits are anticipated to be indirect and/or minor.

Hazard Vulnerability and Risk Assessment

The landslide risk in Rohnert Park is largely outside the city. All of Rohnert Park, and its critical facilities are located in flat areas within the City limit, and none are considered to be at high risk.

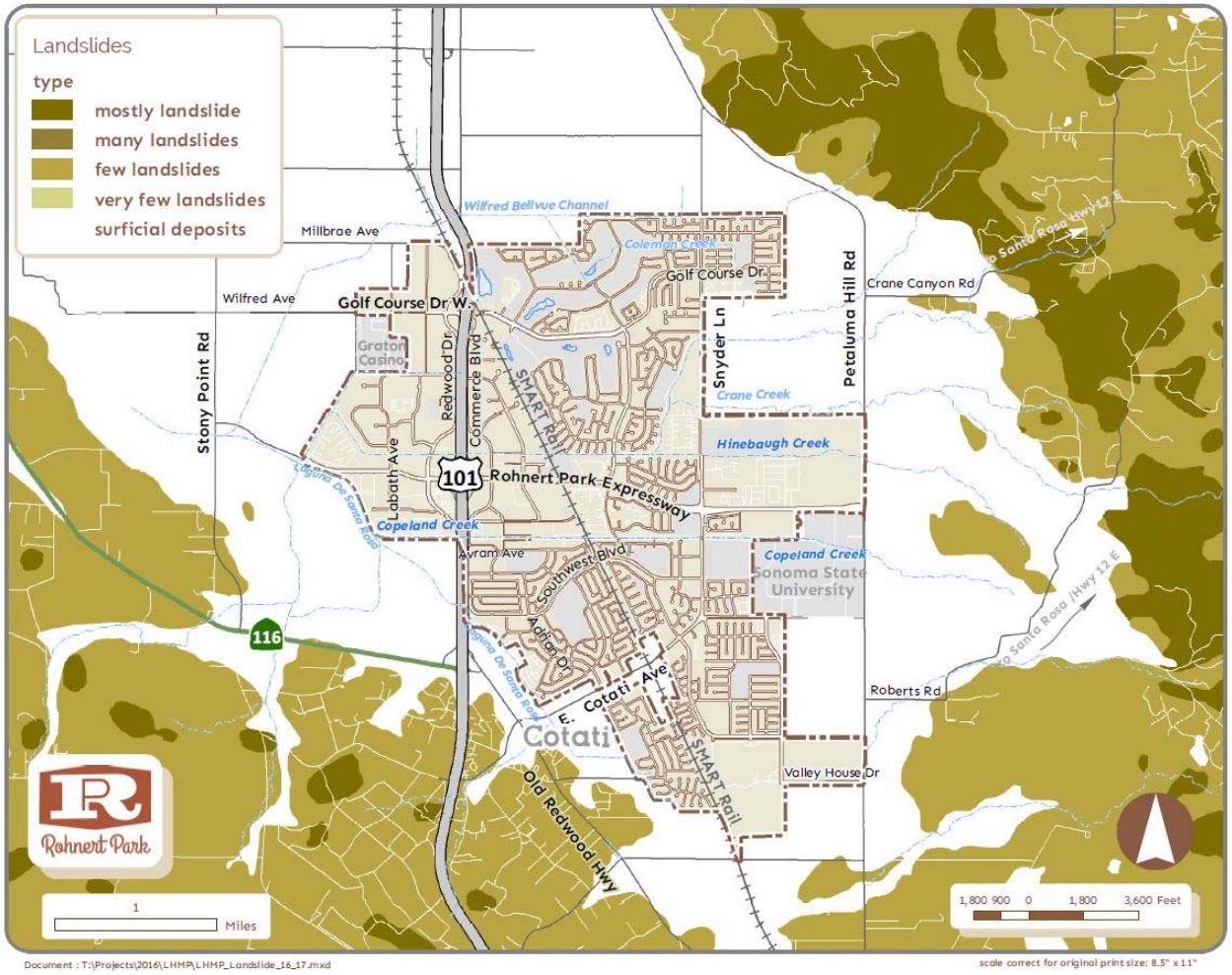

Figure 3.20: Landslide Risk around Rohnert Park

Dam Inundation

Hazard Description

The US Army Corps of Engineers built Warm Springs Dam across Dry Creek. Completed in 1982, this rolled-earth embankment dam is 319 feet (97 m) high, 3,000 feet (900 m) long, and 30 feet (9 m) wide at the top. It contains 30,000,000 cubic yards (23,000,000 m^3) of earth. The dam aids in flood control, and a hydroelectric plant produces electricity from the water released downstream. A minimum amount of flow must be maintained in Dry Creek to allow fish migration.

Figure 3.21: Warm Springs Dam at Lake Sonoma

Hazard Vulnerability and Risk Assessment

An SPRA cadre assessed the Warm Springs Dam in 2006 and, after considering probability of failure and potential failure consequences, categorized it as being in Dam Safety Action Class (DSAC) IV based upon the Dam Safety risk. Dams in Class IV are considered to be marginally safe, in that the combination of life or economic consequences with probability of failure is low. No potential failure modes were identified by the SPRA process using existing data.

Although the SPRA team did not report any potential failure modes caused by flooding, they did analyze the consequences of a dam failure. A relatively low probability of failure along with a moderate sized downstream population, residential and commercial structures including contents, roads, farm land, bridge damage, and utilities, has led to the dam's inclusion in the DSAC IV category. The consequences are judged to be similar for breaches caused by seepage, overtopping, or a seismic even. Portions of the communities of Healdsburg, Windsor, Santa Rosa, Sebastopol, and Guerneville, as well as some rural population areas in the floodplain immediately downstream of the dam, would be at risk if the dam failed as they are within the 1 to 24 hour flood wave travel time bracket. Half of the rural population immediately downstream of the dam is important as -half are within a 15 minute flood wave travel time and all are within a 1 hour flood wave travel time. Based on the 2000 Census of Population and flood inundation maps, up to 84,854 people could be impacted from a dam failure, with an estimated loss of life of up to 100 people from a maximum flood event. Damage includes industrial and residential structures and their contents, roadways, infrastructure, agriculture (mainly viticulture), and bridge damage along the Dry Creek. The estimated damages are up to $13 billion, including $219 million for repairing the dam. Potential inundation areas are found in the County map in the Appendix. Only minor impacts are expected in the worst case scenario along the western edge of Rohnert Park.

Earthquake Faulting

Hazard Description

Surface fault ruptures can result from large magnitude earthquakes. Surface rupture occurs when movement on a fault deep within the earth breaks through to the surface. Structures located within the fault rupture zone are subjected to excessive ground deformations. Most structures are not designed to withstand such large deformations and experience major damage. Pipelines crossing the fault zones can also be damaged by the stresses. During the 1906 San Francisco earthquake horizontal displacement along the San Andreas Fault averaged 15 feet in Sonoma County. The Healdsburg, Rodgers Creek and Maacama faults also show evidence of surface displacement during the past 11,000 years.

Surface rupture is the most easily avoided seismic hazard. The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. Its main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. It requires projects to conduct a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. A structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet).

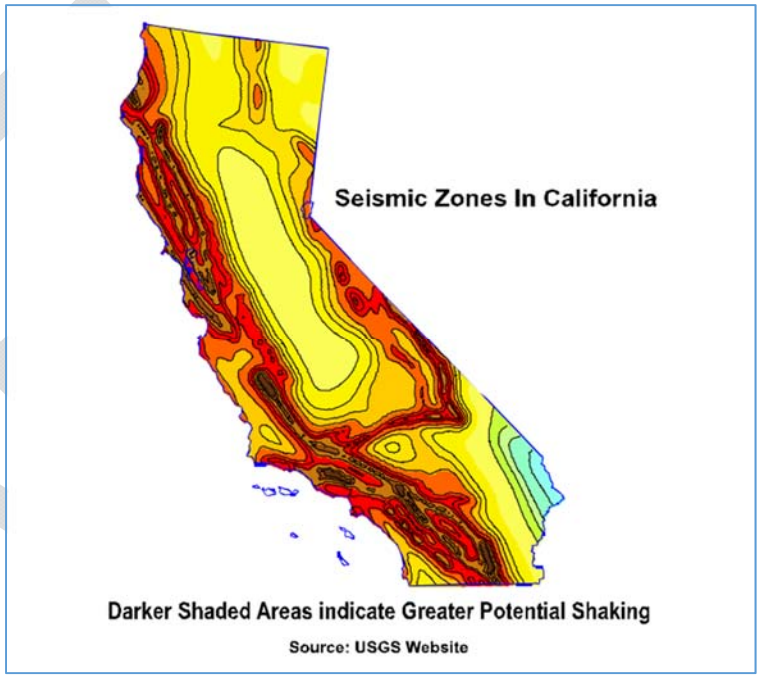

Figure 3.22: Earthquake Hazards in California

Hazard Types

Earthquake Faults: A fault is a fracture along between blocks of the earth's crust where either side moves relative to the other.
Strike-slip: Strike-slip faults are vertical or almost vertical rifts where the earth's plates move mostly horizontally. From the observer's perspective, if the opposite block looking across the fault moves to the right, the slip style is called a right lateral fault; if the block moves left, the shift is called a left lateral fault.

