

Second Draft Plan

December 18, 2017

Hazard Mitigation Plan



Q&A | ELEMENT A: PLANNING PROCESS | A1c.

Q: Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person’s position or title and agency within the jurisdiction.) (Requirement §201.6(c)(1))

A: See **Credits** below.

Credits

Special Thanks

Hazard Mitigation Planning Team:

Agency	Name	Department	Position
City of Rosemead	Jason Chacon	Parks & Recreation	Director
	Mark Donohue	City Clerk’s Office	City Clerk
	Michelle Ramirez	Public Works	Public Works Director
	Cory Hanh	Community Development	Associate Planner
	Evelyn Gutierrez	Human Resources	Human Resources Specialist
	Colleen Ishibashi	Finance	Finance Services Supervisor
	Wassim Ismail	Public Works	Intern
	Marty Jones	Public Works	Administrative Specialist
	Brad McKinney	Administration	Assistant City Manager
	Jerry Mota	Parks & Recreation	Recreation Supervisor
	Patrick Piatt	Public Works	Senior Management Analyst
	Monday Regan	Parks & Recreation	Recreation Supervisor
	John Scott	Public Works	Public Works Superintendent
Emergency Planning Consultants	Steven Torres	Public Safety	Code Enforcement Officer
	Mandy Wong	Public Safety	Public Safety Supervisor
	Matthew Whittington	Public Works	Intern
	Carolyn J. Harshman	Consultant	President

Acknowledgements

City of Rosemead

- ✓ Polly Low, Mayor
- ✓ Steven Ly, Mayor Pro Tem
- ✓ Bill Alarcon, Council Member
- ✓ Sandra Armenta, Council Member
- ✓ Margaret Clark, Council Member

Point of Contact

To request information or provide comments regarding this mitigation plan, please contact:

Name & Position Title	Mandy Wong, Public Safety Supervisor
Email	mwong@cityofrosemead.org
Mailing Address	8301 Garvey Avenue, Rosemead, CA 91770
Telephone Number	(626) 569-2168

Consulting Services

Emergency Planning Consultants

- ✓ Project Manager: Carolyn J. Harshman, CEM, President
- ✓ Lead Research Assistant: Alex L. Fritzler
- ✓ HAZUS/GIS: Michael McDaniel

3665 Ethan Allen Avenue
 San Diego, California 92117
 Phone: 858-483-4626
 epc@pacbell.net
 www.carolynharshman.com

Mapping

The maps in this plan were provided by the City of Rosemead, County of Los Angeles, Federal Emergency Management Agency (FEMA), or were acquired from public Internet sources. Care was taken in the creation of the maps contained in this Plan, however they are provided "as is". The City of Rosemead cannot accept any responsibility for any errors, omissions or positional accuracy, and therefore, there are no warranties that accompany these products (the maps). Although information from land surveys may have been used in the creation of these products, in no way does this product represent or constitute a land survey. Users are cautioned to field verify information on this product before making any decisions.

Mandated Content

In an effort to assist the readers and reviewers of this document, the jurisdiction has inserted "markers" emphasizing mandated content as identified in the Disaster Mitigation Act of 2000 (Public Law – 390). Following is a sample marker:

EXAMPLE

Q&A | ELEMENT A: PLANNING PROCESS | A1a.

Q Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))

A:

Table of Contents

CREDITS.....	2
TABLE OF CONTENTS.....	4
PART I: PLANNING PROCESS	5
INTRODUCTION	5
PLANNING PROCESS.....	14
PART II: RISK ASSESSMENT	26
COMMUNITY PROFILE	26
RISK ASSESSMENT	32
EARTHQUAKE HAZARDS	44
Puente Hills M7.1 Earthquake Scenario	53
Sierra Madre M7.2 Earthquake Scenario	56
San Andreas M8.0 Earthquake Scenario.....	59
FLOOD HAZARDS.....	63
DAM FAILURE HAZARDS	67
WINDSTORM HAZARDS.....	73
PART III: MITIGATION STRATEGIES	76
MITIGATION STRATEGIES	76
Mitigation Actions Matrix	84
PLAN MAINTENANCE.....	94
PART IV: APPENDIX.....	100
GENERAL HAZARD OVERVIEWS	100
Earthquake Hazards	100
Flood Hazards.....	104
Dam Failure Hazards.....	108
Windstorm Hazards	109
ATTACHMENTS.....	114
FEMA Letter of Approval	114
City Council Staff Report	115
City Council Resolution	116
Planning Team Sign-In Sheets.....	117
Web Postings and Notices	118
List of Maps, Tables, Figures	121

Part I: PLANNING PROCESS

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | A1b.

Q: Does the plan list the jurisdiction(s) participating in the plan that are seeking approval?
(Requirement §201.6(c)(1))

A: See **Introduction** below.

Introduction

The Hazard Mitigation Plan (Mitigation Plan) was prepared in response to Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 (also known as Public Law 106-390) requires state and local governments to prepare mitigation plans to document their mitigation planning process, and identify hazards, potential losses, mitigation needs, goals, and strategies. This type of planning supplements the City’s comprehensive land use planning and emergency management planning programs. This document is a federally mandated update to the City of Rosemead 2012 Hazard Mitigation Plan and ensures continuing eligibility for Hazard Mitigation Grant Program (HMGP) funding.

DMA 2000 was designed to establish a national program for pre-disaster mitigation, streamline disaster relief at the federal and state levels, and control federal disaster assistance costs. Congress believed these requirements would produce the following benefits:

- ✓ Reduce loss of life and property, human suffering, economic disruption, and disaster costs.
- ✓ Prioritize hazard mitigation at the local level with increased emphasis on planning and public involvement, assessing risks, implementing loss reduction measures, and ensuring critical facilities/services survive a disaster.
- ✓ Promote education and economic incentives to form community-based partnerships and leverage non-federal resources to commit to and implement long-term hazard mitigation activities.

The following FEMA definitions are used throughout this plan (Source: FEMA, 2002, *Getting Started, Building Support for Mitigation Planning*, FEMA 386-1):

Hazard Mitigation – “Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards”.

Planning – “The act or process of making or carrying out plans; specifically, the establishment of goals, policies, and procedures for a social or economic unit.”

Planning Approach

The four-step planning approach outlined in the FEMA publication, *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies* (FEMA 386-3) was used to develop this plan:

- ✓ **Develop mitigation goals and objectives** - The risk assessment (hazard characteristics, inventory, and findings), along with municipal policy documents, were utilized to develop mitigation goals and objectives.
- ✓ **Identify and prioritize mitigation actions** - Based on the risk assessment, goals and objectives, existing literature/resources, and input from participating entities, mitigation activities were identified for each hazard. Activities were 1) qualitatively evaluated against the goals and objectives, and other criteria; 2) identified as high, medium, or low priority; and 3) presented in a series of hazard-specific tables.
- ✓ **Prepare implementation strategy** - Generally, high priority activities are recommended for implementation first. However, based on community needs and goals, project costs, and available funding, some medium or low priority activities may be implemented before some high priority items.
- ✓ **Document mitigation planning process** - The mitigation planning process is documented throughout this plan.

Hazard Land Use Policy in California

Planning for hazards should be an integral element of any City's land use planning program. All California cities and counties have General Plans (also known as Comprehensive Plans) and the implementing ordinances that are required to comply with the statewide land use planning regulations.

The continuing challenge faced by local officials and state government is to keep the network of local plans effective in responding to the changing conditions and needs of California's diverse communities, particularly in light of the very active seismic region in which we live.

Planning for hazards requires a thorough understanding of the various hazards facing the City and region as a whole. Additionally, it's important to take an inventory of the structures and contents of various City holdings. These inventories should include the compendium of hazards facing the City, the built environment at risk, the personal property that may be damaged by hazard events and most of all, the people who live in the shadow of these hazards. Such an analysis is found in this hazard mitigation plan.

State and Federal Partners in Hazard Mitigation

All mitigation is local and the primary responsibility for development and implementation of risk reduction strategies and policies lies with each local jurisdiction. Local jurisdictions, however, are not alone. Partners and resources exist at the regional, state and federal levels. Numerous California state agencies have a role in hazards and hazard mitigation.

Some of the key agencies include:

- ✓ California Office of Emergency Services (Cal OES) is responsible for disaster mitigation, preparedness, response, recovery, and the administration of federal funds after a major disaster declaration;
- ✓ Southern California Earthquake Center (SCEC) gathers information about earthquakes, integrates information on earthquake phenomena, and communicates this to end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives.

- ✓ California Department of Forestry and Fire Protection (CAL FIRE) is responsible for all aspects of wildland fire protection on private and state properties, and administers forest practices regulations, including landslide mitigation, on non-federal lands.
- ✓ California Division of Mines and Geology (DMG) is responsible for geologic hazard characterization, public education, and the development of partnerships aimed at reducing risk.
- ✓ California Division of Water Resources (DWR) plans, designs, constructs, operates, and maintains the State Water Project; regulates dams; provides flood protection and assists in emergency management. It also educates the public, serves local water needs by providing technical assistance
- ✓ FEMA provides hazard mitigation guidance, resource materials, and educational materials to support implementation of the capitalized DMA 2000.
- ✓ United States Census Bureau (USCB) provides demographic data on the populations affected by natural disasters.
- ✓ United States Department of Agriculture (USDA) provides data on matters pertaining to land management.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **Stakeholders** below.

Stakeholders

A Hazard Mitigation Planning Team (Planning Team) consisting of department representatives from City of Rosemead staff worked with Emergency Planning Consultants to create the updated Plan. **The Planning Team served as the primary stakeholders throughout the planning process.**

As required by DMA 2000, the Planning Team involved the “general public” by making the Second Draft Plan available online during the plan writing phase. In addition, the Planning Team provided a briefing on the Second Draft Plan during a monthly meeting of the City’s CONNECTIONS Forum. The Public Safety Department’s CONNECTIONS Forum is a group of community organizations and individuals, including the City of Rosemead, the Sheriff’s Department, school districts, and faith based organizations who are committed to educating parents, grandparents, and other caregivers of their responsibilities in helping young people avoid negative consequences associated with alcohol and drug use. The mission of CONNECTIONS is to:

- Serve as a community “think tank” and “information clearinghouse” to prevent crime and combat drugs and alcohol abuse;
- Develop and promote positive and wholesome recreational activities and community service opportunities for young people and their families;
- Coordinate with organizations that address human and social services needs to promote a healthy community; and
- Promote and encourage emergency preparedness by all community members.

The briefing to CONNECTIONS is scheduled for January 25, 2018. Also, the Planning Team notified the Business Watch Group, Rosemead Advanced CERT and HAM members, and the

Chamber of Commerce of the Draft’s online availability. Lastly, external agencies (including utility providers, special districts and adjoining jurisdictions) were directed to the Draft Plan via an email invitation. The Second Draft Plan was announced and posted on the City’s website on December 18, 2017 along with a request to forward any comments to the Planning Team Chair Mandy Wong.

The general public, CONNECTIONS, Business Watch Group, Rosemead Advanced CERT and HAM, Chamber of Commerce, and external agencies served as secondary stakeholders with opportunity to contribute to the plan during the Plan Writing Phase of the planning process.

Hazard Mitigation Legislation

Hazard Mitigation Grant Program

In 1974, Congress enacted the Robert T. Stafford Disaster Relief and Emergency Act, commonly referred to as the Stafford Act. In 1988, Congress established the Hazard Mitigation Grant Program (HMGP) via Section 404 of the Stafford Act. Regulations regarding HMGP implementation based on the DMA 2000 were initially changed by an Interim Final Rule (44 CFR Part 206, Subpart N) published in the Federal Register on February 26, 2002. A second Interim Final Rule was issued on October 1, 2002.

The HMGP helps states and local governments implement long-term hazard mitigation measures for natural hazards by providing federal funding following a federal disaster declaration. Eligible applicants include state and local agencies, Indian tribes or other tribal organizations, and certain nonprofit organizations.

In California, the HMGP is administered by Cal OES. Examples of typical HMGP projects include:

- ✓ Property acquisition and relocation projects
- ✓ Structural retrofitting to minimize damages from earthquake, flood, high wind, wildfire, or other natural hazards
- ✓ Elevation of flood-prone structures
- ✓ Vegetative management programs, such as:
 - Brush control and maintenance
 - Fuel break lines in shrubbery
 - Fire-resistant vegetation in potential wildland fire areas

“Floods and hurricanes happen. The hazard itself is not the disaster – it’s our habits, it’s how we build and live in those areas...that’s the disaster.”

**Craig Fugate,
Former FEMA
Administrator**

Pre-Disaster Mitigation Program

The Pre-Disaster Mitigation Program (PDM) was authorized by §203 of the Stafford Act, 42 United States Code, as amended by §102 of the DMA 2000. Funding is provided through the National Pre-Disaster Mitigation Fund to help state and local governments (including tribal governments) implement cost-effective hazard mitigation activities that complement a comprehensive mitigation program.

In Fiscal Year 2009, two types of grants (planning and competitive) were offered under the PDM Program. Planning grants allocate funds to each state for Mitigation Plan development. Competitive grants distribute funds to states, local governments, and federally recognized Indian tribal governments via a competitive application process. FEMA reviews and ranks the submittals based on pre-determined criteria. The minimum eligibility requirements for competitive grants include participation in good standing in the National Flood Insurance Program (NFIP) and a FEMA-approved Mitigation Plan.

(Source: <http://www.fema.gov/fima/pdm.shtm>)

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101). Financial support is provided through the National Flood Insurance Fund to help states and communities implement measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.

Three types of grants are available under FMA: planning, project, and technical assistance. Planning grants are available to states and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for project grants to implement measures to reduce flood losses. Technical assistance grants in the amount of 10 percent of the project grant are available to the state for program administration. Communities that receive planning and/or project grants must participate in the NFIP. Examples of eligible projects include elevation, acquisition, and relocation of NFIP-insured structures. (Source: <http://www.fema.gov/fima/fma.shtm>)

Q&A | ELEMENT C. MITIGATION STRATEGY | C2

Q: Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))

A: See **NFIP Participation** below.

National Flood Insurance Program

Established in 1968, the NFIP provides federally-backed flood insurance to homeowners, renters, and businesses in communities that adopt and enforce floodplain management ordinances to reduce future flood damage. The City of Rosemead adopted a floodplain management ordinance and has Flood Insurance Rate Maps (FIRM) that show floodways, 100-year flood zones, and 500-year flood zones. The Community Development Director is designated as the floodplain administrator.

NFIP Participation

The City of Rosemead participates in NFIP and the FEMA FIRM maps for the City of Rosemead were last updated September 26, 2008. 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. According to FEMA, the City of Rosemead is designated a No Special Flood Hazard Area (NSFHA). A Non-Special Flood Hazard Area (NSFHA) is an area that is in a moderate- to low-risk flood zone (Zones B, C, X Pre- and Post-FIRM). The City of Rosemead is located within flood Zones X and D.

The NSFHA is not in any immediate danger from flooding caused by overflowing rivers or hard rains. However, it's important to note that structures within a NSFHA are still at risk. In fact, over 20% of all flood insurance claims come from areas outside of mapped high-risk flood zones.

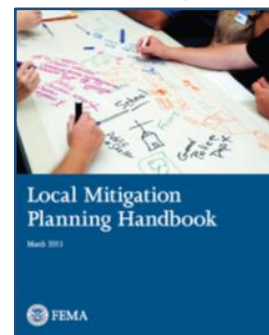
Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B4

Q: Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))

A: See **Repetitive Loss Properties** below.

Repetitive Loss Properties

Repetitive Loss Properties (RLPs) are most susceptible to flood damages; therefore, they have been the focus of flood hazard mitigation programs. Unlike a Countywide program, the Floodplain Management Plan (FMP) for repetitive loss properties involves highly diversified property profiles, drainage issues, and property owner's interest. It also requires public involvement processes unique to each RLP area. The objective of an FMP is to provide specific potential mitigation measures and activities to best address the problems and needs of communities with repetitive loss properties. A repetitive loss property is one for which two or more claims of \$1,000 or more have been paid by the National Flood Insurance Program (NFIP) within any given ten-year period. According to FEMA resources, there are no Repetitive Loss Properties (RLPs) within the City of Rosemead.



State and Federal Guidance in Hazard Mitigation

While local jurisdictions have primary responsibility for developing and implementing hazard mitigation strategies, they are not alone. Various state and federal partners and resources can help local agencies with mitigation planning.

The Mitigation Plan was prepared in accordance with the following regulations and guidance documents:

- ✓ DMA 2000 (Public Law 106-390, October 10, 2000)
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, October 1, 2002
- ✓ 44 CFR Parts 201 and 206, Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule, February 26, 2002
- ✓ How-To Guide for Using HAZUS-MH for Risk Assessment, (FEMA 433), February 2004
- ✓ Mitigation Planning "How-to" Series (FEMA 386-1 through 9 available at: <http://www.fema.gov/fima/planhowto.shtm>)
- ✓ Getting Started: Building Support For Mitigation Planning (FEMA 386-1)
- ✓ Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 386-2)
- ✓ Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 386-3)
- ✓ Bringing the Plan to Life: Implementing the Mitigation Plan (FEMA 386-4)

- ✓ Using Benefit-Cost Review in Mitigation Planning (FEMA 386-5)
- ✓ Integrating Historic Property and Cultural Resource Considerations into Mitigation Planning (FEMA 386-6)
- ✓ Integrating Manmade Hazards Into Mitigation Planning (FEMA 386-7)
- ✓ Multi-Jurisdictional Mitigation Planning (FEMA 386-8)
- ✓ Using the Mitigation Plan to Prepare Successful Mitigation Projects (FEMA 386-9)
- ✓ State and Local Plan Interim Criteria Under the DMA 2000, July 11, 2002, FEMA
- ✓ Mitigation Planning Workshop For Local Governments-Instructor Guide, July 2002, FEMA
- ✓ Report on Costs and Benefits of Natural Hazard Mitigation, Document #294, FEMA
- ✓ LHMP Development Guide – Appendix A - Resource, Document, and Tool List for Local Mitigation Planning, December 2, 2003, Cal OES
- ✓ Local Mitigation Plan Review Guide (FEMA 2011)
- ✓ Local Mitigation Planning Handbook (FEMA 2013)

How is the Plan Organized?

The structure of the plan enables the reader to use a section of interest to them and allows the City to review and update sections when new data is available. The ease of incorporating new data into the plan will result in a Mitigation Plan that remains current and relevant.

Following is a description of each section of the plan:

Part I: Planning Process

Introduction

Describes the background and purpose of developing a mitigation plan.

Planning Process

Describes the mitigation planning process including: stakeholders and integration of existing data and plans.

Part II: Risk Assessment

Community Profile

Summarizes the history, geography, demographics, and socioeconomics of the City.

Risk Assessment

This section provides information on hazard identification, vulnerability and risk associated with hazards in the City.

City-Specific Hazard Analysis

Describes the hazards posing a significant threat to the City including:

Earthquake | Flooding | Windstorm | Dam Failure

Each City-Specific Hazard Analysis includes information on previous occurrences, local conditions, hazard assessment, and local impacts.

Part III: Mitigation Strategies

Mitigation Strategies

Documents the goals, community capabilities, and priority setting methods supporting the Plan. Also highlights the Mitigation Actions Matrix: 1) goals met; 2) identification, assignment, timing, and funding of mitigation activities; 3) benefit/cost/priorities; 4) plan implementation method; and 5) activity status.

Plan Maintenance

Establishes tools and guidelines for maintaining and implementing the Mitigation Plan.

Part IV: Appendix

The plan appendices are designed to provide users of the Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

General Hazard Overviews

Generalized subject matter information discussing the science and background associated with the identified hazards.

Attachments

- FEMA Letter of Approval
- City Council Staff Report
- City Council Resolution
- Planning Team sign-in sheets
- Web postings and notices

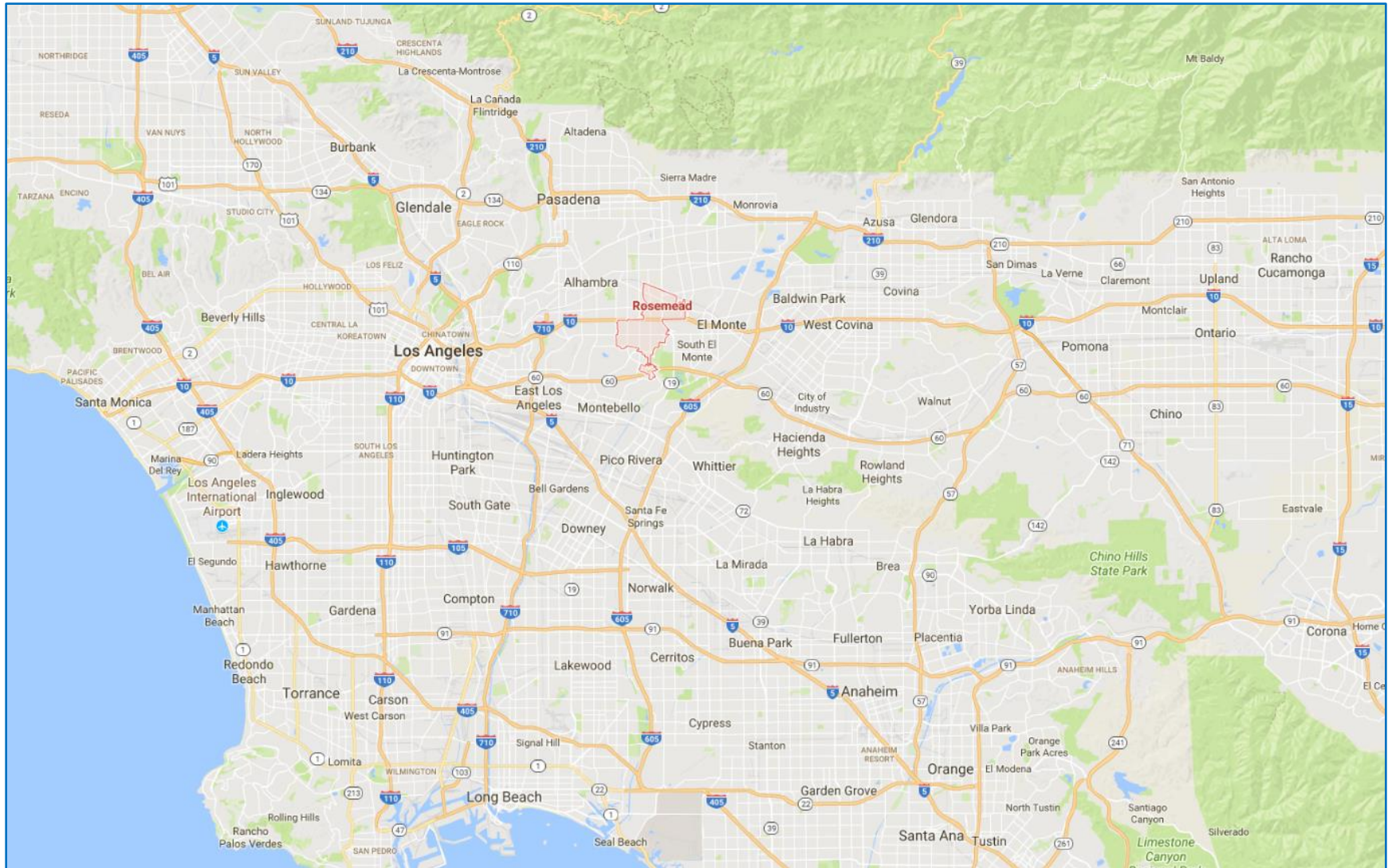
Plan Adoption and Approval

As per DMA 2000 and supporting Federal regulations, the Mitigation Plan is required to be adopted by the City Council and approved by FEMA. See the **Planning Process Section** for details.

Who Does the Mitigation Plan Affect?

This plan provides a framework for planning for natural hazards. The resources and background information in the plan are applicable City-wide and to City-owned facilities outside of the City boundaries, and the goals and recommendations provide groundwork for local mitigation plans and partnerships. **Map: City of Rosemead** shows the regional proximity of the City to its adjoining communities.