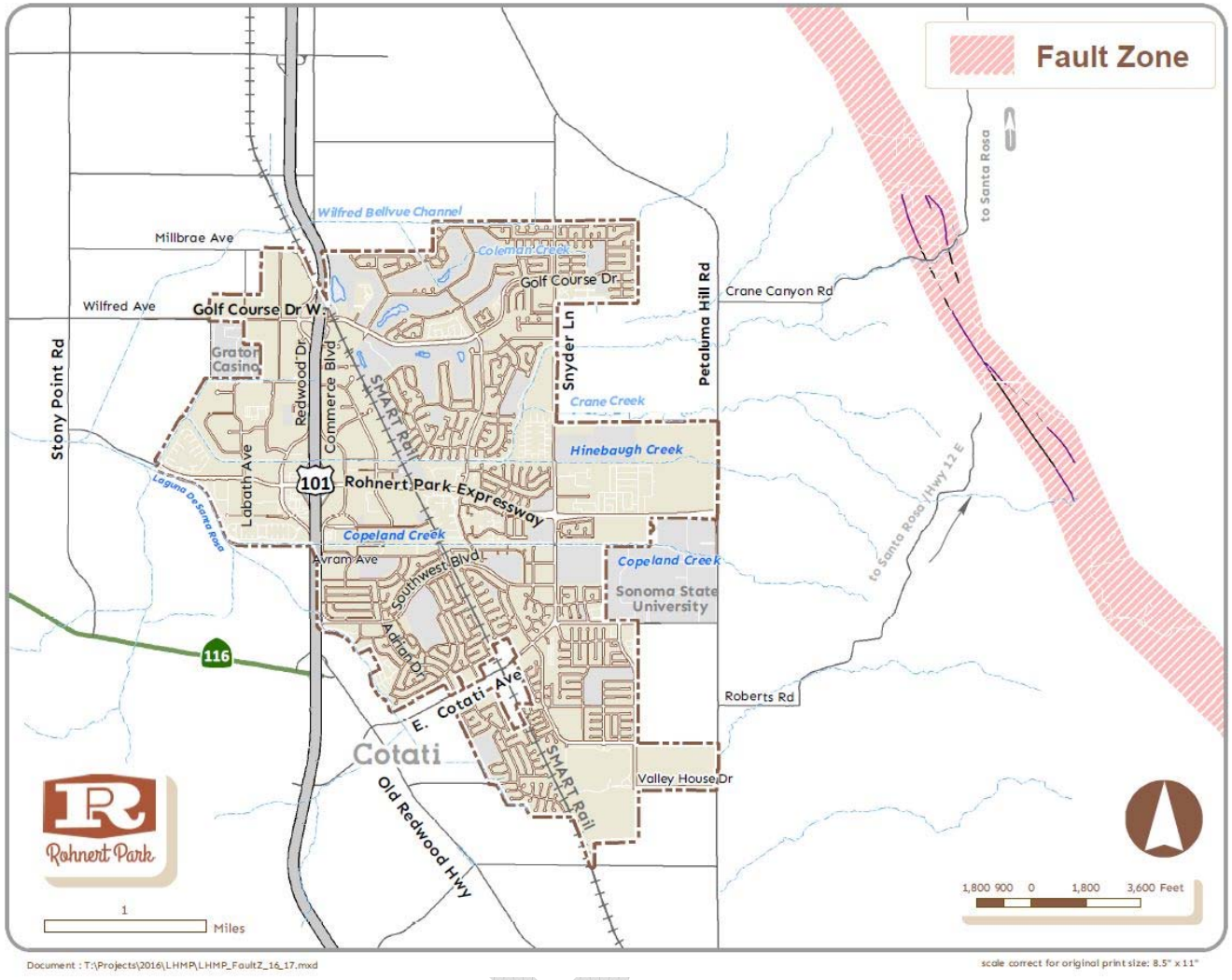

Figure 3.23: Location of nearest fault zone to Rohnert Park

Dip-slip: Dip-slip faults are slanted fractures where the blocks mostly shift vertically. If the earth above an inclined fault moves down, the fault is called a normal fault, but when the rock above the fault moves up, the fault is called a reverse fault. Thrust faults have a reverse fault with a dip of 45 ° or less.

Hazard Vulnerability and Risk Assessment

No known faults are located in Rohnert Park. The Rodgers Creek/Hayward Fault Zone is several miles east of the city limits, and could potentially sever Crane Canyon Road – disconnecting the City's direct link to the Bennett Valley area.

Summary of Vulnerabilities

This Table identifies the Critical Facilities that are at risk from potential hazards. The facilities are classified into separate categories including Government Center, Community, Fire, Health, Parks, and Schools. Facilities with more than a low level risk to specific hazard are denoted accordingly and shaded in orange. As landslide, and hazardous material risks are low throughout the community they are omitted from the table.

Primary Vulnerabilities

- **Localized Flooding (based on local experiences from winter storms)**
- **Flooding based on FEMA 100 and 500 Year Flood Event Maps**
- **Earthquake Shaking**
- **Earthquake Liquefaction**
- **Drought**
- **Wildland-Urban Interface Fire**

Secondary Vulnerabilities

- **Dam Inundation**
- **Landslides**
- **Hazardous Materials**
- **Earthquake Fault Ruptures**

Figure 3.24: Winter storm induced flooding on Commerce Blvd.

Vulnerability Analysis of Critical Facilities

This analysis was conducted by analyzing the location of these facilities in relation to the relative likelihood and intensity of the potential hazards that could impact them. The table does not include several potential hazards that affect only a few select areas or facilities in Rohnert Park (such as dam inundation), nor potential hazards that pose only a low level of vulnerability in Rohnert Park (such as Hazardous Materials). Similarly, landslides, and earthquake faulting are not included in this table as they do not have the potentially to directly impact the City of Rohnert Park (though there is the potential of secondary impacts from these hazards).

Table 4.1: Vulnerability Analysis

Facility	Address	Facility Type	Flood (Local)	Flood (FEMA)	Earthquake (Shaking)	Earthquake (Liquefaction)	Drought	WUI-Fire
City Properties								
City Hall	130 Avram Avenue	Government Center	High		High	Medium		
Corporation Yard (Public Works)	600 Enterprise Drive	Public Works			High	Medium		
Senior Center	6800 Hunter Drive	Community	Medium		High	Medium		
Community Center	5401 Snyder Lane	Community		Medium	High	Medium		
Burton Avenue Recreation Center	7421 Burton Avenue	Community			High	Medium		
Spreckels Performing Arts Center	5409 Snyder Lane	Community		Medium	High	Medium		
Callinan Recreation Center	5405 Snyder Lane	Community			High	Medium		

Facility	Address	Facility Type	Flood (Local)	Flood (FEMA)	Earthquake (Shaking)	Earthquake (Liquefaction)	Drought	WUI-Fire
Animal Shelter	301 J Rogers Lane	Community			High	Medium		
Pump Facility	201 J Rogers Lane	Public Works	Medium		High	Medium		
Public Safety Facility (Main)	500 City Center Drive	Government Center			High	Medium		
Fire Station 2 (North)	5200 Country Club Drive	Fire			High	Medium		
Fire Station 3 (West) *(Future)*	5870 Labath Avenue	Fire			High	Medium		
Fire Station 4 (South)	1312 Maurice Avenue	Fire			High	Medium		
State Farm Expressway Landscaping	State Farm Expressway	Public Works			High	Medium	Medium	
Enterprise Avenue Landscaping	Enterprise Avenue	Public Works	Medium		High	Medium	Medium	
Water Tanks	Various Locations	Public Works			High	High	High	Medium
Parks								
Alicia Park	300 Arlen Drive	Park						
Benicia Park	7471 Bernice Avenue	Pool						
Benicia Pool	7421 Burton Avenue	Park			High	Medium		