Map: City of Rosemead
(Source: Google Maps)



Planning Process

Throughout the project, the City followed its traditional approach to developing policy documents which included preparation of a First Draft Plan for review by the City’s Hazard Mitigation Planning Team who served as the primary stakeholders. Next, following any necessary revisions, a Second Draft Plan was shared with the general public, local community groups, and external agencies (utilities, special districts, adjoining jurisdictions) during the plan writing phase. The general public, local community groups, and external agencies all served as the secondary stakeholders. Next, the comments gathered from the secondary stakeholders were incorporated into a Third Draft Plan which was submitted to Cal OES and FEMA. Next, the Planning Team completed any mandated amendments to satisfy input from Cal OES and FEMA.

Following receipt of FEMA’s “approvable pending adoption”, the Fourth Draft Plan was posted as per jurisdictional practices in advance of the City Council meeting. Any questions or comments gathered in advance of the City Council meeting were incorporated into the City Council Staff Report. Following consideration and adoption by the City Council, the Final Draft Plan was re-submitted to FEMA with a request for final approval. The planning process described above is portrayed below in a timeline:

Q&A | ELEMENT A: PLANNING PROCESS | A1a.

Q: Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)?

A: See **Plan Methodology and Planning Phases Timeline** below.

Q&A | ELEMENT A: PLANNING PROCESS | A3

Q: Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))

A: See **Planning Phases Timeline** below.

Table: Planning Phases Timeline

PLANNING PHASES TIMELINE				
Plan Writing Phase (First & Second Draft Plan)	Plan Review Phase (Third & Fourth Draft Plan)	Plan Adoption Phase (Fourth Draft Plan)	Plan Approval Phase (Final Draft & Final Plan)	Plan Implementation Phase
<ul style="list-style-type: none"> • Planning Team input – research, meetings, writing, review of First Draft Plan • Incorporate input from the Planning Team into Second Draft Plan • Invite public, local community groups, and external agencies to review, comment, and contribute to the Plan • Incorporate input into the Third Draft Plan 	<ul style="list-style-type: none"> • Third Draft Plan sent to Cal OES and FEMA for “approvable pending adoption” • Planning Team addressed any mandated revisions identified by Cal OES and FEMA into Fourth Draft Plan • Invite public and external agencies to review, comment, and contribute to the Fourth Draft Plan 	<ul style="list-style-type: none"> • Incorporate input into the City Council staff report. • Post public notice of City Council meeting • Fourth Draft Plan distributed to City Council in advance of meeting • Present Fourth Draft Plan to the City Council • City Council Adopted Plan • Incorporate input from City Council public meeting into Final Draft Plan 	<ul style="list-style-type: none"> • Submit Final Draft Plan to FEMA with request for final approval • Receive FEMA final approval • Incorporate FEMA approval into the Final Plan 	<ul style="list-style-type: none"> • Conduct quarterly Planning Team meetings • Integrate mitigation action items into budget, CIP and other funding and strategic documents



Plan Methodology

The Planning Team discussed knowledge of natural hazards and past historical events, as well as planning and zoning codes, ordinances, and recent planning decisions.

The rest of this section describes the mitigation planning process including 1) Planning Team involvement, 2) extended Planning Team support (department heads), 3) public and external agency involvement; and 4) integration of existing data and plans.

Q&A | ELEMENT A: PLANNING PROCESS | A1a.

Q: Does the plan document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)? (Requirement §201.6(c)(1))

A: See **Table: Planning Team Involvement and Level of Participation** below.

Planning Team Involvement

The Planning Team consisted of representatives from City of Rosemead departments related to hazard mitigation processes. The Planning Team served as the primary stakeholders throughout the planning process. Citizens and businesses (“the public”) along with external agencies served as secondary stakeholders in the planning process. The Planning Team was responsible for the following tasks:

- ✓ Confirming planning goals
- ✓ Prepare timeline for plan update
- ✓ Ensure plan meets DMA 2000 requirements
- ✓ Organize and solicit involvement of public and external agencies
- ✓ Analyze existing data and reports
- ✓ Update hazard information
- ✓ Review HAZUS loss projection estimates
- ✓ Update status of Mitigation Action Items
- ✓ Develop new Mitigation Action Items
- ✓ Participate in Planning Team meetings and City Council public meeting
- ✓ Provide existing resources including maps and data

The Planning Team, with assistance from Emergency Planning Consultants, identified and profiled hazards; determined hazard rankings; estimated potential exposure or losses; evaluated development trends and specific risks; and developed mitigation goals and action items.

Table: Planning Team Level of Participation

Name	Research and Writing of Plan	Planning Team Meeting 8/31/17	Planning Team Meeting 9/28/17	Planning Team Meeting 10/26/17	Planning Team Comment on First Draft Plan	Review and input from general public and external agencies of the Second Draft Plan	Submit Third Draft Plan to Cal OES/FEMA for Approvable Pending Adoption	Post Fourth Draft Plan for review by general public and external agencies	Present Fourth Draft Plan to City Council at Public Meeting for Plan Adoption	Submit Final Draft Plan to FEMA for Final Approval
City of Rosemead										
Jason Chacon		X								
Mark Donohue		X	X	X						
Evelyn Gutierrez			X	X						
Cory Hanh		X	X	X						
Colleen Ishibashi		X	X	X						
Wassim Ismail		X								
Marty Jones		X	X							
Brad McKinney		X	X	X						
Jerry Mota				X						
Patrick Piatt		X	X							
Michelle Ramirez		X	X	X						
Monday Regan		X	X							
John Scott		X	X	X						
Steven Torres		X	X	X						
Mandy Wong, Planning Team Chair		X	X	X						
Matthew Whittington		X	X							
Emergency Planning Consultants										
Carolyn J. Harshman	X	X	X	X						

Table: Planning Team Timeline

	August 2017	September	October	November	December	January 2017	February	March	April	May	June
Research and Writing of First Draft Plan	X	X									
Planning Team Meetings	X	X	X								
Planning Team Review and Comment on First Draft Plan			X	X							
Second Draft Plan review and comment by public, local community groups, and external agencies					X						
Submit Third Draft Plan to Cal OES/FEMA for Approvable Pending Adoption						X					
Incorporate mandated amendments into Fourth Draft Plan											
Post Fourth Draft Plan for review by public and external agencies along with posting of City Council meeting.											
Present Fourth Draft Plan to City Council at Public Meeting											
Submit Final Draft Plan to FEMA for Final Approval											
Incorporate FEMA Approval into Final Plan											

Q&A | ELEMENT A: PLANNING PROCESS | A2a.

Q: 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 interested parties to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **Secondary Stakeholder Involvement** below.

Q&A | ELEMENT A: PLANNING PROCESS | A2b.

Q: 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 interested parties to be involved in the planning process? (Requirement §201.6(b)(2))

A: See **Secondary Stakeholder Involvement** below.

General Public and External Agency Involvement

In addition to the Planning Team, the secondary stakeholders also provided information, expertise, and other resources during plan writing phase. The secondary stakeholders included: general public, local community groups, and external agencies (e.g. utilities, special districts, adjoining jurisdictions, etc.).

Following review and input by the Planning Team of the First Draft Plan, a Second Draft Plan incorporating any revisions was made available to the secondary stakeholders as identified above. All gathered input from the secondary stakeholders was directed to the Chair of the Planning Team who reviewed the input and incorporated it as appropriate into the Third Draft Plan. Following is a specific accounting of comments received from the review of the Second Draft Plan by the secondary stakeholders:

Date Informed	Agency, Name, Title	Date & Information Gathered	How Information was Addressed

Local community group members and external agencies listed below were invited via email and provided with an electronic link to the City’s website. Following is the email distributed along with the invitation to comments:

Figure: Email Invitation

(INSERT EMAIL HERE)

Following receipt of FEMA’s “Approvable Pending Adoption” and in advance of the City Council public meeting, the general public (via public noticing) and external agencies (via email) were informed of the Fourth Draft Plan and encouraged to attend the public meeting. Gathered comments on the Fourth Draft Plan from the general public, local community groups, and external agencies were noted in the City Council Staff Report and added to the Final Draft Plan.

Q&A | ELEMENT C. MITIGATION STRATEGY | C1a.

Q: Does the plan document each jurisdiction’s existing authorities, policies, programs and resources? (Requirement §201.6(c)(3))

A: See **Capability Assessment – Existing Processes and Programs** below.

Capability Assessment – Existing Processes and Programs

The City will incorporate mitigation planning as an integral component of daily operations. This will be accomplished by the Planning Team working with their respective departments to integrate mitigation strategies into the planning documents and operational guidelines within the City. In addition to the Capability Assessment below, the Planning Team will strive to identify additional policies, programs, practices, and procedures that could be created or modified to address mitigation activities.

Table: Capability Assessment - Existing Processes and Programs

Process	Action	Implementation of Plan
Hazard Mitigation	Ensure representation on Planning Team includes all departments responsible for the existing processes and programs identified in this table	<ul style="list-style-type: none"> ✓ <i>Planning Team's effectiveness in implementing Plan and creating a culture of mitigation</i> ✓ <i>Planning Team members become "ambassadors" in the various departments charged with influencing development, infrastructure, and future planning</i> ✓ <i>Involve Hazard Mitigation Planning Team in review of future updates of the City General Plan or Zoning Ordinance to ensure consideration of threats posed by hazards (See Mitigation Actions Matrix)</i>
Administrative	Departmental or organizational work plans, policies, and procedural changes	<ul style="list-style-type: none"> ✓ <i>City Manager's Office</i> ✓ <i>Community Development Department</i> ✓ <i>Public Works Department</i> ✓ <i>Other departments as appropriate</i> ✓ <i>Continue training staff for all aspects of Emergency Management and ensure adequate staffing levels by cross-training staff for each identified capability/task</i>
Administrative	Other plans	<ul style="list-style-type: none"> ✓ <i>Reference plan in Emergency Operations Plan</i> ✓ <i>Address plan findings and incorporate mitigation activities in General Plan</i>
Budgetary	Capital and operational budgets	<ul style="list-style-type: none"> ✓ <i>Include line item mitigation measures in budget as appropriate</i>
Regulatory	Executive orders, ordinances, and other directives	<ul style="list-style-type: none"> ✓ <i>Building Code</i> ✓ <i>Capital Improvement Program (Require hazard mitigation in design of new construction)</i> ✓ <i>General Plan (Institutionalize hazard mitigation in land use and new construction)</i> ✓ <i>National Flood Insurance Program</i> ✓ <i>Storm Water Management Plan</i> ✓ <i>Zoning Ordinance</i>
Funding	Traditional and nontraditional sources	<ul style="list-style-type: none"> ✓ <i>Once plan is approved, seek authority to use bonds, fees, loans, and taxes to finance projects</i> ✓ <i>Seek assistance from federal and state government, foundation, nonprofit, and private sources, such as Hazard Mitigation Grant Program</i> ✓ <i>Research and grant opportunities through U.S. Department of Housing and Urban Development, Community Development Block Grant</i>
Partnerships	Creative funding and initiatives	<ul style="list-style-type: none"> ✓ <i>Community volunteers</i> ✓ <i>In-kind resources</i> ✓ <i>Public-private partnerships</i> ✓ <i>State support</i>
Partnerships	Advisory bodies and committees	<ul style="list-style-type: none"> ✓ <i>Disaster Council</i> ✓ <i>Disaster Management Area Coordinator</i> ✓ <i>Disaster and Emergency Committee</i> ✓ <i>CONNECTIONS Forum</i>

Q&A | ELEMENT A: PLANNING PROCESS | A4

Q: Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))

A: See **Use of Existing Data** below.

Use of Existing Data

The Planning Team gathered and reviewed existing data and plans during plan writing and specifically noted as “sources”. Numerous electronic and hard copy documents were used to support the planning process:

City of Rosemead General Plan and Elements

www.cityofrosemead.org

Applicable Incorporation: Land Use map, Community Profile section – geography, environmental, population, housing, transportation and demographic data

County of Los Angeles All-Hazards Mitigation Plan (2014)

www.lacoa.org

Applicable Incorporation: Information about hazards in the County contributed to the hazard-specific sections in the City’s Mitigation Plan.

California State Hazard Mitigation Plan (2013)

www.caloes.ca.gov

Applicable Incorporation: Used to identify hazards posing greatest hazard to State.

HAZUS Maps and Reports

Created by Emergency Planning Consultants

Applicable Incorporation: Numerous HAZUS results have been included for earthquake scenarios to determine specific risk to City of Rosemead.

California Department of Finance

www.dof.ca.gov/

Applicable Incorporation: Community Profile section – demographic and population data

FEMA “How To” Mitigation Series (386-1 to 386-9)

www.fema.gov/media

Applicable Incorporation: Mitigation Measures Categories and 4-Step Planning Process are quoted in the Executive Summary.

National Flood Insurance Program

www.fema.gov/national-flood-insurance-program

Applicable Incorporation: Used to confirm there are no repetitive loss properties within the City

Local Flood Insurance Rate Maps

www.msc.fema.gov

Applicable Incorporation: Provided by FEMA and included in Flood Hazard section.



California Department of Forestry and Fire Protection (CAL FIRE)

www.fire.ca.gov

Applicable Incorporation: Wildland fire hazard mapping

California Department of Conservation

www.conservation.ca.gov/cgs

Applicable Incorporation: Seismic hazards mapping

U.S. Geological Survey (USGS)

www.usgs.gov

Applicable Incorporation: Earthquake records and statistics

Q&A | ELEMENT E: PLAN ADOPTION | E1

Q: Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))

A: See **Plan Adoption Process** below.

Plan Adoption Process

Adoption of the plan by the local governing body demonstrates the City's commitment to meeting mitigation goals and objectives. Governing body approval legitimizes the plan and authorizes responsible agencies to execute their responsibilities.

The City Council must adopt the Mitigation Plan before the Plan can be approved by FEMA.

In preparation for the public meeting with the City Council, the Planning Team prepared a Staff Report including an overview of the Planning Process, Risk Assessment, Mitigation Goals, and Mitigation Actions. The staff presentation concluded with a summary of the input received during the public review of the document in advance of the City Council meeting. The meeting participants were encouraged to present their views and make suggestions on possible mitigation actions.

The City Council heard the item on [REDACTED]. The City Council voted [REDACTED] to adopt the updated Mitigation Plan. The Resolution of adoption by the City Council is in the **Appendix**.

Plan Approval

FEMA approved the Plan on [REDACTED]. A copy of the FEMA Letter of Approval is in the **Appendix**.

Part II: RISK ASSESSMENT

Community Profile

Geography and the Environment

According to the City of Rosemead’s General Plan (2010), the City is approximately 5.2 square miles in size and located in the San Gabriel Valley, approximately 11 miles east of downtown Los Angeles. Rosemead has easy accessibility to several freeways that connect it to the City of Los Angeles and the larger Los Angeles metropolitan region. The San Bernardino Freeway (Interstate 10) runs east-west through the City, and the Pomona Freeway (State Route 60) runs through the southern portion. Interstate 710 to the west provides direct access to Long Beach, and Interstate 605 to the east connects to Huntington Beach. Interstate 210 to the north provides east-west connection to the San Fernando Valley and the Inland Empire.



Climate

According to the National Weather Service, the City has a moderate climate, including dry summers with an average temperature of about 71°F and cool, wet winters with an average temperature of 58°F. The average annual rainfall for the region is between 14-18 inches.

As the State of California and the Los Angeles region has undergone a several-year drought, rainfall has been much lower in the City. However, rainfall totals should increase as the City is expected to be in an El Niño year for 2017.

Furthermore, actual rainfall in the Southern California region tends to fall in large amounts during sporadic and often heavy storms rather than consistently over storms at somewhat regular intervals. In short rainfall in Southern California might be characterized as feast or famine within a single year.

Population and Demographics

According to the City’s General Plan, the City was incorporated in 1959 with a population of 15,476. According to the California Department of Finance (2017), the population has grown to 54,984 as of 2017. From 2000 to 2017, the City has experienced an average growth rate of 0.13 percent annually. Similarly, the population of Los Angeles County experienced a growth rate of 0.4 percent per year. Despite being home to Southern California Edison, the City has experienced relatively slow economic growth.

According to the California Department of Finance (2015), the demographic makeup of the City is as follows:

Table: City of Rosemead Demographics
(Source: California Department of Finance, 2015)

Racial/Ethnic Group	2010	2015	Change	Change %
White	11,348	11,896	548	5%
Black	273	180	(93)	-34%
American Indian or Alaska Native	396	419	23	6%
Asian or Pacific Islander	32,649	33,831	1,182	4%
Other	7,940	8,902	962	12%
Total	53,764	54,615	851	2%
Hispanic	18,147	18,000	(147)	-1%

Housing and Community Development

Table: City of Rosemead Housing
(Source: California Department of Finance, 2015)

2015	Number	Percent %
Housing Type:		
1-unit, detached	11,464	73.6 %
1-unit, attached	2,003	12.9 %
2-4 Units	575	3.7 %
5+ Units	1,275	8.2 %
Mobile homes/Other	257	1.7 %
Housing Statistics:		
Total Occupied Housing Units	14,768	100 %
Owner-Occupied Housing	6,872	46.5 %
Renter-Occupied	7,896	53.5 %
Average Household Size:	3.7 persons	
Median Home Price:	\$442,600	

Employment and Industry

According to the City of Rosemead General Plan – Housing Element (2014-2021), the predominant employment industries for Rosemead residents are Educational, Health and Social Services (17.9%); Manufacturing (13.0%); and Retail Trade (12.7%).

Overall employment rose by approximately 18 percent from 2000 to 2015. Manufacturing employment experienced the largest decline of any industry during this time, dropping by more than one-third. Over 87 percent of employed residents drive to work, with an average commute of about 27 minutes, suggesting that most are employed outside of Rosemead but within Los Angeles County.

Table: City of Rosemead Industry
(Source: American Community Survey - 2015)

Industry	2015	
	Number	Percent %
Agriculture, forestry, fishing and hunting, and mining	59	0.2 %
Construction	1,256	5.3 %
Manufacturing	3,094	13.0 %
Wholesale Trade	1,369	5.7 %
Retail Trade	3,033	12.7 %
Transportation and Warehousing, and Utilities	1,599	6.7 %
Information	405	1.7 %
Finance and insurance, and real estate and rental and leasing	1,436	6.0 %
Professional, scientific, and management, and administrative and waste management services	1,819	7.6 %
Educational services, and health care and social assistance	4,275	17.9 %
Arts, entertainment, and recreation, and accommodation and food services	2,569	10.8 %
Other services, except public administration	1,869	7.8 %
Public administration	1,106	4.6 %

Table: City of Rosemead Occupation
(Source: American Community Survey - 2015)

Occupation	2015	
	Number	Percent
Civilian employed population (16 years and over)	23,886	100.0 %
Management, business, science, and arts occupations	5,864	24.5 %
Service occupations	5,484	23.0 %
Sales and office occupations	6,736	28.2 %
Natural resources, construction, and maintenance occupations	1,919	8.0 %
Production, transportation, and material moving	3,883	16.3 %

Transportation and Commuting Patterns

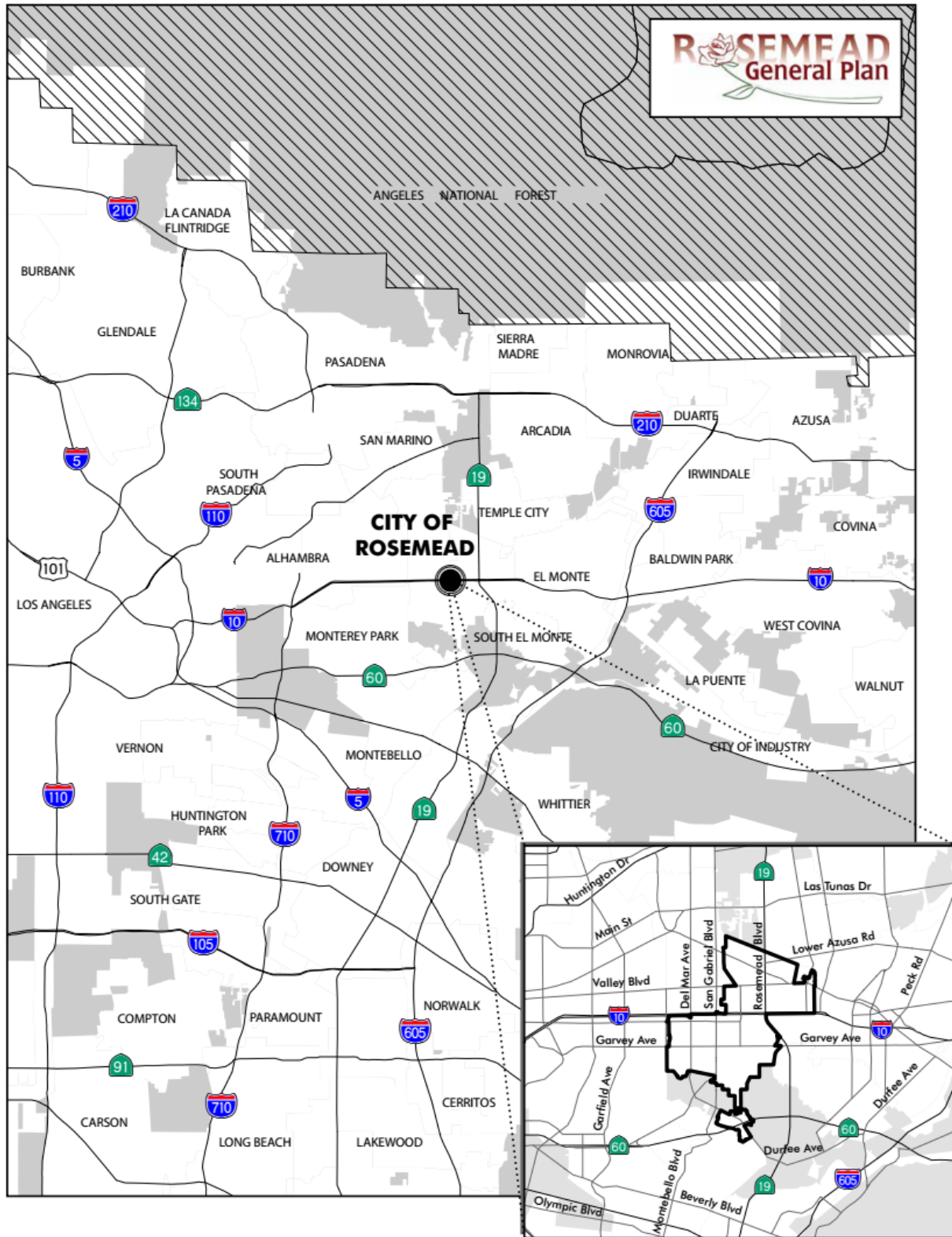
According to the City of Rosemead’s General Plan, the local circulation system within Rosemead has evolved over time to provide travel routes for both local and regional trips. Major roadways provide access to the I-10 freeway and the State Route (SR) 60 freeway. The I-10 and SR-60 freeways are both east-west trending facilities within the City that have access ramps at major north-south roadways. These freeways link Rosemead residents and businesses to destinations throughout the Los Angeles area and the Southern California region.

Rosemead Boulevard, Walnut Grove Avenue, San Gabriel Boulevard, and Del Mar Avenue are the major north-south roadways within the City. All four-major north-south roads provide connections to Interstate 10. In addition, San Gabriel Boulevard connects to SR-60 within the southern area of the city. Valley Boulevard, Garvey Avenue, Graves Avenue, and Rush Street are the major east-west roadways within the City. Although these arterials often act as relief valves to the freeways during peak commute periods, they also provide good alternative travel routes to destinations throughout the San Gabriel Valley.

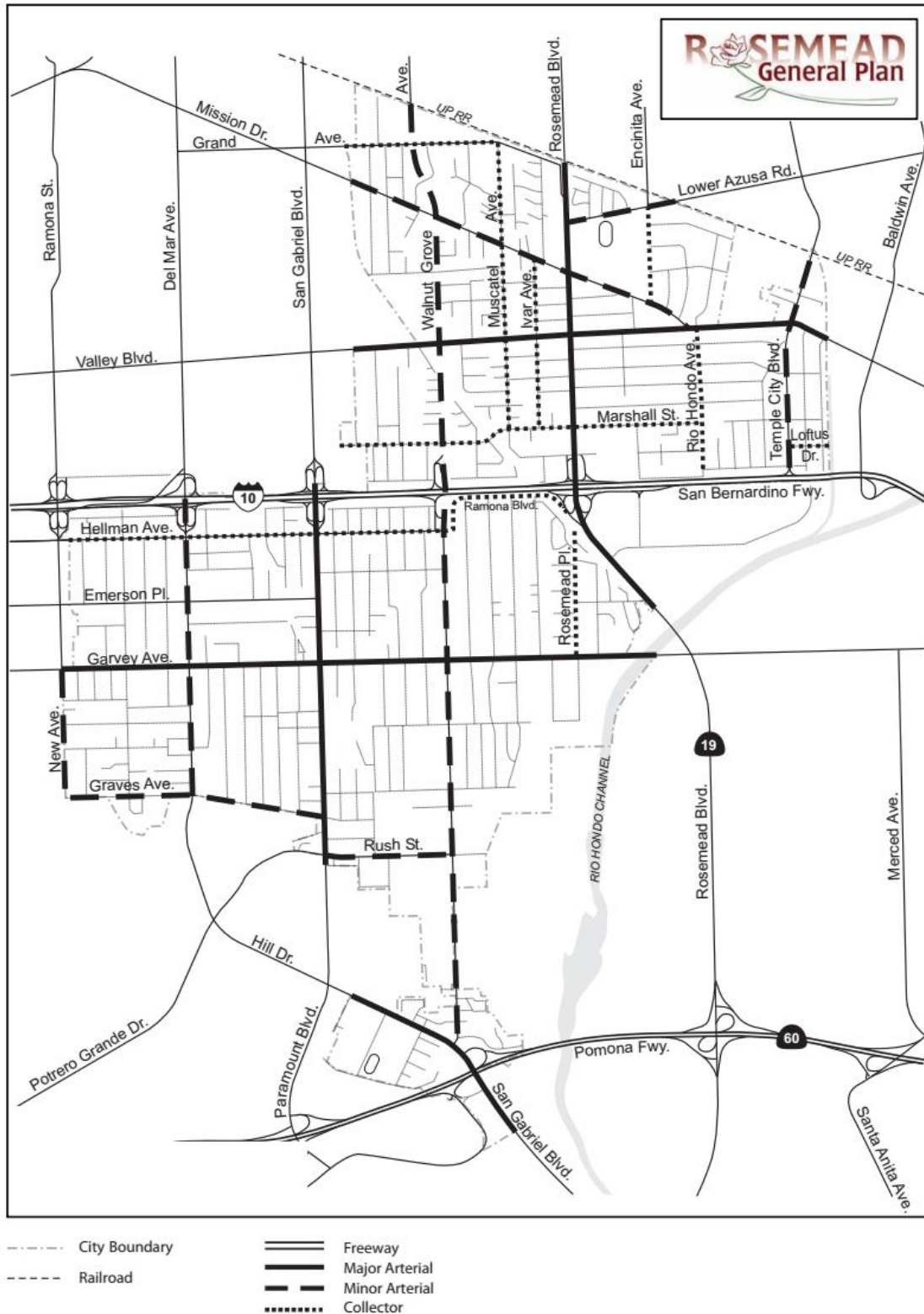
Rosemead is served by a basic network of regional transit lines and the local shuttle lines operated by the City. Fixed route transit is provided by the Metropolitan Transit Authority. Additionally, bicycle riding is permitted and encouraged on City streets.



Map: Regional Location Map
 (Source: City of Rosemead General Plan - 2010)



Map: Roadway Classifications
 (Source: City of Rosemead General Plan - 2010)



Risk Assessment

What is a Risk Assessment?

Conducting a risk assessment can provide information regarding: the location of hazards; the value of existing land and property in hazard locations; and an analysis of risk to life, property, and the environment that may result from natural hazard events. Specifically, the five levels of a risk assessment are as follows:

1. *Hazard Identification*
2. *Profiling Hazard Events*
3. *Vulnerability Assessment/Inventory of Existing Assets*
4. *Risk Analysis*
5. *Assessing Vulnerability/Analyzing Development Trends*

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

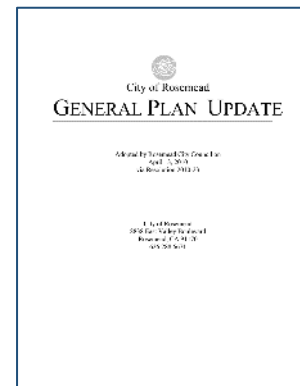
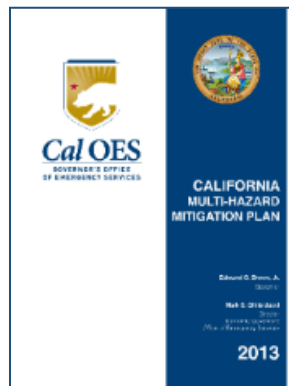
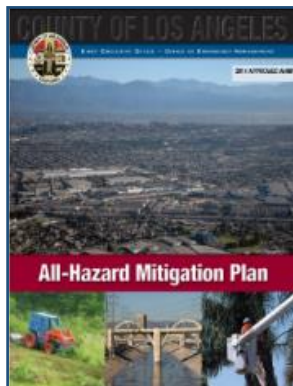
Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Hazard Identification** below.

1) Hazard Identification

This section is the description of the geographic extent, potential intensity, and the probability of occurrence of a given hazard. Maps are used in this plan to display hazard identification data. **The City of Rosemead utilized the categorization of hazards as identified in California’s State Hazard Mitigation Plan, including: Earthquakes, Floods, Levee Failures, Wildfires, Landslides and Earth Movements, Tsunami, Climate-related hazards, Volcanoes, and Other hazards.**

Next, the Planning Team reviewed existing documents to determine which of these hazards posed the most significant threat to the City. In other words, which hazard would likely result in a local declaration of emergency.



The geographic extent of each of the identified hazards was identified by the Planning Team utilizing maps and data contained in the City's General. In addition, numerous internet resources and the County of Los Angeles All-Hazards Mitigation Plan served as valuable resources. Utilizing the Calculated Priority Risk Index (CPRI) ranking technique, the Planning Team concluded the following hazards posed a significant threat against the City:

Earthquake | Flooding | Windstorm | Dam Failure

The hazard ranking system is described in **Table: Calculated Priority Risk Index**, while the actual ranking is shown in **Table: Calculated Priority Risk Index Ranking for City of Rosemead**.

Table: Calculated Priority Risk Index
 (Source: Federal Emergency Management Agency)

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	Extremely rare with no documented history of occurrences or events. Annual probability of less than 1 in 1,000 years.	1	45%
	Possibly	Rare occurrences. Annual probability of between 1 in 100 years and 1 in 1,000 years.	2	
	Likely	Occasional occurrences with at least 2 or more documented historic events. Annual probability of between 1 in 10 years and 1 in 100 years.	3	
	Highly Likely	Frequent events with a well-documented history of occurrence. Annual probability of greater than 1 every year.	4	
Magnitude/ Severity	Negligible	Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure. Injuries or illnesses are treatable with first aid and there are no deaths. Negligible loss of quality of life. Shut down of critical public facilities for less than 24 hours.	1	30%
	Limited	Slight property damage (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). Injuries or illnesses do not result in permanent disability, and there are no deaths. Moderate loss of quality of life. Shut down of critical public facilities for more than 1 day and less than 1 week.	2	
	Critical	Moderate property damage (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). Injuries or illnesses result in permanent disability and at least 1 death. Shut down of critical public facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	Severe property damage (greater than 50% of critical and non-critical facilities and infrastructure). Injuries and illnesses result in permanent disability and multiple deaths. Shut down of critical public facilities for more than 1 month.	4	
Warning Time	> 24 hours	Population will receive greater than 24 hours of warning.	1	15%
	12-24 hours	Population will receive between 12-24 hours of warning.	2	
	6-12 hours	Population will receive between 6-12 hours of warning.	3	
	< 6 hours	Population will receive less than 6 hours of warning.	4	
Duration	< 6 hours	Disaster event will last less than 6 hours	1	10%
	< 24 hours	Disaster event will last less than 6-24 hours	2	
	< 1 week	Disaster event will last between 24 hours and 1 week.	3	
	> 1 week	Disaster event will last more than 1 week	4	

Table: Calculated Priority Risk Index Ranking for City of Rosemead

Hazard	Probability	Weighted 45% (x.45)	Magnitude Severity	Weighted 30% (x.3)	Warning Time	Weighted 15% (x.15)	Duration	Weighted 10% (x.1)	CPRI Total
Earthquake – San Andreas M8.0	3	1.35	4	1.20	4	0.6	1	0.1	3.25
Earthquake – Sierra Madre M7.2	3	1.35	3	0.9	4	0.6	1	0.1	2.95
Earthquake – Puente Hills M7.1	3	1.35	3	0.9	4	0.6	1	0.1	2.95
Windstorm	3	1.35	2	0.6	1	0.15	2	0.2	2.30
Dam Failure	1	.45	3	0.9	4	0.6	2	0.2	2.15
Flooding	2	.90	2	0.6	1	0.15	3	0.3	1.95

2) Profiling Hazard Events

This process describes the causes and characteristics of each hazard and what part of the City's facilities, infrastructure, and environment may be vulnerable to each specific hazard. A profile of each hazard discussed in this plan is provided in the City-Specific Hazard Analysis. **Table: Vulnerability: Location, Extent, and Probability for City of Rosemead** indicates a generalized perspective of the community's vulnerability of the various hazards according to extent (or degree), location, and probability.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1b.

Q: Does the plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Rosemead** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1c.

Q: Does the plan include a description of the **location** for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Rosemead** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1d.

Q: Does the plan include a description of the **extent** for all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Rosemead** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Rosemead** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2b.

Q: Does the plan include information on the **probability** of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Table: Vulnerability: Location, Extent, and Probability for City of Rosemead** below.

Table: Vulnerability: Location, Extent, and Probability for City of Rosemead

Hazard	Location (Where)	Extent (How Big an Event)	Probability (How Often) *	Previous Occurrences
Earthquake	Entire Project Area	The Southern California Earthquake Center (SCEC) in 2007 concluded that there is a 99.7% probability that an earthquake of M6.7 or greater will hit California within 30 years. ¹	Moderate	1987 – Whitter Narrows
Flooding	Entire Project Area	Urban flooding to streets and underpasses from heavy rains.	Moderate	January-February 2017
Windstorm	Entire Project Area	50 miles per hour or greater.	High	November, 2011
Dam Failure	Eastern portion of City adjacent to Rio Hondo Flood Control Channel	Water depth inundation between (10-40 feet) along Rio Hondo Flood Control Channel	Low	None

* Probability is defined as: Low = 1:1,000 years, Moderate = 1:100 years, High = 1:10 years

¹ Uniform California Earthquake Rupture Forecast

3) Vulnerability Assessment/Inventory of Existing Assets

A Vulnerability Assessment in its simplest form is a simultaneous look at the geographical location of hazards and an inventory of the underlying land uses (populations, structures, etc.). Facilities that provide critical and essential services following a major emergency are of particular concern because these locations house staff and equipment necessary to provide important public safety, emergency response, and/or disaster recovery functions.

Critical Facilities

FEMA separates critical buildings and facilities into the five categories shown below based on their loss potential. All of the following elements are considered critical facilities:

Essential Facilities are essential to the health and welfare of the whole population and are especially important following hazard events. Essential facilities include hospitals and other medical facilities, police and fire stations, emergency operations centers and evacuation shelters, and schools.

Transportation Systems include airways – airports, heliports; highways – bridges, tunnels, roadbeds, overpasses, transfer centers; railways – trackage, tunnels, bridges, rail yards, depots; and waterways – canals, locks, seaports, ferries, harbors, drydocks, piers.

Lifeline Utility Systems such as potable water, wastewater, oil, natural gas, electric power and communication systems.

High Potential Loss Facilities are facilities that would have a high loss associated with them, such as nuclear power plants, dams, and military installations.

Hazardous Material Facilities include facilities housing industrial/hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, and toxins.

Table: Critical Facilities Vulnerable to Hazards illustrates the hazards with potential to impact critical facilities owned by or providing services to the City of Rosemead.

Table: Critical Facilities Vulnerable to Hazards

Name of Facility	Earthquake	Flooding	Windstorm	Dam Failure
Rosemead Community Center 3936 N. Muscatel Avenue	X	X	X	
Garvey Community Center 9108 Garvey Avenue	X	X	X	
City Hall 8838 E. Valley Boulevard	X	X	X	
Public Safety Center (Code Enforcement, Law Enforcement, Emergency Management) 8301 Garvey Avenue	X	X	X	
Dinsmoor Heritage House 9632 Steele Street	X	X	X	X
Garvey Park Gymnasium 7954 Dorothy Avenue	X	X	X	X
Garvey Intermediate (Gym) 2720 Jackson Avenue	X	X	X	X
Temple Intermediate (Gym) 8510 Fern Avenue	X	X	X	X
Splash Zone at Garvey Park 3233 Kelburn Avenue	X	X	X	
Rosemead Aquatic Center 9155 E. Mission Drive	X	X	X	
Garvey Park 7933 Emerson Place	X	X	X	
Los Angeles County Fire Department – Station 42 9319 Valley Boulevard	X	X	X	
Los Angeles County Fire Department – Station 4 2644 North San Gabriel Boulevard	X	X	X	
Rosemead Skatepark 9155 Mission Drive	X	X	X	
Rosemead Park 4343 Encinita Avenue	X	X	X	
Jay Imperial Park				
Zapopan Park 3018 N. Charlotte Avenue	X	X	X	
Sally Tanner Park	X	X	X	

8343 E. Mission Drive				
Guess Park 8555 E Mission. Drive	X	X	X	
Klingerman Park 8800 Klingerman Street	X	X	X	X
Jezz Gonzalez Sports Complex 8471 Klingerman Street	X	X	X	X

Map: Critical Facilities



4) Risk Analysis

Estimating potential losses involves assessing the damage, injuries, and financial costs likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. For each hazard where data was available, quantitative estimates for potential losses have been included in the hazard assessment. Data was not available to make vulnerability determinations in terms of dollar losses for all of the identified hazards. The **Mitigation Actions Matrix** includes an action item to conduct such an assessment in the future.

5) Assessing Vulnerability/ Analyzing Development Trends

This step provides a general description of City facilities and contents in relation to the identified hazards so that mitigation options can be considered in land use planning and future land use decisions. This Mitigation Plan provides comprehensive description of the character of the City of Rosemead in the **Community Profile Section**. This description includes the geography and environment, population and demographics, land use and development, housing and community development, employment and industry, and transportation and commuting patterns. Analyzing these components of the City of Rosemead can help in identifying potential problem areas and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

Hazard assessments are subject to the availability of hazard-specific data. Gathering data for a hazard assessment requires a commitment of resources on the part of participating organizations and agencies. Each hazard-specific section of the plan includes a section on hazard identification using data and information from City, County, state, or federal sources.

Regardless of the data available for hazard assessments, there are numerous strategies the City can take to reduce risk. These strategies are described in the action items detailed in the Mitigation Actions Matrix in the **Mitigation Strategies Section**. Mitigation strategies can further reduce disruption to critical services, reduce the risk to human life, and alleviate damage to personal and public property and infrastructure.

Land and Development

The City of Rosemead General Plan provides the framework for the growth and development of the City. This Plan is one of the City's most important tools in addressing environmental challenges including transportation and air quality; growth management; conservation of natural resources; clean water and open spaces.

According to the City's General Plan (2010), the City is designated into five major land use categories: (1) residential, (2) commercial, (3) office/light industrial, (4) mixed-use, and (5) public facilities. Many residential neighborhoods in Rosemead are fully developed and not expected to experience any significant new development or "recycling" where an existing structure is removed and a new structure is built in its place.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard’s **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impacts to Types of Land Uses** below.

Impacts to Types of Land Uses

City of Rosemead’s General Plan identifies primarily residential land uses with other land uses consisting of commercial, office/light industrial, mixed-use, and public facilities.

Table: Impacts to Existing and Future Land Uses in the City of Rosemead
(Source: EPC Analysis Based on City of Rosemead General Plan - 2010)

Category of Land Use Designation	Acres (Area)	Earthquake	Flooding	Windstorm	Dam Failure
Residential	1,663	X	X	X	X
Commercial	263	X	X	X	X
Office/Light Industrial	132	X	X	X	X
Mixed-Use	125	X	X	X	X
Public Facilities	455	X	X	X	X

Q&A | ELEMENT D: MITIGATION STRATEGY | D1

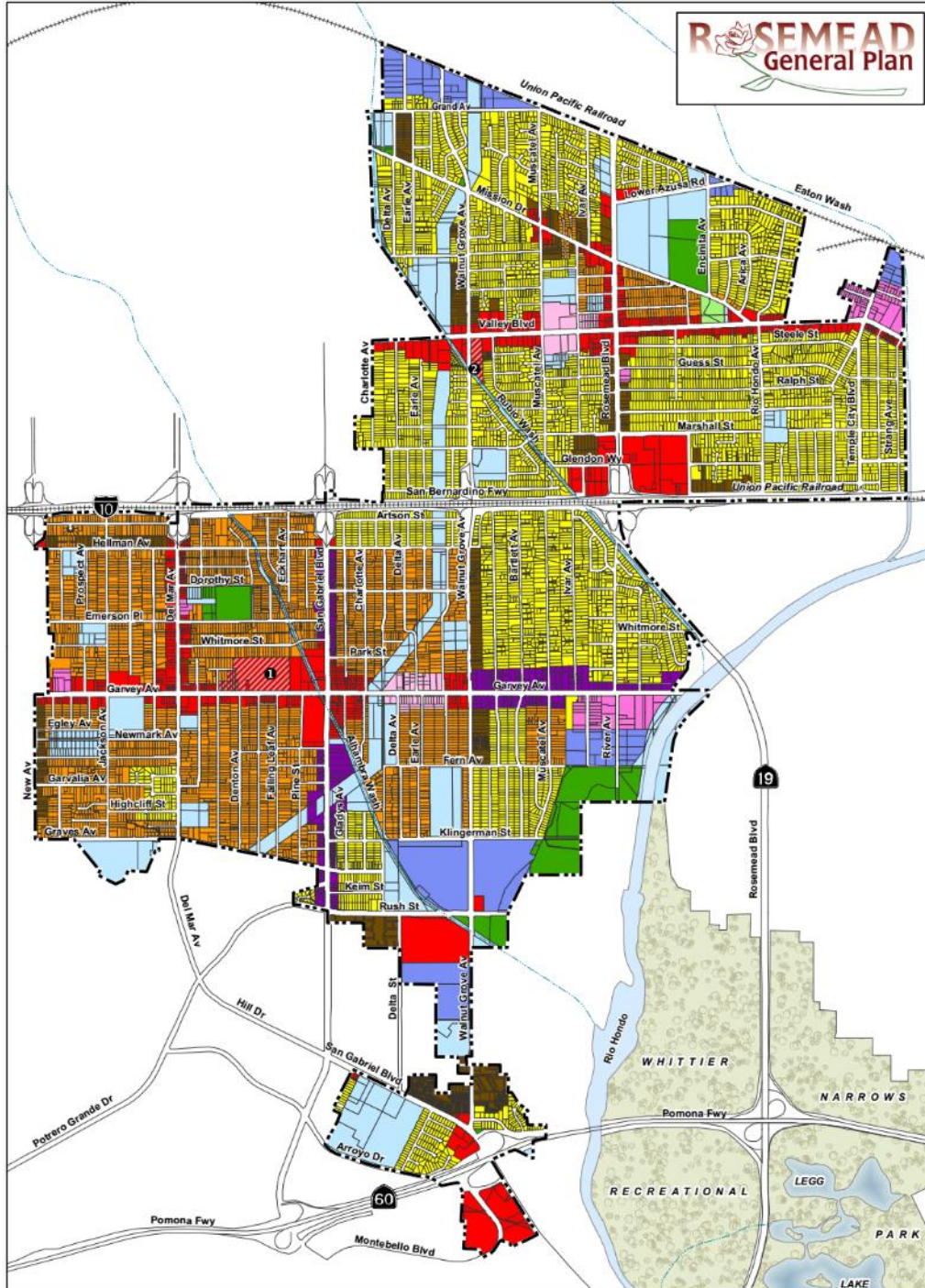
Q: Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))

A: See **Changes in Development** below

Changes in Development

Since the adoption of the 2012 Plan, there have been no significant alterations to the development pattern of the City in the hazard prone areas. This conclusion was reached after a thorough review of the General Plan and discussion with the Planning Team.

Map: Land Use Map
 (Source: City of Rosemead General Plan, 2010)



Legend

- | | | |
|---|---|---|
|  Low Density Residential (0-6 du/ac) |  Mixed Use: Residential/Commercial (30 du/ac; 3 Stories) |  Office/Light Industrial |
|  Medium Density Residential (0-12 du/ac) |  Mixed Use: Residential/Commercial (60 du/ac; 4 Stories) |  Public Facilities |
|  High Density Residential (0-30 du/ac) |  Mixed Use: Industrial/Commercial |  Open Space |
|  Commercial |  High Intensity Commercial |  Cemetery |
- High Intensity Commercial Areas**
-  High Intensity Commercial Area 1
 -  High Intensity Commercial Area 2

Earthquake Hazards

Previous Occurrences of Earthquakes in the City of Rosemead

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Earthquakes in the City of Rosemead** below.

The following earthquake events significantly impacted the region surrounding the City of Rosemead.

In October 1987, the moderate, magnitude 5.9 Whittier Narrows Earthquake, struck the Southern Gabriel Valley with an estimated epicenter in the City of Rosemead.



According to Caltech, the earthquake occurred on a previously unknown, concealed thrust fault. It resulted in eight fatalities and \$358 million in property damage. Severe damage was confined mainly to communities near the epicenter. Residences that sustained damage usually were constructed of masonry, were not fully anchored to foundations, or were houses built over garages with large door openings. Many chimneys collapsed and in some cases, fell through roofs. Wood frame residences sustained relatively little damage.

Since the writing of the 2012 Mitigation Plan, there have been no significant earthquake events in the City of Rosemead.

Previous Occurrences of Earthquakes in Los Angeles County

Southern California has a history of powerful and relatively frequent earthquakes, dating back to the powerful magnitude 8.0+ 1857 San Andreas Earthquake which did substantial damage to the relatively few buildings that existed at the time.

Paleoseismological research indicates that large magnitude (M8.0+) earthquakes occur on the San Andreas Fault at intervals between 45 and 332 years with an average interval of 140 years. Other lesser faults have also caused very damaging earthquakes since 1857. Notable earthquakes include the 1933 Long Beach Earthquake, the 1971 San Fernando Earthquake, the 1987 Whittier Earthquake and the 1994 Northridge Earthquake.

Scientists have stated that such devastating shaking should be considered the norm near any large thrust earthquake. Recent reports from scientists of the U.S. Geological Survey and the Southern California Earthquake Center say that the Los Angeles Area could expect one earthquake every year of magnitude 5.0 or more for the foreseeable future.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

According to the City of Rosemead General Plan (2010), the City lies within a metropolitan area that has historically been seismically active. Faults are prevalent throughout California and are commonly classified as either “active” or “potentially active.” An active fault is a break that has moved in recent geologic time (the last 11,000 years) and that is likely to move within the next approximately 100 years. Active faults are the primary focus of concern in attempting to prevent earthquake hazards. A potentially active fault is one that has shifted but not in the recent geologic period (or, between 11,000 and 3,000,000 years ago) and is therefore considered dormant or unlikely to move in the future.

Several active faults have been identified within close proximity or within the City boundaries which, most importantly, indicates that the community falls under the State Earthquake Fault Zoning Act and the State Hazards Mapping Act. These Acts require that local governments, in the general plan update process, adopt policies and criteria to ensure the structural adequacy of buildings erected across active faults for human occupancy. In some cases, the development of structures must be prohibited.

Earthquakes that could affect the City would most likely originate from the San Andreas (M8.0), Sierra Madre (M7.2), or Puente Hills (M7.1) Faults. These faults are close enough in proximity or expected to generate strong enough shaking that could significantly affect the City.