Facility	Address	Facility Type	Flood (Local)	Flood (FEMA)	Earthquake (Shaking)	Earthquake (Liquefaction)	Drought	WUI-Fire
Caterpillar Park	7430 Circle Drive	Park					Medium	
Colegio Vista	1200 Southwest Boulevard	Park						
Dorotea Park	895 Santa Dorotea Park	Park						
Eagle Park	1115 Emily Avenue	Park			High			
Gold Ridge Park	1455 Golf Course Drive	Park			High			
Golis Park	1450 Golf Course Drive	Park	Medium	Medium	High		Medium	
Honeybee Park	1170 Golf Course Drive	Park	High				Medium	
Honeybee Pool	1170 Golf Course Drive	Pool	High		High	Medium		
Ladybug Park	8517 Liman Way	Park					Medium	
Magnolia Park	1401 Middlebrook	Park						
Magnolia Pool	1501 Middlebrook Way	Pool			High	Medium		
Oak Grove Park *(Future)*	Keiser Avenue	Park	High	High				Medium
Rainbow Park	1345 Rosana Way	Park						

Facility	Address	Facility Type	Flood (Local)	Flood (FEMA)	Earthquake (Shaking)	Earthquake (Liquefaction)	Drought	WUI-Fire
Sunrise Park	5201 Snyder Lane	Park	Medium		High			
Twin Creeks Park	Kerry Road	Park			High			Medium
Willow Glen Park *(Future)*	Bodway Parkway	Park			High			
Robert's Lake	5010 Robert's Lake Road	Park			High			Medium
Rohnert Bark (Dog Park)	5010 Robert's Lake Road	Park						
Field Of Friends (Dog Park)	7471 Bernice Avenue	Park						
Creekside Multi-Use Paths	N/A	Multi-Use Paths	Medium	Medium	High	High	High	
Municipal Golf Course (North)	100 Golf Course Drive	Park	High		Medium	Medium		Medium
Municipal Golf Course (South)	100 Golf Course Drive	Park			Medium	Medium		
Non-City Facilities								
California Highway Patrol	6100 Labath Avenue	State			High	Medium		
SMART Station	N/A (Rohnert Park Expressway)	Transportation			High	Medium		
Sutter Pacific	1400 Medical Center Drive	Medical		Medium	Very High	Medium		

Facility	Address	Facility Type	Flood (Local)	Flood (FEMA)	Earthquake (Shaking)	Earthquake (Liquefaction)	Drought	WUI-Fire
Kaiser Permanente	5900 State Farm Drive	Medical			High	Medium		
Rohnert Park Cancer Center	301 Professional Center Drive	Medical			High	Medium		
Schools								
Marguerite Hahn Elementary	825 Hudis Street	School			Very High	Medium		
Evergreen Elementary	1125 Emily Avenue	School			Very High	Medium		
Technology Middle School	7165 Burton Avenue	School			High	Medium		
Rancho Cotate High School	5450 Snyder Lane	School			Very High	High		
Monte Vista Elementary	1400 Magnolia Avenue	School			Very High	Medium		
Lawrence E. Jones Middle School	5154 Snyder Lane	School		Medium	Very High	Medium		Medium
Richard Crane Elementary	1290 Southwest Boulevard	School			High	Medium		
John Reed Elementary	390 Arlen Drive	School			High	Medium		
Waldo Rohnert Elementary	550 Bonnie Avenue	School			High	Medium		

Facility	Address	Facility Type	Flood (Local)	Flood (FEMA)	Earthquake (Shaking)	Earthquake (Liquefaction)	Drought	WUI-Fire
Technology High School	1801 East Cotati Avenue	School			Very High	High		
La Fiesta Elementary	8511 Liman Way	School			High	Medium		
Sonoma State University	1801 East Cotati Avenue	University			Very High	High		Medium
Credo High School	1300 Valley House Drive	School			Medium	Medium		Medium
Mobile Home/RV Parks								
Rancho Verde	650 Rohnert Park Expressway	Mobile Home Park	Very High	Very High	High	Medium	Medium	
Rancho Grande	5099 Snyder Lane	Mobile Home Park		Medium	Very High	Medium	Medium	Medium
Rancho Feliz	6607 Redwood Drive	Mobile Home Park		Medium	High	Medium		Medium
Valley Village	6401 Country Club Drive	Mobile Home Park		High	High	Medium		
Las Casitas	7545 Bridget Drive	Mobile Home Park			High	Medium		
Wine Country RV Park	7450 Cristobal Way	RV Park			High	Medium		

Table 4.2: Infrastructure Vulnerability and Exposure

Hazard	Roads (miles)	Rail/Transit (miles)
Total Miles of Infrastructure	*130*	*4*
Earthquake Shaking (within highest two shaking categories)	130	4
Liquefaction Susceptibility (within moderate, high, or very high liquefaction susceptibility	130	4
Earthquake-Induced Landslides	0	0
Earthquake Faulting	0	0
Flooding (within 100 year floodplain)	6	0
Flooding (within 500 year floodplain)	5	0
Landslides (within areas of existing landslides)	None	None
Wildfires (subject to high, very high, or extreme wildfire threat)	None	None
Wildland-Urban Interface Fire Threat	17	1
Dam Inundation (within inundation zone)	<1	0

Potential Impacts to Critical Facilities from Earthquake

Bed Loss in Hospitals

The City of Rohnert Park has two medical facilities; Kaiser Permanente on State Farm Drive and St. Joseph's Urgent Care Center on Medical Center Drive. There are a total of eight major medical facilities within Sonoma County. Public service agencies and volunteer personnel would be used to assist in the care of the injured.

Several of the acute care hospitals in Sonoma County may be lost due to structural damage. In addition, even the most modern hospitals can be incapacitated by non-structural damage. Earthquake shaking can damage sensitive equipment, topple storage units, and dislodge ceilings or light fixtures. Damage to water pipes could flood portions of buildings. Damages can be serious, and it can cause major areas within hospitals to be nonfunctional during the critical hours immediately following a major quake. This will decrease the number of beds available and create the need for alternate treatment facilities or field hospitals. Although a percentage of the remaining beds could be made available by discharging or transferring non-emergency patients, it will probably be necessary to receive an immediate influx of emergency medical aid and/or export some of the seriously injured to out-of-county facilities.

Building Survivability
An earthquake could shake all parts of the City of Rohnert Park and Sonoma County. Every building in the City is exposed to high risk of damage in earthquakes by virtue of being located in a seismically active part of the country. Some of these structures face an elevated risk because they are located in high hazard zones, such as near the fault, on liquefiable soils, or on slopes subject to landslides. Other structures face high risk because their construction quality is inadequate to withstand strong shaking, primarily because they were built decades ago before modern building codes were enacted. Some structures house critical City and County functions, such as emergency response activities, and it is important that these structures remain functional after an earthquake.

Communications
System failure, overloads, loss of electrical power and possible failure of some alternate power systems will affect telephone and cellular systems. Numerous failures can be expected to occur, and the systems will be overloaded beyond capacity. The anticipated damage could disable up to 80% of the telephone system for one day. In light of this, emergency planners should not expect the use of telephone or cellular systems for the first few days after the event.

The City of Rohnert Park and Sonoma County as a whole have a wireless communications network used for public safety and emergency response. The communications network is used by the County and City agencies, public safety officials and emergency responders. The network is comprised of remote mountain top communication sites, consisting of towers and equipment buildings, which provide wireless communications coverage throughout Sonoma County. While the communications system is designed to be functional even after the loss of one or more antennas, a major earthquake impacting multiple sites could significantly reduce communications effectiveness.

Electrical Power
Major power plants are expected to sustain some damage due to liquefaction and the intensity of the earthquake. Up to 60% of the system load may be interrupted immediately following the initial shock. According to representatives of PG&E, electrical power may not be rerouted, resulting in wide spread outages for an undefined period of time. A great deal of the imported power is expected to be lost. In areas of greatest shaking, it should be anticipated that some distribution lines, both underground and surface, would be damaged. Much of the affected area may have service restored in days; areas that suffer extensive damage or have underground distribution may require a longer time.

Fire Operations
Although total collapse of fire stations is not expected, possible disruption of utilities, twisted doors and loss of power can create major problems. Numerous fires due to disruption of power and natural gas networks can be expected. Many connections to major

water sources may be damaged and storage facilities would have to be relied on; water pressure and supply could be inadequate to non-existent. First response from fire personnel is expected to be damage assessment and determining resources needed for response and recovery needs. Response could be further complicated and delayed by the disruption of transportation routes.

Secondary responses by the fire service will focus on search and rescue of trapped persons. Rescuers should expect loss of power and water, jammed doors, restricted mobility due to debris, possible loss of communications capability and delays in reaching maximum effectiveness due to personnel shortages.

Roads, Highways and Bridges

Many roads in the County of Sonoma traverse areas subject to liquefaction and landslides. Roadways that experience liquefaction can develop very large cracks that prevent their use, and can develop smaller cracks and sinkholes that impede traffic. Landslides triggered by earthquakes can both block and rip out sections of roads. Numerous roads will be subject to delays and detours. Damage to freeway systems is expected to be major, despite seismic upgrades. Portions of surface streets in the vicinity of freeways may be blocked due to collapsed overpasses. Many surface streets in the older central business district will be blocked by debris from buildings, falling electrical wires and pavement damage. Local bridges that have not been seismically retrofitted may experience a high percentage of failure. The failures of major roadways in the county could impact safe routes for mutual aid resources responding to the City of Rohnert Park.

Sanitation Systems

Many of the wastewater treatment facilities could be disrupted, depending on the severity and intensity of the earthquake and damage caused by liquefaction. There is a limited amount of storage available in the wastewater treatment plants; if the treatment train cannot be restored before the storage is exceeded, wastewater will require discharge with emergency chlorination to reduce health hazards. Overflow of sewage through manholes and from ponds can be expected due to breaks in sewer mains and loss of power. As a result, there may be danger of excessive collection of explosive gas in sewer mains, and flow of untreated sewage in some street gutters. Many house sewer connections will break and plug.

Water Supply

Several ruptures are anticipated along the water pipelines in the City and County Areas. A majority of water wells are expected to be disabled by loss of electricity and the lack of backup power sources. In addition, shear forces could render about a third of the wells inoperative for an indefinite period. Water availability and distribution for needed life support, to treat the sick and injured and for fire suppression activities is of major concern to each community.

Social Vulnerability Analysis

A hazard event has the potential to effect members of the community in varying ways, even if the extent and severity of the hazard is precisely the same. In some cases, an earthquake event may be more impactful and damaging to persons of lower income, as they are more likely to lack the financial resources to have retrofitted their home to be more resistant and resilient to ground shaking. A community member's vulnerability to a hazard situation could also be affected by other factors such as age, disability status, education, English proficiency, or other factors. Together, these factors reflect a community member's vulnerability independent of the hazard or disaster itself. This is known as social vulnerability.

Table 4. 3 Community-Wide Social Vulnerability Metrics

Social Vulnerability Metric	Roads (miles)
Number of residents	42, 622
Number of households	15,808
Number of households with children	4,363
Median household income	$58,317
Percentage of households under the poverty limit	15.2%
Number of elderly households	3,048
Number of adults without a high school diploma	3,072
Percentage of people with limited English proficiency	9.5%
Percentage of households with a disabled family member	12.5%

MITIGATION AND ADAPTATION STRATEGY

The purpose of hazard mitigation is to reduce potential losses from future disasters. The intent of mitigation planning, therefore, is to maintain a process that leads to hazard mitigation actions. Mitigation plans identify the natural hazards that impact communities, identify actions to reduce losses from those hazards, and establish a coordinated process to implement the plan. (44 CFR §201.1(b))

The findings of the vulnerability and risk assessments in the previous chapter were used to develop actions that reduce and/or eliminate potential losses from relevant hazards.

FEMA Element C: Mitigation Strategy

- ***C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources, and its ability to expand on and improve these existing policies and programs? 44 CFR 201.6(c)(3)***
- ***C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? 44 CFR 201.6(c)(3)(ii)***
- ***C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? 44 CFR 201.6(c)(3)(i)***
- ***C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? 44 CFR 201.6(c)(3)(ii) and 44 CFR 201.6(c)(3)(iv)***
- ***C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? 44 CFR 201.6(c)(3)(iii) and 44 CFR (c)(3)(iv)***
- ***C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? 44 CFR 201.6(c)(4)(ii)***

Hazard Mitigation Goals, Priorities, Benefits narrative

The City of Rohnert Park established LHMP mitigation priorities and goals as a component of the planning process in order to guide the development of a thorough plan. The goals were developed by the planning team and drawn from the previous LHMP and the City's General Plan. The mitigation goals and priorities for the LHMP are:

1. Implement the Local Hazard Mitigation Plan to increase Rohnert Park's level of preparation for potential disasters and to minimize the impacts associated with natural and man-made hazards.

2. Identify strategies and tools to facilitate community disaster and hazards awareness and education.

3. Provide for the safety of Rohnert Park citizens by maintaining efficient, well-trained, and adequately equipped City personnel.

4. Encourage a disaster-resistant City and surrounding area by reducing the potential for loss of life, property damage, and environmental degradation from disasters and hazards.

5. Reduce the vulnerability of public and private facilities and infrastructure to the effects of earthquakes, flooding, and drought.

6. Promote conditions and strategies that will accelerate the capacity for physical and economic recovery from disasters and hazards.

The City's hazard mitigation goals are intended to develop effective policy choices that protect community members, property, infrastructure, and natural resources from hazards. These goals shape the mitigation actions taken by the City and the community to reduce the risks from natural disasters, and act as a checkpoint that City departments can use to check on the progress of mitigation actions and implementation.

Mitigation Goals and Mitigation Actions Development

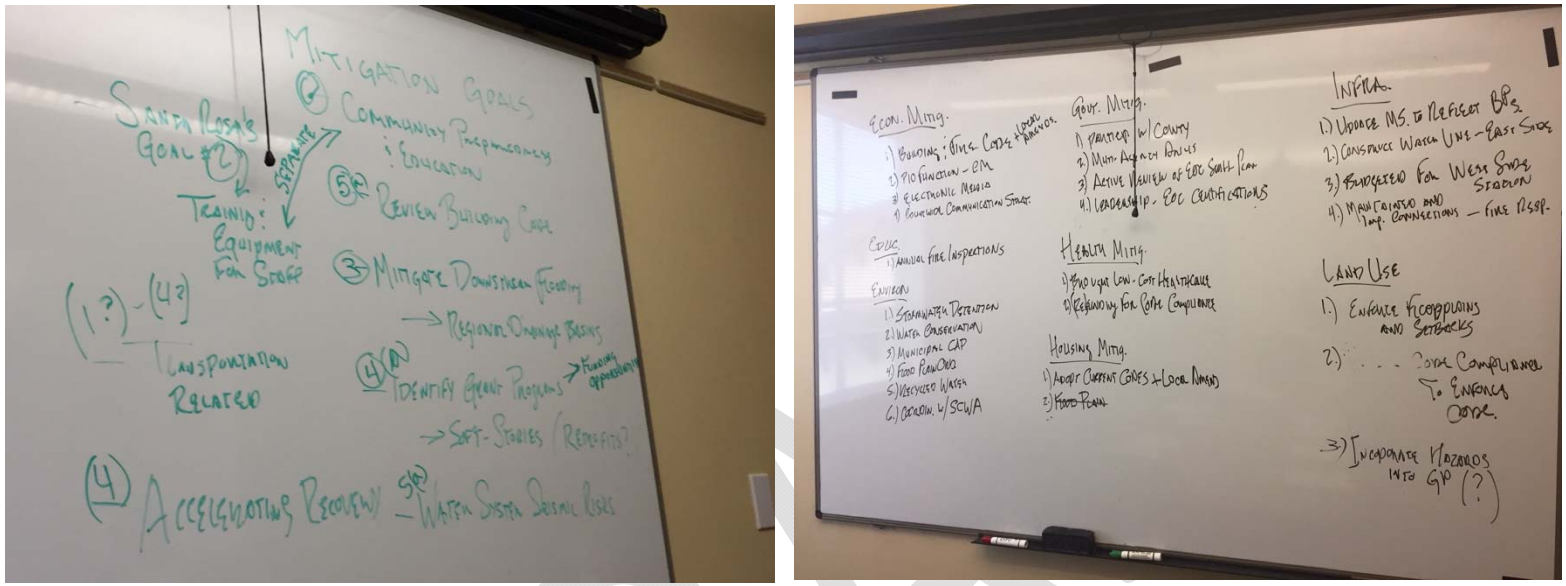

Figure 5.1 and 5.2: Mitigation Goals and Mitigation Actions Process

The LHMP Team met several times to discuss hazard mitigation goals and hazard mitigation actions. The Team looked at the risks and vulnerabilities identified in previous sections of this plan. While generally goals did exist with the 2010 Annex, new goals were formulated and identified for the new LHMP. After mitigation goals were completed, hazards identified and described, and risk assessed, the LHMP Team prepared draft actions, and revised and prioritized them based on data analysis and local knowledge about the risks and priorities associated with each hazard. FEMA directs local governments to use the following criteria as part of its evaluation of mitigation actions:

- The frequency and severity of individual hazard types, and the vulnerability of the community to these hazards
- The impacts reduced or avoided by the action
- The amount of benefits provided by the action
- The critical facilities benefited by the action, including the number of facilities and their importance
- The environmental benefits of the action

The LHMP Team also reviewed the proposed mitigation actions in terms of considering of the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria. The team did not conduct a formal SAPLE/E analysis, but considered these criteria as part of the evaluation process and discussed how the STAPLE/E criteria may be used to evaluate any grant applications the City of Rohnert Park may submit to assist with LHMP implementation.

Table 5.1 STAPLE/E Criteria

Issue	Criteria
Social	• Is the measure socially acceptable to City residents? • Would the measure treat some individuals unfairly? • Could the measure reasonably cause potential social disruption?
Technical	• Is the measure likely to reduce the risk from a hazard, or will it only reduce the consequences of the risk? • Will the measure create more problems or exacerbate existing ones? • Is the measure the most useful course of action to address the risk, given the goals of the City?
Administrative	• Does the City have the administrative capabilities to implement the measure? • Is the City's staff available to coordinate and lead implementation of the measure? • Does the City have sufficient technical support, staff, and funding for implementation? • Dos the City face administrative barriers to implementation?
Political	• Is the measure politically acceptable to the City and to other jurisdictions within the City's borders? • Do community members support beginning and or/continuing measure implementation?
Legal	• Does the City have the authority to implement the measure and enforce it as needed? • Are there potential legal consequences or barriers that could reasonably hinder measure implementation? • Could the measure expose the City to legal liabilities? • Could the measure reasonably face legal challenges?
Economic	• What are the monetary costs of the measure, and do these costs exceed the monetary benefits? • What are the start-up, maintenance, and administrative costs associated with the measure? • Has funding for the measure been secured, or is there a source of funding available? • How will the measure affect the City's financial capabilities? • Will the measure reasonably place any potential burden on the local economy or tax base? • What are the budgetary and revenue effects of the measure to the City?
Environmental	• How will the measure effect the environment? • Will the measure need environmental regulatory approvals? • Will the measure reasonably affect any endangered, threatened or otherwise sensitive species?

Hazard Mitigation Cost – Benefit Review

Local governments are required to consider the costs and benefits of a full range of mitigation activities that can be implemented to reduce the potential effects of a particular hazard within the specific community. Cost-benefit analysis is generally used in hazard mitigation to provide guidance on whether the benefits to life and property protected through mitigation efforts have the potential outweigh the costs of the associated mitigation action. The conducting of a cost-benefit review for a particular mitigation activity has the ability to assist communities in determining whether a project is substantially worth undertaking in order to minimize or even avoid damages later on.

An LHMP must demonstrate that a process was employed that emphasized a substantial review of the cost-benefits when evaluating and prioritizing mitigation actions. The cost-benefit review must be comprehensive enough in the way it reviews actions so that it can sufficiently evaluate the monetary and non-monetary benefits and specific costs that are tied to each action.

Factors to be considered in a cost-benefit analysis:

- How large an area is potentially impacted?
- How many people are expected to benefit from the action?
- How do critical facilities and infrastructure benefit from the action?
- Does such an action make sense for the environment?

The LHMP Team used a simple method to estimate and determine the relative cost of mitigation activities. The table identifies the relative cost of mitigation actions, which uses three categories: *$ - Indicates Low Cost (<$50,000), $$ - Indicates Medium Cost ($50,000-$100,000), and $$$ - Indicates High Cost (>$100,000).* During the City's implementing period, and annual review of the plan, more specific costs will be determined, and the cost-benefit matrix refined as necessary.

Mitigation Actions

The Rohnert Park LHMP Team utilized data from the Hazard Profiles and Vulnerability Assessment, Capabilities Assessment, and progress on past actions to formulate Mitigation Actions for the new LHMP. The Table below identifies the proposed mitigation actions, who the responsible city department would be, some potential funding sources, the individual action's overall priority and goal completion date, which mitigation goal the action fulfills, and the relative cost: $=low, $$=medium, $$$=high.

The following abbreviations are used in the table:

- Dev. Services: Rohnert Park Development Services Department (includes Planning, Engineering, and Building).
- Admin.: Rohnert Park Administration
- Public Safety: Rohnert Park Department of Public Safety (combined police and fire)
- I.T.: Rohnert Park Information Technology
- Public Works: Rohnert Park Department of Public Works
- HMGP: Hazard Mitigation Grant Program
- FMA: Flood Mitigation Grant Program
- PDM: Pre-Disaster Mitigation Grant Program
- FMAG: Fire Management Assistance Grant Program