Additional faults located within 25 miles of Rosemead include the Whittier (M6.8), Upper Elysian Park (M6.4), Raymond (M6.5), Verdugo (M 6.9), San Jose (M6.4), Hollywood (M6.4), and Clamshell-Sawpit (M6.5) faults. The only known active fault at the surface within the City is the Alhambra Wash fault (zoned as an Alquist-Priolo Earthquake Fault Zone - APEFZ) as shown on **Map: Alquist-Priolo Earthquake Fault Zone**. This designation implies the fault is well known, its location is well defined, and potential surface rupture exists.

San Andreas Fault Zone

The San Andreas Fault Zone is located approximately 28 miles northeast of the City of Rosemead. This fault zone extends from the Gulf of California northward to the Cape Mendocino area where it continues northward along the ocean floor. The total length of the San Andreas Fault Zone is approximately 750 miles. The activity of the fault has been recorded during historic events, including the 1906 (M8.0) event in San Francisco and the 1857 (M7.9) event between Cholame

and San Bernardino, where at least 250 miles of surface rupture occurred. These seismic events are among the most significant earthquakes in California history. Geologic evidence suggests that the San Andreas Fault has a 50 percent chance of producing a magnitude 7.5 to 8.5 quake (comparable to the great San Francisco earthquake of 1906) within the next 30 years.

Sierra Madre Fault Zone

The Sierra Madre Fault Zone is located approximately 7 miles north of the City of Rosemead. This fault zone is a series of moderate angle, north-dipping, reverse faults (thrust faults). Movement along these frontal faults has resulted in the uplift of the San Gabriel Mountains. According to the Southern California Earthquake Data Center, rupture on the Sierra Madre fault zone (theoretically) could be limited to one segment at a time, it has recently been suggested that a large event on the San Andreas fault to the north (like that of 1857) could cause simultaneous rupture on reverse faults south of the San Gabriel Mountains – the Sierra Madre fault zone being a prime example of such. Whether this could rupture multiple Sierra Madre fault zone segments simultaneously is unknown. Seismic activity on the Sierra Madre Fault is expected to have a maximum magnitude of 7.2.

Puente Hills Fault

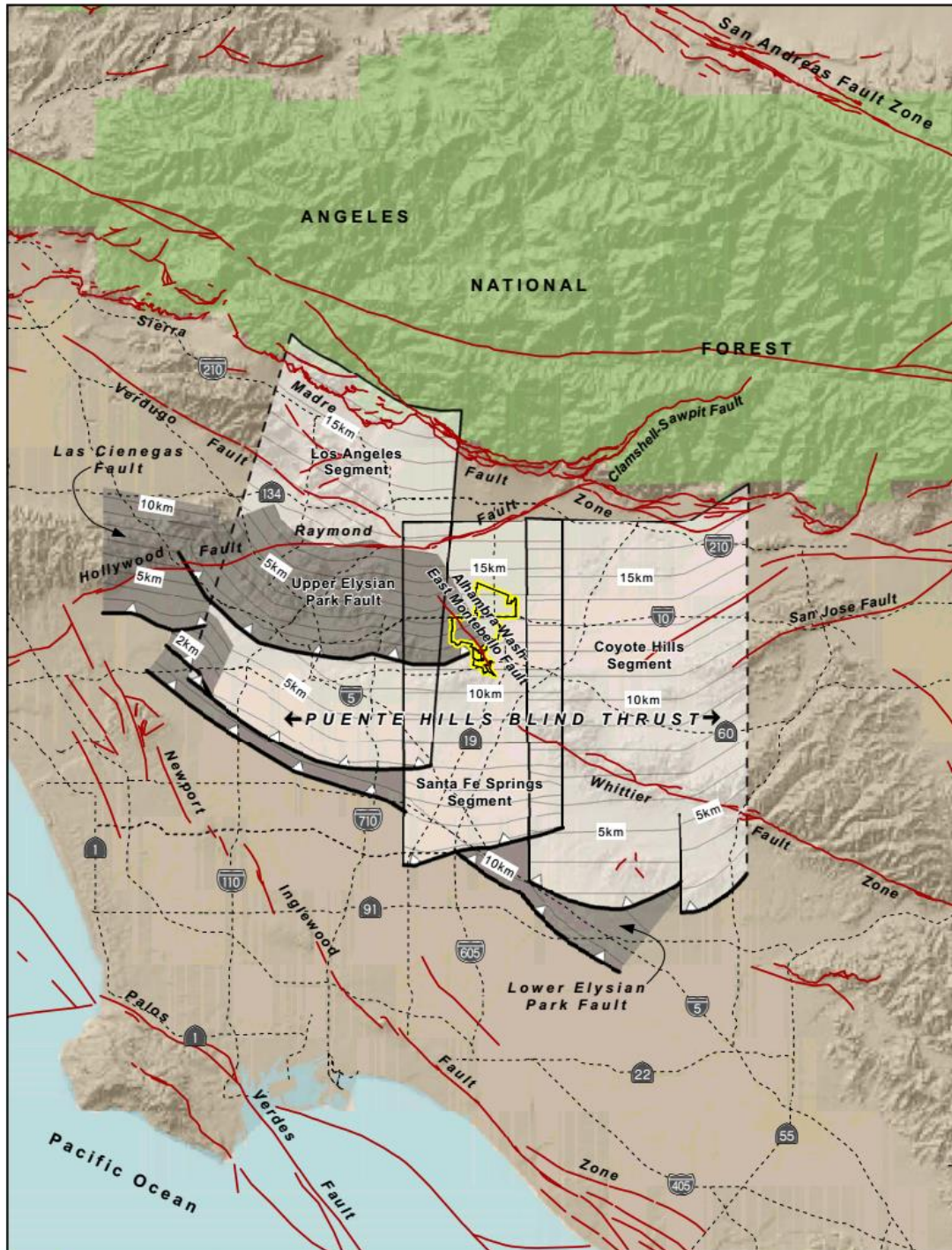
The Puente Hills fault is located approximately 8 miles south of the City. According to USGS, the Puente Hills Fault was most recently responsible for the M5.1 La Habra earthquake on March 28, 2014 which caused an estimated \$2.6 million in damage. The USGS estimates that a future, larger M7.5 earthquake along the Puente Hills fault could kill 3,000 to 18,000 people and cause up to \$250 billion in damage. In contrast, a larger M8.0 quake along the San Andreas would cause an estimated 1,800 deaths.





Alhambra Wash Fault


The Alhambra Wash fault is a short northwest-southeast-trending fault in the southern part of the San Gabriel Valley. The fault is approximately 1.5 miles long and extends from I-60 on the southeast to San Gabriel Boulevard on the northwest. The potential for surface displacement on the Alhambra Wash fault is poorly known and must be based on empirical fault length/earthquake magnitude relationships. According to these empirical relationships, the maximum magnitude of an event on the Alhambra Wash fault could be about 6.25.


Map: Local Faults plots the various major faults located closest to the City of Rosemead. Additionally, City of Rosemead has one earthquake fault – the Alhambra Wash fault – identified within the City limits as indicated on **Map: Alquist-Priolo Earthquake Fault Zone**.

Map: Local Faults
(Source: City of Rosemead General Plan – 2010)

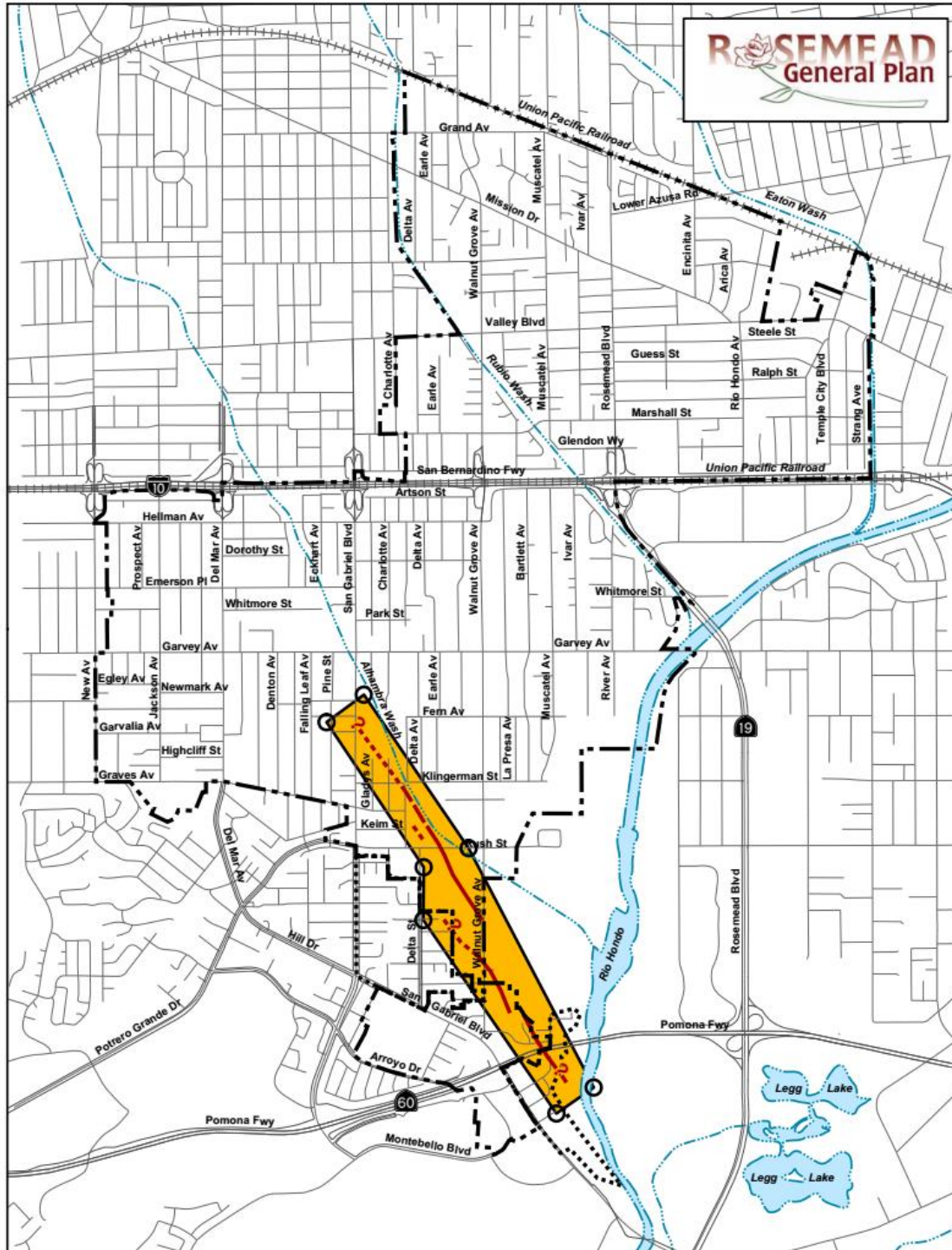


-  Rosemead City Boundary
-  Primary Road
-  Potential Earthquake Faults (See Table 5-2) - Could cause strong ground shaking in Rosemead.
- 

Blind Thrust Faults - 
 Faults are buried below the surface; small triangles indicated fault dip direction (north) and thin gray lines indicate the depth contours (e.g., 5 km = 5 kilometers deep) on the fault surface (Shaw et al, 2002).

Surface Faults - 
 Faults exposed at the ground surface; solid where well located, dashed where approximate, and dotted where concealed (Bryant, 2005)

Map: Alquist-Priolo Earthquake Fault Zone
 (Source: City of Rosemead General Plan – 2010)



- | | | |
|---|--|---|
| <ul style="list-style-type: none"> --- Rosemead City Boundary Sphere of Influence Boundary — Major Roads +++++ Railroad River/Wash | <p>Active Faults</p> <ul style="list-style-type: none"> — Well Located - - - Approximate Located Inferred Location - ? - Query indicates additional uncertainty. | <ul style="list-style-type: none"> ■ Alquist-Priolo Earthquake Fault Zone ○ Turning Point |
|---|--|---|

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Earthquakes in the City of Rosemead** below.

Impact of Earthquakes in the City of Rosemead

Based on the risk assessment, it is evident that earthquakes will continue to have potentially devastating economic impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew;
- ✓ Damage to roads/bridges resulting in loss of mobility;
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community;
- ✓ Negative impact on commercial and residential property values; and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Earthquake-Induced Landslides

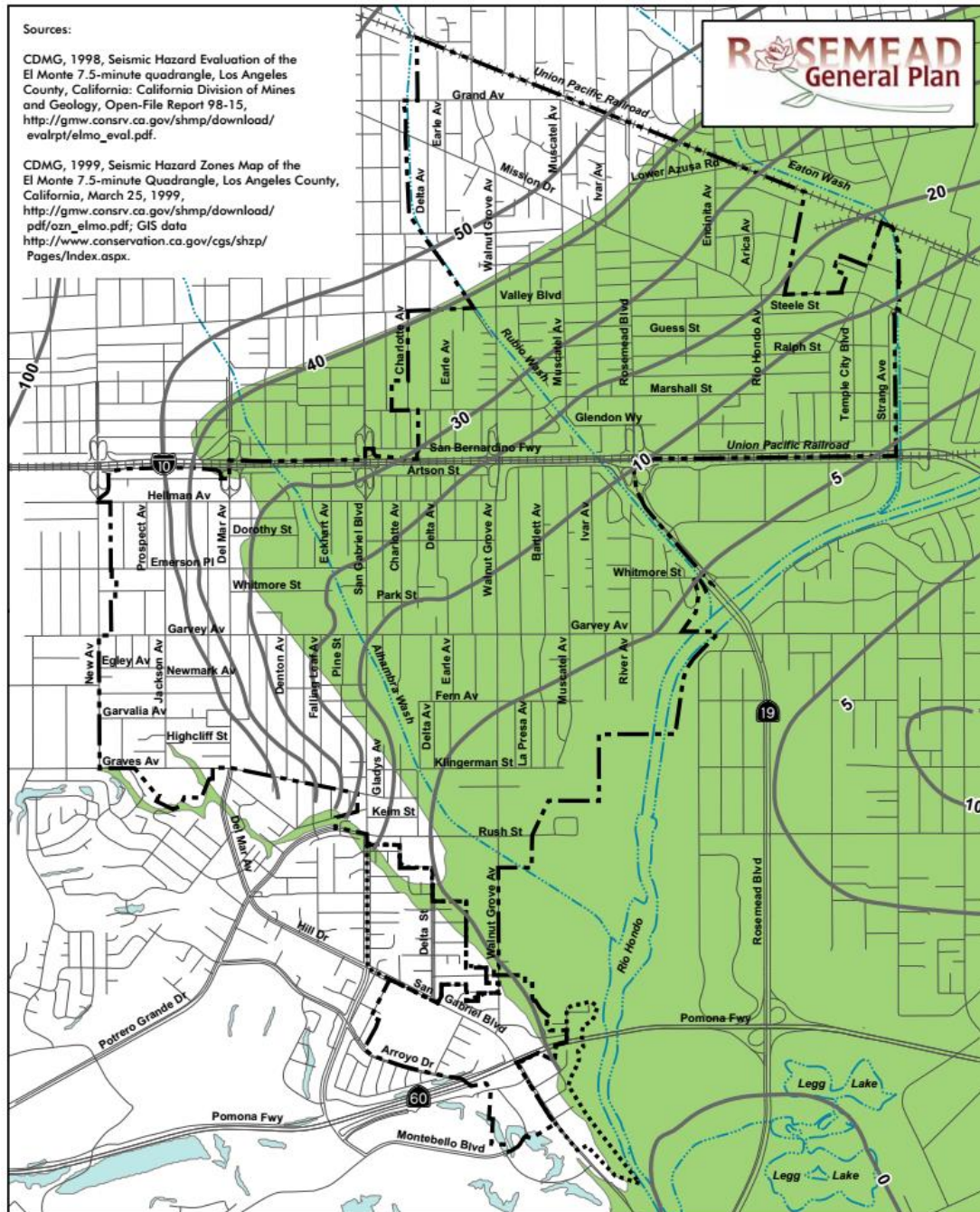
Earthquake-induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Many communities in Southern California have a high likelihood of encountering such risks, especially in areas with steep slopes. Seismically induced landslides have the potential to occur in a limited area in the south of Rosemead, but proper geotechnical investigation and mitigation will minimize these secondary seismic hazards.

Liquefaction

Liquefaction is a phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other events. Liquefaction occurs in saturated soils, which are soils in which the space between individual soil particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low lying areas. Typically, liquefaction is associated with shallow groundwater, which is less than 50 feet beneath the earth's surface.

According to the City of Rosemead's General Plan (2010), liquefaction presents the most prominent secondary earthquake ground failure issue in the City. Liquefaction-related lateral spreads can occur adjacent to stream channels and deep washes that provide a free face toward which the liquefied mass of soil fails. Lateral spreads can cause extensive damage to pipelines, utilities, bridges, roads and other structures.



Map: Earthquake-Induced Liquefaction & Landslide Areas
 (Source: Rosemead General Plan – 2010)



Sources:
 CDMG, 1998, Seismic Hazard Evaluation of the El Monte 7.5-minute quadrangle, Los Angeles County, California: California Division of Mines and Geology, Open-File Report 98-15, http://gmw.consrv.ca.gov/shmp/download/evalrpt/elmo_eval.pdf.

CDMG, 1999, Seismic Hazard Zones Map of the El Monte 7.5-minute Quadrangle, Los Angeles County, California, March 25, 1999, http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_elmo.pdf; GIS data <http://www.conservation.ca.gov/cgs/shzp/Pages/Index.aspx>.

Zones of Required Investigation:

-  **Liquefaction**
 Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.
-  **Earthquake-Induced Landslides**
 Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigations as defined in Public Resources Code Section 2693(c) would be required.

-  **—30—** Historically Highest Groundwater Contours (Depth in Feet)
-  Rosemead City Boundary
-  Sphere of Influence Boundary
-  Major Roads
-  Railroad
-  River/Wash

Exposure

The data in this section was generated using the HAZUS-MH program for earthquakes. Once the location and size of a hypothetical earthquake are identified, HAZUS-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the amount of damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

Building Inventory

HAZUS estimates approximately 93% of the building stock within the City of Rosemead is residential housing consisting of wood frame construction.

Critical Facility Inventory

HAZUS breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

Table: Critical Facility Inventory – HAZUS

Essential Facilities	Count	High Potential Loss (HPL) Facilities	Count
Hospitals	1	Dams	0
Schools	19	Levees	0
Fire Stations	2	Military Installations	0
Police Stations	0	Nuclear Power Plants	0
Emergency Operations Facilities	1	Hazardous Material Sites	0

Transportation and Utility Lifeline Inventory

Within HAZUS, the lifeline inventory is divided between transportation and utility lifeline systems. Transportation systems include highways, railways, light rail, bus, ports, ferry and airports. Utility systems include potable water, wastewater, natural gas, crude & refined oil, electric power and communications.

Casualties

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

- ✓ **Severity Level 1:** Injuries will require medical attention but hospitalization is not needed.
- ✓ **Severity Level 2:** Injuries will require hospitalization but are not considered life-threatening
- ✓ **Severity Level 3:** Injuries will require hospitalization and can become life threatening if not promptly treated.
- ✓ **Severity Level 4:** Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Building-Related Losses

Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

HAZUS Earthquake Event Summary Results

Puente Hills M7.1 Earthquake Scenario

Building Damage

Table: Expected Building Damage Puente Hills M7.1

Damage Extent	None	Slight	Moderate	Extensive	Complete
Total	8,091	4,908	1,523	157	28

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Puente Hills M7.1

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	2,201	204	51
Waste Water	1,321	146	37
Natural Gas	880	42	10
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Puente Hills M7.1

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	14,743	89	0	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 80 households to be displaced due to the earthquake. Of these, 74 people (out of a total population of 55,255) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for Puente Hills M7.1 earthquake scenario.

Table: Casualty Estimates – Puente Hills M7.1

Time	Level 1	Level 2	Level 3	Level 4
2 AM	34	4	0	0
2 PM	67	12	1	3
5 PM	46	9	2	2
* Level 1: Injuries will require medical attention but hospitalization is not needed. Level 2: Will require hospitalization but are not considered life-threatening. Level 3: Will require hospitalization and can become life threatening if not promptly treated. Level 4: Victims are killed by earthquake.				

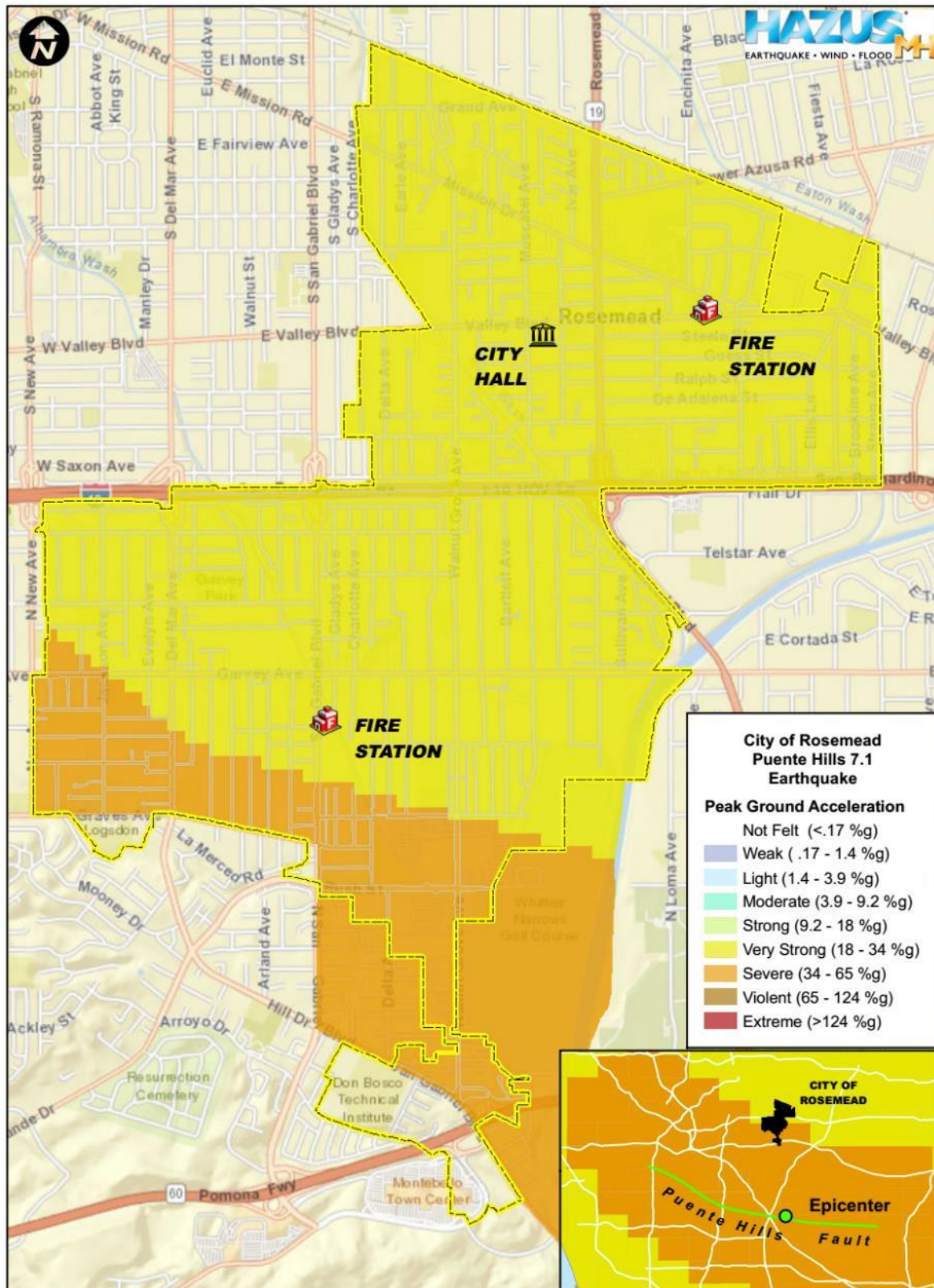
Economic Losses

The total economic loss estimated for the Puente Hills M7.1 earthquake scenario is **\$274.52 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Economic Losses (\$ Dollars) – Puente Hills M7.1

Category	Estimated Loss (\$)
Income	\$30,920,600
Capital Stock	\$190,848,000
Transportation Systems	\$1,201,000
Utility Systems	\$51,551,800
TOTAL	\$274,521,400

Map: Shake Intensity Map – Puente Hills M7.1
(Source: Emergency Planning Consultants)



Sierra Madre M7.2 Earthquake Scenario

Building Damage

Table: Expected Building Damage Sierra Madre M7.2

Damage Extent	None	Slight	Moderate	Extensive	Complete
Total	8,041	4,924	1,546	166	30

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – Sierra Madre M7.2

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	2,201	229	57
Waste Water	1,321	164	41
Natural Gas	880	47	12
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – Sierra Madre M7.2

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	14,743	178	0	0	0	0
Electric Power		0	0	0	0	0

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 85 households to be displaced due to the earthquake. Of these, 77 people (out of a total population of 55,255) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for Sierra Madre M7.2 earthquake scenario.