Table 5.2: Mitigation Actions

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
1. Multiple Hazards - Related Actions							
1.1	Continue to apply appropriate development conditions/restrictions for projects in higher hazards zones to reduce risks	Dev. Services, Public Safety	General Fund, HMGP, PDM, Cost Recovery	Ongoing	High	4	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
1.2	Continue to analyze and improve emergency response communication. This strategy should include building redundant capacity into public safety alerting, and answering points as well as replacing or hardening communication systems. Use the City website and social media for community outreach purposes.	Admin., Public Safety, I.T.	General Fund, HMGP, PDM, FMAG, Other Grant Sources	2019	Low	2, 3, 4	$
1.3	Continue to assess critical facilities that are vulnerable to damage from natural disasters, including availability of backup power and sufficient supplies to maintain essential functions, and make recommendations for appropriate mitigation.	Dev. Services, Public Safety, Public Works	General Fund, HMPG, PDM, Other Grant Resources	2018	High	5, 6	$
1.4	Retrofit, replace, or relocate critical facilities that are shown to be vulnerable to damage in natural disasters.	Public Works	General Fund, HMGP, PDM, Cost Recovery	Ongoing	Moderate	4, 5,6	$$$
1.5	Continue to participate not only in general mutual-aid agreements, but also in agreements with adjoining jurisdictions and special districts for cooperative response to fires, floods, earthquakes, and other disasters.	Public Safety	General Fund, HMGP, PDM, Other Grant Sources	Ongoing	Low	1, 2	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
1.6	In accordance with the adaptation strategies of the Sonoma County Climate Action Plan (SCCAP) continue to regularly inform, and solicit feedback from City organizations on potential climate change risks, and hazards with all departments as relevant.	Dev. Services, Public Safety, Public Works	General Fund, Cost Recovery	Ongoing	Moderate	2, 4	$
1.7	In accordance with the adaptation strategies of the SCCAP, revise Rohnert Park's General Plan, and other applicable documents to better integrate, and prioritize climate change issues, and best practices during required updates and as funding opportunities permit.	Dev. Services	General Fund, Cost Recovery	Ongoing	High	2, 4, 6	$$
1.8	In accordance with the adaptation strategies of the SCCAP, integrate climate change adaptation into future updates of the Zoning Code and General Plan, and other related documents.	Dev. Services	General Fund, Other Grant Sources	Ongoing	High	2, 4, 6	$$
1.9	Continue to coordinate with Sonoma County, and surrounding jurisdictions on emergency notifications, including alerts of imminent threats or a need to evacuate.	Public Safety	General Fund, Other Grant Sources, PDM, HMPG	Ongoing	Moderate	1, 2, 3	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
1.11	To the extent possible, avoid locating new critical facilities in areas of elevated hazard risks. Use extensive mitigation measures to reduce vulnerability if no suitable alternative site exists.	Dev. Services	General Fund, Cost recovery	Ongoing	Low	4, 5	$
1.12	Continue to work with regional companies and service agencies, including energy providers, telecommunications services, and transit operators, to maintain basic services as much as possible during emergency conditions and to restore services as quickly as possible following an emergency event.	Public Safety, Public Works	General Fund, PDM, HMGP	Ongoing	Low	4, 5, 6	$
1.13	Work to improve estimates of potential casualties and property damage as a result of different emergency situations.	Dev. Services, Public Safety	General Fund, HMPG, PDM, Other Grant Resources	2019	Low	1, 4, 6	$$
1.14	Continue to update the City's emergency planning documents to ensure consistency with state and federal law, local conditions, best practices, and most recent science and technology.	Dev. Services, Public Works, Public Safety	General Fund, General Plan Maintenance Fund	2018	High	1, 2, 4	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
1.15	Continue to improve the reliability of the water supply for emergency response purposes through new water main connections and system improvements.	Dev. Services, Public Works, Public Safety	General Fund, Cost Recovery, Other Grant Sources	Ongoing	Moderate	4, 5, 6	$$
1.16	Invest in continued training for City staff in emergency preparedness and response.	All Departments	Other Grant Sources, PDM, HMPG	Ongoing	Low	3	$$
1.17	Continue to make strategic investments in modern equipment for City staff.	All Departments	General Fund, Other Grant Sources	Ongoing	Moderate	2, 3, 6	$$
1.18	Continue to maintain and periodically update the LHMP.	All Departments	General Fund, PDM, HMPG	Ongoing	High	1, 2	$$
2. Flooding							
2.1	Sustain the City's participation in FEMA's National Flood Insurance program (NFIP).	Dev. Services, Public Works, Public Safety	General Fund, Other Grant Sources	Ongoing	High	1, 4, 5, 6	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
2.2	When FEMA creates, updates, and publishes flood zone mapping of the 100-year and 500-year floodplains, quickly integrate new information from the maps into the City's GIS, and use flood information in the development review and public project review process. In areas with high flood risk, continue to evaluate, and implement flood hazard mitigation projects to reduce potential for property damage, street flooding, and stream erosion.	Dev. Services, Public Works	General Fund, Other Grant Sources	Ongoing	High	1, 4, 5	$$
2.3	Continue to analyze pump station conditions, capacity, and upgrades when appropriate.	Public Works	General Fund, Development Fees	Ongoing	Low	3, 4, 5, 6	$$
2.4	Evaluate, monitor, and maintain the City's storm water drainage system to ensure it can effectively handle anticipated storm water volumes to the maximum extent possible, and make upgrades and repairs as needed. Coordinate with the Sonoma County Water Agency to clear debris, and remove vegetation and sediment in flood control channels within the City to protect flow capacity.	Public Works	General Fund, Other Grant Resources	Ongoing	Moderate	1, 4, 5	$$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
2.5	Continue to pursue grant funding to complete creek restoration projects that result in bank stabilization, enhanced habitat, and flood capacity.	Public Works, Dev. Services	Other Grant Resources	Ongoing	Low	4, 5	$$
2.6	Retrofit public areas, including plazas, sidewalks, and parking lots as feasible, to use permeable paving and other low-impact development features that promote infiltration, and reduce storm water runoff.	Public Works	General Fund, Other Grant Resources	Ongoing	Low	4, 5	$$$
2.7	Continue to pursue project to mitigate downstream flooding through the preservation, and construction of regional drainage basins.	Public Works, Dev. Services	General Fund, Development Fees, Other Grant Sources	Ongoing	Moderate	5	$$
3. Seismic Hazards (Shaking)							
3.1	Consider the development of funding mechanisms to assist building owners' affordability of retrofits to unreinforced or retrofitted structures.	Dev. Services	TBD	TBD	Low	2, 4, 5	$$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
3.2	Require the retrofit of seismically vulnerable structures consistent with City Code at the time of major renovations or redevelopment. This program should include community education and outreach.	Dev. Services	General Fund	Ongoing	Low	4, 5, 6	$$
3.3	Identify/analyze sewer and water lines that are determined to be structurally deficient, and retrofit and replace as necessary.	Public Works	General Fund, Development Fees, HMPG, PDM, Other Grant Resources	2019	Low	5, 6	$$$
3.4	Conduct seismic evaluations of City-owned properties that contain critical facilities/operations to determine the need for upgrades/retrofitting.	Dev. Services, Public Works	TBD	2019	Moderate	1, 3, 4, 5	$$$
4. Geologic Hazards (Liquefaction)							
4.1	Require comprehensive geotechnical investigations prior to development approval, where applicable. Investigations shall include evaluation of liquefaction potential, settlement, seismically induced land-sliding, or weak and expansive soils.	Dev. Services	Development Fees	Ongoing	Moderate	1, 4, 5	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
4.2	Restrict development from areas where people might be adversely affected by natural or man-made geologic hazards, including unstable slopes, liquefiable or expansive soils, and poorly engineered fills, as determined by a California-registered geologist or engineer.	Dev. Services	General Fund, General Plan Maintenance Fund	Ongoing	High	4, 5, 6	$$
4.3	Pursue implementation of regulatory requirements related to erosion and sediment control. As needed, adopt additional, mandatory, minimum sediment and erosion control measures for current properties, and those under construction that exhibit high erosion potential or have experience past erosion problems. Sediment and erosion control measures shall reduce soil erosion from primary erosional agents including wind, construction operations, and storm water runoff.	Dev. Services	TBD	2019	Low	5	$$
4.4	Identify grant programs, and other funding opportunities to retrofit soft-stories.	Dev. Services	TBD	2019	Low	4, 5	$$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
5. Hazardous Materials							
5.1	Provide reliable water delivery, and wastewater collection during, and after disasters to reduce the risk to public health, and the environment.	Public Works	General Fund, Other Grant Resources, Development Fees	Ongoing	High	4, 5, 6	$$$
5.2	Generate, and support public awareness, and participation in household waste management, control, and recycling.	Public Safety	General Fund, Other Grant Resources	Ongoing	Low	1, 2	$
5.3	Continue to improve the capabilities of the Public Safety Department to respond to new hazardous material incidents/emergencies.	Public Safety	General Fund, Other Grant Resources	Ongoing	Moderate	1, 2, 3	$$
5.4	Update the HazMat Response Plan.	Public Safety	General Fund, Other Grant Resources	2019	Low	2, 4, 6	$$
5.5	Develop strategies to enhance protection of existing groundwater resources from hazardous material sites.	Public Safety, Public Works	TBD	2018	Moderate	2, 4, 5	$$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
5.6	Continue to improve outreach to businesses that store, handle, and use hazardous materials over the state threshold or generate hazardous waste.	Public Safety, Public Works	General Fund, HMPG, PDM, Other Grant Resources	Ongoing	Low	1, 2, 4	$
6. Drought							
6.1	Continue to participate in the Russian River Watershed Association to provide water conservation guidance, encourage drought-tolerant landscaping, and reduce the consumption of potable water.	Public Works	General Fund	Ongoing	Low	1, 2, 4	$
6.2	Continue to wisely use, where available, water resources from the recycled water system.	Dev. Services, Public Works	General Fund, Development Fees	Ongoing	High	4, 5	$$
6.3	Develop a plan for expediting the repair, and functional restoration of water, and wastewater systems through the stockpiling of materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.	Public Works	TBD	2019	Low	5, 6	$$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
6.4	Host regular workshops, and classes on water conservation strategies, including drought-tolerant landscaping. Available rebates for water conservation, and water efficiency actions. Continue workshops, classes and other education efforts even in the absence of drought conditions.	Public Works	General Fund, Other Grant Resources	TBD	Low	1, 2, 4	$
7. Dam Inundation							
7.1	Utilize mapping tools to better understand potential impacts of dam failure on the recently annexed Northwest Specific Plan Area and areas along creeks west of Highway 101 that drain in to the Laguna de Santa Rosa.	Public Works, Development Services	General Fund, CID, Other Grant Resources	2019	Moderate	4, 5	$
8. Landslides and Earthquake Faulting							
8.1	Prepare a report based on mapping activities documenting potential secondary impacts of landslides and earthquake fault ruptures on transportation infrastructure, utilities, and communications facilities that service Rohnert Park.	Public Works, Development Services	General Fund	2019	Low	4, 5	$$
8.2	Assess the potential impact of fire damage triggered landslides and debris on property and streams within the City of Rohnert Park	Public Works, development Services	Other Grant Resources	2018	High	4, 5	$