Table: Casualty Estimates – Sierra Madre M7.2

Time	Level 1	Level 2	Level 3	Level 4
2 AM	34	4	0	0
2 PM	72	13	2	3
5 PM	49	10	2	2
* Level 1: Injuries will require medical attention but hospitalization is not needed. Level 2: Will require hospitalization but are not considered life-threatening. Level 3: Will require hospitalization and can become life threatening if not promptly treated. Level 4: Victims are killed by earthquake.				

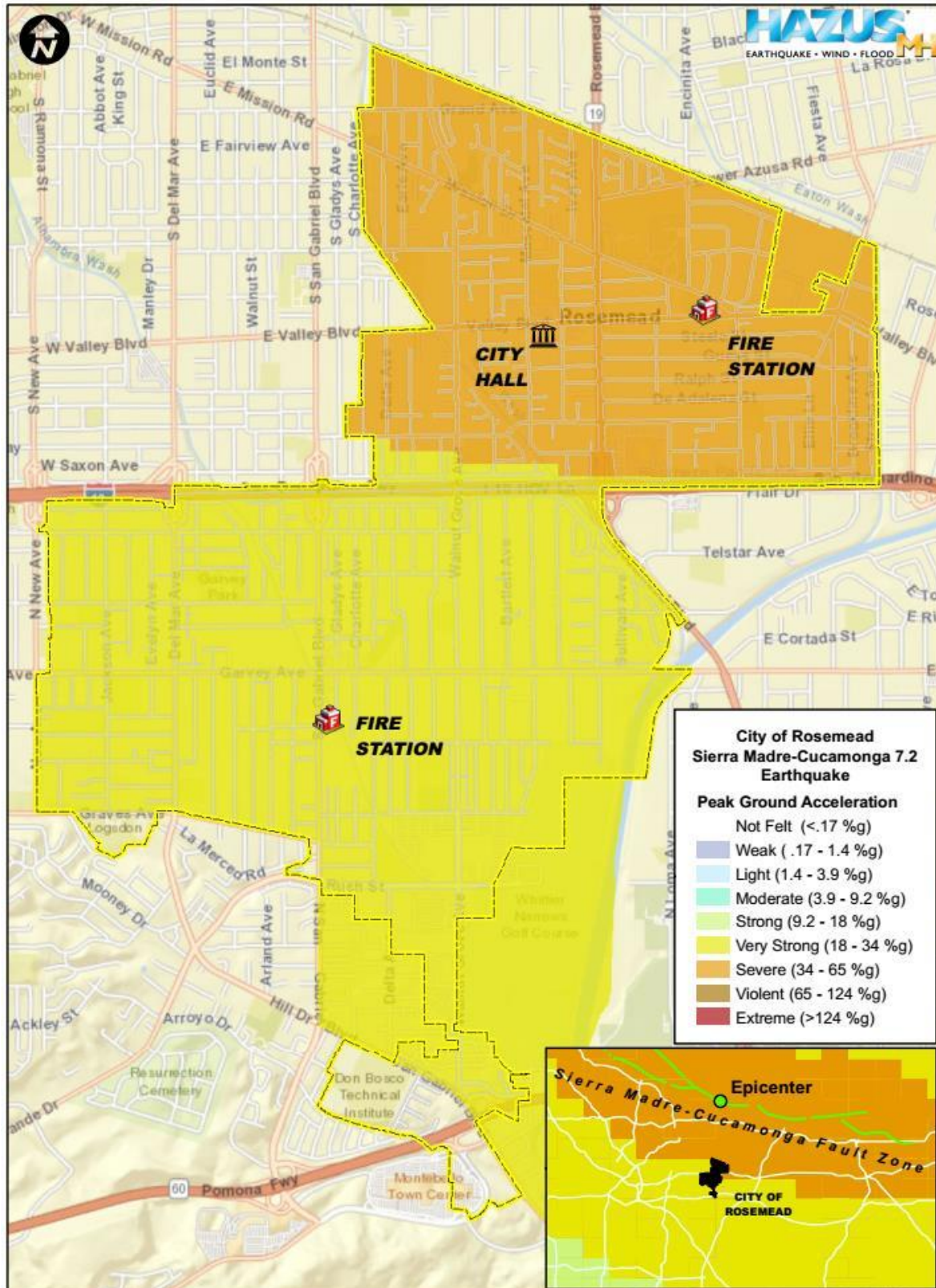
Economic Losses

The total economic loss estimated for the Sierra Madre M7.2 earthquake scenario is **\$280.15 million dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Economic Losses (\$ Dollars) – Sierra Madre M7.2

Category	Estimated Loss (\$)
Income	\$32,885,500
Capital Stock	\$201,498,500
Transportation Systems	\$1,138,400
Utility Systems	\$44,628,000
TOTAL	\$280,150,400

Map: Shake Intensity Map – Sierra Madre M7.2
(Source: Emergency Planning Consultants)



San Andreas M8.0 Earthquake Scenario

Building Damage

Table: Expected Building Damage San Andreas M8.0

Damage Extent	None	Slight	Moderate	Extensive	Complete
Total	6,367	6,845	969	213	314

Transportation and Utility Lifeline Damage

Table: Expected Utility System Pipeline Damage – San Andreas M8.0

System	Total Pipelines (Length km)	Number of Leaks	Number of Breaks
Potable Water	2,201	54,004	13,501
Waste Water	1,321	38,703	9,676
Natural Gas	880	11,101	2,775
Oil	0	0	0

Table: Potable Water and Electric Power System Performance – San Andreas M8.0

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	14,743	14,743	14,743	14,473	14,743	14,743
Electric Power		1,218	684	242	41	2

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 250 households to be displaced due to the earthquake. Of these, 225 people (out of a total population of 55,255) will seek temporary shelter in public shelters.

Casualties

The table below represents a summary of casualties estimated for San Andreas M8.0 earthquake scenario.

Table: Casualty Estimates – San Andreas M8.0

Time	Level 1	Level 2	Level 3	Level 4
2 AM	87	21	3	6
2 PM	577	179	30	59
5 PM	342	114	29	36
* Level 1: Injuries will require medical attention but hospitalization is not needed. Level 2: Will require hospitalization but are not considered life-threatening. Level 3: Will require hospitalization and can become life threatening if not promptly treated. Level 4: Victims are killed by earthquake.				

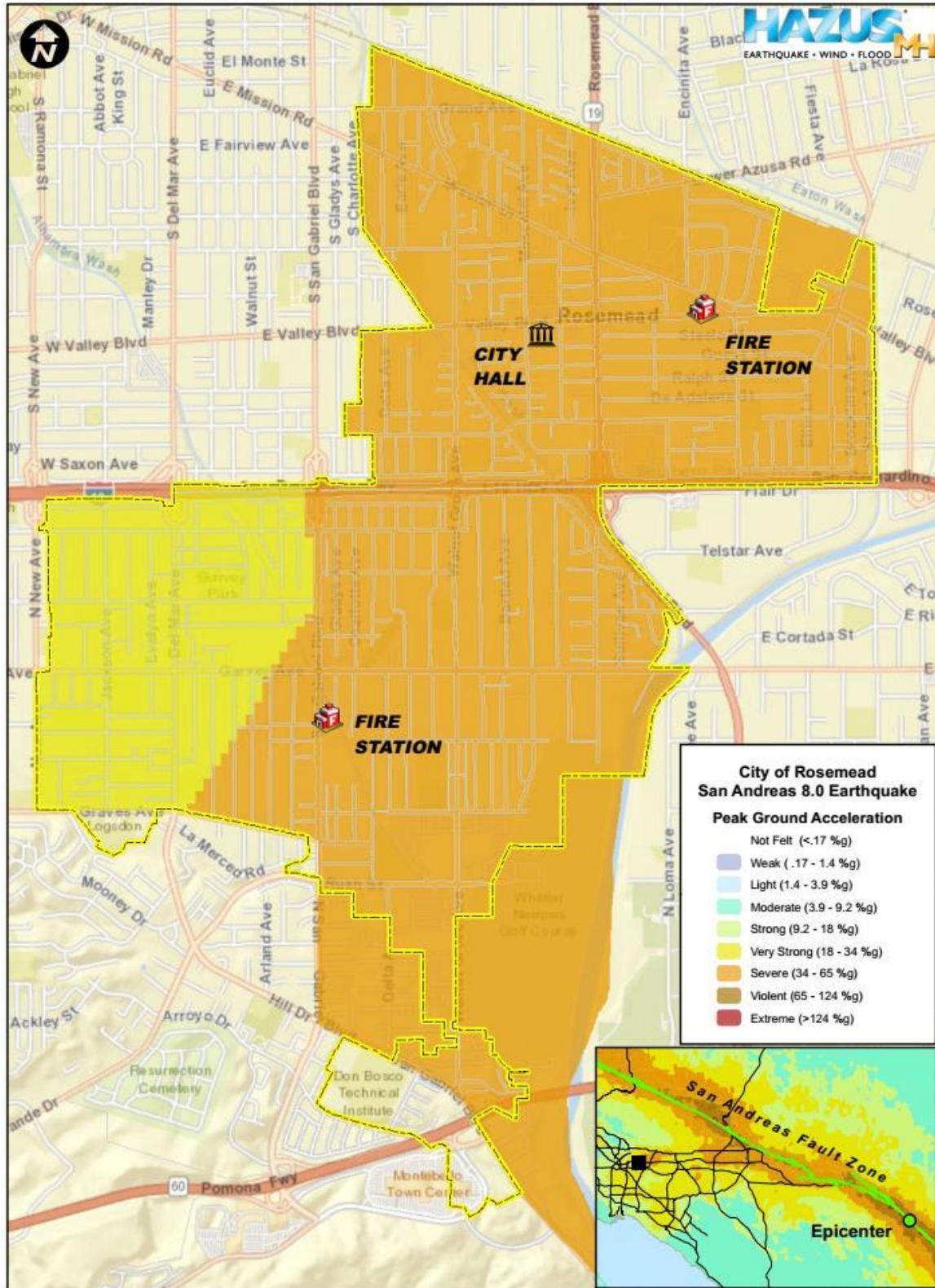
Economic Losses

The total economic loss estimated for the San Andreas M8.0 earthquake scenario is **\$1.16 billion dollars** which includes building and lifeline related losses based on the region's available inventory. The following tables provide more detailed information about these losses.

Table: Economic Losses (\$ Dollars) – San Andreas M8.0

Category	Estimated Loss (\$)
Income	\$97,693,900
Capital Stock	\$520,781,100
Transportation Systems	\$7,719,800
Utility Systems	\$530,481,600
TOTAL	\$1,156,676,400

Map: Shake Intensity Map – San Andreas M8.0
(Source: Emergency Planning Consultants)



Structures and Building Code

The built environment is susceptible to damage from earthquakes. Buildings that collapse can trap and bury people. Lives are at risk, and the cost to clean up the damages is great. In most California communities, including the City of Rosemead, many buildings were built before 1993 when building codes were not as strict. In addition, retrofitting is not required except under certain conditions and can be expensive. Therefore, the number of buildings at risk remains high. The California Seismic Safety Commission makes annual reports on the progress of the retrofitting of unreinforced masonry buildings. According to the City of Rosemead General Plan (2010), the City of Rosemead had seven unreinforced masonry structures however five have been strengthened and two were demolished.

Implementation of earthquake mitigation policy most often takes place at the local government level. The City of Rosemead Building and Safety Unit enforces building codes pertaining to earthquake hazards.

Additionally, the City has implemented basic building requirements that are above and beyond what the State demands for hazard mitigation. Newly constructed buildings in Rosemead that are built in an area subject to Earthquake-induced landslide or liquefaction are typically built with extra foundation support. Such support is found in the post-tension reinforced concrete foundation; this same technique is used by coastal cities to prevent home destruction during cases of liquefaction.

Generally, these codes seek to discourage development in areas that could be prone to flooding, landslide, wildfire and/or seismic hazards; and where development is permitted, that the applicable construction standards are met. Developers in hazard-prone areas may be required to retain a qualified professional engineer to evaluate level of risk on the site and recommend appropriate mitigation measures.

Flood Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Flood in the City of Rosemead** below.

Previous Occurrences of Flooding in the City of Rosemead

Flooding has not been a serious hazard to Rosemead in several decades, and the risk of disastrous flooding in the City is considered minimal. Rosemead does not lie within a 100- or 500- year floodplain, as delineated by the Federal Emergency Management Agency (FEMA). However, the potential for a localized flood event still exists within Rosemead, and it is an important hazard to be addressed in the City’s Hazard Mitigation Plan.

Since the writing of the 2012 Mitigation Plan, heavy rains in January and February of 2017 resulted in flooding to several streets and underpasses in the City of Rosemead.

Previous Occurrences of Flooding in Los Angeles County

Los Angeles County records reveal since 1861, the Los Angeles River has flooded 30 times, on average once every 6.1 years. But averages are deceiving, for the Los Angeles basin goes through periods of drought and then periods of above average rainfall. Between 1889 and 1891 the river flooded every year, from 1941 to 1945, the river flooded 5 times. Conversely, from 1896 to 1914, and again from 1944 to 1969, a period of 25 years, the river did not have serious floods.

Average annual precipitation in Los Angeles County ranges from 13 inches on the coast to approximately 40 inches on the highest point of the Peninsular Mountain Range that transects the County. Several factors determine the severity of floods, including rainfall intensity and duration. A large amount of rainfall over a short time span can result in flash flood conditions. A sudden thunderstorm or heavy rain, dam failure, or sudden spills can cause flash flooding. The National Weather Service’s definition of a flash flood is a flood occurring in a watershed where the time of travel of the peak of flow from one end of the watershed to the other is less than six hours.

The towering mountains that give the Los Angeles region its spectacular views also wring a great deal of rain out of the storm clouds that pass through. Because the mountains are so steep, the rainwater moves rapidly down the slopes and across the coastal plains on its way to the ocean.

Naturally, this rainfall moves rapidly downstream, often with severe consequences for anything in its path. In extreme cases, flood-generated debris flows will roar down a canyon at speeds near 40 miles per hour with a wall of mud, debris and water, tens of feet high. Flooding occurs when climate, geology, and hydrology combine to create conditions where water flows outside of its usual course.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard’s overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

According to the City of Rosemead’s General Plan (2010), Rosemead does not have natural floodplain areas, although it is bordered by the Rio Hondo flood control channel on its eastern and southeastern extremes.

According to FEMA, the City of Rosemead is designated a No Special Flood Hazard Area (NSFHA). A Non-Special Flood Hazard Area (NSFHA) is an area that is in a moderate- to low-risk flood zone (Zones B, C, X Pre- and Post-FIRM). According to **Map: Flood Insurance Rate Map**, the built areas of the City are in “Flood Zone X” and “Flood Zone D”. Zone X is defined as the area outside the 500-year flood and protected by levee from 100-year flood. Zone D is defined as areas in which flood hazards are undetermined (no analysis of flood hazards has been conducted), but possible.

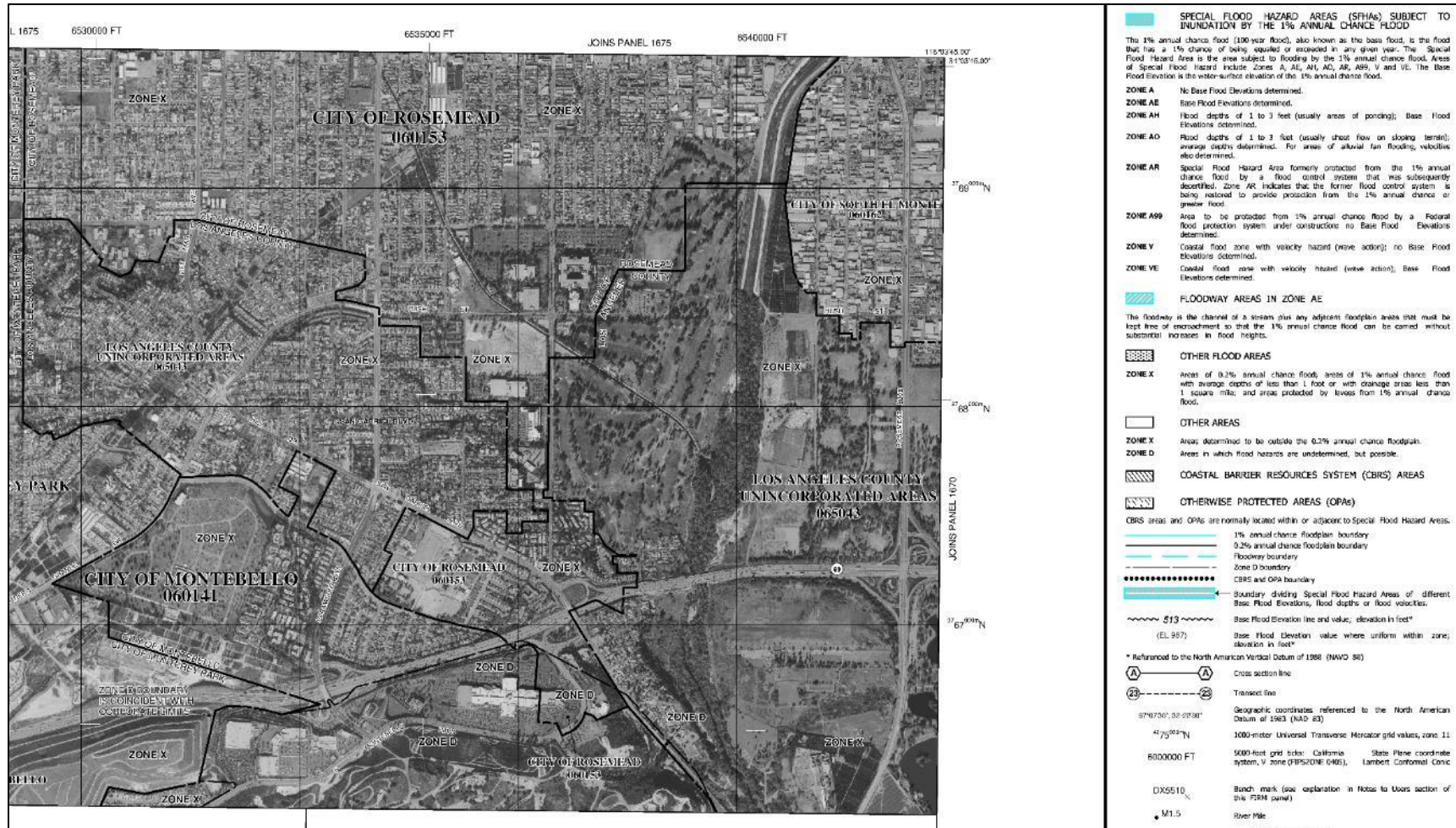
An NSFHA is not in any immediate danger from flooding caused by overflowing rivers or hard rains. However, it’s important to note that structures within a NSFHA are still at risk. In fact, over 20-percent of all flood insurance claims come from areas outside of mapped high-risk flood zones.

Any low-lying urban area is prone to flooding. With Rosemead’s geographic location approximately seven to eight from the foot of the San Gabriel mountains, there is a remote possibility of flooding. Flooding in urban areas is likely when water generated by runoff exceeds the storm-drain system’s capacity to remove it.

National Flood Insurance Program

The City participates in the National Flood Insurance Program (NFIP). Created by Congress in 1968, the NFIP makes flood insurance available in communities that enact minimum floodplain management rules consistent with the Code of Federal Regulations §60.3.

Map: Flood Insurance Rate Map
 (Source: FEMA Flood Map Service Center)



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Flooding in the City of Rosemead** below.

Impact of Flooding in the City of Rosemead

Floods and their impacts vary by location and severity of any given flood event, and likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that floods will continue to have devastating economic impact to certain areas of the City.

Impact that is not quantified, but anticipated in future events includes:

- ✓ Injury and loss of life;
- ✓ Commercial and residential structural damage;
- ✓ Disruption of and damage to public infrastructure;
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values and
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

Dam Failure Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Dam Failure in the City of Rosemead** below.

Previous Occurrences of Dam Failure in the City of Rosemead

The City of Rosemead has not been recently affected by a release/failure of any of the dam facilities identified in **Table: Dams Near City of Rosemead**.

Since the writing of the 2012 Mitigation Plan, there have been no dam failure incidents that have impacted the City of Rosemead.

Previous Occurrences of Dam Failure in Los Angeles County

There are a total of 103 dams in Los Angeles County, owned by 23 agencies or organizations, ranging from the Federal government to Home Owner Associations. These dams hold billions of gallons of water in reservoirs. Releases of water from the major reservoirs are designed to protect Southern California from flood waters and to store domestic water. Seismic activity can compromise the dam structures, and the resultant flooding could cause catastrophic flooding. Following the 1971 Sylmar earthquake the Lower Van Norman Dam showed signs of structural compromise, and tens of thousands of persons had to be evacuated until the dam could be drained. The dam has never been refilled.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

Q: Is there a description of each identified hazard's overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

Loss of life and damage to structures, roads, and utilities may result from a dam failure. Economic losses also result from a lowered tax base and lack of utility profits. Because dam failure has severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with county officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner.

Table: Dams Near City of Rosemead

Name of Facility	Owner	Primary Purpose
Santa Fe Dam	U.S. Army Corps of Engineers (ACOE)	Flood Control
Whittier Narrows	U.S. Army Corps of Engineers (ACOE)	Flood Control
Garvey Reservoir	Metropolitan Water District	Water Supply Storage

Santa Fe Dam

Santa Fe Dam and Reservoir is a flood control project in the Los Angeles County Drainage Area (LACDA) flood control system. The dam’s embankment is a horseshoe-shaped, curved gravity structure, located on the San Gabriel River, south of Azusa. The project was completed in January 1949. The primary purpose of the dam is to provide flood risk management to the communities along the San Gabriel River downstream of the basin.

A total of 2,554 acres was acquired in fee for construction, operation, and maintenance of the Dam. The Corps reserves 1,272 acres exclusively for Dam operations. The remaining 1,282 acres are available for compatible purposes with a preference towards recreational purposes. The Corps granted a lease of approximately 836 acres in the Reservoir for recreation purposes to the County of Los Angeles.



Whittier Narrows Dam

According to the U.S. Army Corps of Engineers, Whittier Narrows Dam is a flood risk management and water conservation project constructed in 1957 and operated by the U.S. Army Corps of Engineers, Los Angeles District. The project is located, as its name implies, at the "Whittier Narrows," a natural gap in the hills that form the southern boundary of the San Gabriel Valley. The Rio Hondo and the San Gabriel rivers flow through this gap and are impounded by the reservoir.

Whittier Narrows Dam, a typically dry flood risk management structure located 11 miles east of downtown Los Angeles, has been reclassified from Dam Safety Action Classification (DSAC) 2 to DSAC 1.

The DSAC 1 rating indicates that the U.S. Army Corps of Engineers considers the incremental risk – the combination of life or economic consequences with the likelihood of failure – to be very high. The reclassification as DSAC 1 identifies the dam as one of the highest priority dam safety projects in the Corps’ portfolio of dams.

In a May 25, 2016, memorandum to Col. Kirk Gibbs, commander of the Corps' Los Angeles District, Mr. James Dalton, chief of Engineering and Construction at Corps headquarters, emphasized that new findings with respect to the anticipated performance of the spillway gates drove the reclassification.

The Los Angeles District is currently working with a nationwide team of experts to develop a plan to reduce the risk associated with the spillway. The Corps anticipates that some of the potential solutions will be in operation prior to the 2016-2017 winter rains; other measures will likely be installed before the end of 2017.



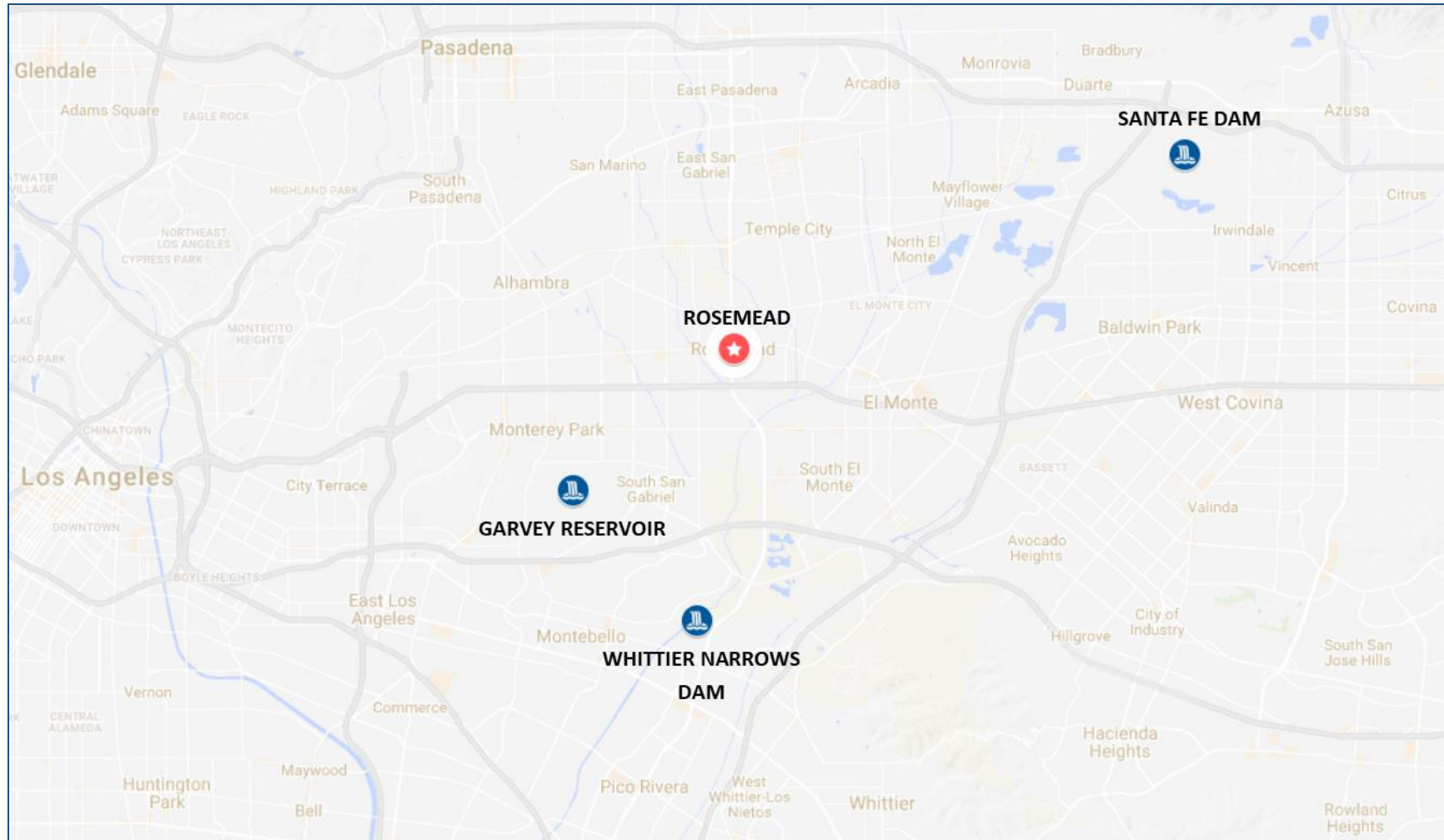
Garvey Reservoir

Garvey Reservoir, owned by the Metropolitan Water District of Southern California (MWD), stores municipal water supplies for MWD customers. The reservoir lies impounded behind a north dam and a south dam. MWD completed a substantial overhaul of the facility in 1999 to address seepage and ensure overall reservoir integrity. The state Department of Conservation, Division of Dam Safety conducts periodic dam inspections to verify the dams' ability to withstand seismic stresses. A major seismic event has the potential to cause significant damage and potential failure at this facility.

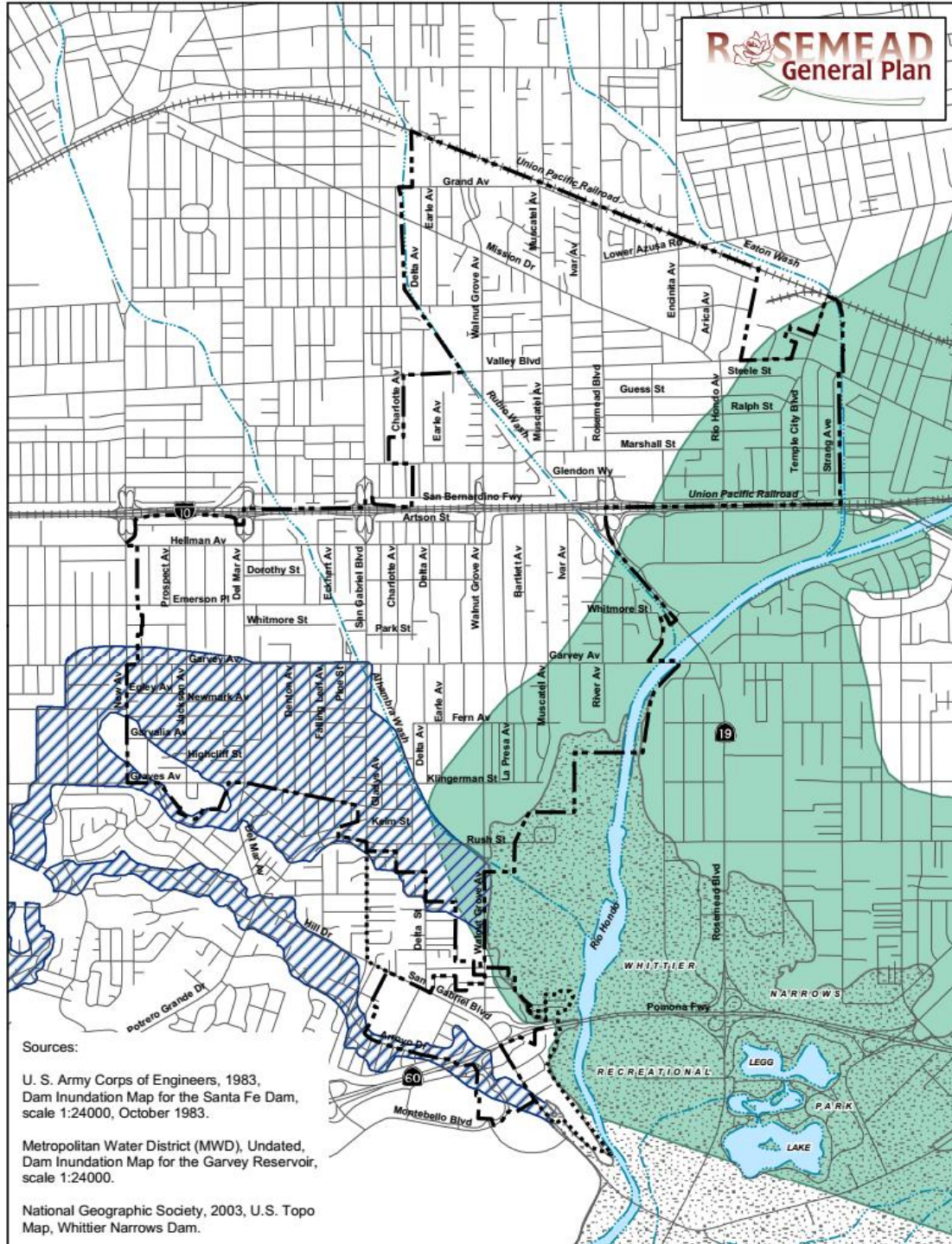


Map: Dam Failure Inundation Areas below shows the potential flood inundation areas in the event of a catastrophic dam failure at any of the aforementioned facilities.

Map: Dams Near City of Rosemead
 (Source: Emergency Planning Consultants, Google Maps)



Map: Dam Failure Inundation Areas
 (Source: Rosemead General Plan – 2010)



Sources:
 U. S. Army Corps of Engineers, 1983, Dam Inundation Map for the Santa Fe Dam, scale 1:24000, October 1983.
 Metropolitan Water District (MWD), Undated, Dam Inundation Map for the Garvey Reservoir, scale 1:24000.
 National Geographic Society, 2003, U.S. Topo Map, Whittier Narrows Dam.

- Rosemead City Boundary
- Sphere of Influence Boundary
- Major Roads
- ++++ Railroad
- River/Wash
- Flood Inundation Areas - Due to Catastrophic Dam Failure
- Whittier Narrows Dam
- Garvey Reservoir
- Santa Fe Dam

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Dam Failure in the City of Rosemead** below.

Impacts of Dam Failure in the City of Rosemead

Based on the risk assessment, it is evident that dam failures will continue to have potentially devastating economic impacts to certain areas of the City.

Impacts that are not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations are needed

Windstorm Hazards

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B2a.

Q: Does the plan include information on **previous occurrences** of hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Previous Occurrences of Windstorms in the City of Rosemead** below.

Previous Occurrences of Windstorms in the City of Rosemead

According to City of Rosemead, the most recent windstorm on record occurred in the winter of 2011. The City of Rosemead suffered approximately \$130,000 of loss during the windstorms of November 30 and December 1, 2011. The fierce windstorm, with gusts of 80mph and greater, toppled power lines and trees, left debris on roads, and left many traffic signals inoperable. Many Rosemead residents were left without power for three days. A local emergency was declared and a small-scale activation of the Emergency Operations Center (EOC) was initiated.

Since the writing of the 2012 Mitigation Plan, there have been no significant windstorms in the City of Rosemead.



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B1a.

Q: Does the plan include a general **description** of all natural hazards that can affect each jurisdiction? (Requirement §201.6(c)(2)(i))

A: See **Local Conditions** below.

Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3b.

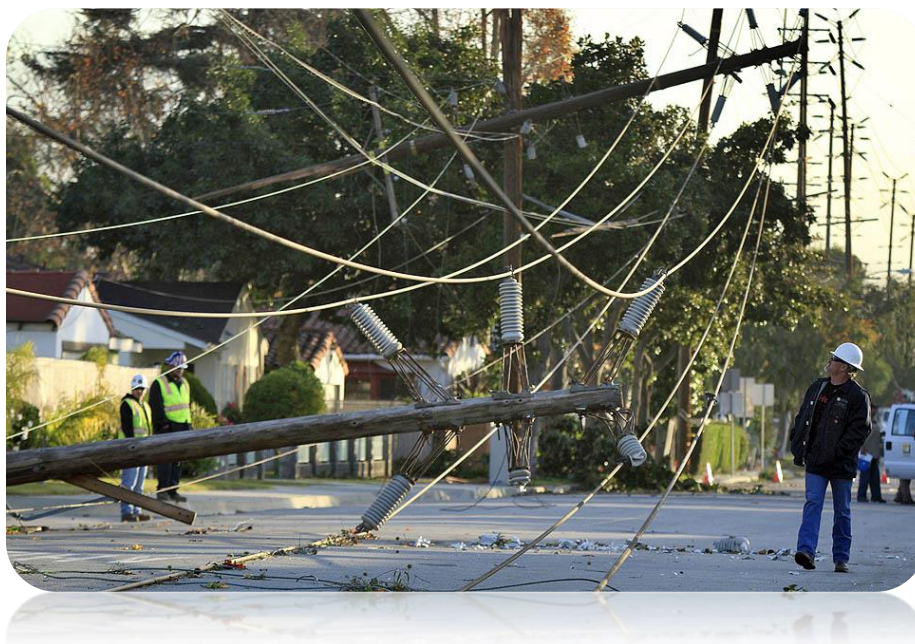
Q: Is there a description of each identified hazard’s overall **vulnerability** (structures, systems, populations, or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction? (Requirement §201.6(c)(2)(ii))

A: See **Local Conditions** below.

Local Conditions

Based on the 2011 windstorm, it is not difficult to assume that a future windstorm event could generate similar damage. Severe windstorms pose a significant risk to life and property in the City of Rosemead by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses in and near the community. High winds have destructive impact, especially to trees, power lines, and utility services.

The most common wind condition is a Santa Ana Wind. This condition has generated winds that have exceeded 100 mph. Wind velocities of up to 111 mph have been generated from the same Santa Ana wind, resulting in the loss of life due to flying debris.



Q&A | ELEMENT B: HAZARD IDENTIFICATION AND RISK ASSESSMENT | B3a.

Q: Is there a description of each hazard's **impacts** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? (Requirement §201.6(c)(2)(ii))

A: See **Impact of Windstorms in the City of Rosemead** below.

Impacts of Windstorms in the City of Rosemead

Based on the risk assessment, it is evident that Windstorms continue to have potentially devastating economic impact to certain areas of the City.

Impacts that is not quantified, but can be anticipated in future events, include:

- ✓ Injury and loss of life
- ✓ Commercial and residential structural damage
- ✓ Disruption of and damage to public infrastructure
- ✓ Secondary Health hazards e.g. mold and mildew
- ✓ Damage to roads/bridges resulting in loss of mobility
- ✓ Significant economic impact (jobs, sales, tax revenue) upon the community
- ✓ Negative impact on commercial and residential property values
- ✓ Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.

PART III: MITIGATION STRATEGIES

Mitigation Strategies

Overview of Mitigation Strategy

As the cost of damage from natural disasters continues to increase nationwide, the City of Rosemead recognizes the importance of identifying effective ways to reduce vulnerability to disasters. Mitigation Plans assist communities in reducing risk from natural hazards by identifying resources, information and strategies for risk reduction, while helping to guide and coordinate mitigation activities throughout the City.

The plan provides a set of action items to reduce risk from natural hazards through education and outreach programs, and to foster the development of partnerships. Further, the plan provides for the implementation of preventative activities, including programs that restrict and control development in areas subject to damage from natural hazards.

The resources and information within the Mitigation Plan:

1. Establish a basis for coordination and collaboration among agencies and the public in the City of Rosemead;
2. Identify and prioritize future mitigation projects; and
3. Assist in meeting the requirements of federal assistance programs

The Mitigation Plan is integrated with other City plans including the City of Rosemead Emergency Operations Plan, General Plan as well as department-specific standard operating procedures.

Mitigation Measure Categories

Following is FEMA's list of mitigation categories. The activities identified by the Planning Team are consistent with the six broad categories of mitigation actions outlined in FEMA publication 386-3 *Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies*.

- ✓ **Prevention:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- ✓ **Property Protection:** Actions that involve modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- ✓ **Public Education and Awareness:** Actions to inform and educate citizens, property owners, and elected officials about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- ✓ **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses preserve or restore the functions of natural systems. Examples include sediment and

erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- ✓ **Emergency Services:** Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- ✓ **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, retaining walls, and safe rooms.

Q&A | ELEMENT C. MITIGATION STRATEGY | C3

Q: Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))

A: See **Goals** below.

Goals

The Planning Team developed mitigation goals to avoid or reduce long-term vulnerabilities to hazards. These general principles clarify desired outcomes.

The goals are based on the risk assessment and Planning Team input, and represents a long-term vision for hazard reduction or enhanced mitigation capabilities. They are compatible with community needs and goals expressed in other planning documents prepared by the City.

Each goal is supported by mitigation action items. The Planning Team developed these action items through its knowledge of the local area, risk assessment, review of past efforts, identification of mitigation activities, and qualitative analysis.

The five mitigation goals and descriptions are listed below.

Protect Life and Property

Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from natural, human-caused, and technological hazards.

Improve hazard assessment information to make recommendations for avoiding new development in high hazard areas and encouraging preventative measures for existing development in areas vulnerable to natural, human-caused, and technological hazards.

FEMA defines **Goals** as general guidelines that explain what you want to achieve. They are usually broad policy-type statements, long-term, and represent global visions.

FEMA defines **Mitigation Activities** as specific actions that help you achieve your goals and objectives.

Enhance Public Awareness

Develop and implement education and outreach programs to increase public awareness of the risks associated with natural, human-caused, and technological hazards.

Provide information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

Preserve Natural Systems

Support management and land use planning practices with hazard mitigation to protect life.

Preserve, rehabilitate, and enhance natural systems to serve hazard mitigation functions.

Encourage Partnerships and Implementation

Strengthen communication and coordinate participation with public agencies, citizens, non-profit organizations, business, and industry to support implementation.

Encourage leadership within the City and public organizations to prioritize and implement local and regional hazard mitigation activities.

Strengthen Emergency Services

Establish policy to ensure mitigation projects for critical facilities, services, and infrastructure.

Strengthen emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

Coordinate and integrate hazard mitigation activities where appropriate, with emergency operations plans and procedures.

The Planning Team also developed hazard-specific mitigation goals, which appear in the **Mitigation Strategies Section**.

How are the Mitigation Action Items Organized?

The action items are a listing of activities in which City agencies and citizens can be engaged to reduce risk. Each action item includes an estimate of the timeline for implementation.

The action items are organized within the following **Mitigation Actions Matrix**, which lists all of the multi-hazard (actions that reduce risks for more than one specific hazard) and hazard-specific action items included in the mitigation plan. Data collection and research and the public participation process resulted in the development of these action items. The Matrix includes the following information for each action item:

Funding Source

The action items can be funded through a variety of sources, possibly including: operating budget/general fund, development fees, Community Development Block Grant (CDBG), Hazard Mitigation Grant Program (HMGP), other Grants, private funding, Capital Improvement Plan, and other funding opportunities.

Coordinating Organization

The Mitigation Actions Matrix assigns primary responsibility for each of the action items. The hierarchies of the assignments vary – some are positions, others departments, and other committees. The primary responsibility for implementing the action items falls to the entity shown as the “Coordinating Organization”. The coordinating organization is the agency with regulatory responsibility to address hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Coordinating organizations may include local, County, or regional agencies that are capable of or responsible for implementing activities and programs.

Plan Goals Addressed

The plan goals addressed by each action item are included as a way to monitor and evaluate how well the mitigation plan is achieving its goals once implementation begins.

The plan goals are organized into the following five areas:

- ✓ Protect Life and Property
- ✓ Enhance Public Awareness
- ✓ Preserve Natural Systems
- ✓ Encourage Partnerships and Implementation
- ✓ Strengthen Emergency Services

Q&A | ELEMENT C. MITIGATION STRATEGY | C5a.

Q: Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Benefit/Cost Ratings** and **Priority Rating** below.

Benefit/Cost Ratings

The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

High: Existing jurisdictional funding will not cover the cost of the action item so other sources of revenue would be required.

Medium: The action item could be funded through existing jurisdictional funding but would require budget modifications.

Low: The action item could be funded under existing jurisdictional funding.

Benefit ratings were defined as follows:

High: The action item will provide short-term and long-term impacts on the reduction of risk exposure to life and property.

Medium: The action item will have long-term impacts on the reduction of risk exposure to life and property.

Low: The action item will have only short-term impacts on the reduction of risk exposure to life and property.

Priority Rating

Going beyond rating “benefit and cost”, the Planning Team adopted the following process for rating the “priority” of each mitigation action item. Designations of “High”, “Medium”, and “Low” priority have been assigned to each action item using the following criteria:

Does the Action:

- solve the problem?
- address Vulnerability Assessment?
- reduce the exposure or vulnerability to the highest priority hazard?
- address multiple hazards?
- benefits equal or exceed costs?
- implement a goal, policy, or project identified in the General Plan or Capital Improvement Plan?

Can the Action:

- be implemented with existing funds?
- be implemented by existing state or federal grant programs?
- be completed within the 5-year life cycle of the LHMP?
- be implemented with currently available technologies?

Will the Action:

- be accepted by the community?
- be supported by community leaders?
- adversely impact segments of the population or neighborhoods?
- require a change in local ordinances or zoning laws?
- positive or neutral impact on the environment?
- comply with all local, state and federal environmental laws and regulations?

Is there:

- sufficient staffing to undertake the project?
- existing authority to undertake the project?

As mitigation action items were updated or written the Planning Team, representatives were provided worksheets for each of their assigned action items. Answers to the criteria above determined the priority according to the following scale.

- 1-6 = Low priority
- 7-12 = Medium priority
- 13-18 = High priority

Q&A | ELEMENT C. MITIGATION STRATEGY | C1b.

Q: Does the plan document each jurisdiction's ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3) c

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4a.

Q: Does the plan identify and analyze a comprehensive range (different alternatives) of specific mitigation actions and projects to reduce the impacts from hazards? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4b.

Q: Does the plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C4c.

Q: Do the identified mitigation actions and projects have an emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C5a.

Q: Does the plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT C. MITIGATION STRATEGY | C5b.

Q: Does the plan identify the position, office, department, or agency responsible for implementing and administering the action/project, potential funding sources and expected timeframes for completion? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D1

Q: Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D2

Q: Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Q&A | ELEMENT D. MITIGATION STRATEGY | D3

Q: Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))

A: See **Mitigation Actions Matrix** below.

Mitigation Actions Matrix

Following is **Table: Mitigation Actions Matrix** which identifies the existing and future mitigation activities developed by the Planning Team.