	Mitigation Action	Responsible Department	Potential Funding Sources	Target Complete Date	Priority	Mitigation Goal	Relative Cost
9. Wildland-Urban Interface Fire							
9.1	Continue to monitor the Wildland-Urban Interface areas of the City, and develop maps and materials as a part of plan to mitigate exposure to current and future fire risks.	Public Safety, Dev. Services	FMAG, Other Grant Resources	2018	High	1, 4, 5	$$
9.2	Map properties that were impacted by the October 2017 fires, either directly, or through Emergency Operations activities, and assess needs and methods for future access and emergency response.	Public Safety, Public Works, Dev. Services	FMAG, Other Grant Resources	2018	High	1, 4, 5	$
9.3	Assess what additional equipment, resources, or authority may be needed to mitigate the risk of future fire emergencies, and to respond effectively in the event one occurs.	Admin., Public Safety, Public Works, Dev. Services	FMAG, General Fund, Other Grant Resources	2018	High	1, 4, 5	$$

$ Indicates Low Cost (<$50,000)

$$ Indicates Medium Cost ($50,000-$100,000)

$$$ Indicates High Cost (>$100,000)

Implementation of Select Mitigation Actions

Stream Maintenance to Reduce Flooding Impacts: In Rohnert Park, SCWA performs periodic channel maintenance activities which may include sediment removal, debris removal, and vegetation maintenance. Though initially designed and built as constructed channels to move stormwater and other runoff through and away from developed land, the waterways that traverse the City are thought of by many as creeks -- assets with value beyond storm water conveyance. Responding to this changing attitude, SCWA is moving away from the dredging and clearing activities of the past, and has developed a Stream Maintenance Program that is its new channel maintenance regime. Follow this link for more on the Stream Maintenance Program on SCWA's website.

Figure 5.3: 2017 SCWA Stream Maintenance

Rohnert Park's Low Impact Development Strategy: Low Impact Development (LID) is defined as a design strategy to maintain or reproduce the way storm water infiltrates or runs off a site before development occurs. LID principles control storm water runoff by using small scale landscape based features that are distributed throughout the site. Projects designed following LID principles must maintain the undeveloped volume of storm water runoff and mimic the natural water balance through infiltration, evapo-transpiration, or through capture and reuse of storm water.

LID is intended to minimize the impact of development —our buildings, roads, parking lots, driveways— on our watersheds. LID correlates the relationship between storm water runoff and the land, including our built environment. LID techniques lessen the quantity of runoff and improve its quality by "slowing, spreading, or sinking" runoff on the site as much as possible. Slowing down storm water runoff keeps the water in the channels from rising too high and too fast and devastating communities downstream. Spreading does the same, helping to dissipate the storm water's power. Sinking means infiltrating water through soil, which cleans the water and recharges the groundwater table.

The City's MS4 permit requires compliance with the City of Santa Rosa and County of Sonoma's LID Technical Design Manual (dated August 2011). Adherence to these guidelines requires new development projects to incorporate LID design strategies and BMPs to reduce pollutants in runoff to the maximum extent practicable. The LID manual was updated and in effect as of 2017.

Capabilities Assessment

An LHMP is required to conduct a capabilities assessment to identify local personnel, agencies, and resources that have the capability and capacity to assist with and support hazard mitigation activities. The LHMP team identified and defined known local resources available to the City of Rohnert Park. Many of these resources were used or consulted in the development of this LHMP. They are briefly summarized in the table below.

Rohnert Park's capabilities are, like any governmental jurisdiction, constantly undergoing refinement and improvement. The new Westside Fire Station, which has been approved and is expected to break ground in 2018 will be a significant upgrade in the physical resources available to the City in terms of hazard preparedness and emergency response.

Figure 5.4: Approved Westside Public Safety Station

Table 5.3: Available Resources

Resource	Type	Background and Capacity	Further Information
City of Rohnert Park			
Building Code	Policy Document	Provides a guidance and framework for the construction and maintenance of structures within the City in conformance with the International Building Code. Specifically formulated to mitigate seismic and fire hazards.	http://www.rpcity.org
Zoning Code	Policy Document	Primary tool to serve as the implementing document of the General Plan. It sets specific land use regulations and includes the zoning map for the City. The zoning code is supplemented by Specific Plans, and also includes a Form Based Code for Sonoma Mountain Village	http://cityofrohnertpark.hosted.civiclive.com

Resource	Type	Background and Capacity	Further Information
General Plan	Policy Document	This is the principal policy document that guides development and ongoing evolution in Rohnert Park. The General Plan includes programs and policies pertaining to land use, housing, and natural resources. This is the current 8th Edition of the General Plan that was completed in 2000. A new General Plan process is expected to start in early 2018. Hazard data and mitigation activities described in the LHMP can incorporated in to the General Plan.	http://www.rpcity.org
Fire Code	Policy Document	The Fire Code of the City of Rohnert Park provides guidance that complies with the International Fire Code. The code is recognized for its ability to mitigate fire hazards.	http://www.rpcity.org
Building Code	Policy Document	Specified how new structures can be built. It includes the California Building Code in addition to any amendments made by the City. Mitigation actions may involve amending the Building Code to improve a building's safety or structural stability.	http://www.rpcity.org
Zoning Code	Policy Document	Is responsible for the practical implementation of the General Plan. Specifies the physical makeup of the City. Mitigation actions may involve amending the Zoning Code to create a safer community.	http://www.rpcity.org
Emergency Management Plan	Policy Document	The Emergency Management Plan was prepared in 2012 and outlines the City's response and procedures in the event of natural or man-made hazards.	http://www.rpcity.org

Resource	Type	Background and Capacity	Further Information
Capital Improvement Program (CIP)	Policy Document	The capital Improvement Program is the City's primary method for upgrading and maintaining critical infrastructure. The CIP is a key vehicle for implementing actions from the LHMP.	http://www.rpcity.org
Administration	Personnel Resource	Rohnert Park's administrative unit handles finance, personnel, and overall administration/management.	http://www.rpcity.org
Public Safety	Personnel Resource	The department, which combines the functions of police and fire, conducts emergency preparedness activities for the community. Mitigation activities related to emergency preparedness can be implemented by the department.	http://www.rpcity.org
Public Works	Personnel Resource	The department is responsible for the construction and maintenance of the City's physical infrastructure.	http://www.rpcity.org
Development Services	Personnel Resource	The department, which encompasses planning, engineering, and building, may be responsible for mitigation activities related to its functions.	http://www.rpcity.org
Sonoma County			
Emergency Council	County Resource	Is responsible for the revision and maintenance of the Sonoma County Emergency Plan. Is also responsible for the implementation of mutual aid agreements throughout the county.	http://sonomacounty.ca.gov/Emergency-Council/
Fire Prevention Division	County Resource	Is responsible for programs, procedures, and projects for preventing the outbreak of fires in the unincorporated areas of the county which may impact populations, resources, and urban areas.	http://sonomacounty.ca.gov/FES/Fire-Prevention/

Resource	Type	Background and Capacity	Further Information
Sonoma County Water Agency (SCWA)	Agency Resource	The SCWA is responsible for maintaining over 75 miles of streams throughout Sonoma County and provides flood protection for facilities in the county. The SCWA is also the controlling agency for the water supply system throughout much of Sonoma County.	http://www.scwa.ca.gov/
Sonoma County General Plan	Policy Document	The Sonoma County General Plan, like Rohnert Park's, is the guiding document for the evolution of the county.	http://sonomacounty.ca.gov
Sonoma County Hazard Mitigation Plan	Policy Document	The Sonoma County Plan provided general background information for the development of the Rohnert Park LHMP.	http://www.sonoma-county.org/prmd/docs/hazard-mitigation-update/
Santa Rosa Hazard Mitigation Plan	Policy Document	The newly approved Santa Rosa Hazard Mitigation Plan served as a primary resource and guide for the development of the Rohnert Park LHMP.	https://srcity.org/540/Local-Hazard-Mitigation-Plan
SCWA Urban Water Management Plan	Agency Resource	Is a long-range planning document to aid cities in Sonoma County to help plan for services and emergencies through 2035. The plan includes projections for water demands and supplies.	http://www.scwa.ca.gov/
Sonoma County Climate Action Plan	Advisory Document	The Sonoma County CAP, developed by the Regional Climate Protection Authority was developed in coordination with all major jurisdictions in the County. However, prior to formal adoption by all jurisdictions, the document was challenged in court and found to have been inadequate in its full scope to address GHG emissions. The document is now merely advisory but includes many useful policies and recommendations.	https://rcpa.ca.gov/