Table: Mitigation Actions Matrix

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
MULTI-HAZARD ACTION ITEMS															
MH-1	Integrate the goals and action items from the City of Rosemead Hazard Mitigation Plan into existing regulatory documents and programs where appropriate.	Community Development	Ongoing	X	X	X	X	X	Y	GF, GR	GF, GR	H	M	H	Zoning Ordinance was updated in 2013, General Plan updated in 2010 (Hazard Mitigation Plan provided to consultant)
MH-2	Partner with local groups and agencies to identify and pursue	All Departments	Ongoing	X	X	X	X	X	Y	GF, GR	GR	H	H	H	

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
	funding opportunities to develop and implement local mitigation activities.														
MH-3	Develop public and private partnerships to foster hazard mitigation program coordination and collaboration in Rosemead.	Disaster & Emergency Committee	Ongoing	X	X	X	X	X	Y	GF, GR	SP, GF	M	L	H	Notes: CERT, HAM Radio, Outreach to Schools
MH-4	Maintain inventories of infrastructure and facilities to prioritize mitigation projects.	Public Works	Ongoing	X	X	X	X	X	Y	GF	CIP, GP	H	H	H	
MH-5	Strengthen emergency services preparedness and response by linking emergency services with hazard mitigation programs and enhancing public education Citywide.	Emergency Services	3-5 years	X	X										Deleted – lack of staff and funding
MH-5	Continue education programs aimed at mitigating natural hazards and reducing the risk	Public Safety, City Manager	Ongoing	X	X		X	X	Y	SP, GF	GF	H	L	H	Revised Action Item, Agency, Timeline,

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
	to citizens, public agencies, private property owners, and businesses.														
MH-6	Maintain a shelter plan for major disaster events impacting the City of Rosemead.	Public Safety, Parks & Recreation	Ongoing	X	X		X	X		GF	GF	H	L	H	Revised Action Item
MH-7	Maintain an evacuation route map in coordination with County of Los Angeles.	Public Safety, Los Angeles Sheriff's Department	Ongoing	X			X	X		GF	GF	H	L	H	Revised Action Item, Timeline
MH-8	Fund and install retrofit for fire sprinklers in all City-owned building.	Public Works	1-5 years	X	X		X		Y	GF, GR	GF, GR	H	M	H	New
MH-9	Strengthen communications repeater tower to mitigate against damage from earthquake and high winds.	Public Works	1-5 years	X	X		X		Y	GF, GR	GF, GR	H	M	H	New
MH-10	Establish and adequately equip a facility for animal care and	Public Safety, Public Works	1-5 years	X	X	X	X	X	Y	GF	GF	H	M	H	New

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
	storage of deceased animals following a disaster.														
MH-11	Purchase and install emergency generators at each of the designated shelters in Rosemead.	Public Works	1-5 years	X	X	X	X	X	Y	GF, GR	GF, GR	H	M	H	New
MH-12	Seek funding and prepare a Facilities Master Plan.	Community Development	3-5 years	X	X	X	X	X	Y	GR	GR	H	H	H	New
MH-13	Fund and prepare a Pre-Disaster Debris Management Plan	Public Works, Public Safety	3-5 years	X	X	X	X	X	Y	GF, GR	GF, GR	H	H	H	New
MH-14	Inventory existing equipment resources needed for debris management and flooding.	Public Works, Public Safety	1 year	X	X	X	X	X	Y	GF	GF	H	L	H	New
MH-15	Seek funding and purchase equipment needed for debris management and flooding (e.g. barricades, chipper, dump truck, etc.).	Public Works, Public Safety	2-5 years	X	X	X	X	X	Y	GR	GR	H	L	H	New

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
MH-16	Assess structural adequacy and location of existing EOC (now located on a known earthquake fault)	Public Works, Public Safety	1 year	X	X	X	X	X	Y	GF	GF	H	M	H	New
EARTHQUAKE ACTION ITEMS															
EQ-1	Review earthquake standards for the City of Rosemead and incorporate necessary changes into the City General Plan.	Community Development	Every 3 years	X	X		X	X	Y	GF	GF	H	M	H	Revised Agency, Timeline; Note: Coincides with Building Code Updates
EQ-2	Develop a permanent relationship with local private and public earthquake research and education institutions.	Public Safety	Completed		X			X							Completed
EQ-3	Conduct public awareness campaign to encourage seismic-strength evaluations of	Public Safety	Ongoing	X	X	X	X	X	Y	GF	SP, GF	H	L	H	Revised Action Item, Agency, Timeline

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
	privately-owned structures in the City.														
EQ-4	Identify funding sources for structural retrofitting of City-owned structures in the Rosemead.	Public Safety, Public Works	Ongoing	X				X	Y	GR	CIP	H	H	H	Revised Action Item, Agency, Timeline
EQ-5	Develop public information programs to encourage earthquake preparedness.	Public Safety	Ongoing		X			X		GF	GF	H	L	H	Revised Timeline
EQ-6	Encourage the purchase of private earthquake insurance in Rosemead.	Public Safety, Community Development	Ongoing	X	X		X	X		GF	GF	H	L	H	Revised Agency, Timeline
EQ-7	Develop a response model based on the possibility of accurate earthquake prediction techniques.	Public Safety, LA County Sheriff's Department, LA County Fire Department	Completed	X			X								Completed with HAZUS in the HMP Update
EQ-8	Establish a program to fund seismic retrofit projects for private structures.	Public Safety	1-5 years	X	X	X	X	X	Y	GR	GR	H	M	H	New

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
EQ-9	Fund and construct seismic retrofit for all City facilities and designated shelters.	Community Development	1-5 years	X	X	X	X	X	Y	GR	GR	H	H	H	New
FLOODING ACTION ITEMS															
FLD-1	Encourage local residents and businesses to take steps to prepare for the winter rainy season.	Public Safety	Ongoing	X	X	X	X	X		GF	SP, GF	H	L	H	Revised Timeline
FLD-2	Continue frequent communications with LA County Flood Control District to update the City on any changes in the management of the Eaton Canyon Dam and local flood control channels.	Public Works	Ongoing	X	X	X	X	X	Y	GF	GF	M	L	M	Revised Action Item, Goals
FLD-3	Continue to participate in Alert LA and HAM Program.	Public Safety, LA County Sheriff's Department, Public Works	Ongoing	X	X		X	X		GF	GF	H	L	H	Revised Action Item, Agencies, Goals

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
FLD-4	Review development requirements in potential floodplain areas.	Community Development, Public Works	3-5 Years	X	X	X	X	X	Y	GR	GR	H	H	H	Revised Agencies, Timeline, Goals
FLD-5	Seek funding and prepare Stormwater Management Plan.	Public Works	1-5 years	X	X	X	X	X	Y	GR	CIP	H	H	H	Revised Action Item, Agencies, Goals
FLD-6	Identify potential or developing surface water drainage obstructions in the City of Rosemead.	City Planning Division, City Engineer	3-5 years	X											Deleted – already addressed with FLD-5 above
FLD-7	Construct projects identified in the Stormwater Management Plan.	Public Works	1-5 years	X	X	X	X	X	Y	GR	CIP	H	H	H	New

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes	
FLD-8	Develop a Community Bioswales Program. Bioswales are landscape elements designed to concentrate or remove silt and pollution out of surface runoff water.	Community Development	Completed													New
FLD-9	Improve drainage capabilities at locations with a history of urban flooding (e.g. streets and underpasses).	Public Works	1-5 years	X	X	X	X	X	Y	GR	GR	H	H	H		New
WINDSTORM ACTION ITEMS																
WS-1	Provide public notification during periods when high winds are forecast for the area.	Public Safety	Ongoing	X	X		X	X		GF	SP	H	L	H		Revised Action Item, Agency, Goals
WS-2	Assist private property owners regarding windstorm mitigation activities.	Public Works, Public Safety	Ongoing	X	X		X	X	Y	GF, GR	SP, GF	M	L	H		Revised Agencies, Goals
WS-3	Upgrade the current utility pole system in the City. Many of the utility poles in the City are over	Public Works, Southern California Edison	Completed													Completed in 2017

Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant, Strategic Plan-SP	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	2017 Comments and Status - Completed, Revised, Deleted, New, Deferred, and Notes
	20 years old. Develop a plan to inspect and replace aging poles.														
WS-4	Study and fund replacement of City-owned light poles.	Public Works	1-5 years	X	X		X	X	Y	GF, GR	GF, GR	H	M	H	New
WS-5	Increase frequency of existing tree-trimming schedule.	Public Works	1 year	X	X	X	X	X		GF, GR	GF, GR	H	M	H	New
WS-6	Fund and write a Tree Master Plan.	Community Development	3-5 years	X	X	X	X	X		GR	GR	H	H	H	New
DAM FAILURE ACTION ITEMS															
DF-1	Continue to work closely with Army Corps of Engineers on status of Whittier Narrows Dam.	Public Works	Ongoing	X	X		X	X		GF	GF	H	L	H	New
DF-2	Conduct public awareness activities to educate the public on status of Whittier Narrows Dam.	Public Safety, Public Works	Ongoing	X	X		X	X		GF	GF	H	L	H	New

Plan Maintenance

The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan update every five years. This section describes how the City will integrate public participation throughout the plan maintenance process.

Method and Scheduling of Plan Implementation

The Planning Team that was involved in research and writing of the Plan will also be responsible for implementation. The Planning Team will be led by the Chair of the Planning Team and will be referred to as the Local Mitigation Officer.

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring	X	X	X	X	X
Evaluating					X
Internal Planning Team Evaluation	X	X	X	X	X
Cal OES and FEMA Evaluation					X
Updating					X

Monitoring and Implementing the Plan

Plan Adoption

The City Council will be responsible for adopting the Mitigation Plan. This governing body has the authority to promote sound public policy regarding hazards. Once the plan has been adopted, the Local Mitigation Officer will be responsible for submitting it to the State Hazard Mitigation Officer at California Office of Emergency Services (Cal OES). Cal OES will then submit the plan to the Federal Emergency Management Agency (FEMA) for review and approval. This review will address the requirements set forth in 44 C.F.R. Section 201.6 (Local Mitigation Plans). Upon acceptance by FEMA, City of Rosemead will gain eligibility for Hazard Mitigation Grant Program funds.

Local Mitigation Officer

Under the direction of the Local Mitigation Officer, the Planning Team will take responsibility for plan maintenance and implementation. The Local Mitigation Officer will facilitate the Planning Team meetings and will assign tasks such as updating and presenting the Plan to the members of the Planning Team. Plan implementation and evaluation will be a shared responsibility among all of the Planning Team members. The Local Mitigation Officer will coordinate with City leadership to ensure funding for 5-year updates to Plan as required by FEMA.

The Planning Team will be responsible for coordinating implementation of plan action items and undertaking the formal review process. The Local Mitigation Officer will be authorized to make changes in assignments to the current Planning Team.

The Planning Team will meet on a quarterly basis to review the status of the mitigation action items. Meeting dates will be scheduled once the final Planning Team has been established. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan.

Q&A | ELEMENT C. MITIGATION STRATEGY | C6a.

Q: Does the plan identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated? (Requirement §201.6(c)(4)(ii))

A: See **Implementation through Existing Program** below.

Implementation through Existing Programs

The City of Rosemead addresses statewide planning goals and legislative requirements through its General Plan, its Capital Improvement Plan, and the State's Building and Safety Codes. The Mitigation Plan provides a series of recommendations - many of which are closely related to the goals and objectives of existing planning programs. The City of Rosemead will implement recommended mitigation action items through existing programs and procedures.

The City of Rosemead Community Development Department is responsible for adhering to the State of California's Building and Safety Codes. In addition, the Planning Team will work with other agencies at the state level to review, develop and ensure the adopted Building and Safety Codes are adequate to mitigate or prevent damage by hazards. This is to ensure that life-safety criteria are met for new construction.

Some of the goals and action items in the Mitigation Plan will be achieved through activities recommended in the CIP. Various City departments develop the CIP and review it on an annual basis. Upon annual review of the CIP, the Planning Team will work with the City departments to identify areas that the Mitigation Plan action items are consistent with CIP goals and integrate them where appropriate.

As indicated in the **Mitigation Actions Matrix**, several action items have been added to ensure implementation through other existing planning mechanisms. Also, the **Table: Capability Assessment: Existing Processes and Programs** identifies the need to maintain balance and diversify the Hazard Mitigation Planning Team to accomplish an efficient and effective implementation of the Plan. The 2017 Plan's success will be ensured by the following:

- Diversity of Planning Team membership
- Quarterly implementation meetings and reporting
- Including Planning Team in review of development projects

Upon FEMA approval, the Planning Team will begin the process of incorporating existing planning mechanisms at the City level. The meetings of the Planning Team will provide an opportunity for Planning Team members to report back on the progress made on the integration of mitigation planning elements into City planning documents and procedures.

Economic Analysis of Mitigation Projects

FEMA's approach to identify the costs and benefits associated with hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis.

Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later.

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the Planning Team will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the Planning Team will use other approaches to understand the costs and benefits of each action item and develop a prioritized list.

The “benefit”, “cost”, and overall “priority” of each mitigation action item was included in the Mitigation Actions Matrix located in Part III: Mitigation Strategies. A more technical assessment will be required in the event grant funding is pursued through the Hazard Mitigation Grant Program. FEMA Benefit-Cost Analysis Guidelines are discussed below.

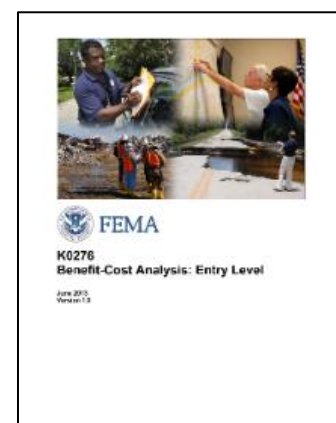
FEMA Benefit-Cost Analysis Guidelines

The Stafford Act authorizes the President to establish a program to provide technical and financial assistance to state and local governments to assist in the implementation of hazard mitigation measures that are cost effective and designed to substantially reduce injuries, loss of life, hardship, or the risk of future damage and destruction of property. To evaluate proposed hazard mitigation projects prior to funding FEMA requires a Benefit-Cost Analysis (BCA) to validate cost effectiveness. BCA is the method by which the future benefits of a mitigation project are estimated and compared to its cost. The end result is a benefit-cost ratio (BCR), which is derived from a project’s total net benefits divided by its total project cost. The BCR is a numerical expression of the cost effectiveness of a project. A project is considered to be cost effective when the BCR is 1.0 or greater, indicating the benefits of a prospective hazard mitigation project are sufficient to justify the costs.

Although the preparation of a BCA is a technical process, FEMA has developed software, written materials, and training to support the effort and assist with estimating the expected future benefits over the useful life of a retrofit project. It is imperative to conduct a BCA early in the project development process to ensure the likelihood of meeting the cost-effective eligibility requirement in the Stafford Act.

The BCA program consists of guidelines, methodologies and software modules for a range of major natural hazards including:

- ✓ Flood (Riverine, Coastal Zone A, Coastal Zone V)
- ✓ Hurricane Wind
- ✓ Hurricane Safe Room
- ✓ Damage-Frequency Assessment
- ✓ Tornado Safe Room
- ✓ Earthquake
- ✓ Wildfire



The BCA program provides up to date program data, up to date default and standard values, user manuals and training. Overall, the program makes it easier for users and evaluators to conduct and review BCAs and to address multiple buildings and hazards in a single BCA module run.

Q&A | ELEMENT A: PLANNING PROCESS | A6a.

Q: Does the plan identify how, when, and by whom the plan will be **monitored** (how will implementation be tracked) over time? (Requirement §201.6(c)(4)(i))

A: See **Monitoring the Plan** below.

Q&A | ELEMENT A: PLANNING PROCESS | A6c.

Q: Does the plan identify how, when, and by whom the plan will be **updated** during the 5-year cycle? (Requirement §201.6(c)(4)(i))

A: See **Monitoring the Plan** below.

Monitoring the Plan

Under the direction of the Local Mitigation Officer, the Planning Team will take responsibility for plan maintenance and implementation. Quarterly meetings will be established to ensure the identified mitigation action items are being accomplished. On the fifth year of the planning cycle, the Planning Team will meet to evaluate the effectiveness of the planning process and to update the overall content of the Plan. The Local Mitigation Officer will coordinate with City leadership to ensure funding for 5-year updates to Plan as required by FEMA.

The Planning Team will be responsible for coordinating implementation of plan by monitoring the progress of the mitigation action items and documenting progress notes for each item. It will be up to the Local Mitigation Officer to hold either a live meeting versus tasking the coordinating agencies with status updates on their own assigned mitigation action items. The monitoring meetings will take place no less than quarterly. These meetings will provide an opportunity to discuss the progress of the action items and maintain the partnerships that are essential for the sustainability of the mitigation plan. See the **Quarterly Implementation Report** discussed below which will be a valuable tool for the Planning Team to measure the success of the Hazard Mitigation Plan. The focus of the quarterly meetings will be on the progress and changes to the Mitigation Action Items.

Quarterly Implementation Report

The Quarterly Implementation Report is the same as the Mitigation Action Matrix but with a column added to the far right to track the quarterly status of each Action Item. Upon approval and adoption of the Plan, the entire Quarterly Implementation Report will be added to the Appendix of the Plan. Following is a view of the Quarterly Implementation Report:

Quarterly Implementation Report First Quarter 2018															
Item Identifier	Mitigation Action Item	Coordinating Agency	Timeline	Goal: Protect Life and Property	Goal: Public Awareness	Goal: Natural Systems	Goal: Emergency Services	Goal: Partnerships and Implementation	Buildings & Infrastructure: Does the Action item involve New and/or Existing Buildings and/or Infrastructure? Yes (Y)	Funding Source: GF- General Fund, GR-Grant	Planning Mechanism: GP-General Plan, CIP, GF-General Fund, GR-Grant	Benefit: L-Low, M-Medium, H-High	Cost: L-Low, M-Medium, H-High	Priority: L-Low, M-Medium, H-High	First Quarter 2018 Comments
MULTI-HAZARD ACTION ITEMS															
MH-1	Integrate the goals and action items from the City of Rosemead Hazard Mitigation Plan into existing regulatory documents and programs where appropriate.	Community Development Department	Ongoing					X							
MH-2	Partner with local groups and agencies to identify and pursue funding opportunities to develop and implement local mitigation activities.	Public Safety and Community Development Department	Ongoing					X							

An equally part of the monitoring process is the need to maintain a strategic planning process which needs to include funding and organizational support. In that light, at least one year in advance of the FEMA-mandated 5-year submission of an update, the Local Mitigation Officer will convene the Planning Team to discuss funding and timing of the update planning process.

On the fifth year of the planning cycles, the Planning Team will broaden its scope to include discussions and research on all of the sections within the Plan with particular attention given go goal achievement and public participation.

Q&A | ELEMENT A: PLANNING PROCESS | A6b.

Q: Does the plan identify how, when, and by whom the plan will be **evaluated** (assessing the effectiveness of the plan at achieving stated purpose and goals) over time? (Requirement §201.6(c)(4)(i))

A: See **Evaluating and Updating the Plan** below.

Evaluating and Updating the Plan

Formal Update Process

The Mitigation Plan will be monitored on a quarterly basis to determine the effectiveness of mitigation action items and to reflect changes in land development or programs that may affect mitigation actions or their priorities. The evaluation process includes a firm schedule and timeline, and identifies the agencies and organizations participating in plan evaluation. The Local Mitigation Officer or designee will be responsible for contacting the Planning Team members and organizing the quarterly meeting. Planning Team members will also be responsible for participating in the formal update to the Plan every fifth year of the planning cycle.

The Planning Team will review the goals and mitigation action items to determine their relevance to changing situations in the City, as well as changes in State or Federal policy, and to ensure

they are addressing current and expected conditions. The Planning Team will also review the Plan's **Risk Assessment** portion of the Plan to determine if this information should be updated or modified, given any new available data. The **coordinating organizations** responsible for the various action items will report on the status of their projects, including the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised. Amending will be made to the Mitigation Actions Matrix and other sections in the Plan as deemed necessary by the Planning Team.

Q&A | ELEMENT A: PLANNING PROCESS | A5

Q: Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))

A: See **Continued Public Involvement** below.

Continued Public Involvement

The City of Rosemead is dedicated to involving the public directly in the continual review and updates to the Mitigation Plan. Copies of the plan will be catalogued and made available at City Hall and at all City operated public libraries. The existence and location of these copies will be publicized in City newsletters and on the City website. This site will also contain an email address and phone number where people can direct their comments and concerns. A public meeting will also be held after each evaluation or when deemed necessary by the Planning Team. The meetings will provide the public a forum in which they can express their concerns, opinions, or ideas about the Plan.

The Local Mitigation Officer will be responsible for using City resources to publicize the annual public meetings and maintain public involvement through the public access channel, web page, and newspapers.

PART IV: APPENDIX

General Hazard Overviews

Earthquake Hazards

Measuring and Describing Earthquakes

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter. Soft soils can further amplify ground motions. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. One way to express an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. The acceleration due to gravity is often called "g". A ground motion with a peak ground acceleration of 100%g is very severe. Peak Ground Acceleration (PGA) is a measure of the strength of ground motion. PGA is used to

When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter.

project the risk of damage from future earthquakes by showing earthquake ground motions that have a specified probability (10%, 5%, or 2%) of being exceeded in 50 years. These ground motion values are used for reference in construction design for earthquake resistance. The ground motion values can also be used to assess relative hazard between sites, when making economic and safety decisions.

Another tool used to describe earthquake intensity is the Magnitude Scale. The Magnitude Scale is sometimes referred to as the Richter Scale. The two are similar but not exactly the same. The Magnitude Scale was devised as a means of rating earthquake strength and is an indirect measure of seismic energy released. The Scale is logarithmic with each one-point increase corresponding to a 10-fold increase in the amplitude of the seismic shock waves generated by the earthquake. In terms of actual energy released, however, each one-point increase on the Richter scale corresponds to about a 32-fold increase in energy released. Therefore, a Magnitude 7 (M7)

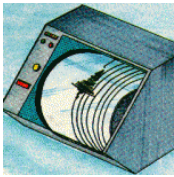


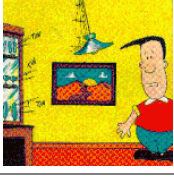

earthquake is 100 times (10 X 10) more powerful than a M5 earthquake and releases 1,024 times (32 X 32) the energy.


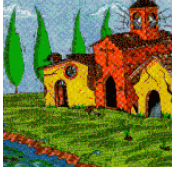





An earthquake generates different types of seismic shock waves that travel outward from the focus or point of rupture on a fault. Seismic waves that travel through the earth's crust are called body waves and are divided into primary (P) and secondary (S) waves. Because P waves move faster (1.7 times) than S waves, they arrive at the seismograph first. By measuring the time delay between arrival of the P and S waves and knowing the distance to the epicenter, seismologists can compute the magnitude for the earthquake.

The duration of an earthquake is related to its magnitude but not in a perfectly strict sense. There are two ways to think about the duration of an earthquake. The first is the length of time it takes for the fault to rupture and the second is the length of time shaking is felt at any given point (e.g. when someone says, "I felt it shake for 10 seconds" they are making a statement about the duration of shaking). (Source: www.usgs.gov)

The Modified Mercalli Scale (MMI) is another means for rating earthquakes, but one that attempts to quantify intensity of ground shaking. Intensity under this scale is a function of distance from the epicenter (the closer to the epicenter the greater the intensity), ground acceleration, duration of ground shaking, and degree of structural damage. The Modified Mercalli Intensity Scale below rates the level of severity of an earthquake by the amount of damage and perceived shaking.

Table: Modified Mercalli Intensity Scale

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	I	N/A	N/A	Not Felt
	II	N/A	N/A	Felt by persons at rest, on upper floors, or favorably placed.
	III	N/A	N/A	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
	IV	N/A	N/A	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motorcars rock. Windows, dishes, doors rattle. In the upper range of IV, wooden walls and frame creak.
	V	Light	Pictures Move	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clock stop, start, change rate.

	MMI Value	Description of Shaking Severity	Summary Damage Description Used on 1995 Maps	Full Description
	VI	Moderate	Objects Fall	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked.
	VII	Strong	Nonstructural Damage	Difficult to stand. Noticed by drivers of motorcars. Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Small slides and caving in along sand or gravel banks. Concrete irrigation ditches damaged.
	VIII	Very Strong	Moderate Damage	Steering of motorcars affected. Damage to masonry C, partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Cracks in wet ground and on steep slopes.
	IX	Violent	Heavy damage	General panic. Damage to masonry buildings ranges from collapse to serious damage unless modern design. Wood-frame structures rack, and, if not bolted, shifted off foundations. Underground pipes broken.
	X	Very Violent	Extreme Damage	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land.
	XI	N/A	N/A	Rails bent greatly. Underground pipelines completely out of services.
	XII	N/A	N/A	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Earthquake Related Hazards

Ground shaking, landslides, liquefaction, and amplification are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

Seismic activity along nearby or more distant fault zones are likely to cause ground shaking within the City limits.

Earthquake-Induced Landslide Potential

Generally, these types of failures consist of rock falls, disrupted soil slides, rock slides, soil lateral spreads, soil slumps, soil block slides, and soil avalanches. Areas having the potential for earthquake-induced landslides generally occur in areas of previous landslide movement, or where local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements.

Liquefaction

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these structures. Liquefaction generally occurs during significant earthquake activity, and structures located on soils such as silt or sand may experience significant damage during an earthquake due to the instability of structural foundations and the moving earth. Many communities in Southern California are built on ancient river bottoms and have sandy soil. In some cases, the soil may be subject to liquefaction, depending on the depth of the water table.

Flood Hazards

Flood Terminology

Floodplain

A floodplain is a land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess flood water. The floodplain is made up of two sections: the floodway and the flood fringe.

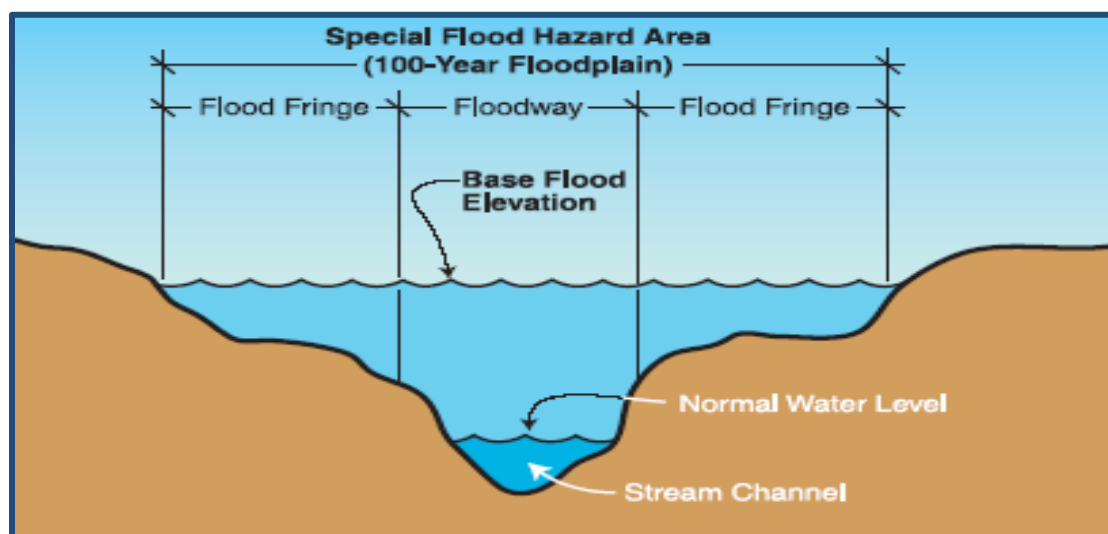
100-Year Flood

The 100-year flooding event is the flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood. Schematic: Floodplain and Floodway shows the relationship of the floodplain and the floodway.

The 100-year flooding event is the flood having a 1% chance of being equaled or exceeded in magnitude in any given year.

Contrary to popular belief, it is not a flood occurring once every 100 years.

Figure: Floodplain and Floodway
(Source: FEMA How-To-Guide Assessing Hazards)



Floodway

The floodway is one of two main sections that make up the floodplain. Floodways are defined for regulatory purposes. Unlike floodplains, floodways do not reflect a recognizable geologic feature. For NFIP purposes, floodways are defined as the channel of a river or stream, and the overbank areas adjacent to the channel. The floodway carries the bulk of the flood water downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties.

Base Flood Elevation (BFE)

The term "Base Flood Elevation" refers to the elevation (normally measured in feet above sea level) that the base flood is expected to reach. Base flood elevations can be set at levels other than the 100-year flood. Some communities use higher frequency flood events as their base flood elevation for certain activities, while using lower frequency events for others. For example, for the purpose of storm water management, a 25-year flood event might serve as the base flood elevation; while the 500-year flood event serves as base flood elevation for the tie down of mobile homes. The regulations of the NFIP focus on development in the 100-year floodplain.

Types of Flooding

Two types of flooding can affect the City of Rosemead: slow-rise or flash flooding. Slow-rise floods in Rosemead may be preceded by a warning period of hours or days. Evacuation and sandbagging for slow-rise floods have often effectively lessened flood related damage. Conversely, flash floods are most difficult to prepare for, due to extremely limited, if any, advance warning and preparation time. Unlike most of California, the areas of Los Angeles County that are subject to slow-rise flooding are not associated with overflowing rivers, aqueducts, canals or lakes. Slow-rise flooding in Rosemead is usually the result of one or a combination of the following factors: extremely heavy rainfall, saturated soil, area recently burned in wild fires with inadequate new ground cover growth, or heavy rainfall with runoff from melting mountain snow.

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in flood waters that rise very rapidly and peak with violent force.

The City of Rosemead has a high concentration of impermeable surfaces that either collect water, or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding. Drainage systems within the City of Rosemead have been updated and it is anticipated that they would be fully functional in an emergency.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Definitions of FEMA Flood Zone Designations

Flood zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.

Moderate to Low Risk Areas

In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones:

ZONE	DESCRIPTION
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

High Risk Areas

In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones:

ZONE	DESCRIPTION
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.

ZONE	DESCRIPTION
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

Undetermined Risk Areas

ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

Dam Failure Hazards

Hazard Characteristics

Definition

Dams are man-made structures built for a variety of uses including flood protection, power, agriculture, water supply, and recreation. When dams are constructed for flood protection, they usually are engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If a larger flood occurs, then that structure will be overtopped. Overtopping is the primary cause of earthen dam failure in the United States.

Failed dams can create floods that are catastrophic to life and property as a result of the tremendous energy of the released water. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives. Dams typically are constructed of earth, rock, concrete, or mine tailings. Two factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream.

Dam failures can result from any one or a combination of the following causes:

- ✓ Prolonged periods of rainfall and flooding, resulting in excess overtopping flows
- ✓ Earthquake
- ✓ Inadequate spillway capacity, resulting in excess overtopping flows
- ✓ Internal erosion caused by embankment or foundation leakage or piping
- ✓ Improper design
- ✓ Improper maintenance
- ✓ Negligent operation
- ✓ Failure of upstream dams on the same waterway

Since 1929, the State of California is responsible for overseeing dams to safeguard life and property (California Department of Resources, 1995). This legislation was prompted by the 1928 failure of St. Francis Dam. In 1965, the law was amended to include off stream storage reservoirs due to the 1963 failure of Baldwin Hill Reservoir. In 1973, Senate Bill 896 was enacted to require dam owners, under the direction of Cal OES, to show the possible inundation path in the event of a dam failure.

Governmental assistance could be required and continued for an extended period. These efforts are required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and welfare for the affected population including, as required, temporary housing for displaced persons.

Windstorm Hazards

Hazard Characteristics

Santa Ana wind conditions results in two general disaster conditions. The most common is fire fanned by the high winds. This was the situation in 1993 in Laguna Beach when a massive fire destroyed a number of homes in the surrounding hills. Wind driven flames again caused the destruction of more than 3,000 homes in Southern California in October of 2003. Other forms of disaster would be direct building damage, damage to utilities and infrastructure as a result of the high winds. This has occurred in the past few years in many southland communities including Los Angeles County.



Santa Ana winds commonly occur between October and February, with December having the highest frequency of events. Summer events are rare. Wind speeds are typically north to east at 35 knots through and below passes, and canyons with gusts to 50 knots. Stronger Santa Ana winds has gusts greater than 60 knots over widespread areas, and gusts greater than 100 knots in favored areas. Frequently, the strongest winds in the basin occur during the night and morning hours due to the absence of a sea breeze. The sea breeze which typically blows onshore daily, can moderate the Santa Ana winds during the late morning and afternoon hours. Santa Ana winds are an important forecast challenge because of the high fire danger associated with them. Also, unusually high surf conditions on the northeast side of the Channel Islands normally accompany a Santa Ana event.

The Beaufort Scale below, coined and developed by Sir Francis Beaufort in 1805, illustrates the effect that varying wind speed can have on sea swells and structures:

Table: Beaufort Scale
(Source : NOAA Storm Center)

Beaufort Force	Speed (mph)	Wind Description - State of Sea - Effects on Land
0	Less 1	Calm - Mirror-like - Smoke rises vertically
1	1-3	Light - Air Ripples look like scales; No crests of foam - Smoke drift shows direction of wind, but wind vanes do not
2	4-7	Light Breeze - Small but pronounced wavelets; Crests do not break - Wind vanes move; Leaves rustle; You can feel wind on the face
3	8-12	Gentle Breeze - Large Wavelets; Crests break; Glassy foam; A few whitecaps - Leaves and small twigs move constantly; Small, light flags are extended
4	13-18	Moderate Breeze - Longer waves; Whitecaps - Wind lifts dust and loose paper; Small branches move
5	19-24	Fresh Breeze - Moderate, long waves; Many whitecaps; Some spray - Small trees with leaves begin to move

Beaufort Force	Speed (mph)	Wind Description - State of Sea - Effects on Land
6	25-31	Strong Breeze - Some large waves; Crests of white foam; Spray - Large branches move; Telegraph wires whistle; Hard to hold umbrellas
7	32-38	Near Gale - White foam from breaking waves blows in streaks with the wind - Whole trees move; Resistance felt walking into wind
8	39-46	Gale - Waves high and moderately long; Crests break into spin drift, blowing foam in well-marked streaks - Twigs and small branches break off trees; Difficult to walk
9	47-54	Strong Gale - High waves with wave crests that tumble; Dense streaks of foam in wind; Poor visibility from spray - Slight structural damage
10	55-63	Storm - Very high waves with long, curling crests; Sea surface appears white from blowing foam; Heavy tumbling of sea; Poor visibility - Trees broken or uprooted; Considerable structural damage
11	64-73	Violent Storm - Waves high enough to hide small and medium sized ships; Sea covered with patches of white foam; Edges of wave crests blown into froth; Poor visibility - Seldom experienced inland; Considerable structural damage
12	>74	Hurricane - Sea white with spray. Foam and spray render visibility almost non-existent - Widespread damage. Very rarely experienced on land.

Santa Ana Winds and Tornado-Like Wind Activity

Based on local history, most incidents of high wind in the City of Rosemead are the result of the Santa Ana and El Niño related wind conditions. While high impact wind incidents are not frequent in the area, significant wind events and sporadic tornado activity have been known to negatively impact the City. In addition, the City is increasingly concerned with “global warming” ramifications and potential increases in wind related events.

What are Santa Ana Winds?

“Santa Ana winds are generally defined as warm, dry winds that blow from the east or northeast (offshore). These winds occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles and Orange County basins. Santa Ana winds often blow with exceptional speed in the Santa Ana Canyon (the canyon from which it derives its name). Forecasters at the National Weather Service offices in Oxnard and San Diego usually place speed minimums on these winds and reserve the use of “Santa Ana” for winds greater than 25 knots.” These winds accelerate to speeds of 35 knots as they move through canyons and passes, with gusts to 50 or even 60 knots.

“The complex topography of Southern California combined with various atmospheric conditions create numerous scenarios that may cause widespread or isolated Santa Ana events. Commonly, Santa Ana winds develop when a region of high pressure builds over the Great Basin (the high plateau east of the Sierra Mountains and west of the Rocky Mountains including most of Nevada and Utah). Clockwise circulation around the center of this high-pressure area forces air downslope from the high plateau. The air warms as it descends toward the California coast at the rate of five degrees F per 1,000 feet due to compressional heating. Thus, compressional heating provides the primary source of warming. The air is dry since it originated in the desert, and it dries out even more as it is heated.”

These regional winds typically occur from October to March, and, according to most accounts are named either for the Santa Ana River Valley where they originate, or for the Santa Ana Canyon, southeast of Los Angeles, where they pick up speed.

What are Tornadoes?

Tornadoes are spawned when there is warm, moist air near the ground, cool air aloft, and winds that speed up and change direction. An obstruction, such as a house, in the path of the wind causes it to change direction. This change increases pressure on parts of the house, and the combination of increased pressures and fluctuating wind speeds creates stresses that frequently cause structural failures.

In order to measure the intensity and wind strength of a tornado, Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale. This scale compares the estimated wind velocity with the corresponding amount of suspected damage. The scale measures six classifications of tornadoes with increasing magnitude from an “F0” tornado to a “F6+” tornado.

Table: Fujita Tornado Damage Scale
(Source: NOAA Storm Prediction Center)

Scale	Wind Estimated (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys and TV antennas; breaks twigs off trees; pushes over shallow-rooted trees.
F1	73-112	Moderate damage. Peels surface off roofs; windows broken; light trailer houses pushed or overturned; some trees uprooted or snapped; moving automobiles pushed off the road. 74 mph is the beginning of hurricane wind speed.
F2	113-157	Considerable damage. Roofs torn off frame houses leaving strong upright walls; weak buildings in rural areas demolished; trailer houses destroyed; large trees snapped or uprooted; railroad boxcars pushed over; light object missiles generated; cars blown off highway.
F3	158-206	Severe damage. Roofs and some walls torn off frame houses; some rural buildings completely demolished; trains overturned; steel-framed hangar-warehouse-type structures torn; cars lifted off the ground; most trees in a forest uprooted snapped, or leveled.
F4	207-260	Devastating damage. Whole frame houses leveled, leaving piles of debris; steel structures badly damaged; trees debarked by small flying debris; cars and trains thrown some distances or rolled considerable distances; large missiles generated.
F5	261-318	Incredible damage. Whole frame houses tossed off foundations; steel-reinforced concrete structures badly damaged; automobile-sized missiles generated; trees debarked; incredible phenomena can occur.
F6-F12	319 to sonic	Inconceivable damage. Should a tornado with the maximum wind speed in excess of F5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage on structures.

Microbursts

Unlike tornados, microbursts are strong, damaging winds which strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. But unlike a tornado, they affect only a rather small area. University of Chicago storm researcher Dr. Ted Fujita first coined the term "downburst" to describe strong, downdraft winds flowing out of a thunderstorm cell that he believed were responsible for the crash of Eastern Airlines Flight 66 in June of 1975.



A downburst is a straight-direction surface wind in excess of 39 mph caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms. In later investigations into the phenomena he defined two sub-categories of downbursts: the larger macrobursts and small microbursts.

Macrobursts are downbursts with winds up to 117 mph which spread across a path greater than 2.5 miles wide at the surface and which last from five to 30 minutes. The microburst, on the other hand is confined to an even smaller area, less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 270 km/hr (170 mph) and often last for less than five minutes.

Downbursts of all sizes descend from the upper regions of severe thunderstorms when the air accelerates downward through either exceptionally strong evaporative cooling or by very heavy rain which drags dry air down with it. When the rapidly descending air strikes the ground, it spreads outward in all directions, like a fast-running faucet stream hitting the sink bottom.

When the microburst wind hits an object on the ground such as a house, garage or tree, it can flatten the buildings, and strip limbs and branches from the tree. After striking the ground, the powerful outward running gust can wreak further havoc along its path. Damage associated with a microburst is often mistaken for the work of a tornado, particularly directly under the microburst. However, damage patterns away from the impact area are characteristic of straight-line winds rather than the twisted pattern of tornado damage."

Tornados, like those that occur every year in the Midwest and Southeast parts of the United States, are a rare phenomenon in most of California, with most tornado-like activity coming from micro-bursts.

What is Susceptible to Windstorms?

Life and Property

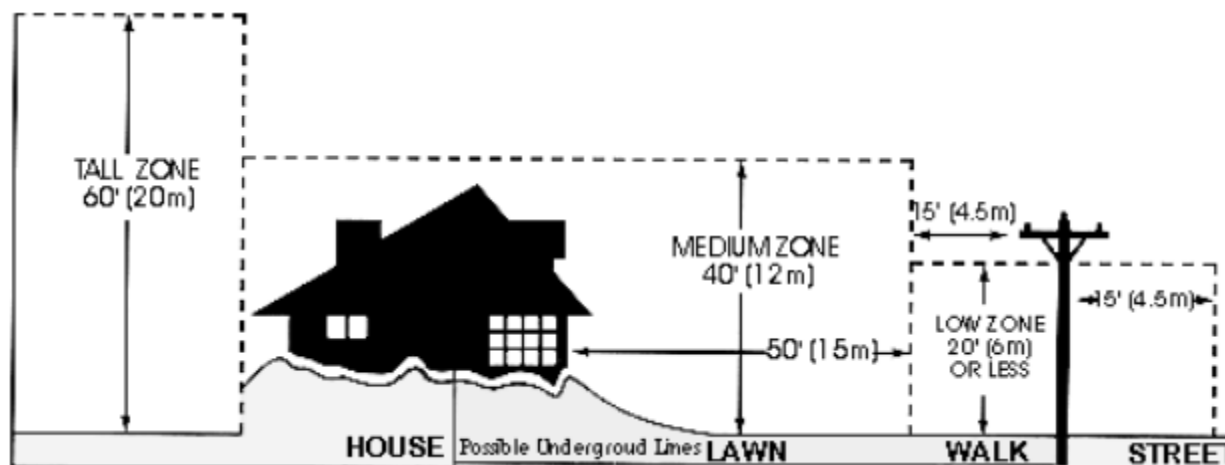
Based on the history of the region, windstorm events can be expected, perhaps annually, across widespread areas of the region which can be adversely impacted during a windstorm event. This can result in the involvement of City emergency response personnel during a wide-ranging windstorm or microburst tornadic activity. Both residential and commercial structures with weak reinforcement are susceptible to damage. Wind pressure creates a direct and frontal assault on

a structure, pushing walls, doors, and windows inward. Conversely, passing currents creates lift suction forces that pull building components and surfaces outward. With extreme wind forces, the roof or entire building can fail causing considerable damage.

Debris carried along by extreme winds can directly contribute to loss of life and indirectly to the failure of protective building envelopes, siding, or walls. When severe windstorms strike a City, downed trees, power lines, and damaged property can be major hindrances to emergency response and disaster recovery.

Utilities

Historically, falling trees are the major cause of power outages in the region. Windstorms such as strong microbursts and Santa Ana Wind conditions cause flying debris and downed utility lines. For example, tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, overhead power lines are damaged, even in relatively minor windstorm events. Falling trees bring electric power lines down to the pavement, creating the possibility of lethal electric shock.



Infrastructure

Windstorms damage buildings, power lines, and other property, and infrastructure, due to falling trees and branches. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds.

Increased Fire Threat

Perhaps the greatest danger from windstorm activity in Southern California comes from the combination of the Santa Ana winds with the major fires that occur every few years in the urban/wildland interface. With the Santa Ana winds driving the flames, the speed and reach of the flames is even greater than in times of calm wind conditions.

Transportation

Windstorm activity impacts local transportation in addition to the problems caused by downed trees and electrical wires blocking streets and highways. During periods of extremely strong Santa Ana winds, major highways can be temporarily closed to truck and recreational vehicle traffic. However, typically these disruptions are not long lasting, nor do they carry a severe long term economic impact on the region.

Attachments

FEMA Letter of Approval

City Council Staff Report

City Council Resolution

Planning Team Sign-In Sheets

City of Rosemead
Public Safety Department

Disaster and Emergency Committee Meeting
and
Local Hazard Mitigation Kick-Off Planning Meeting
City Hall, Conference Room



August 31, 2017
9:00 a.m. – 11:00 a.m.

Name

Title

[Signature]

City Clerk

[Signature]

Sr. Mgmt Analyst

Colleen Spivack

Finance Services Supervisor

[Signature]

Director Parks & Rec

CORY HANH

ASSOCIATE PLANNER

John Scott

Public Works Supt.

Brad McKinney

ASST CITY MANAGER

Monday Regan

RECREATION SUPERVISOR

Steven Torres

Public Safety

[Signature]

ADMIN SPECIALIST

Matthew Whittington

Intern

Wassim Ismail

Intern

Mandy Wong

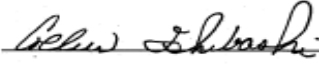

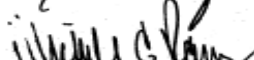
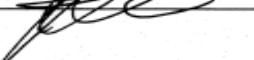
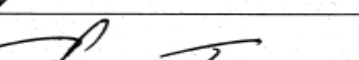
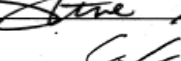
Public Safety Supervisor

City of Rosemead
Public Safety Department



Disaster and Emergency Committee Meeting &
Local Hazard Mitigation Kick-Off Planning Meeting
City Hall, Conference Room

September 28, 2017
9:00 a.m. – 11:00 a.m.




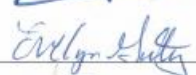

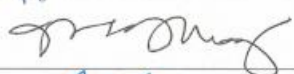

<u>NAME</u>	<u>SIGNATURE</u>	<u>TITLE</u>
Brad McKinney		Assistant City Manager
Colleen Ishibashi		Finance Services Supervisor
Cory Hanh		Associate Planner
Evelyn Gutierrez		Human Resources Specialist
Jason Chacon		Parks and Rec Director
John Scott		Public Works Superintendent
Mandy Wong		Public Safety Supv - EP
Marc Donohue		City Clerk
Marty Jones		Public Works Adm. Specialist
Michelle Ramirez		Public Works Director
Monday Regan		Parks and Rec Supervisor
Pat Piatt		Senior Management Analyst
Pearl Lieu		Finance Director
Steve Torres		Code Enforcement Officer
Matthew Whitham		Intern

City of Rosemead
Public Safety Department



Disaster and Emergency Committee Meeting &
Local Hazard Mitigation Kick-Off Planning Meeting #3
City Hall, Conference Room

October 26, 2017
9:00 a.m. – 11:00 a.m.

<u>NAME</u>	<u>SIGNATURE</u>	<u>TITLE</u>
Brad McKinney		Assistant City Manager
Colleen Ishibashi		Finance Services Supervisor
Cory Hanh		Associate Planner
Evelyn Gutierrez		Human Resources Specialist
Jason Chacon JERAY MOTA		Parks and Rec Director REC. SUPERVISOR
John Scott		Public Works Superintendent
Mandy Wong		Public Safety Supv - EP
Marc Donohue		City Clerk
Marty Jones		Public Works Adm. Specialist
Michelle Ramirez		Public Works Director
Monday Regan		Parks and Rec Supervisor
Pat Piatt		Senior Management Analyst
Pearl Lieu		Finance Director
Steve Torres		Code Enforcement Officer

Web Postings and Notices

List of Maps, Tables, Figures

Map: City of Rosemead.....	13
Table: Planning Phases Timeline.....	15
Table: Planning Team Level of Participation.....	17
Table: Planning Team Timeline.....	18
Figure: External Agencies Email Invite.....	20
Table: Capability Assessment - Existing Processes and Programs.....	22
Table: City of Rosemead Demographics.....	27
Table: City of Rosemead Housing.....	27
Table: City of Rosemead Industry.....	28
Table: City of Rosemead Occupation.....	29
Map: Regional Location Map.....	30
Map: Roadway Classifications.....	31
Table: Calculated Priority Risk Index.....	34
Table: Calculated Priority Risk Index Ranking for City of Rosemead.....	35
Table: Vulnerability: Location, Extent, and Probability for City of Rosemead.....	36
Table: Critical Facilities Vulnerable to Hazards.....	38
Map: Critical Facilities.....	39
Table: Impacts to Existing and Future Land Uses in the City of Rosemead.....	42
Map: Land Use Map.....	43
Map: Local Faults.....	47
Map: Alquist-Priolo Earthquake Fault Zone.....	48
Map: Earthquake-Induced Liquefaction & Landslide Areas.....	50
Table: Critical Facility Inventory – HAZUS.....	51
Table: Expected Building Damage Puente Hills M7.1.....	53
Table: Expected Utility System Pipeline Damage – Puente Hills M7.1.....	53
Table: Potable Water and Electric Power System Performance – Puente Hills M7.1.....	53
Table: Casualty Estimates – Puente Hills M7.1.....	54
Table: Economic Losses (\$ Dollars) – Puente Hills M7.1.....	54
Map: Shake Intensity Map – Puente Hills M7.1.....	55
Table: Expected Building Damage Sierra Madre M7.2.....	56
Table: Expected Utility System Pipeline Damage – Sierra Madre M7.2.....	56
Table: Potable Water and Electric Power System Performance – Sierra Madre M7.2.....	56
Table: Casualty Estimates – Sierra Madre M7.2.....	57
Table: Economic Losses (\$ Dollars) – Sierra Madre M7.2.....	57
Map: Shake Intensity Map – Sierra Madre M7.2.....	58
Table: Expected Building Damage San Andreas M8.0.....	59
Table: Expected Utility System Pipeline Damage – San Andreas M8.0.....	59
Table: Potable Water and Electric Power System Performance – San Andreas M8.0.....	59
Table: Casualty Estimates – San Andreas M8.0.....	60
Table: Economic Losses (\$ Dollars) – San Andreas M8.0.....	60
Map: Shake Intensity Map – San Andreas M8.0.....	61
Map: Flood Insurance Rate Map.....	65
Table: Dams Near City of Rosemead.....	68
Map: Dams Near City of Rosemead.....	70
Map: Dam Failure Inundation Areas.....	71
Table: Mitigation Actions Matrix.....	84
Table: Modified Mercalli Intensity Scale.....	101
Figure: Floodplain and Floodway.....	104

Table: Beaufort Scale.....109
Table: Fujita Tornado Damage Scale.....111