Resource	Type	Background and Capacity	Further Information
SCWA Hazard Mitigation Plan	Agency Resource	The Sonoma County Water Agency, similar to the City of Rohnert Park, must develop and publish a hazard mitigation plan, to be updated every five years.	http://www.scwa.ca.gov/
Regional Resources			
Association of Bay Area Governments	Agency Resource	Serves as the primary vehicle for Regional Governance and research particularly in regards to planning, land use, hazards, and climate change.	https://www.abag.ca.gov/
Metropolitan Transportation Commission	Agency Resource	Coordinates the planning of major transportation infrastructure improvements throughout the San Francisco Bay Area including within Sonoma County.	http://mtc.ca.gov/
Pacific Gas and Electric	Technical Resource	The Pacific Gas and Electric Company (PG&E) owns the electricity and natural gas transmission and distribution system in and around Rohnert Park. It also provides natural gas service and some electrical service to the community. PG&E can work with the City to reduce the vulnerability of energy infrastructure to natural hazards and to reduce the likelihood of their infrastructure triggering or exacerbating a hazard.	https://www.pge.com
State and Federal Resources			
California Department of Transportation	State Resource	State agency charged with upkeep and development of California's roads and bridges.	http>//www.dot.ca.gov/
Office of Planning and Research	State Resource	Constitutes the state planning agency and is responsible for research and guidance in a number of different planning areas.	http://www.opr.ca.gov/

Resource	Type	Background and Capacity	Further Information
California Office of Emergency Services	State Resource	Cal OES performs its broader mission by administering numerous programs that support our stakeholders, protect our communities, and help create a resilient California.	http://www.caloes.ca.gov/
State Hazard Mitigation Plan	Policy Document	State document that provides guidance at a state level on mitigation actions to reduce the vulnerability of the state and its citizens from hazards.	http://www.caloes.ca.gov/for.../hazard-mitigation-planning/state-hazard-mitigation-plan
National Weather Service (NWS)	Federal Resource	Decision support program that improves forecasts and interpretations and helps to make more informed decisions.	http://www.weather.gov/
Federal Emergency Management Agency	Federal Resource	General guidance for hazard mitigation planning processes and resources.	https://www.fema.gov/
Cal-Adapt	Technical Resource	This tool provides estimates of future climate conditions for locations throughout California, incorporating the expected impacts of climate change. Cal-Adapt is a resource for understanding how climate change may affect natural hazards.	http://cal-adapt.org

Additional Capabilities – WUI Fire Response

Much of the County's unincorporated area is designated by the State Board of Forestry as "State Responsibility Areas" (SRA). California Department of Forestry and Fire Protection (CDFFP) provides "primary" wild land fire protection in these areas. While the SRA designation implies that only CDFFP provides protection for these areas, local fire districts and Community Services Areas (CSA) also assist with protecting and responding to fires in them. Technically, a fire district/community services area (CSA 40) that has SRA lands within it is responsible for providing fire protection to structures, and other improvements. In practice, when a wild land fire occurs in SRA, a mutual aid system is in place that immediately responds CDFFP fire resources as well as local fire resources.

Redwood Empire Dispatch Communications Authority (REDCOM) is responsible for notifying local fire resources and CDFFP's Sonoma/Lake/Napa Emergency Command Center dispatches CDFFP resources.

Ground fire resources are augmented by CDFFP's helicopter stationed at Boggs Mountain in Lake County and two air tankers based at the Sonoma Air Attack Base at the Sonoma County Airport. The Sheriff's Helicopter Unit (Henry One) is equipped with a 150-gallon water-dropping bucket that can also assist in the effort when other resources are not available.

Sonoma County's 40 plus fire agencies have signed a countywide mutual aid agreement to insure that firefighting resources and personnel will be available to combat a wild land/urban interface fire. If these resources are not enough to meet the threat, fire resources from throughout California can be summoned under the State's Master Mutual Aid Agreement administered by the Governor's Office of Emergency Services.

PLAN MAINTENANCE AND ADOPTION PROCESS

FEMA Element D: Plan Review, Evaluation and Implementation

- **D1. Was the plan revised to reflect changes in development? *44 CFR 201.6(d)(3)***
- **D2. Was the plan revised to reflect progress in local mitigation efforts? *44 CFR 201.6(d)(3)***
- **D3. Was the plan revised to reflect changes in priorities? *44 CFR 201.6(d)(3)***

FEMA Element E: Plan Adoption

- **E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? *44 CFR 201.6(c)(5)***

It is of crucial importance that this LHMP is up to date, as this will help ensure that Rohnert Park continues to be protected against hazards and eligible for state and federal mitigation funding. The Plan's structure allows the City to easily update individual sections as information becomes available and as needs arise. This will help ensure that the Plan remains current.

Coordinating Group

Maintaining and updating the LHMP is the primary responsibility of the Rohnert Park LHMP Team. The primary departments to oversee this process are Development Services, Public Safety, and Public Works, under the direction of the LHMP project manager. The LHMP project manager will function to coordinate the general maintenance of this plan, conduct the formal review process, and prepare updates to the plan.

Incorporation into Existing Planning Mechanisms

The City has several planning mechanisms:

- General Plan (including Safety Element)
- Specific Plans
- Zoning Ordinance
- Building Code
- Capital Improvements Plan

The City has a Safety Element in its General Plan that includes a discussion of fire, earthquake, flooding, and landslide hazards. In addition, the City enforces the requirements of the California Environmental Quality Act (CEQA), which, since 1988, requires mitigation for identified natural hazards. The City has used these pre-existing programs as a basis for identifying gaps that may lead to disaster vulnerabilities in order to work on ways to address these risks through mitigation.

The Design Review Committee (DRC) will continue to evaluate ways in which mitigation strategies identified in this planning process can be incorporated into other projects going on within the City to support risk reduction across a broad range of projects and plans.

Plan Update Process

As required by the Disaster Mitigation Act of 2000, the City of Rohnert Park will update this plan at least once every five years, by exercising the LHMP Team.

The City of Rohnert Park Planning Department will ensure that monitoring of the LHMP will occur. The plan will be monitored on an on-going basis. However, any major disasters affecting our City, legal changes, notices from ABAG or Cal OES and other triggers will be used. Finally, the LHMP will be a discussion item of a meeting of Department managers at least once a year in April. At that meeting, the department heads will focus on evaluating the LHMP in light of technological and political changes during the past year or other significant events. The Department Managers will be responsible for determining if the plan should be updated. The public will continue to be involved whenever the plan is updated and as appropriate during the monitoring and evaluation process. Prior to adoption of updates, the City will provide the opportunity for the public to comment on the updates. A public notice will be posted prior to the meeting to announce the comment period and meeting logistics.

Subsequent to this plan's adoption, a process will kick-off in early 2018 to update priorities, threat analysis, and mitigation activity sections pertaining to Wildland-Urban Interface fires subsequent to the October 2017 Sonoma County Fire event.

Adoption

The Rohnert Park City Council is the primary group responsible for adopting and updating the plan. Re-adoption should occur every five years. After the plan has been adopted by the City Council, the Rohnert Park Department of Development Services will be responsible for transmitting the adopted version to Cal OES and FEMA for their records.

Implementation

The effectiveness of the Plan depends on the implementation of the mitigation actions it contains, including how mitigation actions are incorporated into existing City plans, policies, and programs. The mitigation actions in the Plan are intended to reduce the loss and damage from hazard events and to provide a framework for hazard mitigation activities for the City to carry out over the Plan's lifetime. The City has prioritized the goals and actions in the Plan, to be implemented through existing mechanism as the resources to do so are available. The information in this Plan, including the hazard profiles, the risk and vulnerability analyses, and the mitigation actions, are based on the best available information, technology, methods, and practices available to the Plan authors as the time this Plan was prepared.

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TECHNICAL APPENDICES AND DOCUMENTS

Appendix A – Acronyms, Abbreviations, and Glossary
Appendix B – Planning Process Documents
Appendix C – Mapping
Appendix D – 2010 ABAG Annex
Appendix E – Supplemental Materials
Appendix F – Plan Review